An exploration of the underlying generative mechanisms that shape university students' agency in their educational digital practices.

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ABSTRACT

Research in educational technology is often approached from an enthusiastic stance that emphasises questions related to 'what works', 'best practice', and 'efficiency', leaving the messy and nuanced lived digital culture and experiences of young people relatively unexplored. This study explores this gap, challenging deterministic therefore, reductive ideas such as young people being 'digital natives' and tools being naturally powerful drivers for change. The aim is to understand why and how undergraduates in Education Studies engage with digital tools and platforms? Rather than just accumulating facts and experiences about observable facts, emphasis is given not only to students' meaning making and decision-making concerning digital engagements with tools and platforms but also to explanations of the deeper levels of social reality. The overarching goal of the study is thus, to seek knowledge through scrutinising the level of the real where the generative mechanisms are found. The study was conducted at one small, post 92 university in the UK with 22 undergraduates attending the Education Studies course. For this empirical study, mapping was used as a means to inquire into students' daily entanglements with digital technology under a qualitative and critical approach. Whilst the philosophical anchor is critical realism, theoretical guidance is provided by Realist Social Theory. Under this framework, an explanation of the hidden and invisible generative mechanisms that shape students' reflexive engagement -their agency with digital technology was given. Through this viewpoint, the use of educational technology was addressed not from an individual perspective but in relation to the social structures in which students operate. The results of the study show how the institutional digital space is a space of struggle for many making it a structural barrier for students' agency. Emotions, one of the generative mechanisms at play, has a significant influence in shaping students' lack of engagement with open digital practices. It was also found that digital capability defined as a generative mechanism entails internal and external aspects such as the social position that students occupy in relation to others and technology, and the concomitant vested interest of students proves to have a strong impact in the digital practices that students engage with. Moreover, it was elicited that how the institutional culture operates has a powerful influence on students' reflexive engagement with open and participatory tools. In this study, three aspects of the institutional culture were addressed, the belief that students are digital natives, the assessment that prevails in the School of Education and the centrality of the VLE as the

main digital technology used to manage learning and teaching. Through bringing these findings to light, I make an empirically grounded contribution to the ongoing theoretical debates about structure and agency in students' open educational practices.

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CHAPTER 1
SETTING THE SCENE FOR THE STUDY

1.1. INTRODUCTION

To launch this study, I start with presenting the vignette of Debby who is a typical university student:

> *It [the Web] is too big, too open, too messy. And people assume (at the university) that I am the generation that was brought up with it. But I am not. I am the generation that people have forgotten, that the teachers didn't know how to teach it, so we are the ones that don't know. (Debby, a participant in one of the focus groups, Y-1 student, 19 years old)*

Debby is one of the participants of the study, who felt rather anxious when talking about her digital practices. She is one of the students of today, who were born in fact a decade later than the so-called first-generation digital natives. She is an engaged and proactive first year student at the School of Education, always curious and keen to learn new things and very enthusiastic when it comes to digital technology. However, despite all of this enthusiasm, she claims she is frightened of technology, and she feels that she has been forgotten, with no space for her voice to be heard. Despite of her eagerness to overcome her lack of digital literacies she is not able to do so.

It is the existence of these unheard and frustrated students who are vulnerable and very confused, that drives my exploration of the complex and nuanced entanglements of these young people with digital tools and platforms in their educational contexts. I am intrigued by a number of questions that I wish to explore through carrying out this study: What is the place of student agency in such landscape? What is constraining student ability to explore and reflexively engage with digital tools? Moreover, I feel it is important to understand how the institution can provide opportunities for student agency to be enacted and in so doing, pave their journey toward flourishing and emancipation. It appears that much remains to be done to reach a state where Debby and many others do not sense that they are forgotten but rather, feel the inspiration that drives our passion for learning.

1.2. RESEARCH BACKGROUND

Higher education is undergoing a period of intense change. This is being driven by many factors, such as the increasing number of students, the decrease in governmental funding, globalisation and marketisation, which has led to what Czerniewicz (2018) calls unbundling. This refers to the disaggregation of educational services that are further taken up by private business in partnership with HE institutions. Some of factors are political and economic in nature, whilst others are technological. In particular, the technological drivers are reshaping the context in which universities operate, allowing for new models of education to be introduced. While technologies are ubiquitous, being woven into students' daily lives, the reality of technology impacting on HE institutions is nuanced and complex. Thus, it is not simply about adding new tools for students to use under a quick fix approach (Eynon and Selwyn 2019)[1]. The quick fix is invariably informed by a deterministic technological rhetoric (which I will explain in more detail in chapter 2) that ascribes to technology all powers of change, thereby ignoring the work that needs to be undertaken by students and teachers to improve and transform education (Webster, 2017) through employing the affordances of technologies.

Selwyn and Eynon (2019) contend that the majority of interventions in educational technology are characterised by easily and quickly implemented tweaks, such as every student being given access to a computer. In so doing, the real problem, relating to the more profound, and most of the time, imperceptible structural issues that constrain technology use and student agency are overlooked. Ignoring the agency of those involved in the use of technology is highly problematic. For instance, the Horizon Report (2016, 2017) for HE[2] suggested that the key issue impeding the full creative adoption of technology is the low level of digital fluency among teachers and students within the academic environment.

[1] Interview by Neil Selwyn with Rebecca Eynon (May 2019): Digital Inequalities in education. Available at https://soundcloud.com/eetheducationesearcher/digital-inequalities-and-education-rebecca-eynon

[2] The Horizon Report was originally created by the New Media Consortium, a US based centre. In early 2018 the rights to the Report were acquired by EDUCAUCE, a non-profit association in the USA that advances HE through the use of technology. The Horizon report describes higher education trends, challenges, and developments in educational technology likely to have an impact on learning, teaching, and creative inquiry. It serves as a reference and technology planning guide for educators, higher education leaders, administrators, policy makers, and technologists.

As Eynon (2019) reminds us,

> *The digital is being used as a kind of fix for a wider range of social problems. Rather than thinking about the broader social structural issues we create this kind of individual fixes for people, (...) it might be giving them tools, or a set of digital skills that we hope will transform all of their life circumstances and solve all their problems.*

Eynon argues in this interview, that the aspect requiring research is not so much related to technology per se, but rather, pertains to understanding how people navigate their way through the world using technology and how different social structures shape these experiences. That is, the challenge is to understand the perspectives and practices of those who use technologies, whilst taking into account the various contexts in which these happen, as Corrin et al. (2018) have proposed. Archer (2012) contends that the properties and powers of human beings emerge through their relationship with the world, that is, through practice.

Oliver (2011), Selwyn (2012) and Selwyn and Facer (2013) argue for more theoretically driven methodologies to explore the complex realities regarding the use of technology in educational settings. Furthermore, Costa et al. (2019) hold that a particular challenge in educational technology research is to articulate the relationship between the tool, the person and the environment (the context) and to illuminate the opportunities for individual agency. Elucidating this relationship would offer an antidote to what Bishop (2002, p. 425) has identified as problematic, namely, that investigators often attempt to develop explanations based on "context-free-laws or models that identify the efficient causes of events in the human realm." For Bishop, such accounts reduce human actions to "just another passive link in the causal chain of events" with the consequence being that the interplay between human agency, cultural and social structures is overlooked which, in turn, inhibits any possibilities for generating social change.

One concept which has arisen from a deterministic mindset is that of the digital native. The specific label 'digital natives' was a neologism made popular by Mark Prensky[3] (2001a, 2001b, 2011), who described the generations born since 1980 as such, suggesting that they have a 'natural' confidence in using different technologies and that due to this exposure,

[3] boyd (2014, p. 177) explains how the term 'digital native' was coined by John Perry Barlow in 1996. He used it with political meaning in a manifesto that was challenging the 'Governments of the Industrial World' trying to put in opposition those who "came from cyberspace" to those who did not. For those interested in more details I refer you to boyd's interesting account in her book. boyd writes her name in lowercase deliberately.

they think and act differently and are different people. He was not the only scholar to describe young people in this way for Tapscott (1998, 1999, 2009) coined the term the 'Net-Generation' and described them in similar ways,

> *They accept little at face value (...) unlike the TV generation which had no viable means to interact with media content. The N-Generation has the tools to challenge ideas, people, statements - anything. These youth love to argue and debate...they are also learning to think critically as well.* (Tapscott 2009, P.88)

These authors seem to imply that due to the increasing exposure to digital technology that a particular generation has had they have unproblematic, positive, and homogenous access to, and experiences with the digital world and its concomitant practices. They hold that technologies bring collaboration and creativity to their users and assume that technologies are always used to their full potential. This perspective appears to align with an essentialist approach to technology use (Hamilton and Friesen, 2013, p. 4). Under this lens, in the context of education the student's agency is completely overlooked. Moreover, the problem that arises when it is assumed that students are digital natives is that, as Corrin et al. (2017) and Kennedy et al. (2008) contend, there is a failure to recognize the need to develop young people's digital capabilities effectively, particularly in an educational context.

Evidence shows that students are still uncertain about how and which technologies they should use for studying (Beetham and White, 2013) but they are willing to incorporate technology into their learning in ways that are relevant for their academic success. This matter was raised in an OECD report (2012), where it is claimed that whilst students lack the necessary digital literacies for their learning, they expect them to be enhanced through their university experience. Clearly, these are issues that need further exploration and research. Beetham and White (2013) looked at ways in which institutions could respond to students' changing expectations of their digital environment, citing the following as their main concerns. This set of issues inspires my curiosity to investigate this field, in depth.

- Students do not have clear ideas when they arrive about how digital technologies can support their studies or how technologies may be important in their lives beyond university. Students need help to develop these ideas.
- Students are eager to be co-creators, not only of content, but also of their digital environment. They think being consulted is not enough.

- Students need a flexible environment that allows them to experiment, tinker with new tools, learn from each other and create their own blend.
- Students are uncertain about the technologies they will use for studying; they don't know how to use personal devices, services, networks, and practices in academic contexts legitimately.

Given these contradictions and challenges in students' reports regarding the use of technology, there is a need to explore further what is happening on the ground with regards to students' digital educational practices. It is useful to enquire about the origins of the points raised by Beetham and White, and to understand the real stories of students' experiences when they attempt to engage with digital technologies in their educational and personal digital spaces. Furthermore, Czerniewicz and Brown (2010) point out that it is far more conducive to social change to explore the contradictions that are observed in students' daily use of technology than to stick to fixed views and enthusiastic rhetoric as these will never lead to change.

Selwyn & Facer (2014) argue that the idea of digital improvement/ transformation/ disruption of education requires problematisation. Jones & Czerniewicz (2011) and Hew et al. (2019) concur agreeing that the discipline of educational technology has been one where the use of theory has been scant, which has had a negative impact upon the development of the field. Selwyn and Facer (2014) urge social researchers to pose questions such as, how are digital technologies finding a place in education settings and educational contexts? To address such issues, it is imperative to have a social theoretical approach that assists in finding out the state of the actual, rather than assuming that there is one reality: one that is homogenous and naturally digitally oriented for all students. This requires that researchers unpack the messiness of students' daily entanglements with digital technologies. Cuban (1986), Waters (2012, 2015b) and Liu (2019) contend that there is a further pressing need to address the political dimensions around education, technology, and society. Clarity about these dimensions has become even more relevant in the current reality of COVID-19 where the HE sector has been forced to switch to online learning over the course of just a matter of weeks with negative consequences for students' learning experiences as well as a shock for some lecturers. It seems it is more urgent than ever to explore the interplay between student agency in digital spaces and the social and cultural conditions of the institutions where students are learning.

In order to address this gap and be able to unpack the aforementioned complexity, a critical realist perspective will be adopted in this study as it treats social reality as layered, open, and complex, whilst the fine grain details of complex reality will be analysed using a realist social lens informed by the work of Margaret Archer (Archer, 1995, 2003; 2007a). Her theory of social/individual change involves the interplay of structure, culture, and agency, with agency being an important building block of her work. Little research has been undertaken in the field of educational technology using this approach, with some notable exceptions (Hodgkinson-Williams, 2010; Cox, 2016a; Cox and Trotter, 2016; Cronin, 2017). However, in most cases, these scholars have put the focus of their investigations on lecturers instead of students.

The key advantage of working with Archer's theory is that she offers analytical tools to think about individuals as having agency and being able to do things, thus having control over their lives. At the same time, she maintains the view that social structures are real and influence what individuals do, while conversely, people can potentially change these structures and consequently, their practices. I consider this framework to be a strong counterargument to deterministic approaches regarding the use of educational technology and essentialist depictions of young people. Given some of the challenges that the HE sector is facing, an approach based on sustainable change could prove useful. For this to be possible, students' agency should be placed at the core of any technology inspired initiative. I consider it highly relevant to make technological innovation meaningful and sustainable for it seems that digital technology has a paramount role to play in the immediate future of teaching and learning.

I end this section with a quote from a current student attending one of my modules who feels completely overwhelmed with the new online learning that has been imposed due to the pandemic; she feels helpless and anxious.

> *I have been going over the resources posted and keeping as up to date as I can, just find the virtual classroom sessions quite scary and they make me a bit anxious (not sure exactly why, but just a bit overwhelming).* (Year two, 21 years old)

In the light of these reflections, I describe in the following section the purpose, the aims, and goals, as well as the design of this study.

1.3. PURPOSE OF THE STUDY: AIMS AND OBJECTIVES

The overall aim of the study is to explore the 'state-of-the-actual' (Selwyn, 2010) by looking at students' daily entanglements with digital tools and platforms, so as to reveal their constraints and potentialities, by placing the digital inside the fabric of everyday life. I will undertake this by using mapping (Le Cornu and White, 2017) as a means to inquire into student engagement with digital tools and platforms. Using a critical realist framework together with realist social theory (RST) (Archer, 1995, 2000, 2007) I set out on a journey of exploration to uncover the tensions between the institutional culture, the socio technical system, and students' agency in personal and institutional digital spaces. My intention in carrying out this study is to seek knowledge through scrutinising the deeper levels of social reality. Rather than relying on the accumulation of stories and experiences from what is observable, my emphasis is on uncovering what shapes students' meaning making and decision-making with respect to their (non)engagements with digital technologies. Furthermore, explanations pertaining to the deeper levels of social reality where the generative mechanisms that are responsible for and shape human action exist, are sought.

The main goal of the study is to explore and understand how, and if so, why and how a cohort of 20 undergraduates in Education Studies engaged or did not engage with digital tools and platforms in personal and institutional settings. The study is undertaken in two stages. First there is an exploratory one, where the aim is to investigate the participant students' digital profiles and hear the voices of the broader community of students. The second stage comprises in-depth investigation of the reality of students' digital practices in personal and institutional settings.

To accomplish the aims of the study I have posed a set of research questions, covering the aforementioned two stages, I list these below.

Exploratory stage:

R.Q.1. What is student's digital profile? (This is about the tools they use, hardware they own, technological infrastructure they have access to)

In depth study:

R.Q.2: Why and how do undergraduates, in Education Studies, engage with digital tools and platforms in formal and informal settings? This question is divided in two sub-questions:

2.1. Why do undergraduates in Education Studies engage/not engage with digital technologies in formal and informal settings?

2.2. How do undergraduates in Education Studies engage/not engage with digital technologies in formal and informal settings?

R.Q.3: How do undergraduates make sense of the environment where the engagement happens?

Two peer-reviewed articles have been published based on this study. One is based on the initial coding process of the empirical level of the phenomenon. The other is based on the literature review carried out for the study. The literature review and another contribution have been combined in a publication that was included in my keynote address in OER19 Galway (see appendix 1). A book chapter that is forthcoming is drawn from my research on critical approaches to participation in online learning experiences.

1.4. OVERVIEW OF THE STUDY

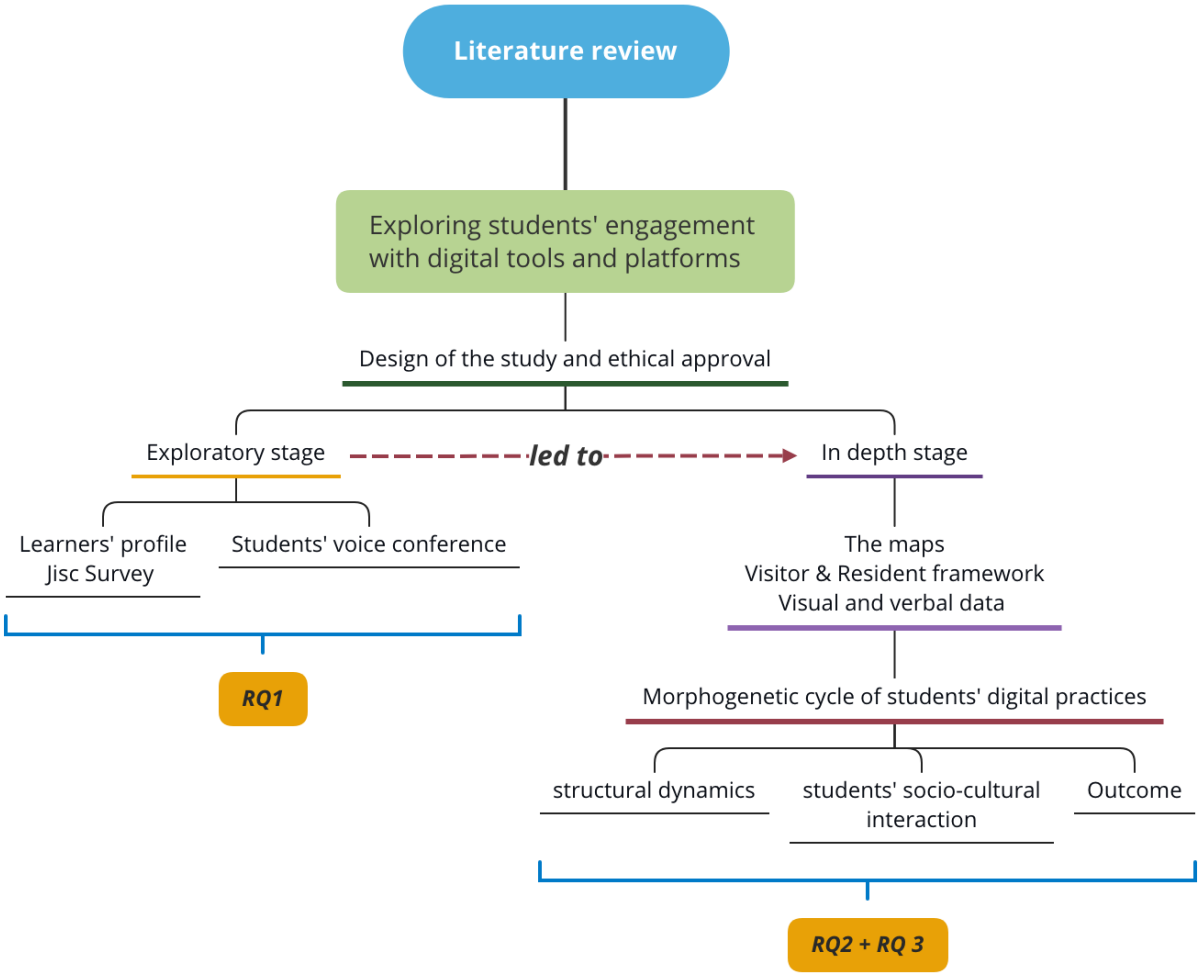

Figure 1: Overview of the study

1.5. THE SIGNIFICANCE OF THE STUDY

In this thesis, I contribute to both theory and practice by re-conceptualising deterministic approaches to technology use in education. This work focuses on students' agency in institutional digital spaces and its interplay with social and cultural structures. Instead of assuming that students have a natural and confident approach to the use of technology, in this thesis I set out to explore how students use technology and why they do so. This thesis investigates what shapes the process of engaging with technology, and how these engagements appear *in situ*. The study contributes to the understanding of the nature of students' reflexive engagement/lack of and digital practices and what are the main constraints they encounter in the process. In so doing, this thesis contributes to the understanding of the importance of reflexive engagement when it comes to open and more sophisticated educational practices. In addition, it furthers the understanding of how technology could be best integrated meaningfully into students' daily educational practices.

The thesis brings new knowledge to the field of educational practices in that it takes into account the constraints and enablers that shape students' reflexive engagement with digital technology, specifically with open and participatory tools in the academic context. These constraints are often invisible for students, which makes it difficult for them to identify the problem and plan a course of action to remedy them. Hence, this research contributes to the fostering of student agency in digital spaces, by improving their digital capabilities (internal and external). This will assist in making them able to navigate the open web with more confidence and enabling them to take advantage of the plethora of opportunities that are available online for their learning experience at the university.

I make an empirically grounded contribution to the ongoing theoretical debates about the interplay of structure, culture, and agency in student open educational practices. This contribution is achieved by systematically uncovering the nature and strength of relevant emergent generative mechanisms as well as accounting for their interaction with the structural conditions. These offer explanatory power regarding students' lack of reflexive engagement with open and participatory tools in the institutional context. In sum, this study sheds light on how the use of technology can, in an educational setting, be human

centred instead of tool centred. Understanding what mechanisms are affecting students' digital practices is a valuable and significant outcome of this thesis.

1.6. BASIC TERMINOLOGY USED IN THIS STUDY

I consider it useful to provide a conceptual common ground for the reader to avoid any confusion. Here, I am only considering the general meaning of the terms which will be explored in depth in the literature review, were pertinent.

Digital technologies/open and participatory tools and platforms

Digital technology is understood in this study as the technological infrastructure that comprises hardware, software, and the Internet. Examples of digital technologies are tools such as Word, Hypothes.is, Diigo, learning management systems, the Internet, devices, etc. Within digital technologies, there is a distinction i.e. closed tools and open and participatory tools. Closed tools are those to which the individual has to subscribe and pay a fee, or which are provided by an institution that holds a licence. Open tools, in contrast, are tools and platforms that are either open source such that they are available to the public freely not only for using them but also for co-authoring, or those that do require a licence, but the individual does not have to pay for their use. An example of an open tool is Zotero, this software being open source and available for free. Twitter is also an open platform but not open source, WordPress is an open-source platform that has different plans to access some of the more sophisticated features. Hegarty (2015) defines participatory tools as those that encourage users to share content and that promote social participation, thus fostering a participatory culture (Jenkins *et al.*, 2009).

I refer to the work of Srnicek (2017) to define platforms. He states these are "digital infrastructures that enable two or more groups to interact." (p. 43). They serve as intermediaries that bring together different users in a common activity. A typical example of a closed platform is Blackboard or Canvas that are used as learning management systems in educational institutions.

Digital practices – open educational practices

Practices are the distributed everyday doings, sayings and thinking that are part of all that we do in our everyday lives. When I refer to digital practices, I mean those doings, sayings

and thinking that unfold in the digital space. The practice of blogging is an example of this. In the context of this study, there are two settings that I refer to, both of them in the digital space. There is the personal context containing the practices in which students engage for their digitally mediated personal social life. There is also the institutional context, by which I mean the university setting. Moreover, when I raise the matter of open educational practices, I mean those that unfold for education purposes that are mediated by open and participatory tools that are openly available on the Web. This can entail, in some cases, engagement with open educational resources that are freely available and ready to use, remix and share.

Socio-technical system

The socio-technical system points to the interplay between people and things (Leonardi, 2012) and it refers to the entire organisation of work, i.e. the system. A useful definition of socio-technical system is provided by Leonardi (2012, p. 42):

> *The recognition of a recursive (not simultaneous) shaping of abstract social constructs and a technical infrastructure that includes technology's materiality and people's localized responses to it.*

1.7. STRUCTURE OF THE THESIS

The thesis is structured in seven chapters.

Chapter 2: Literature Review

The chapter sets out to scope the field of educational technology in Higher Education (the context of this study). It starts by looking closely into deterministic accounts of the use of technology and young people and then explores the current landscape of HE in the arena of educational technology. Alternative ideas to market-based education, such as debates around *Bildung* as a humanist understanding of education are introduced, critically exploring how this intersects with open educational practices. The chapter ends with a critical review of research regarding reflexive engagement. As a by-product of this chapter a peer reviewed article has been published, the reference and a link are provided in appendix 1b.

Chapter 3: Theoretical framework: Critical Realism and Realist Social Theory

This chapter addresses the theoretical framework used in the study. I explain and justify the main concepts and the analytical tools I have chosen, the main ones being reflexivity as a personal account (Archer, 1997, 2003); the social dimension of reflexive engagement (Donati, 2013); and the morphogenetic cycle (Archer, 1995).

Chapter 4: Methodology

In this chapter, I present the methodology of the project (Charmaz, 2006) that comprises two stages, an exploratory one and an in-depth one. I present the findings for the exploratory stage, namely, the data regarding the nature of students' digital profiles. This employs the notions of consumers and producers in the Web. I also present the pictorial data collected for the Visitor and Resident (White and Le Cornu, 2011) maps produced during the focus groups that were held for the in-depth study. As a result of the first stage of the coding process and to think through the data I wrote a peer reviewed paper for which I received helpful feedback that refined my initial ideas (reference and link are provided in appendix 1a.)

Chapter 5: Data analysis

In this chapter, I present the framework for the analysis for a CR investigation and the findings regarding the phenomenon I set out to explore. This process of analysis consists of two main logics of discovery. The first one is the process of abduction, that is, the re-description of the themes that emerged from the initial thematic coding of the collected data (Charmaz, 2006), using realist social theory. The aim is to identify the invisible generative mechanisms that are part of the real level of social reality (Bhaskar, 1979). The next step undertaken is retroduction, where social action as well as social and cultural structures are linked together. This is achieved, creating a causal pathway or a model of complex interacting forces to explain the issue under investigation. The outcome of the process of retroduction is the two candidate configurations -causal pathways- that depict the interaction of the structural conditions (i.e. situational logics) with the emergent generative mechanisms. These configurations are used to address RQ 2 (RQ 2.1. and 2.2.) and RQ 3 in the following chapter, chapter 6.

Chapter 6: Discussion: the morphogenetic cycle of students' digital practices in the institutional setting

I move, in this chapter, to address the level of the real (Bhaskar, 1979) where the underlying generative mechanisms are examined. I explain the two candidate arrangements or causal pathways that I presented in chapter 5. That is, I explain in detail each of the configurations I proposed, addressing them one at the time and explaining how students interact with the structural conditions in which they are embedded. Through these I seek to present and justify how specific mechanisms and structures interact in the present HE context by employing the morphogenetic cycle (Archer, 1995) as the explanatory framework. In short, I state and explain two plausible hypotheses -causal pathways- regarding students' engagement or lack of engagement with open digital tools and platforms in the institutional context.

In sum, this chapter responds to Research Question 2 by explaining and justifying two configurations: the first one contains the normative structure of the institution and its culture of assessment, the socio-technical system and students' emergent conflicting emotions and their social position in the institution. The second configuration includes false beliefs about students being digital natives, the socio-technical system, and students' emergent conflicting emotions and lack of digital capabilities. I address Research Question 3 by unpacking the emergent conflicting emotions of students and the socio-technical system to identify how students make sense of their academic digital space.

Chapter 7: Conclusions and final reflections

This chapter contains the conclusion to the thesis where I recap the three research questions. I state the limitations of this study and my contributions to theory and practice. I propose as possible new avenues of enquiry in the field of educational technology in HE. I end by sharing my reflective journey as a researcher.

CHAPTER 2
DETERMINISM IN EDUCATIONAL TECHNOLOGY AND ITS CONSEQUENCE FOR STUDENTS AND HEIS

In this chapter, I will engage critically with the literature to address what is meant by determinism and how it not only has considerable consequences for students and their use of technology, but also, for HE institutions. Through that discussion I show how my study is located within the current body of knowledge regarding students' engagement with digital practices from a non-deterministic stance. I will touch on some historical aspects of determinism (subsection 2.1.1.1.) from a more general perspective, engaging with the work of scholars, such as Castoriadis, who oppose deterministic views of society. I then consider the field of educational technology and the deterministic takes that are present in current debates (subsection 2.1.2.). In this subsection, I also engage with the history of technological determinism to trace that development and how it has influenced what we can see today in the field. This first section (2.1.) accounts for the dimension of technology as a context for action. I then explore HEIs and the current landscape. In this section (2.2.), I review current debates around the neoliberal university and its implications for the use of technology. These two themes cover the context of the study. Then, I engage with the issue of students (section 2.3) and how they are described as a different generation, namely, one that is said to have dramatically changed due to the exposure to technology. I consider debates regarding the idea/myth of the digital native and its consequences for students. In the context of this study education plays an important role. I devote a subsection (2.4.1) to *Bildung*, an alternative approach to education that aims at a holistic and humanistic development of the individual, conceiving education as the critical engagement of the individual with the external world. I then contextualise this approach in a participatory culture, which I describe briefly in subsection 2.4.3. This participatory culture affords certain practices, open educational practices (OEP) being one of them. In subsection 2.4.4 I explore the field of OEP, explaining how it can be seen as an approach to *Bildung* in the 21st century. Finally, in section 2.5. I critically engage with debates around reflexive engagement in the context of educational technology and HE.

2.1. DETERMINISM AND ITS CONSEQUENCES FOR SOCIAL REALITY

Determinism stands in opposition to different ideas, one of which is that of free will. Under a deterministic lens, there is a refusal to acknowledge that there is a connection between social change and humans, be it at the individual or group level (Adler, 2006). In addition, that social structures and technologies co-evolve in unexpected emergent patterns is rejected. Tracing this notion back in history to the times of the advent of Newtonian physics, in the 17th century, the physical matter of the universe was illustrated as operating according to a set of fixed, knowable laws. Once the initial conditions of the universe were established, then the trajectory of the universe followed inevitably, much like billiard balls moving and striking each other in predictable ways to produce predictable results. That is, determinism holds that reality operates according to a set of fixed and knowable laws, unfolding in predictable ways to produce predictable results. The notion of the inevitable order of things entails a set of consequences in the realm of educational technology that will be discussed later in this chapter (subsection 2.1.1).

More generally, determinism can be considered as a philosophical position under which every event is causally determined by an unbroken chain of prior occurrences. When an event is related to the human realm instead of the natural world, it implies that the level of influence individuals have in their futures depends heavily on the past. Under this lens, human action is always determined by external forces acting on the will of the character and causing particular behaviours (Hoefer, 2016). This brings to the fore debates around humans and free will, which will not be addressed in this section nor directly in the thesis, as they fall outside of the scope of my research.

In contrast to the deterministic take, Castoriadis (1987) holds that we cannot reduce social change and individual behaviours to determined outcomes based on a single observation. He argues that human action cannot be predetermined and thus, is not predictable. Causality, he explains, can take the form of motivation, that is, a sequence of events takes place so that something happens that motivates people. which he refers to as the 'subjective rational element'. It can also take the form of natural causal relationships that are constantly present in historical relations, referred to as the 'objective rational element', whereby under certain conditions certain events are likely to happen. Lastly, there are regular behaviours in individuals or groups that remain as pure facts, which are termed the

'raw causal elements' and it is not possible to reduce them to objective or subjective causal relations. He then explains that, if we are to place behaviours under laws and give these abstract expressions, which is what determinism does, we are eliminating the 'real' content of the lived behaviour of individuals. Castoriadis (1987) notes that there are certain aspects in social reality that can be attributed to regular causality, but it is only a very small cross section of social life that is subject to determinism and even this involves engagement with networks of non-deterministic relations. These relations continually refer to one another, and any change in one will affect all the rest. I cite:

> *The partial dynamics that we establish are, of course, incomplete; they continually refer to one another, and any modification of one modifies all the others. But if this creates immense difficulties in practice, it creates none in principle. In the physical universe as well, a relation holds only with the proviso 'all other things being equal.'* (1987, p. 44)

This is due to the nature of the social that contains the non-causal as one of its essential moments. This non-causal manifests as behaviour that is not only unpredictable, but also, creative (on different levels, individuals, groups, classes, or entire societies). Again, I cite, this time more extensively, as I consider the following explanation as being key to the main argument of the thesis:

> *It [the non-causal] appears not as a simple deviation in relation to an existing type but as the position of a new type of behaviour, as the institution of a new social rule, as the invention of a new object of a new form - in short, as an emergence of a production which cannot be deduced on the basis of a previous situation, as a conclusion that goes beyond the premises or as the position of new premises. It has already been observed that the living being goes beyond a simple mechanism because it can provide new responses to new situations. But the historical being goes beyond the simply living being because it can provide new responses to the 'same' situations or create new situations. History cannot be thought in accordance with the determinist schema, because it is the domain of creation.* (1987, p.44)

The reproduction and/or transformation of society is most of the time unconsciously achieved. Nevertheless, as Bhaskar (1998) holds, it is still a skilled accomplishment of active and intentional subject activity; not mechanical as a consequence of antecedent conditions. What Bhaskar advocates for is a social reality that is systematically open, emergent, complex and multi-layered, hence being unpredictable and always in the making, thus refuting any idea of predictable reality. Open systems are characterised, following Rutzou (2017), by the concurrence of different causes that can generate tendencies that can rarely be reduced to laws. The social world, therefore, cannot be understood as a well-ordered machine that produces predictable patterns that can be expressed in mathematical formulas, rules, or as general linear reality. Instead, a complex

understanding of the world is needed, a world that is not conceived as flat, but rather, one that is layered and complex, behaving in unexpected ways, organised and assembled in varied modes, and acting and interacting in different manners.

2.1.1. TECHNOLOGY UNDER A DETERMINISTIC LENS

In ancient times, the intention behind the artefact was revealed through the final object. Once it was declared by Descartes that, "we would become the masters and possessors of nature" through the application of science, a profound change impacted the conception of technology, i.e. technology no longer fulfilled nature's potential as the Greeks believed, but rather, could realise human plans, thus introducing a different element in the realisation of artefacts and making it possible to frame technology in deterministic terms. I will draw from the philosophy of technology to scrutinise and problematise ideas around technology and society that are apparently natural and taken for granted as common sense. As Feenberg would say, "Insofar as our society is technological at its base, philosophy of technology is its theoretical self-awareness. ...[it] teaches us to reflect on what we take for granted (...)" (2006, p. 6). He sustains that a philosophy of technology is part of the self-awareness of a technologically mediated society. I acknowledge that an extended philosophical discussion of what technology is, could be a thesis in itself, but I keep the scope of this discussion in the realm of educational technology.

2.1.1.1. TRACING THE HISTORY OF THE ROLE OF TECHNOLOGY IN SOCIETY

Etymologically the word originated from the Greeks, who made a distinction between what is man-made and that which emerges out of itself. They called these two processes physis and poeisis, respectively. Physis refers to the realm of nature, that which creates itself, which emerges out of itself. Poiesis, in turn, pertains to the practical activity in which human beings engage when they produce something and what is created by them is termed an artefact and includes the products of arts, crafts and social convention. Techne is the Greek word associated with the process, the knowledge or the discipline of poiesis and thus, there is active knowledge embedded in techne. An example of techne is the activity that medical doctors engage in to heal the ill, or the mathematician who seeks a general explanation for the equation denoting a straight line. That is, the general equation and the particular diagnosis and treatment, are the artefact, and the body of knowledge engaged

with in order to create these artefacts is the techne. In the Greek tradition, Feenberg (2006) claims, each techne includes a purpose and a meaning for the artefact. The production, thus the active knowledge, is guided by this purpose and the meaning for artefacts. For the Greeks, the idea is that the essence of the artefact is contained in the techne prior to the act of making. That is, it is objective in nature and revealed by techne, with the purpose of the thing being included in the idea. This means that humans produce artefacts according to a plan and a purpose that is an objective aspect of the world. The origins of the 'ology' part of the word technology refer to the field of study. So, technology is the field of study of techne, that is, the art and craft of the production of artefacts.

Technology is no longer the study of the art and craft, where humans engage to uncover the objective essences of the idea that was revealed through the process of creation. Descartes and Bacon changed this idea of techne completely. For them, the idea was that through the cultivation of science humans were going to master nature and to possess it, as Feenberg (2006) tells us. Hence, the essences, the purpose and the meaning are not something to be revealed and discovered to us through techne, as the Greeks believed, but rather, should be attributed to the things that humans create. The critical question for modern Western science is not anymore about 'what it is', but 'how it works'.

Subsequently, at the beginning of the 19th century, some changes in science and engineering influenced the use of the term technology. Lawson (2017) illustrates in his work how scientists tended to associate practical innovation with research and in so doing, they could argue for financial support for their work. In parallel to this, Lawson continues, engineers wanted to be differentiated from artisans and raise their professional status to that of learned professionals. Engineers and scientists, thus, required a word for the outcome of applied science, and so technology was the one chosen at that time (Lawson, 2017).[4] In such an environment, innovation was rising, not only in terms of machines or the isolated artefact, but also, in relation to the supporting artefacts and the infrastructure (social and technical, thus socio-technical) required to operate those new inventions, e.g. the engine. Such supporting artefacts could be mechanical, for example, railways, stations, tunnels, bridges, and a network of tracks, as well as social. They could also be management

[4] In 1911 the purpose of MIT was reflected in this statement: "technology is the incorporation of higher scientific knowledge into the arts." (Lawson, 2017, p. 23). This statement makes evident how it was important to make it clear that academia became respectable, because the university focused on technological knowledge rather than technical training.

structures for administering the significant capital investment, technical skills and specialised knowledge, for which a specialised workforce needed to be trained according to new regulations. All of these elements formed networks of interdependent processes and objects, where the technological artefact was only a small part of the whole socio-technical infrastructure (Lawson, 2017). In such an interdependent system, the term technology had a more significant scope, as it had to include not only the material innovation as such, but also, the whole socio-technical infrastructure where the innovation was to function. Technology, innovation, and progress were linked. This is what we now call technological infrastructure or socio-technical infrastructure (Bijker, Hughes and Pinch, 1987). This broader understanding of technology is that used when I am referring to digital technology and in the context of this study this infrastructure is considered as the material context for action.

Modernity was seen as progress towards fulfilling human needs through technological advancement. Science has given humanity the ability to define its purposes as it sees right. The means is the technology, and the ends seem to be set by humans, with the direct consequence being that technologies are not value free. They are laden with values, assumptions, and beliefs of those who design and built the socio-technical infrastructure. Lawson (2017) agrees with the idea that technologies are imprinted with the values and intentions of their designers, which reduces the social to a material dimension. This is complemented by Mutch (2010), who argues that technology is not neutral, instead being shaped by social interests. In this respect, critical theory of technology advocates that society must oppose the idea of technology being neutral (Feenberg, 2006), acknowledging that the values embodied in it are social, being much more than efficiency and control. Efficiency is only a frame, which Feenberg (2006) maintains, frames every possible technology but does not determine the values realised within that frame. Technology frames different possibilities of ways of life, each of which reflects different choices of design and extensions of technological mediation. In a talk Feenberg gave to undergraduates at Columbia university[5], he suggested that the question for all of us should be which values should be embodied in the technical framework of our lives? In order to answer this question, it would be pertinent to focus on technological determinism as this

[5] This is taken from a speech that Feenberg gave to a group of undergraduates at Columbia university, which is also part of a chapter he wrote in a book about technological literacy and is referenced in the bibliography.

will illuminate the different ways in which the relation between technology and social change can be understood and approached.

2.1.2. TECHNOLOGICAL DETERMINISM

Technological determinism, Lawson (2007b) argues, is referred in the literature in an undifferentiated way. "A real problem here, is that even amongst prominent and well-respected accounts of technological determinism, it is unclear exactly why they are so labelled, and what exactly is meant by determinism." (Lawson, 2017, p. 7). In the same line of thought, Bimber (1990) holds that "technological determinism is a somewhat elusive concept," but he does suggest that it concerns a variety of standpoints about the relationship between technology and other aspects of society. For any of these accounts what is invariably the case is that history is determined by some causal law or biological and physical conditions, which can be explained by relying upon the features of technology (Bimber, 1990). That is, a technological deterministic claim is one that is founded on the features of technology.

In more general terms, Lawson (2004) suggests a spectrum of technological determinisms that moves along a continuum from soft to hard determinism. The soft end emphasises the broad scope for human agency, whereas at the other end of the spectrum is the hard determinism, which holds that technology has intrinsic features that give little autonomy to humans (p. 3) and thus, agency is in the technology. In order to establish with more accuracy the two poles, Bimber (1996, as cited in Lawson 2004) points to three different types of technological determinism: the nomological, where there is no scope for human choices as there is "only one possible future course for social change" (p. 4); the unintended consequences, where technology seems to be out of control, because certain values and ideas are concretised in within it, i.e. these are perceived as being fixed and hard to change; and the normative approach, where technology use is driven by efficiency and productivity and so, ethical and political processes are removed. Lawson illustrate Bimber's nomological approach showing how social relations become concretised in particular technologies, which then act to maintain or reproduce those social relations. Whilst Lawson's work is not related with digital technologies as such, it can be used as an analogous case when considering learning management systems, also called virtual learning environments (VLEs), which I will discuss in more detail in subsection 2.3. Learning management systems

are invariably used in universities as the mediators and managers of knowledge along with mediating many other relations between students and staff. The relations between the different actors in HE are concretised in the technology (the role of the student and the role of the teacher in the VLE is clearly established).

The normative account that Bimber (1990) describes is one where there is no political justification of norms by which technology is advanced and instead, what prevails are goals of efficiency or productivity. In the words of Bimber (1990, p. 340), "Technology could be considered autonomous and deterministic when (...) the goals of efficiency and productivity become surrogates for value-based debate over methods, alternatives, means and ends." Lawson (2004) argues that ethical and moral criteria are ignored, thus "producing a process that operates independently of larger political processes and context." (p. 6).

Hamilton and Friesen (2013) suggest that there are two main tendencies when conceptualising technology in education. Firstly, the essentialist stance, "takes technologies to be embodiments of abstract pedagogical principles. Technologies under this lens are portrayed as independent forces for the achievement of pedagogical objectives that are intrinsic to the technologies before they are used." (p. 3). As an independent force, technology is seen as independent of society. The second position, what they call instrumentalist, "depicts technologies as tools to be interpreted in light of this or that pedagogical framework or principle and measured against how well they correspond in practice to that framework or principle." Here, technologies are seen as passive tools and neutral means used for ends determined independently by their users. In this approach the potential of what technology can do is conflated with what is achieved in practice (Hamilton and Friesen, 2013, p. 3). As an alternative to these deterministic approaches, they propose a more constructivist approach to technology studies, where it is possible to understand the interplay of social and technical factors within processes of technical development (p. 4). Instrumentalism is viewed from a slightly different perspective by Schatzberg (2012, para. 4), who argues that "most significantly, the instrumental concept of technology effaces the role of human agency. It focuses on innovation rather than use, treating technology like an objective force stripped of creativity and craft, subordinate to scientific knowledge, mere means to ends." Schatzberg introduces a cultural concept of technology that is human centred, putting the attention on the use of technology and not

so much on the innovation. Under this perspective, technology is viewed as a creative and value laden human practice.

The difficulty in pinpointing technological determinists' accounts is because it is rare to encounter people admitting that they are proponents of this particular view. This may be due to the fact that determinism, particularly in the context of educational technology, tends to have a negative connotation, as Webster (2017) has shown. However, as Friesen and Hamilton (2013) demonstrate, deterministic takes on technology do have an effect in educational technology use and hence, the need to consider this more closely.

A deterministic stance regarding technologies consists in the belief that technology has an inherently transformational effect independently of the socio-technical context where they are used, here the view is that technologies are a 'magic solution', a quick fix for every problem in education. Perceiving that new technologies will disrupt and revolutionise education is a tendency that is not new. More than a century ago, this was the case when Thomas Edison in 1913 thought the new technological discovery he was working on, the motion picture, would disrupt education. Back then he said, "I believe that the motion picture is destined to revolutionize our educational system and that in a few years it will supplant largely, if not entirely, the use of textbooks." (Cuban, 1986, p. 9).

At that time, he complained about the inefficiency of schoolbooks and teachers:

> *I should say that on the average we get about two per cent efficiency out of schoolbooks as they are written today. The education of the future, as I see it, will be conducted through the medium of the motion picture... where it should be possible to obtain one hundred per cent efficiency.* (Ibid.)

What was not clear was how the motion picture would achieve this revolution. Less than half a century later, Skinner, the famous Harvard psychologist, believed that, "(...) teaching machines are destined to revolutionise our educational system and that in a few years they will supplant largely, if not entirely, the use of teachers" (Skinner, 1968, p. 1).

At that same time, one could read in the US newspapers headings like,

> *Suddenly -with the push of a button- your home becomes a space-age classroom! New automated HONOR machine helps your child learn faster, learn better in ALL school subjects -without strain or tension! (Exclusive at Brentano's).* (Popular Science, 1963)

Hence, according to this perspective, this was another revolutionary solution that would, now with the push of a button, erase the inherent struggle and tension involved in the learning processes.

Edison and Skinner are examples of the widespread belief that regard it to be evidently clear that technology and education are a combination that will 'inevitably' bring a revolution to society that renders both, the book and the teacher, obsolete and inefficient. If Edison and Skinner's ideas are interrogated by considering the beneficiaries of the technologies they were putting forward, it can be inferred that teachers are not amongst these. That is, it would appear that they were excluded from the picture in motion and threatened with losing their jobs. In the hypothetical case that the motion picture and the teaching machines would have 'revolutionised' education, a valid question to ask is, whether a revolution aimed only at efficiency, faster learning and the lack of tension and struggle is what is needed? Two decades ago, Biesta (1998) would have answered that education cannot be understood as a neutral process driven by machines. Instead, it has a political character, and it should be understood in its political and sociohistorical context. Biesta (1998) argues for an education that is inspired by humanism, which is far from being a technique that renders predictable outcomes. In addition to Biesta's argument, Arendt's (1958) understanding of what it means to act and interact is related with taking initiative; to begin something new. This, Arendt argues, is an inherently unpredictable process for which machines would be unsuitable. She holds that "It is in the nature of beginning that something new is started which cannot be expected." (p. 177).

In present times, the debates are not so much around the motion picture and its 'revolutionary' effects in education, but rather, pertain to the 'power' of platforms as some sort of innovative learning machines that will completely transform education, bringing a revolution from Silicon Valley to the rest of the world. The acceptance of accounts about universal technological solutions for education (Watters, 2012; Selwyn and Jandrić, 2020) raises various questions regarding the discounting of local experiences. A platform is a technological system that can be programmed and thus, customised by people from outside. Platforms can be useful technical frameworks, but how they are designed, what comes into that framework, who makes that choice, what are the power relations between the stakeholders and users as well as how these communications are imagined and mobilised for different ends, is the part of the story that needs to be crafted with care and

criticality. This is because, as Williamson (2017) affirms, "Myths and imaginative visions, moreover, can become material realities when given technical form are inserted into social contexts." (p. 8).

As Watters argues (2012), the programmatic aspect of platforms is where the attention needs to be. She sustains that the open web is an excellent education platform, but little focus has been devoted to its potential as a learning tool. This has also been argued by Liu (2018) in her different talks[6]. Instead, there is a plethora of closed commercial platforms that offer, as Edison did a hundred years ago, to revolutionise and disrupt education through universal solutions that make the learning experience efficient, yet personalised, at the same time. These educational platforms, e.g. Blackboard, are hermetic spaces, where students have no access to design (Baker and Grossman, 2013) and are merely encouraged to consume the content. Arguably, the design of these platforms supresses from the outset the very idea of student agency and identity in digital spaces. This is an important matter in a society that is digitally mediated and technologically driven, not only for matters of education, but also, increasingly for many aspects of daily life, such as work prospects, access to social services, different learning opportunities, to name a few. In this regard, Biesta (2013) suggests how education needs more responsible approaches than responsive ones. Institutions, Biesta acknowledges, ought to have a critical stance regarding the society for which they are preparing students.

The use that has been given to the different technologies, be it the motion picture, Skinner's learning machines or the different Silicon Valley platforms, touches on the idea of technological determinism, as some authors have elaborated upon (Coleman, 2008; Hamilton, 2008; Selwyn, 2010; Hamilton and Friesen, 2013; Selwyn and Facer, 2013). It must not be forgotten that technologies are man-made, a product of the "World Three" in Popper's (1978) words. There is the risk of overlooking the discursive and interpretive process out of which technical things emerge (Hamilton and Friesen, 2013; Schatzberg, 2018). As a result, the complex ecology where technology is designed and envisioned becomes invisible, bringing with it the risk of defining it in relation to the practical purposes that users assign to them, thus incurring in what Bimber (1990) described earlier as a normative approach to technological determinism. In this same line of thought, Selwyn

[6] More of her work can be accessed here: https://newsocialist.org.uk/author/wendy

and Facer (2013) encourage us to work, not from our privileged position and experience with digital technologies, but connected with a more politically aware and sociologically grounded narrative of change that understands educational technology as an,

> *(…) intense site of negotiation and struggle between (…) different actors. These are struggles that take place across a number of fronts - from the allocation of resources to the design of curriculum, from maximizing the profit and political gain to attempts to mitigate patterns of exclusion.* (Selwyn & Facer, 2013, p. 5)

It is this negotiation and struggle that deserve deeper exploration and to this end, Selwyn and Facer (2013) suggest approaching this analysis with criticality, instead of blind enthusiasm fueled with utopian rhetoric. The authors suggest there is a need to open up the black boxes of educational technology, which, in their words, entails two things: to bring to the fore the negotiation and struggle of technological practices; and to critique the logic of the inevitability of sociotechnical change. That is, the idea that progress driven by technological innovation follows an inevitable course needs to be questioned. At the same time, the assumption that new technologies have inevitable internal logics of development no matter the circumstances (Selwyn and Facer, 2013, p. 9) also needs to be interrogated.

One could make an analogy using the development of the web as a broader context and its development follows the same logic explained above. The case was made recently by Liu (2018)[7], who argued the need for critical literacies. Liu pointed to the fact that the material infrastructure of the web cannot be ignored, as this materiality is owned by a few multinational corporations. This brings forth the idea of the privatised landscape of the internet as natural and inevitable - the only way things could be - rather than the outcome of political choices. This, Liu suggests, has implications for how individuals understand the 'open web' and limits the possibilities of what it could be (Liu, 2018). One example where this is eloquently illustrated is in the fight to preserve 'net neutrality', a core principle underpinning a free and open Internet. By ensuring net neutrality providers have to follow the existing network neutrality rules: no blocking, no throttling, and no fast lanes that protected the Open Internet. This has changed, with the ISPs (Internet Service Providers) arguing that an internet where content providers are prepared to pay should be able to

[7] The talk is available via this link: https://conf.owlteh.org/contributions/published/critical-radical-understanding-of-the-open-web/

access an internet 'fast lane', which "is inevitable in today's data-hungry net world" (Wakefield, 2014).

Counterarguing the idea of a neutral technology that serves as a quick fix for educational problems that drives inevitable change, Bijker and Law (1992, p. 3, as cited in Selwyn & Facer 2013) put forward an understanding of educational technology that relies more on the social. By this, they meant that technologies are socially constructed, shaped and negotiated among different actors and interests. As Wiener (1980) would say, technologies have internal politics that are the outcome of competing agendas. Technologies have implicit in their design and implementation a particular type of order, whereby they allow some behaviours and impede others (Matthewmann, 2011). Technologies are material entities and they have *real* existence, that is, they exert causal influence in the context they are deployed shaping but never determining social reality.

As aforementioned, and in line with Selwyn and Facer (2013), technologies carry with them a set of values, "(...) power is centralized, hierarchies are embedded, allocation is uneven, and there are structural constraints between social classes" (p. 10). Implied in this assumption is the idea that individuals and institutions need to adapt to technological change as quickly as possible, if they want to stay in the loop of development, something that Webster (2017, p. 111) points out clearly in his study,

> *Discourses dominated by technological determinism can create anxiety and place pressure on individuals and organisations to uncritically pursue technological change for fear of failing to keep pace with it.*

What is more, Webster (2017) argues that when technology is seen as inevitable there is also the risk of implementing it without enough empirical evidence (p. 119). Once more the drive is efficiently to adapt instead of maybe resisting and thinking critically about possible ways forward. The idea of using technology blindly and in a utopian manner was picked up in an editorial of The Guardian (*The Guardian Editorial*, 2013):

> *Like rabbits caught in the beam of powerful headlights, we have swallowed the narrative that the technology is both unstoppable and benign without noticing the ideology that underpins it is a strange confluence of technological determinism and neoliberal economics.*

Morozov (2013) is also critical of the idea that given the right tool, technology can seamlessly and naturally solve all society's problems, which he calls solutionism. He argues that this approach to technology weakens the effort that individuals have to undergo in

order to put the technology to work and actually solve some of the problems they are confronted with. Techno-centrism endangers an individual's ability to understand the world and thus be able to change it.

2.2. HIGHER EDUCATION INSTITUTIONS

The current landscape for HE is framed by a neoliberal architecture (Johnston, McNeill and Smyth, 2018), which implies a set of things, among them, the imposition of market mechanisms and managerial control. In this landscape, technological infrastructure is harnessed to achieve, amongst other things, market and consumer-based educational objectives. In the present neoliberal setting of HE (Pelletier, 2004; Johnston, McNeill and Smyth, 2018), there is reduction in public funding and rising operational costs, which has prompted HE institutions to scrutinise the cost-effectiveness of many academic activities. This, in turn, has increased the casualisation of the workforce and thus, resulted in a steady increase in workloads for those who are not casual workers (University and College Union[8]), which has been accompanied by the imposition of market mechanisms and managerial control. In this landscape, universities compete for students as they represent the major source of income (this is particularly the case for post-92 universities). In such fierce competition, HE institutions' mantra is 'value-for-money', which is presented as a key determinant of the student experience. Within this challenging environment, technological infrastructure is harnessed to achieve, amongst other things, a "market and consumer-based educational objective." (Johnston et al., p. 11). When discussing the significance of digital technology for universities in terms of a neoliberal framework, they are assessed in terms of their technical capabilities, for example, how VLEs enhance the experience of students or support staff in managing increasing numbers of students in a standardised fashion. In this regard, the VLE can be seen as an extension of the organisational, administration and managerial concerns of the neoliberal university.

As a consequence, the use of the VLE is highly valued by the culture of the institution (Farrelly, Raftery and Harding, 2018) and this permeates how students perceive the platform. In fact, one of the questions asked in the National Student Survey, a national survey administered every year to students where their experience is reviewed, relates to

[8] https://www.ucu.org.uk/article/9037/My-workload-your-education

students' perception of the VLE. In a recent study (JISC, 2005; Phipps, Cormier and Styles, 2008), students expressed how the availability of material in the VLE was highly relevant for the quality of their learning experience. All of this implies an increasing pressure for staff to delivering the best student experience possible. In a study, Farelly et al. (2018) explored how VLEs are used in seven HE institutions and colleges in Ireland. The findings showed that 98% of the respondents (n=580) used it as a content repository and communication tool and then, as an assessment manager. Utilisation of discussion forums, journals, and wiki, which are the equivalent to open and participatory tools, was as low as 6%. In the study, there are different quotes cited where lecturers commented on their thoughts, with many of them agreeing that the VLE is a commercial technology in search of a use, not a legitimate pedagogical tool. Adding to this, Bond et al. (2020) showed in their most recent study how across 243 studies they reviewed, the top five most researched tools were VLE (n=89), discussion forum (n=80), videos (n=44), recorded lectures (n=25), and chat (n=24), thus showing the relevance of the VLE in the research agenda of educational technology.

VLEs are platforms designed, more often than not, by commercial ventures (e.eg. Blackboard, Canvas, Google), meant to be used as tools to manage learning and assessment at educational institutions. They are depicted as active agents in the educational process that work independently to create the pedagogical conditions in a more efficient way. These platforms are an eloquent example of particular distributions of power, which bring with them a set arrangement of agency, where the role that each actor plays and the practices that are possible have been predetermined. Whilst it would seem at first sight that the working definition of education embedded in the VLE, or at least its function in education, is to manage content for students and to have a single portal for communication with them, it is pertinent to turn to Wiener's (1980) idea that artefacts do have politics, or as Lawson (2017) suggests, objects have some form of technological intentionality. In this regard, Lawson (2017) is poignant when he cites Akrich (Lawson 2017, p. 152), who states that,

> *designers inscribe objects with implicit manuals for use. Things co-shape the use that is made of them - they define relations between people and distribute responsibilities between people and things; technologies create frameworks of action.*

Technology design, in educational settings, is not only about making educational processes more efficient as it might seem, for as Bimber (1990) reminds us in his normative account

of technological determinism, technology seems to the user to be autonomous, because the "norms by which it is advanced are removed from the political and ethical discourse (...) and goals of efficiency become surrogates for value-based debate over (...) alternatives (...)" (p.82). The implication of such normative accounts of technological determinism is that the underlying values and the discourses that are embedded in the design of every technology are overlooked. Hamilton and Friesen (2013, p. 9) show in their work how technology involves discursive and interpretative processes out of which technical things emerge, which is overlooked in the majority of educational settings. Hamilton and Friesen's interpretation implies that technology is treated as a black box,

> *(...) a thing whose features we can observe and employ, but which we do not inquire into as to the processes that brought it into existence. Black-boxing technology means taking for granted all the contingent decisions that accumulate behind artefacts and contribute to making them what they are.* (2013, p. 9)

Whilst the major objectives of institutions are framed by the needs of a more market-based education, one of the implications for staff and the use of technology is that it leaves little space for teachers to explore more creative and less instrumental approaches. They are given little encouragement to use open and participatory technology in their teaching practices (Cronin, 2017). In addition, institutions provide clear expectations and guidance to support staff when it comes to designing learning using the VLE[9]. Hence, there is support and recognition for staff when using the VLE by the different managerial instances of the institution, reassuring them and rewarding their efforts in this matter. This, as Cronin (2017) has shown, has an impact on the digital practices chosen by lecturers and tutors. In this atmosphere, the emblematic VLE is positioned at the centre of the socio-technical network of interdependencies of the educational system at the expense of open and participatory tools, despite there being a networked society that is increasingly digitally driven. In this society, students have to cope with bodies of knowledge that change rapidly and with the fast proliferation of information and data, as well as an ecology of dynamic and emergent tools that increasingly mediate almost every aspect of our lives. In addition, as Floridi (2015, p. 2) suggests, there is also "a shift from the primacy of stand-alone things, properties, and binary relations to the primacy of interactions, processes and networks." However, not only are digital technologies impacting on the way in which knowledge and

[9] An example of the institutional expectations and guidance is available from: https://sulis.bathspa.ac.uk/display/LT/Minerva+Minimum+Expectations

information is created and shared, but they also shape the human condition. As Floridi (2015, p. 2) argues: "(...) we believe that ICTs are not mere tools but rather environmental forces, [structures with powers] that are increasingly affecting: a) our self-conception (who we are); b) our mutual interactions (how we socialise); c) our conception of reality (our metaphysics); and d) our interactions with reality (our agency)."

Grasping the social context within which teachers and students operate can be difficult at times for educational institutions, and this, combined with a difficult relationship between control and innovation (Stiles and Yorke, 2007), interferes in the efforts to transform educational practices through more open and participatory technologies, despite what the majority of the media and ed-tech big corporations wants us to believe (Cuban, 1986; Pelletier, 2004, 2009; Watters, 2015a). Technologies in education, as Cuban (1986) stressed more than thirty years ago, are not merely the product of the advance of technology, but rather, "the result of social and institutional demands which technology helps to fulfil" (Pelletier, 2004, p. 1). This idea is reinforced by Weller (2019), who argued, when thinking about the future of higher education in the next 50 years, that technological change is often a matter of cultural shift and not so much about the technology as such. In his words:

> *Take recent innovations such as e-portfolios or digital badges. The technology here is fairly robust and straightforward, but what they require to have impact is a shift in cultural attitudes from employers and learners regarding recognition, the format of learning and alternative accreditation. A second prediction then will be that many existing technologies will still be around, but that some of them will have developed the appropriate social structures for broad adoption, whereas others will have withered in this task.* (para: 3)[10]

In this regard, as Pelletier (2004) and Johnston et al. (2018) sustain, technologies are systems of cultural transmission, creating new contexts within which existing social interests express themselves, which is the case of the inextricable relationship between the neoliberal university and the deployment and centrality of particular digital technologies.

2.3. STUDENTS UNDER A DETERMINISITC LENS

Central for this study, is to explore the role of students in the given landscape of HE. Students arrive at the described institution with its particular culture and ways of deploying

[10] This quote is taken from Weller's blog, available from: http://blog.edtechie.net/higher-ed/learning-the-rules-of-predicting-the-future/

digital technologies, all of which condition students' digital practices. Students as well as staff, occupy a position at the institution, with its inherent tasks, roles, rights and responsibilities which shape their interests (Porpora, 2015). The role that the majority of undergraduates occupy in HEIs is mainly one of subordination, where most of the time they comply with the normative structure they encounter; this is something students bring from their schooling experience. The arrangement between students and teachers is one where the latter define the rules, norms, and conditions under which the former will interact and these are unquestioned most of the time (Bryson, 2014). Given this is a reality that can be perceived as natural, it is relevant to attend to what Elder-Vass (2010) states as I consider it sheds light to this behaviour, "the conformance with norms may sometimes be a consequence of prudential behaviour in the face of unequal power relations rather than consensus over the value of the norm." (p. 127). It is uncommon to find undergraduates debating against the norms and rules that are already established in the modules they are undertaking, assessment being one key normative element in their learning experience. Hence, students plan their course of actions in consequence of these already established normative structures. Sayer (2000) sheds light on this common behaviour when arguing that the position that a person occupies relative to others shapes what a person can or cannot do (Sayer, 2000).

It is argued by Porpora (2015) that actors are motivated to act in their interests, which are a function of their social position. He continues by explaining that actors do not necessarily act in their interests, but if they choose not to do so, they are likely to suffer. These motivations are relational, as Archer (1995) argues. This implies that students will ponder what is the price or opportunity cost of any situation/courses of action they will potentially engage in. If the opportunity costs are high and have a negative impact in their vested interest, then they tend to avoid that course of action. The work of Entwistle and colleagues (Entwistle, 1989, 2000; Entwistle, McCune and Walker, 2001; Entwistle and Peterson, 2004) regarding the promotion of deep learning through teaching and assessment is relevant here. They explored how students approach their learning in HE. Entwistle et al. (2001) agreed on three categories of learners: deep learners, being those whose intention is to understand ideas for themselves and to explore further to comprehend the meaning of ideas and connect them to the broader picture. The strategic learner, whose intention is to cope as best as possible with the requirements of the course;

and surface learners, who have the aim of achieving the highest possible grades, thus being constantly alert to assessment criteria and gearing their work to the perceived preferences of the lecturers. Each of these approaches entails a particular course of action that has implicit opportunity costs for students.

In addition to the effects that the opportunity costs have in students' decisions, there is an abundance of deterministic approaches to how young people use technology seamlessly and proficiently, for example, according to the year they were born. Such is the case of the digital natives, so labelled by Prensky (Prensky, 2001, 2011) or the Net Generation (Tapscott, 1999, 2009), who, according to Hartman et al. (2008, p. 6.3), express their behaviour through technologies, "to an extent not observed in previous generations." The authors state that students use technologies in new ways, "and in so doing are redefining the landscape in HE and perhaps beyond. (...). To a great extent, the behaviours of the Net Generation are an enactment of the capabilities afforded by modern digital technologies." (idem, p. 6.3).

The specific label 'digital natives' (Prensky, 2001a, 2001b, 2011), describes the generation that was born since 1980 which by being exposed to technology think differently, act differently and are different. However, he was not the only person to describe young people in such terms. Tapscott (1998, 1999, 2009) coined them as the 'Net-Generation' and described them in similar ways. The fact that people were born in a particular year, so it is suggested by Prensky and others (Tapscott, 2009), will determine or predict how they engage in digital practices, but it will do so in a rather unscrutinised manner (Brown and Czerniewicz, 2010; Corrin *et al.*, 2018), thus leaving little room for more nuanced and humanist accounts. The problem of such deterministic interpretations is that they ignore the social settings with their inherent structures as well as the individual particularities of the person, conceiving them as disembodied learners (Ashwin, 2008) that are impervious to the influence of the context.

Prensky's depiction of young people challenges what he calls the 'broken' educational system. The system is portrayed as outdated, not being innovative and dynamic enough to fulfil the native's expectations, as Corrin et al. (2018) and Czerniewicz & Brown (2010) have shown. In his latest book, Weller (2020) has also touched upon this issue, suggesting that such accounts of outdated HE institutions "overestimate the digital native-type account

that all students want a university to be the equivalent of Instagram." (p. 3). More often than not, the opposite tends to occur. As Lanclos (2016) suggests, if the institution works under the presupposition that students are digital natives, there is an implicit assumption that there is no need to provide support regarding the use of digital technologies in their educational practices. In a recent study undertaken by Langer-Cramer et al. (2019) about students' digital experience in their university (they interviewed ten thousand students from 50 FE and HE institutions), the two things that had primary importance to students in terms of their satisfaction, were, to have regular opportunities to review and update their digital skills and to use software and tools that are up to date and in line with the work-place standards.

It can be inferred that the idea of digital native and its implications for HEIs is misleading. It entails different problems, such as assuming that exposure to technology per se brings collaboration and creativity to the life of its users, that the 'natives' will leave the older people, the 'immigrants' behind, implying that the 'immigrants' are incapable of learning to speak the 'native' language without accent (Prensky, 2001). In this regard, Prensky (2001a) suggests that young people experimenting with tools is a result of the ubiquitous technology embedded in the environment, overlooking the quality of those interactions and the process of mediation that takes place,

> *It is now clear that as a result of this ubiquitous environment and the sheer volume of their interaction with it, today's students think and process information fundamentally differently from their predecessors*. (p. 1)

With this perspective, it is assumed that technologies are always used at their full potential, conflating potential possibilities afforded by digital technologies with actual practices (Hamilton and Friesen, 2013, p. 4). These assumptions ignore the inherent difficulties that come with the emergent and dynamic nature of open and participatory tools (Veletsianos, 2010). These emerging technologies Veletsianos (2010) defines in terms of their characteristics and not so much their novelty. One such feature is that they are constantly evolving and exist in a state of "coming into being" (p. 13). By this Veletsianos (2016), means that some technologies and their practices are in a constant state of refinement and development, which implies that there are constantly new features that change the original way the technology functioned.

It seems that, for Palfrey and Gasser (2008) as well as for Prensky (2001a), Tapscott (2009) and Hartman et al. (2008) the agency is embedded in the technology and somehow, young people have acquired all these digital capabilities ready to be used in any context. This perspective abnegates the need to explain what are the critical factors that influence these changes, under which circumstances are all these changes happening, and what is meant by exposure to the Internet. Livingston (2009) stresses that there is a tendency to think that engagement with technology automatically translates into meaningful engagement that fosters agency and empowerment, thereby ignoring the need to address the challenge of interacting proactively with digital technologies:

> *Although young people's newfound skills are justifiably trumpeted by both generations it would be unfortunate if this blinds us to the real challenge of using digital media, namely the potential for engagement with information and education content and for participation in online activities, networks and communities. (P. 43)*

Adding to Livingstone's remarks, Kennedy et al. (2008) and Jones et al. (2010) argue that the picture of young people in relation to the use of digital technology is not homogeneous; on the contrary, the range of diversity is overwhelming (Jones and Healing, 2010; Eynon and Malmberg, 2011). Complementing this idea, whilst also taking into account the perspective of teachers/lecturers, Bayne and Ross (2007) discuss,

> *(…) we argue against the reduction of our understanding of these issues to a simplistic binary which contains within itself the structural de-privileging of the teacher, a marketised vision of higher education, a racialised and divisive understanding of student/teacher relationships and an associated series of metaphors which 'write out' the possibility of learner and teacher agency in the face of technological change. (p. 5)*

Bayne and Ross (2007) sustain that this leads to a deficient model of professional development, where teachers are never going to be natives, but rather, only immigrants, with a tentative foothold and reluctant to embrace any possibility for change. Teachers' agency, in this case, is also affected.

All of the above debates found in the literature indicate that issues relating to agency in digital spaces have not yet been fully addressed in educational technology research and what is more, the complexity and interplay with cultural and structural properties have been overlooked. The thrust of the studies challenging this more deterministic view on young people has been approached from a quantitative perspective (Jarvie, 2001; Livingstone and Helsper, 2007; Kennedy *et al.*, 2008; Helsper and Eynon, 2010; Eynon and

Malmberg, 2011; Smith, Skrbis and Western, 2012; Potter, 2013; Stahl, 2017), finding out in broad terms that students' skills are not homogeneous (Smith, Skrbis and Western, 2012; boyd, 2014), that there is a digital divide of use and experience (Stahl, 2017), and that there are different typologies of young people (Eynon and Malmberg, 2011). There are also studies that are reviewed of the literature pointing out some of these issues like the work of Selwyn (2009) and Corrin et al. (2018) who bring interesting and novel ideas from a more theoretical perspective into the field.

Biesta (2013) urges schools to take *a responsible* instead of a *responsive* approach to education. That is, they should embrace a more critical position about the kind of society pupils are being educated for, whilst also not taking at face value 'commonsensical' notions, such as digital natives and rather, interrogating them. In a society that is increasingly digitally mediated, technology is widely used as a mechanism to access different kinds of governmental support, learning and employment opportunities and as Jenkins et al. (2009) argue, it represents an important part of youth culture. Hence, education has the responsibility to provide opportunities where students can engage meaningfully in more sophisticated digital practices but also can engage in critical approaches to current technologies and its uses.

Determinism does not only impact upon students, but also, the conceptualisation and use of technology, which has important implications for how HE institutions deploy digital technology provision and support. This is problematic for students, because as Floridi (2015, p. 2) has argued: "...ICTs are not mere tools, but rather, environmental forces that are increasingly affecting who we are and our interactions with the world.

2.4. SOME ALTERNATIVE PERSPECTIVES TO EDUCATION FROM A NON-DETERMINISTIC PERSPECTIVE

Education has an important role to play in exploring new avenues that allow students not only to interact critically with the world, but also be able to interrogate it. Biesta (2013) acknowledges that approaches involving critical literacies are more responsible, where the aim is to go beyond the acquisition of knowledge. That is, there is the need to foster awareness and criticality towards the wider socio-political structures in which students are embedded. Critical literacies, Biesta (2013) argues, prepare young people to resist instead

of accepting and adapting to some of these social structures. It is not a matter of being prepared to face an inevitable reality, i.e. a global networked and capitalist society, but rather, being able to question its frame of reference. Moreover, it is about being able to uncover the social structures that hold it together and the organising principle of such a social order (for example, being prepared to uncover apparatuses and structures that perpetuate mechanisms of surveillance capitalism, as Zuboff (2019) has demonstrated). The conception of subjectivity put forward by Biesta (2013) is one that is understood as being in a responsible relation with other humans and by extension, to the world more generally. A way to be critical towards the global network society is to understand how manifestations of it impact on the process of becoming a subject; acknowledging the capacity for self-determination as opposed to being determined by society. In the light of these forms of impact, more responsible educational interventions can be designed, as Biesta suggests.

2.4.1. BILDUNG

Such an education is reflected in the idea of *Bildung*, which is a humanist conceptualisation of education inspired in the German tradition of *Bildung (*see the work of Humboldt as explained by Sorkin (1983) for a detailed explanation). It is rooted in a dynamic idea of transforming the natural and human world more broadly (Bruford, 1975) and in the process, transforming the self. *Bildung* relates to the free, dialogical and dialectical interplay between the individual and the world in such a way that it allows for the individual's self-realisation – the full unfolding of his or her innate potentials (Bruford, 1975). It is seen as a reciprocal process of formation between the individual as a self and the world she/he meets actively, rather than passively (Fossland et al., 2015). It proposes self-education and self-cultivation as a path to transformation, striving and changing in the process of interacting with the world. Hence, the social world cannot be accepted uncritically, at face value, as already suggested by Biesta (2013). *Bildung* addresses the cultural and political dimensions in the socialisation process of education, providing a frame of reference that allows the individual to act in response to the demands of culture and society. Thus, it is not a given state the individual reaches, but rather, an ongoing process of becoming, while critically engaging with the politics of the social world; a world that Floridi (2015) points out is being deeply transformed by the ubiquitous deployment and mediation of digital

technologies. Because the focus of *Bildung* is on the process of the development, it is "thus always and necessarily mediated, necessarily unresolved, dialectical, and *open*." (Deimann and Farrow, 2013, p. 350).

Although *Bildung* has its origins in the 19th century of the German tradition, some more contemporary thinkers (Biesta, 2002; Lovlie and Standish, 2002; Friesen, 2013; Deimann, 2014; Fossland *et al.*, 2015) are aligned with such idea of an education that is intended not to 'produce skilled labour market individuals' but, proactive and critical persons that can meet the world and challenge it. The vision of *Bildung* is inspired by the whole person that will need to have the knowledge, practical wisdom, and criticality to be able to meet the world judiciously. Paulo Freire's idea of 'conscientizacion' is a contemporary example of *Bildung*. Freire (1996) conceived 'conscientization' as the critical process of raising consciousness through the exploration of contradictions and myths (that tend to have a dominant tendency) that arise in the interactions with the cultural context. It is about being able to act upon those contradictions to effect some change in the life of the individual and her/his surroundings. The goal of *Bildung,* then, is to provide a means for materialising human powers to take advantage of opportunities to live a relatively autonomous and critical life. This approach to education, in essence, nurtures difference and as such, stands in contrast with the more deterministic approaches that stress homogeneity among learners. As Farrow and Deinmann (2013) state, "authentic *Bildung* does not conform to market systems and can never be fully subsumed into the status quo. (p. 349)"

2.4.2. *BILDUNG* AND CONTEMPORARY SOCIETY

New technologies afford new spaces for culture and so too for *Bildung* (Marotzki, 2003). New architectures of knowledge require new forms of understanding space and how to inhabit, navigate, and interact in those new spaces as they have a different configuration and quite permeable boundaries, if any. These new spaces that are not built with bricks and mortar, but rather in digital code, offer new possibilities to envision relationships between the self (whose identity is affected by the Internet as Floridi (2015) affirmed) and the world (that has gained a different shape and pace through digital technology), which is the pillar for *Bildung*. In this new space, "the structures of assumptions through which we

understand our experiences" (Deimann 2014, p. 195) are shifting and thus, a re-orientation of how people interact and behave in such different spaces is timely.

New norms, rules, arrangement, positions, ways of relating and interacting, and means to mediate experiences are afforded with every new context. The Internet with the World Wide Web is no different, in that there are new possibilities for expression in new social media spaces exposing the understanding of *Bildung* to new challenges and opportunities. Engaging with the social world and its culture is something the majority of individuals can do using digital technology that they have at their disposal, thus enabling, as Deimann and Farrow (2013) suggest, participation in public affairs more easily (given the enabling structural conditions), which potentially can lead to what Jenkins (2009) has defined as participatory culture. This culture, Jenkins explains, has emerged from the availability of open and participatory tools, or the Web 2.0 and it is a culture where sharing in the open is for many, the norm. Thus, *Bildung* provides a frame of reference to act and interact in response to the demands of social and cultural structures, such as the participatory culture, whilst at the same time, the availability of open educational resources and resources more general, provide an array of possibilities for the realisation of *Bildung, i.e*. to become educated (Deimann, 2013).

This new space - the Web, affords different practices with new capabilities. The world that students currently meet would be enriched, as Biesta (2013) suggested, through critical engagement with digital technologies, whereby they could mediate new forms of social relations, ways of participating in society, communicating as well as co-creating knowledge and sharing it. In short, in order to be *gebildet*, a robust practice that serves as a means to meet and critically engage with the more open, networked and increasingly digitally mediated world, is encouraged. Different authors (Deimann and Farrow, 2013; Deimann, 2014) suggest that one such robust practice can be Open Educational Practices (OEP). One thing in common between OEP and *Bildung*, Deimann and Farrow (2013) argue, is that both can be linked to the broader context of web literacies.[11]

[11] The authors refer to digital literacies, whereas I am suggesting something that includes a more direct interaction with the web, thus, web literacies. In particular web literacies are referred here as conceived by the Mozilla foundation, their manifesto is available from: https://foundation.mozilla.org/en/initiatives/web-literacy/

2.4.3. PARTICIPATORY CULTURE AS AN OPPORTUNITY FOR *BILDUNG*

In this subsection, I aim to explain the role of culture in the process of making meaning in the world. In 1997, Stuart Hall gave a lecture[12] at the Open University (UK), where he addressed the importance of culture as a way in which we make sense of or give meaning to experiences. He explained that culture consists of the maps of meaning, the framework of intelligibility that individuals use in the process of making sense. The last twenty-five years have been a time of intense change, in particular, regarding the socio-technical realm. Higher education takes place within this rapidly changing and fluid (Bauman, 2011) society, characterised by ubiquitous connectivity, a shift from knowledge scarcity to abundance (Weller, 2011), the increased availability of open educational resources (MOOCs accessible from mobile devices and no cost), and a move from hierarchical towards networked forms of social organisation (Castells, 2000). The use of digital technologies and the world wide web have also changed how people find information, communicate with one another, make and sustain relationships and work collaboratively (Jenkins *et al.*, 2009; Ito *et al.*, 2012; Veletsianos and Kimmons, 2012). Hence, the maps of meaning and the framework of intelligibility, has changed. Thus, creating new situational logics or structural conditions for actors.

All these changes imply new social capabilities and cultural competencies - frames of intelligibility – for which Jenkins et al. (2009) hold that young people need to be fully participants in, what they call, a convergence culture. They characterise this society as one where participatory culture is the mainstream, being defined as

> *A participatory culture is a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing creations, and some type of informal mentorship whereby experienced participants pass along knowledge to novices... members also believe their contributions matter and feel some degree of social connection with one another*. (Jenkins et al., 2009, p. xi)

Whilst the authors in their initial work referred to young people, later they acknowledged that this is relevant to all people, not just the young. Later, in 2015, Jenkins together with other scholars (Jenkins, Ito and boyd, 2015) investigated participatory culture in an

[12] Lecture: Representation and the Media (1997) Open University.

educational context, regarding how relevant it could be to learning and literacy. Jenkins et al. (2015) advocate embedding literacies of participatory culture more successfully in HE. This call would appear to acknowledge what Ito et al. (2012) stated about HE not being able to accommodate students. These authors have identified contradictory situational logics between the institutional culture and that where students' social life is framed, i.e. a participatory culture, where their contributions to the learning experience are included. A concrete example that illustrates a plea for change is the European Commission call for action in 2003 stating that the use of ICT and the Internet is becoming the new form of literacy - digital literacy - a prerequisite for creativity and innovation being a key literacy for citizens to participate fully in society (European Commission 2003).[13]

To participate in a culture that is based and geared towards more open participation, where sharing is at the core, different and new literacies are needed. Lankshear and Knobel (2006) highlighted this need,

> *We argue that certain literacies can be identified as 'new' in a historically significant sense to the extent that they are constituted by what we call 'new technical stuff' and 'new ethos stuff.' (...) The new technical stuff has to do with their digitality. The new ethos stuff has to do with the fact that new literacies are affiliated with an emergent mindset that differs profoundly from the mindset that dominated the modern period*. (P. 1)

The emergent mindset that Lankshear and Knobel refer to is participatory, where there is "involvement in some kind of shared purpose of activity." (P. 1). They present a table (which I have reproduced below), where they characterise two mindsets (mindset 2 is the emergent one), explaining that, whilst these mindsets are not the only ones one can hold, they are "useful heuristically for examining new 'ethos stuff' concerning new literacy practices." (2006: 1).

[13] European Commission, 2003. e-Learning: better eLearning for Europe, Lisbon. Available at: http://www.ncbi.nlm.nih.gov/pubmed/24760730.

Mindset 1	Mindset 2 (emergent mindset)
The world is much the same as before, only now it is more technologised or technologised in more sophisticated ways	The world is very different from before and largely as a result of the emergence and uptake of digital electronic inter-networked technologies

• The world is appropriately interpreted, understood and responded to in broadly physical-industrial terms
• Values is a function of scarcity
• An industrial view of production
  • Products as material artifacts
  • A focus on infrastructure and production units (e.g. a firm or company)
  • Tools for producing
• Focus on individual intelligence
• Expertise and authority 'located' in individuals and institutions
• Space as enclosed and purpose specific
• Social relations of 'bookspace'; a stable textual order
	• The world cannot adequately be interpreted, understood and responded to in physical-industrial terms only
	• Value is a function of dispersion
	• A post-industrial view of production
	  • Products as enabling services
	  • A focus on leverage and non-finite participation
	  • Tools for mediating and relating
	• Focus on collective intelligence
	• Expertise and authority are distributed and collective, hybrid experts
	• Space as open, continuous and fluid
	• Social relations of emerging 'digital media space'; texts in constant flux

Table 1: Some dimensions of variations between the mindsets (Lankshear and Knobel, 2006, P. 1)

The authors associate the second mindset with practices such as blogging, which they consider are deeply participatory and unfold naturally in the open web. The article describes the practice of blogging as an example of a participatory culture that individuals with an emergent mindset engage in.

2.4.4. OPEN EDUCATIONAL PRACTICES AS AN ALTERNATIVE

A clear definition of open education remains vague (Cronin, 2020). This is due to the ambiguous use of the term open by different educators and also the media. Nevertheless, several studies have had their focus on the practices that are driven by the open education movement, i.e. open educational practices (OEP). Open educational practices have been defined by different scholars internationally (Beetham *et al.*, 2012; McGill *et al.*, 2013; Atenas, Havemann and Priego, 2014; Nascimbeni and Burgos, 2016; Smyth, Bossu and Stagg, 2016; Cronin, 2017; Paskevicius, 2017), which is going to be addressed briefly in this

subsection. For a deeper and broader approach to OEP please refer to the work of Cronin and McLaren (2018) and Cronin (2018).

The notion of OEP has acquired currency in the last fifteen years. Open education has been defined in The Cape Town Open Education Declaration (2007)[14] with an expansive approach:

> *(…) open education is not limited to just open educational resources. It also draws upon open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues. It may also grow to include new approaches to assessment, accreditation and collaborative learning.*

OEP are underpinned by a collaborative ethos as a means of transforming education. Whilst in earlier definitions of OEP there was more stress on the content, namely, OER, in later definitions (OPAL, 2011; Kimmons, 2016) the focus is more on the ability of openness in supporting educational practices that are more innovative. Cronin (2018) argues that the concept of openness is a response to the rise of digital technology, knowledge ubiquity, and a networked society, where the culture is one of participation (Jenkins *et al.*, 2009). In 2009, the Higher Education Funding Council for England (HEFCE) funded different initiatives that were aimed at exploring more thoroughly conceptualisations of OEP (McGill *et al.*, 2013). One of those studies, the Jisc Higher Education Academy Open Educational Resources (UKOER) programme (Beetham *et al.*, 2012) is of particular interest, as it raised difficulties and challenges regarding "cultural inertia/cultural change" around openness.

As part of their study, Beetham et al. (2012) agreed that OEP encompasses six different practices, three of them being open learning, open pedagogies, and the use of open technologies (including social media and digital open tools). By open learning they meant having access to open learning opportunities, which can be through accessing freely available online content and learners collaborating on open knowledge-building projects, such as wikis and websites. Open pedagogies are about designing courses where students are required to contribute to public knowledge resources, such as Wikipedia and finally, by open technologies, they meant open web-based platforms, applications and services. This includes the use of freely available third-party software to support learning activities and building an open environment for collaboration using cloud services, such as bookmarking

[14] The declaration can be accessed via this link: https://www.capetowndeclaration.org/read-the-declaration

and media sharing sites. In this line of thought, Hegarty (2015) argues that participatory technologies are at the core of open practices, and participatory cultures (Jenkins *et al.*, 2009); both, she claims, lead to more participatory environments. The use of participatory tools and the change to a more participatory culture, among other things, contribute to the tensions in cultural inertia/cultural change in HE, as Beetham et al. (2012) argue in their study. Through OEP practitioners try to facilitate learning that encourages agency and empowerment (Cronin, 2019).

From a more international perspective, the Global South has played an important role in advancing the field of OEP and OER, arguing for more diverse perspectives in this area of knowledge (Czerniewicz, 2013). In particular, at CILT, the Centre for Innovation in Learning and Teaching at the University of Cape Town (UCT), there have been important contributions to the definition of OEP (see ROER4D, 2017[15]). Of particular salience is the work of Hodgkinson-Williams and Gray (2009), who created a framework for analysing openness along a continuum and which was further refined (Hodgkinson-Williams, 2014) by dividing the social dimension of openness into two subdimensions: cultural and pedagogical.

Open pedagogy is a pillar of more critical approaches to education, with DeRosa and Jhangiani (2018), Stommel (2014), and Cronin (2020), among others, being key scholars that have developed this area of critical digital pedagogy. Such approaches to critical digital pedagogy see open practices as spaces to create dialogue and to "function as a form of resistance to inequitable power relations within and outside the educational institutions." (Cronin, 2019, P.7). Open pedagogy, according to DeRosa and Jhiangiani (2018), is a site that is "dynamic, contested, constantly under revision, and resists static definitional claims. But is not a site vacant of meaning or political conviction." (Para 2). Open pedagogy is an approach to education that focuses on democracy, collaboration, connection, and critical assessments of educational tools and structures that, according to DeRosa and Jhiangini, serve as a guiding praxis.

Education reflects the culture of the wider society and culture, in turn, is about the values, customs, and relationships, which inform and shape a society's view of the world and of

[15] ROER4D 2017 update, available from: http://roer4d.org/2929

education (Alexander, 2004). ICT, as recognised by Floridi (2015), is influencing and shaping how we interact with the world; how we socialise and interpret the world around us. Hence, the culture is being impacted upon by these changes. It is, therefore, pertinent to explore and engage with the literature about participatory culture, one that is permeated and impacted upon by these environmental forces that also frame and shape open educational practices. This is what I will explore in the next subsection.

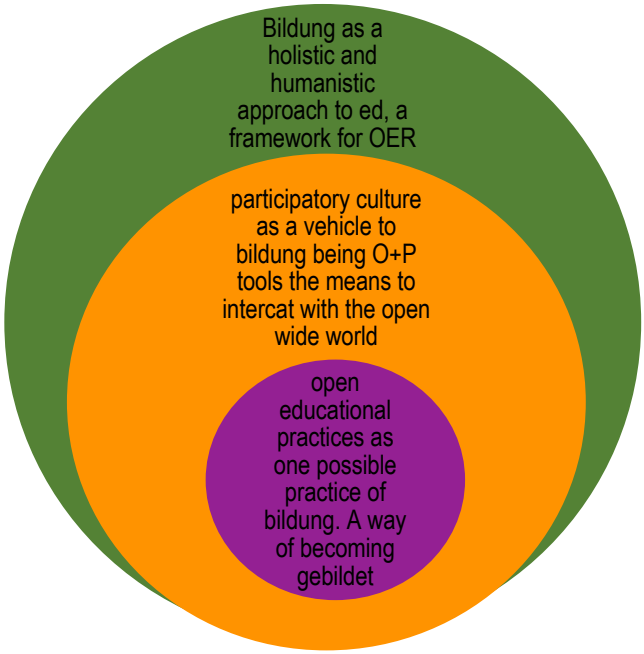

Figure 2: OEP as a way of *Bildung* that takes advantage of a participatory culture. (The researcher, 2020)

In this last section, I presented an alternative framework for thinking about education, i.e. *Bildung*. The goal of *Bildung* is to provide opportunities and means for self-realisation and thus, flourishing. *Bildung* depicts education as a self-reflexive process that provides a frame of reference to behave in response to the demands of society, thereby making it a non-deterministic perspective. In this framework open educational practice is an approach to *Bildung* that has the potential to lead or connect with a participatory culture (Jenkins et al., 2009). OEP is a relatively new field of inquiry and as such it is still under exploration; not making it yet a mainstream approach in HE. Within this exploratory territory issues around participation in such practices are relevant. What I propose, then, is to think about the potential generative mechanisms that make participation in such practices possible. A

candidate for such mechanism can be reflexive engagement and thus, the next section is devoted to exploring critically the debates around what is known on this matter.

2.5. REFLEXIVE ENGAGEMENT

A brief account of OEP has been given pointing to the difficulties and challenges that exist between cultural inertia and cultural change in HEIs. Part of that tension arises from the marginal role that emergent and dynamic participatory tools have in the socio-technical network of interdependencies of HEIs, in contrast with the more closed artefacts that are positioned at the centre of the same network. Open educational practices require intentional engagement with these emergent and dynamic tools. This particular way of intentional and reflexive engagement is going to be addressed next.

In the field of HE, student engagement is an important area of study. It is understood as students' learning that involves behavioural, emotional and cognitive dimensions (Kahu, Picton and Nelson, 2019). The works of Kahu (2013), Kahu and Nelson (2019), Kahu et al. (2019), and Bond et al. (2020) are all salient, as they enable, from slightly different angles, a better understanding of student engagement and consequent outcomes. The work of Bond et al. (2020) and Bond and Bedenlier (2019) is in the context of educational technology, but focuses on the potential technology has to engage students and not on why or how students engage with it; it is more about the consequence of engaging with technology, whereby the object of study is not the engagement with technology but the consequences it has to students' engagement with learning. In the current study, engagement is referred to in a different manner, namely, reflexive engagement with digital practices. That is, engagement with digital technology that entails a process reflexivity, that is a process of inner deliberation to make informed choices aimed at overcoming different constraints that are embedded in the material context of action and in so doing providing the conditions under which agency is likely to emerge. This idea of engagement is inspired by the work of both Donati and Archer on personal and social reflexive engagement. Despite neither of them including digital technology in their conceptualisation, I am of the view that it can be applied in the context of educational technology.

I will start addressing the concept of engagement and then I will link it with Donati and Archer's ideas on engagement. According to the Online Etymology Dictionary, engagement means to attract and occupy the attention of. The suffix '*ment*' comes from the French, and it indicates the result of an action. The fact of being involved with someone, a motive, is another meaning found in the Oxford English Dictionary (online version); the process of encouraging people to be interested in the work of an organisation. For the Merriam-Webster Dictionary, engagement means the state of being in gear, an arrangement to be present at a specified time and place, emotional involvement or commitment. From all these definitions, some elements are particularly useful when considering engagement in a digital context. First, it implies intentional action that requires attention. The fact that it also means being involved with someone entails a bond; a relationship. Lastly, the fact that engagement is related with a state of being in gear is relevant, for it suggests the idea of a mechanism that performs a specific function. Putting all these elements together engagement can be understood as an intentional action that involves another person, that is, it cannot be done in isolation, it requires an intention, and it implies a state of being in gear, thus engaged.

From a more sociological stance, Donati (2013), in his work on engagement as a social relation (explained in detail in subsection 3.3.3) addresses the distinction between commitment, involvement and engagement. He is interested in the difference between commitment and engagement. Commitment, for him, is related to value orientation, which means that it is oriented towards achieving a specific objective (target goal). Engagement, in turn, entails a commitment that necessarily includes a goal and others; it can be a partner in a personal setting, a client or employer in a work setting or a lecturer/student in an educational setting. In first order engagements (figure 7), the goal relates to the individual's main concerns and the project(s)/goals she/he will undertake. In second order engagements (figure 9), the goal - relational good - is decided within the relation. In the words of Donati (2013, p. 156), "Engagement is a commitment that is *lived out and acted out* within a relation that is not only a reference point endowed with a psycho-cultural value (*refero)*, but also a social bond (*religo).*" (Emphasis in the original). Involvement, in contrast, implies getting involved in a situation that is more objective and less personalised; hence, it does not entail creating relations understood as bonds (p. 157).

Engagement is a social phenomenon that has a relational character, as Donati (2013, p. 129) explains: "It entails subjects acting in, with, and through social relations." Engagement displays a novel reflexive relationality and it is considered by Donati as a subject's process of reflexive socialisation in relation to her/his social context. For this reason, engagement should be treated as a social relation, as figure 9 in the next chapter will show. It can be said that engagement is a potential generative mechanism, a causal power that make practices possible. It is oriented towards goals that are situated in a context and it requires means (tools or artefacts that are potential opportunities, as they are not pre-given, but rather, contingent) to mediate the tasks/practices to achieve the goals, being oriented towards personal values. Engagement is depicted as a question of personal reflexivity, whilst also being relational.

Archer, whose work explores the concept of reflexivity thoroughly (her work will be described in detail in the next chapter), developed her work (1995) in a context that was not related to digital technologies. Instead, it stems from her investigation into the educational aspirations of English working-class parents and her work comparing the France Educational system with the English one, at a time where the influence of digital technologies and the digital more generally was relatively unexplored. Moreover, her work about reflexivity (2003; 2007) was undertaken in a context that looked at issues of social mobility. Whilst in her later work (2017) she mentions the impact of the variety of choices that individuals are confronted with nowadays using digital technologies as an example, she does not go into further analysis regarding how agency can be impacted upon by the structural conditions regarding these technologies. Mutch (2010, p. 510), whose work is in the context of information systems, argues that "Archer has little to say about the use or impact of forms of technology." Additionally, Pratt (2014), who is also interested in the role of digital technologies, holds that Archer has not clarified the place of technology within the realist orientation, an orientation on which I base the theoretical framework used for this study (it is explained in detail in chapter 3). Nevertheless, there has been work undertaken by other critical realist scholars and of particular consideration is that of Lawson (Lawson, 2007a, 2008, 2017), who is interested in the role technology has in society as well as the work of Verbeek (2015, 2016) regarding technology as mediator of the world, and Oostelaken (2013) whose work looks at ways to embed technological artefacts in the idea of capability, more particularly her work is geared towards Sen's Capability Approach.

In the field of educational technology use, engagement is rarely referred to in terms of Donati's (2013) ideas on its social dimension. The current literature falls short of thinking through the complexities of this relational phenomenon. According to Donati, second order reflexivity is the link between individual or group agency and social structures. In Helsper and Eynon's paper (2013), the title of which is 'Pathways to digital literacy and engagement', the process of engagement is not explained in much detail, even though they claim to have examined the operationalisation and links between skills and engagement. They also suggest that "engagement with ICT leads to a range of positive outcomes for the individual and society" (p. 3), but the relation between engagement and the outcomes is not explained in any detail. They hold that the term digital engagement refers to the way in which people participate in different internet activities, contexts and platforms. In their discussion, it is suggested that their study should help to inform our understanding of how and why people engage with the Internet. The general idea that unfolds is that there is a relationship between the need for different skills for different types of engagement and more generally, that other economic, cultural and personal inequalities must be taken into account, but engagement is not the object of analysis, Similarly, in Livingstone's (2008) study, titled 'Engaging with Media -a matter of literacy', the process of engagement is overlooked. Nevertheless, she does acknowledge (2008, p. 52) that a more complex analysis of people's engagement with media is needed. Whilst these studies are relevant and provide useful guidance to the field of educational technology, in some respects, engaging in the complexities and nuances of the reflexive engagement from a more sociological perspective can shed some light into the role that the context has when it comes to participation in open educational practices.

Different scholars (DiMaggio and Hargittai, 2001; DiMaggio *et al.*, 2001; Warschauer, 2002, 2003; van Dijk, 2005; Hargittai, 2007; Van Dijk, 2012) have undertaken investigations relating tangentially with engagement. Their main focus has been on addressing digital inequality in more sophisticated ways by transcending the limiting dichotomy of have or not having access. The different authors looked into the quality of the experience individuals have when using the Internet, mainly from a quantitative perspective. They have paid attention to more general aspects of the phenomenon, thus overlooking a more detailed analysis of the institutional contextual conditions where the analysed digital engagement occurs.

Warschauer (2002) pays attention to the complex range of factors where access to digital technology is embedded, but access does not equate to reflexive engagement. He suggests that content and language, literacy and education, and community and institutional structure must be considered as a whole, if the work of equalising access to new technologies is to be advanced. In particular, he describes four resources he considers critical for an effective use of ICT to access, adapt, and create knowledge. These are physical, digital, human and social resources, the last of which refers to the community, institutional and societal structures that support access to ICT (p. 7). His work has been exceptionally useful in shedding light on the complexities of access, where, as he suggests, the problem is not just one of having access, that is, "ICT does not exist as an external variable to be injected from the outside to bring about certain results, rather, it is woven in a complex manner in social systems and process." (p. 5). However, details about those systems and complex processes are not clearly depicted in his work. The study (2002) where he proposed these dimensions, is not an empirical one. Instead, it draws on what he calls "problematic examples" of community technology projects, where he analyses models of technology access that are already in place. He also refers to some empirical work he undertook earlier, that is, a longitudinal case study in Egypt, which was published in 2003 (Warschauer, 2003), where he collected data in a myriad of ways. What is not clear in the paper is the methodological approach he used and how he analysed the data, which makes it difficult for the reader to engage critically in this work.

In the same line of enquiry, DiMaggio and Hargittai (2001) have been exploring issues regarding access to digital technology using a more complex approach that also critiques the have and have nots dichotomy. These authors have defined digital inequalities more broadly as inequality in different aspects related to the use of technology, such as extent of use, knowledge of strategies, quality of technical connections and social support, ability to evaluate the quality of information and diversity of uses. Nevertheless, the study was not developed in an educational context and also, they did not take digital engagement as a variable, but rather, saw it as a given.

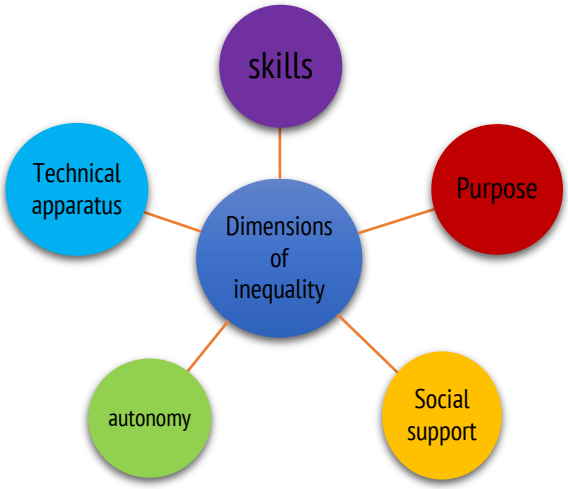

Figure 3: Dimensions of digital inequality (DiMaggio and Hargittai, 2001)

Using a quantitative approach, DiMaggio and Hargittai (2001) developed the model depicted in figure 3, with five dimensions of inequality when it comes to the use of digital technology, these being: technical means (hardware, software, and connection); autonomy when using the Web (whether they use the Internet from home, work or school and whether they are competing with other users for time online); the skills that people bring to their experience online; the social support upon which the user of the Internet can draw; and the purpose for which people use digital technology (p. 31). The authors argue that the degree to which these dimensions vary is what is partly responsible for the inequality observed in the use and deployment of digital technology. Their work sheds light on important aspects that are more in line with the current reality in education. One of these dimensions aligns with Donati's model, depicted in figure 8, i.e. the availability of social support. This dimension can be related to Donati's explanation of the emergence of relational goods from a 'we'-relationship, which is intertwined with the dimension of social support. The work of Lambert (2019) builds on this model, but she contextualised her study in an educational setting and identified a new dimension, namely, learning materials. She proposed in her study the importance that learning materials have for students' engagement in the learning experience and thus, her work is not focused on students engaging with tools, but rather, on how students can better engage with online learning. She has provided a highly interesting model to design online learning experiences with a focus on inclusion and a wider understanding of social justice, drawing heavily on the work of Fraser (1995). Her intention was to foster agency in the learner, but she is not looking at students' agency in situ.

In the body of work of Warschauer, as well as the different studies that were undertaken by DiMaggio and Hargittai, the methodological approaches are mainly quantitative, which has not allowed for in depth investigation into the complexities of the different influences and mechanisms in student engagement with digital technologies. However, what is clear in both cases is that the level that is addressed by these studies is the empirical one, which is excellent as a starting point to embark on further exploration into the different levels of social reality, in particular, the real level, that of students concerning their reflexive engagement with digital practices at the institutional level.

In order to address this gap in the literature, I propose to frame this study within a critical realist (CR) philosophy (Bhaskar, 1979, 1998). Critical realism is a meta theory that conceives the social world as open, complex and multi-layered, hence not being predictable nor determined. As CR is not a theory, but rather, a meta theory, the researcher needs to decide which social theory is going to be used to provide an explanation of the phenomenon under investigation. For this study, I chose realist social theory as it offers a coherent explanatory framework that analyses social structure, culture and agency, whilst at the same time uncovering how they interlink in relational and processual terms (Vandenberghe, 2016). I deem it an effective approach for counteracting the deterministic takes on society, institutions and actors. Archer (2000) strongly opposes deterministic views of social reality or the individual, terming these as downward conflation. What she proposes instead, is a perspective that entails the interplay of structure, culture and agency, each shaping the other and in so doing, leading to the elaboration or reproduction of social structures.

In the next chapter, the use of CR and RST will be explained setting out the theoretical framework that will be used to understand why and how undergraduates engage or not with digital technology in personal and formal settings.

CHAPTER 3
THEORETICAL POSITION OF THE STUDY: CRITICAL REALISM AND REALIST SOCIAL THEORY

This chapter provides a detailed explanation of the theoretical stance of this study, describing and explaining the ontological and epistemological stance taken for this research project. I start with an introduction to the chapter followed by section 3.2, where I explain critical realism (CR) and its three key principles: ontological depth (3.2.1.1); epistemological relativism (3.2.1.2); and judgemental relativism (3.2.1.3). In the next sub-sections, I address three core ideas in CR: emergence (3.2.2), social reality (3.2.3.), and generative mechanisms (3.2.4). In section 3.3. I describe realist social theory (Archer, 1995) (RST) as the social theory I draw upon to understand the data and create conceptual models for the subsequent chapters. In the following sub-sections, I explain the central tenets of RST, i.e. analytical dualism and the morphogenetic cycle (3.3.1.), the role of personal concerns and vested interests in reflexive engagement (3.3.2.) and the social dimension of reflexive engagement (3.3.3.). The chapter concludes with the application of the theoretical framework to the thesis (3.4).

In the previous chapter, I established that on the one hand, digital agency or agency in digital spaces is underexplored and thus, poorly conceptualised, that is, something is missing in the current account of students' agency in digital spaces. On the other hand, the argument goes that young people are already native speakers of the digital language, and HE institutions need to catch up with them. In this case, agency is not questioned, and it seems not needed as students have already mastered all they need when it comes to technology use. Simultaneously there is the naive view that technological change will unquestionably improve education (Selwyn 2010), thus dismissing social factors that will have an impact on the outcomes. This situation forces institutions into courses of action such that they ignore the social/contextual adjustments that need to be included for students to engage reflexively in digital practices, in other words, to foster students' agency in open and digitally mediated educational practices. To address these limitations, I chose a social theory that conceptualises the individual as someone whose sociality makes a dynamic contribution to the materialisation of her/his potential. RST offers a concept of the person as someone who has autonomous properties and powers that is able to reflect

and act upon her/his context in collaboration with others to elaborate on it. This conceptualisation Archer contends grants humankind "temporal priority, relative autonomy, and causal efficacy, in relation to the social beings that they become and the powers of transformative reflection and action which they bring to their social context – powers that are independent of social mediation" (Archer, 2006, p. 268).

The framework that I present in this chapter is the one I used to make sense and understand the data collected, nevertheless it was not articulated from the beginning of the study. I went into the field using constructivist grounded theory (CGT) as the framework, because I thought that given the explorative and unknown nature of the subject of study it would be difficult to find a theory beforehand that would fit. Once I had collected the data and started to make sense of it, was when I realised that CGT was not enough for the task I was faced with and thus, I started to explore social theories that could aid the process of data analysis. I decided on CR and RST as the best framework. A further difficult I encounter is that CR is a philosophy of science and has implications when it comes to conceptualise reality and interpret the data, thus making CGT compatible with CR was a task I was faced with but one that I completed successfully drawing on the work of other scholars that have faced similar issues. it is in this chapter that I have articulated the final framework and explained it to the reader. It is in chapter 5, where I analyse the data, that I give further details of the processes involved in the data analysis from a CR perspective.

3.1. INTRODUCTION

The debate around educational technology and student voice in HE has been poorly served (Selwyn, 2012, 2015; Case, 2013; Hew *et al.*, 2019). This is related, in part, to the scant attention given to the use of social theory (Bennett and Oliver, 2011; Jones and Czerniewicz, 2011; Facer and Selwyn, 2013; Selwyn and Facer, 2013; Murphy and Costa, 2016; Eynon, 2018) when addressing issues related with education and technology use. It might be useful to remind us that this argument is not a new one. Thirty-four years ago, Young (1984) as cited in Selwyn & Facer (2014), argued for a more robust sociological understanding of education and technology compared to more deterministic and instrumental approaches. Such deterministic approaches to educational technology use ignore the role of the individual and their agency as personal emergent powers that are shaped and affected by structure and culture. On the other hand, Ashwin (2008, p. 152) recommends that explanation in

education needs to include both the intentions of students and how these intentions are structured by the institution, as well as, the wider social structures. He adds that, more often than not, agents - students in this study - are affected by precisely these structural and historical factors in ways of which they are not aware, thus making it difficult for them to act upon the different structural barriers.

As a response to the scant attention to the use of theory in the field of educational technology, I propose the use of Critical Realism (CR) as a philosophical stance to think about social reality as an open system, stratified, emergent, and transformed by agents (Fleetwood, 2014). CR looks at the interplay between structure, culture and agency. It gives primacy to the ontology of social reality allowing the researcher to transcend the empirical level of reality and reaching deeper levels of reality where generative powers can be found that are partially responsible for the observed phenomenon. CR has not been widely used in educational research (Oliver, 2011); nevertheless, there are good examples of how it has been used, in most cases, to uncover how hidden generative mechanisms shape what student/lecturers do in educational practices (Czerniewicz, Williams and Brown, 2009; Case, 2013, 2015). More than anything, CR has been used to explore the complexities of learning and teaching (Ashwin, 2008) or in studies where the interest is not so much in the motivations of students' engagement with tools and platforms, but rather, to explore how they interact in online courses where engagement is assumed to be a given (Li, 2016; Kahn *et al.*, 2017).

While issues about social structure and agency have been widely discussed in debates around social theory generally (Bourdieu, 1977; Giddens, 1984; Archer, 1995), they have been hardly discussed in research into technology use in HE. When discussed, they are mostly framed within Bourdieu's theory (Czerniewicz, 2010; Costa, 2013; Murphy, 2013; Costa and Murphy, 2015; Farley et al., 2015; Beckman et al., 2018), which implies there is less importance given to individual agency and more to the structure, leaving agency, an important dimension if the interest lies in sustainable social change, most of the time, unexplored.

In order to fill this gap, a critical realist perspective (Bhaskar, 1979, 2008) is adopted as a broad ontological and philosophical framing that provides sufficient conceptual resources to frame and conduct an enquiry into the phenomenon scoped in chapter 1 and further

developed in chapter 2. I claim that digital practices and their concomitant literacies are not a given, but rather emergent and contingent products of the interplay between agency, culture, and structure. This claim may be possible by adopting a non-mechanistic model of society, which will be covered in detail later in this chapter. I will use realist social theory (RST) (Archer, 1995, 2000; 2007a) to explore the interplay between structure, culture and agency in the context of open and closed educational practices embedded within the institutional culture of HE in the UK. Archer's work (1995) considers agency and structure key components of social change. In this respect, she argues,

> *It is only through analysing the processes by which structure and agency shape and re-shape one another over time that we can account for variable social outcomes at different times* (1995, p. 64).

Little work has been carried out in the field of educational technology using this combination, with some exceptions (Hodgkinson-Williams, 2010; Cox, 2016b; Cox and Trotter, 2016; Cronin, 2018). However, these studies put the focus on lecturers and not so much on students nor emergent generative mechanisms. Nevertheless, in all cases, the advantage of working with Archer's theory is that she offers analytical tools to think about individuals as having agency and being able to do things that affect change, thus having control over their lives if not always over the circumstances they live in. At the same time, she holds that social structures are real and influence what individuals do and that these individuals can potentially have an influence on structures, thereby changing them and thus, altering their practice.

Archer wants to avoid by all means what she calls downward conflation, that is, the displacement of the human subject and the celebration of the power of social forces to shape and mould human activity. She strongly opposes this view suggesting one that is grounded in the interplay of structure, culture, and agency, each shaping one another, as is evident in the quote above. This, I believe, is linked to what Hamilton and Friesen (2013) call essentialism in the realm of technology use. Essentialists, they argue, take the view that technology structures human activity in ways that are not entirely in the control of users. The authors consider this approach quite limiting, as it seems that change is accomplished with little involvement by the individual. These deterministic views on technology (section 2.1.1. is devoted to this topic) entail different limitations, as Hamilton and Friesen (2013, p.8) argue. Some of these are the representation of technology as an independent force;

the separation of technology from society; the externalisation of human values from technical things; and the undermining of users' (students) agency.

Under RST, the interdependence of both structures and agents within a particular cultural system is recognised, but not in a deterministic way. Critical realists agree with Marx when he states that, "Men make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past." (Marx, 1852, 6th English ed. 1972, p. 10). Archer's approach highlights that human experience derives "from what we are as people and how we tacitly understand our social context." (1995, p. 29). To summarise, this framework offers the advantage to conceive students not as completely subjugated or determined by social structures, but rather, with the capacity (exercised or not) through their causal powers, i.e., their agency, to have the autonomy and ability to act intentionally and contribute to social change, which will have an impact on the practices they are part of as well as in their own lives. At the same time, but in a longer time scale, the accumulated changes will eventually impact on the structure and thus, the cultural system of the institution, where the educational practices unfold. This is what I advocate for throughout my work, emancipation and freedom through the exploration and exposure of the real generative mechanisms that constrain and/or enable students' educational practice.

Whilst I have explored both contexts, personal and institutional, what became of particular and growing interest in this study, is the institutional settings. The research questions focus the investigation on understanding students' motivations to engage with digital tools and platforms along with the meaning they give to the space where the engagement happens. Understanding these tensions can shed light on how students perceive the institutional environment, as opposed to the personal one. All of this, I intend to show, has implications for students' digital capabilities; capability in this thesis is taken as sitting broadly in Sen's tradition but framed with a CR perspective (Sen, 1999; Martins, 2006), that is, taking into account not only the skills, knowledge and attitude but also the social conditions that are necessary to develop them.

3.2. CRITICAL REALISM AS PHILOSOPHICAL FRAMEWORK

Critical realism (CR) is not an empirical programme, it is not a methodology, and it is not a theory. It is, rather, a meta-theoretical position in sociology (Archer, 1995; Bhaskar, 1979, 1989), that is, a reflexive stance interested in providing a philosophical account of science and social science that then informs empirical investigations. Whilst Bhaskar (1979) was the original creator and main exponent of CR; he soon was joined by other scholars (Collier, 1994; Sayer, 2000; Danermark *et al.*, 2002; Manzano, 2016; Rutzou, 2017). CR, Sayer (2000) explains, underlabours social science by providing a realist framework for social theories that explore society. Despite Bhaskar's (1979) explanation stemming from natural science, he has endeavoured to establish a plausible analogy with social science. In this, he is of course not alone, for it has also been the work of many other scholars (Collier, 1994; Sayer, 2000; Danermark *et al.*, 2002; Manzano, 2016; Rutzou, 2017). CR has gained popularity in the social sciences but has not been widely adopted in the field of education and technology (Mutch, 2010; M. Oliver, 2011). Emerging out of the positivist/constructivist 'paradigm wars' of the 1980s (Denzin & Lincoln, 2011), it draws components of both approaches to provide a detailed account of ontology and the associated epistemology (Fletcher 2017). Whilst the critical realist lens has advanced discussions in philosophy and methodology, providing guidelines for how research and ways of reasoning might be produced in the social sciences, such as management (Fleetwood, 2004), information systems (Mutch, 2010) and sociology (Archer, 1995, 2000; M Archer, 2007), it is not confined to a single method. Instead, it is compatible with a variety of methodological and theoretical frameworks (Oliver, 2011; Smith, 2018). CR is 'critical' in so far as "it is oriented to the transformation of inadequate beliefs, practices and indeed (in explanatory critique) structures" (Bhaskar, 2016, p. 4).

3.2.1. KEY PRINCIPLES UNDERLYING CRITICAL REALISM

Three main principles guide CR as explained by Porpora (2015): ontological depth, epistemological relativism and judgemental rationality. I will briefly explain each of them in turn.

3.2.1.1. ONTOLOGICAL DEPTH

Conceptualising reality as complex and multi-layered is central to a critical realist perspective (Oliver, 2011). Social reality is, hence, conceptualised as a causal network of interacting forces, an open system; an idea I will expand upon in the next subsection. The guiding principle for CR is that reality exists independently of our concepts and knowledge of it (Bhaskar, 1989). In other words, reality is not knower dependent. The way reality operates is not always accessible to the senses, as it cannot be observed or perceived entirely, because it is layered, stratified, and deep. This position implies that reality is not superficial or flat, but rather, deep. The deepest level of the social is called the domain of the real and it is concerned with generative mechanisms, causes, powers and structures that produce events upon which our experiences are based. In short, generative mechanisms can make things happen in the world and they are not necessarily observable empirically; they need to be approached theoretically with the support of data that are gathered at the empirical level. CR offers the possibility to grasp and understand these invisible mechanisms that have an impact on social phenomena, thus allowing for radical social change to become available. Expressions like, 'something is going on underneath the surface', account for such a dimension, which I set out to explore in my study. An example of this is the superficial dismissal of students being lazy and unwilling to work, because they are young, instead of analysing the situation more in-depth, and going under the surface to find what are the root causes; the generative mechanisms that make this reality happen.

To explain these different levels of reality, Bhaskar (1979) provides a useful ontological map, which I will describe in detail as it will form the basis of the understanding of the reality I aim to study. Social reality in CR is conceived as formed by three different layers, also called ontological domains or strata. The outer stratum of reality is called the *empirical* level, which consists of those events we can observe and perceive, thus capture empirically. It can be said that the *empirical* level is the layer where data lives and the events are witnessed by the observer, being the transitive level of reality where social ideas, meanings, decisions, and actions occur. However, the world must contain more than what is observable, a domain where the interaction of generative mechanisms or causes and powers which cause the observable events to happen, whether we perceive them or not;

this is the level of the *actual*. The events that occur at this level usually differ somehow from what is observed at the *empirical* level (Fletcher, 2017). In the words of Sayer (2000, p. 12), "the actual refers to what happens, if and when, the causal powers of social objects are activated, to what they do and what eventuates when they do." For example, bodies suspended (observable phenomenon) because of gravitational fields (not observable by our senses), are produced by causal powers, forces, generative mechanisms, if you wish, that operate in the background, but cannot be captured through our senses and transformed into data. Decisions, meanings, and the actions taken by individuals require the researcher to acknowledge that there is a deeper and last level, namely the *real*. This domain is where the underlying potential but not yet actualised causal structures of objects, the generative mechanisms are located. For something to be real it needs to be. For something to be real, it needs to be causally efficacious, that is, it needs to make something happen even if it is yet not doing that.

A useful metaphor to understand the ontological depth, taken from Fletcher's work (2017), is the iceberg. The visible mass is the smallest, it only represents 10% of the entire iceberg, and the rest of the mass lies underneath the surface, as can be seen in the figure. Nevertheless, it is what gives icebergs the stability and robustness that they have.

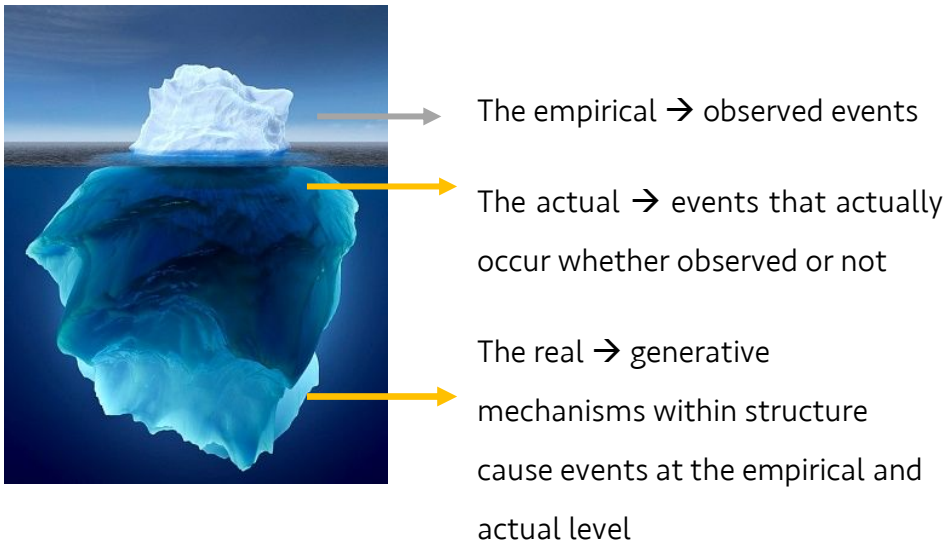

Figure 4: Iceberg metaphor for social reality (Fletcher, 2017)

It is the work of the social researcher to dig deeper and explore these levels of reality. In the words of Danermark et al. (2002),

> *(…) scientific work is (…) to investigate and identify relationships and non-relationships, respectively, between what we experience, what actually happens, and the underlying mechanisms that produce the events in the world* (2002, p.21).

If we ignore the submerged section, we are ignoring 90% of reality, which means we are almost ignoring the totality of social reality. The consequence of departing from a stratified ontology is the belief that human knowledge is limited, and that it can only capture a small part of a deeper and broader reality. However, we should not fall into the trap of thinking that only phenomena that are perceptible to our knowledge are those that can be studied. Bhaskar (1979) calls this confusion the 'epistemic fallacy', which he argues, limits our understanding of the world immensely.

3.2.1.2. EPISTEMOLOGICAL RELATIVISM

All that we come to know is mediated by language, by concepts and through theory. Knowledge is always subject to interpretation. Under the CR lens, the world is theory-laden, but not theory determined. That is, theory is independent of reality; it is a transitive dimension created by humans when attempting to understand the world.

Hence, for CR proponents, the transitive objects of science are knowledge and theories. They are contingent, local, fallible, improvable (at times), subjective and value laden. In short, they are relative to the researcher who is qualified to specify the relevant parts, relationships, and mechanisms pertinent to problems in their area of expertise. However, under CR, the knowledge that the researcher derives from the events and the experiences is only a part of this stratified and deep social reality. There is still much that we do not know and that we have not yet experienced, which makes our knowledge claims open to revision or refutation in the light of new evidence and theories.

3.2.1.3. JUDGMENTAL RATIONALITY

We can know reality despite epistemic relativism, Porpora (2015) argues. Epistemology in CR does not determine the object of study entirely. Judgmental rationality refers to the ability to evaluate different positions towards a social problem under investigation. CR is methodological anarchic; there is not a methodological programme associated with it. The best argument is decided using judgmental rationality, and we have to keep in mind that arguments are not definitive but tentative under a CR perspective. There are better or worse

arguments, but how do we know that we have arrived at the best possible explanation of a social phenomenon? Sayer (1992) proposes practical adequacy (as analogous to judgmental rationality) as a means to achieve this. The question is then, when is a theory practically adequate? Sayer explains that to judge this the researcher needs to consider three aspects, the reality described, the knowledge of that reality and the application to practice of that knowledge. To make the links between these elements more accessible, Rutzou (2016) uses the map as a metaphor:

> *A good map represents a deft blend of ontology, epistemology and practice. A map not only orients our practice and is drawn up with a particular purpose in mind, but it must interpret and transpose, however accurately or not, certain features of the world to guide our action and re-present the world according to various schemas, scales, images, keys, and legends. Maps do not represent everything, let alone everything accurately, but enough to highlight particular features in particular ways with practical purpose in mind. Different maps (fallibly) pick out different features of the world. (…) they are all constrained by the world they are trying to represent, the conceptual schemas they use and the interpretation they give, and the practice they are trying to guide.* (n/p).

When a theory (a map) is inaccurate, it does not help in interpreting the landscape, and it does not guide the individual to that what she/he is seeking to know (understand). Dow (2004), as cited in Olsen (2009), has shown that "the relevance of competing theories to a single social world tends to imply that realists must be rather tolerant of theoretical differences." (p. 5). The researcher will judge according to the practice she/he is trying to illuminate with the chosen theory. What is relevant, Sayer (1992) suggests is that the theories chosen by the researcher should explain the reality under investigation by giving an account of what produced it and that the theory used is robust. In this respect, RST allows exploring what those generative mechanisms or causal powers that shape students' engagement with open and participatory tools and platforms for their studies are. RST gives primacy to agency and through the principle of emergence, it offers an analytical tool to probe the cultural and structural constraints of student agency in the digital space. Nevertheless, as Rutzou argues, a map will never be able to represent all the elements accurately, something that will be reflected upon in the discussion chapter.

3.2.2. EMERGENCE

Emergence is a key concept for CR which RST has taken on board, pertaining to the properties that arise when parts of a whole are organised in particular ways. An emergent entity is constituted by the parts, how they are arranged in relation to one another and the

unique properties the whole holds due to the arrangements of the parts. It is the arrangement, how the parts are related and organised, that will determine what will emerge. Elder-Vass (2007, p. 29) explains it very clearly, "a whole [e.g. structure] can have properties (or powers) ... that would not be possessed by its parts [e.g. agents] if they were not organised as a group into the form of this particular kind of whole." This idea of emergence is what allows for making the distinction between structure, agency and culture. That is, it points to the reality that structure has different powers or properties than agency or culture. Structure can be understood as a set of relations between positions (Elder-Vass, 2007) or in the words of Alvesson & Sköldberg (2005, as cited in Pratt 2014, p. 6), a "configuration of causal mechanisms, rules, resources, powers, relations and practices that provide both a context for human interactions and motivation for social activity." Culture, Archer explains, consists of the accumulations of human ideas and intellectual artefacts (Archer, 1996). Being able to separate structure, culture and agency will be useful for understanding how agency is conditioned by the structures students are operating in.

Social contexts emerge through individual thoughts and action, with both being necessary for this to happen. Nevertheless, social contexts cannot be reduced to one or the other. The unique properties of the context derive from its constituent parts and how they are arranged. The implication of this is that the social context has causal powers. It generates effects over the individual as well as the dynamic between them, thereby producing events. However, what is produced depends on how the parts of the context (people, roles, norms, resources) are arranged. A context where the resources are allocated unevenly will have different effects on the individuals that operate within it, than one where the resources are distributed more evenly among the people.

3.2.3. SOCIAL REALITY AS AN OPEN SYSTEM

As aforementioned, CR treats reality as an open system, emergent and stratified. Following Bhaskar's ideas (2008), reality is complex and multi-layered; it is a multi-causal web of interacting forces, as noted in the previous section. Open systems refer to the concurrence of different causes that, at best, generate tendencies but never regular laws (Rutzou, 2017). The social world, therefore, cannot be understood as a well-ordered machine that produces patterns that can be expressed in mathematical formulas. Instead, a complex understanding of the world is needed. A social reality that is not conceived as flat, but

rather, one that is rich in different things, behaves in different ways, is organised and assembled in different ways as well as acting and interacting in varying ways. This depiction of the world is less ordered and closed; being more like a collage; a patchwork of different levels of reality happening at the same time. Little (2012) suggests that the world in these terms looks like a flea market. In such a market there are a variety of things exposed at the same time. Different people interacting with each other, sellers, policeman, pickpockets, buyers and beggars, who all come together, move about and interact, establishing relationships with each other, all being dependent upon and reproducing different materialisations of social forms (language, expressions, cultures, practices. There is no overall guiding design in this depiction of the world, but it is not completely chaotic, for there are pockets of order and pockets of patterns, but these are not manifestations of a guiding system. In fact, they are not called patterns in CR, but tendencies or demi-regularities, as Rutzou (2017) described above.

This continuous interplay of powers or generative mechanisms means that our social reality is shifting and unpredictable (Oliver, 2011). However, and despite its openness, it is possible to account for social processes that are at work at the deeper level of the real. Accordingly, CR researchers are interested in the theories and concepts that are required to understand the data available and to bring into the view the processes and the generative mechanisms that are 'really' at work (Ackroyd and Karlsson, 2014). In this open system, ideas, and concepts at a higher level of generality are needed to make sense of any evidence produced.

3.2.4. GENERATIVE MECHANISMS

The generative mechanism is another key idea of CR, being an alternative to causality as immutable, following universal laws that certainly do not apply in systems that are open, layered, and complex, like social reality (Case, 2013; Smith, 2018). Intuitively, a mechanism is what makes things work or what make things happen in the world. Bunge (2004) defines a mechanism as one of the processes in a concrete system that makes it what it is. For cells, for example, it would be their metabolism; for the brain, the intraneuronal connections; for a law office, litigation; teaching and research for a university, to name a few. Bhaskar (1979) holds that the objects and structures of the real give rise to powers that have effects called generative mechanisms, which are responsible for the events that we may or may

not see at the level of the empirical and the actual. According to Bhaskar, as cited in Smith (2018), a generative mechanism is "the way of acting of a thing" (p.2), and a thing is, as Fleetwood (2001) suggests, "an ensemble of power, structures and relations that has a tendency to do X" (Smith, 2018, p. 2). The university is an example of such a 'thing', an entity. Andrew Collier's view is that a generative mechanism refers to that "aspect of the structure of a thing by virtue of which it has a certain power" (1994, p. 106 as cited in Archer 2015, p. 2), that is, it generates some effects.

Causal associations are rarely universal in open systems; instead, they are tendencies influenced by the context and the setting where the phenomenon unfolds (Dalkin et al., 2015). Hence, mechanisms are non-deterministic; they depend on other mechanisms that interact in that particular context, that is, a mechanism is only triggered (or not) in the context of other mechanisms. The main objective of inquiry in the critical realist project is to understand the phenomenon under investigation, including the emergent entities, as a result of complex interactions of generative mechanisms. The complex task here is when a mechanism is activated, its effect can be counteracted by another and thus, rendering it observable. For example, a student that is experiencing fear of an exam, but the teacher has decided to provide that student with a quiet space where he can be more relaxed so that although he is afraid, and fear has the ability to block him, this new mechanism in place has balanced the effects of fear. Although the example maybe uses a more evident situation, this can happen at more subtle levels, which is what makes the work complex and nuanced. The extent to which generative mechanisms are actualised, stay dormant or counteract another mechanism will depend on the interactions among mechanisms (Ayers, 2011). This implies that mechanisms can be used to explain, but not to predict phenomena. They allow for asking more nuanced and complex questions that are about the why and how things happen, like for example why, how, and under which conditions do students engage/not engage with digital practices, rather than posing misguided questions, such as does technology enhance learning? (Smith, 2018). It is vital to take into account that mechanisms or powers are partially elusive and, hence we can only partly reveal them with the help of theory. Consequently, explanations will never be complete and always open for critique and alternative theoretical explanation.

3.3 REALIST SOCIAL THEORY AS THE MAIN SOCIOLOGICAL THEORY

Realist social theory (RST) is a body of knowledge that has been systematically developed during the last forty years by Margaret Archer, who is one of the main representatives of critical realism within sociology (Vandenberghe, 2016). Within this theory, three main analytical tools have been developed, analytical dualism, the morphogenetic approach, and emergent powers. The concepts are thought to offer a coherent explanatory framework that analyses social structure, culture and agency, whilst at the same time uncovering how they interlink in relational and processual terms (Vandenberghe, 2016). Whilst Archer is the main representative of the theory, there are other scholars who have taken part in developing the theory further (Sayer, 2000; Vandenberghe, 2005; Porpora, 2013; Donati, 2015; Brock, Carrigan and Scambler, 2017). RST is not a common choice among educational researchers in matters of educational technology with some exceptions (Hodgkinson-Williams, 2010; Cox, 2016b; Cox and Trotter, 2016) but their interest has been regarding open educational practices and the integration of OER in those practices, stressing mainly the role of the lecturer. It has also been used to explore matters of learning and teaching in general (Ashwin, 2008; Case, 2015).

RST helps to unpack the social reality in a more nuanced manner as explained in subsection 3.2.1.1., aiding the understanding of the context and the circumstances that might constraint or enable students' agency, articulated as reflexive engagement. Also, RST offers a route towards the emancipation and flourishing of the individual precisely through the unpacking of these invisible generative mechanisms of which individuals are unaware most of the time, but which, nevertheless, impinge on their doings, sayings and thinking. The institutional culture of a significant number of HE institutions is still driven by traditional norms and rules that guide educational practices. This, in turn, reveal cultural contradictions (Archer, 1996) between students and teachers, thereby providing an opportunity for potential elaboration of the practices students are part of. The morphogenetic approach (which I will explain in the next subsection) is a useful explanatory framework as it allows for exploration of the interplay of structure, culture and agency in a particular moment in time.

What follows is the explanation of the two critical analytical tools in RST, i.e., analytical dualism and morphogenesis. Both are intended as explanatory models to shed light on social change, whether it is institutional change or a more individual change.

3.3.1. ANALYTICAL DUALISM AND THE MORPHOGENETIC APPROACH TO SOCIAL CHANGE AS A TOOL TO EXPLORE THE ELABORATION OR REPRODUCTION OF SOCIAL PRACTICES

The basic ideas in Archer's theory are grounded in what I have described in section 3.2, that is, a stratified ontology of social reality, which stems from critical realism, sharing the same key principles about social reality being an open system and having a depth ontology, that is the three levels I explained above. Archer recognises that, whilst structure and agency are two aspects of social life, which are closely intertwined, they are analytically distinct. Structure and agency, for Archer, are neither different aspects of the same entity (duality) nor different moments of a single process (practice) (Vandenberghe, 2016). Instead, they are different types of emergent entities with different levels of complexity that presuppose each other and cannot be reduced to one another. This can be illustrated with the water molecule (the whole) that, whilst needing oxygen and hydrogen (parts) to exist cannot be reduced either to oxygen or hydrogen. This means that once they interact, unique properties emerge. The case of the brain is another example, none of the parts, i.e. neurons, grey substance, neurotransmitters, etc., can generate ideas and control our thinking process. It is the organisation of the parts in a particular manner that allows for ideas to emerge from the brain, which are generative mechanisms that make things happen in the world.

Social structures need the interaction of people, i.e. they emerge from people's actions and interactions, but they cannot be reduced to people. Agency emerges from different elements in the human, biological, social and cultural realm, but it cannot be reduced to any of those domains. This idea of different entities which interact but cannot be reduced to one another because they are different in nature, is what Archer uses to explain analytical dualism. Structure (relations between parts) and interactions between people operate at different times (Archer, 1995). Structures pre-exist agents. That is, they are things that exist already before the agents start to act and interact with them. Given the reality that agents die or leave, there still will exist the relations between the positions, the

norms and the rules by which those relations are managed and mediated owing to the underlying structures. Structures, seen like this, work like a springboard for agents to interact socially.

For example, students arrive at a particular higher education institution, which is a structure that has existed for almost a millennium. Despite educational institutions only being possible due to the activity (action and interaction) of actors (students and staff), they cannot be reduced to them. So, to be able to track the interplay between structure and agency, Archer proposes distinguishing the systemic level (structure) from the interactive level of society (agency), this separation being what she calls analytical dualism. I will use this approach to explain the present situation of students and their current digital practices at the institutional level. This will involve probing the actual reality of the structural conditioning and students' socio-cultural actions and interactions as well as what results from them.

As a consequence of the explanation that structure predates agents, one cannot say that people (students and staff) produce the university (structure). What one can say, however, is that it is through staff and students' action and interaction that they reproduce or transform the sociocultural system they inherited from their predecessors (Vandenberghe, 2016, p. 104). For action to take place, social and cultural systems need to predate actors and the social practices that reproduce and transform them. In the same way, the structure and culture that are transformed/reproduced through the agent's practices will predate the practices from which they result. As Archer (2013, p. 4) explains, "we can make an analytical cut at some point in time and for some purpose in hand", such that the activities of the agents within the structure can be examined at a given point in time T_1 (T_1 referring to the first cut in time), the steps for which are illustrated in figure 5.

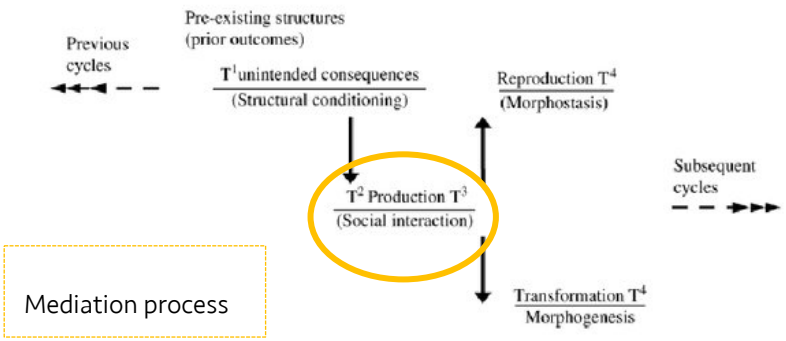

Figure 5:Transformational model of change (Archer, 1998, p. 376). The morphogenetic cycle

Archer considers that the sociology of the individual is fully integrated into the morphogenetic approach when cultural, structural, and personal powers intersect. Morphogenesis is related to change in shape (morpho is form and genesis is change). The morphogenetic/morphostatic framework is an explanatory framework developed by Archer (1979, 1995). The framework is a means to breaking up the processes that happen over time, into smaller phases so that the researcher can explain the outcomes of the processes of change (morphogenesis) or elaboration (morphostasis) of a social feature that is under investigation. This allows the researcher to think of individuals neither as passive recipients of certain powers nor completely free from the influence of the context and the circumstances that are acting in a particular moment in time. Archer argues that "we are simultaneously free and constrained" (1995, p. 2); affected by the social structures we are operating in but are not determined by them. The differentiating characteristic of the individual is a relative freedom that is achieved through her/his capacity to hold inner conversations, how she/he exercises reflexivity. This reflexivity, in turn, exerts a causal force on the external world (Archer, 2012), reproducing, or changing it, as can be seen in figure 5. Reflexivity for Archer (Archer, 2007b) is "the regular exercise of the mental ability, shared by all normal people, to consider themselves in relation to their (social) contexts and vice versa." I consider Archer's use of the term 'normal' contentious as, does Williams (2012). I am curious if the people that do not have the capacity for reflexivity are considered by Archer as subnormal or abnormal? Nevertheless, she uses the term stressing the difference between those individuals that could have had a brain injury that occasions loss of memory or any other mental difficulty that would interfere with the capacity to recognize themselves as the same person throughout time, that is, being able to have a sense of self continuously, which Archer argues is a necessary condition for reflexivity.

Burkitt is sceptic towards some elements of Archer's conceptualisation thus he puts forward a different take on agency, one that is not so much focused on the cognitive capacity of the individual to think and make choices around their vested interests. However, as an outcome of social relations in which we are always nested in some social relations. For Burkitt, unlike Archer, reflexivity should be a conversation within the world and not so much about the world otherwise it seems that the person is almost detached from that world as if the individual is only a spectator of that particular event. For this Burkitt (2015) relies on the fact that Marx and Engels point out that humans begin to distinguish

themselves from other animals when they enter into human relations in order to produce –through the socially organised, practical activity of labour- their means of subsistence, resulting in a definite *mode of life* (Marx and Engels, [1846] 1970: 42, as cited in Burkitt, 2015). Burkitt's focus on the relational aspect of reflexivity is also stressed by Donati (2013), who introduces the idea that personal reflexivity can interact with the different subjects in different ways, in so doing reflexivity becomes not only a 'solo conversation' but more the outcome of social relations.

Returning to Archer's conceptualisation of reflexivity, what she does is bringing to the fore the reflexive capacities of the individual and her/his power to effect change in an attempt to break with the semiautomatic (through habitual action) reproduction of (many times invisible) structures of domination (Vandenberghe, 2016, p. 105). Through this reflexivity, the individual can change the structure as a consequence of his/her self-transformation, what Archer calls double morphogenesis (Archer 1995). Archer's work offers an alternative explanation to conceptualisations of individuals as either the fully autonomous beings of rational choice theory or as social containers lacking distinct agential properties. This approach offers explanatory power instead of blind assumptions because at the heart of the morphogenetic cycle is the idea that individuals are not entirely free to act and interact with the world as there are potential constraints that can inhibit them from interacting. However, they have the capacity to engage reflexively, activating their inner conversation and find ways to overcome the constraints and generate some change. In so doing it becomes evident that they are not entirely determined by the context in which they are operating. By exploring the phenomenon in terms of the interplay of structure, culture and agency the picture of the individual will be more realistic, as it will uncover the difficulties, struggles and constraints that he/she encounter in their social practices. In so doing, one can think about what are the structures that need to be changed to open up possibilities for individuals to approach their social practices with an explorative mindset and a reflexive outlook towards these practices.

3.3.2. THE ROLE OF PERSONAL CONCERNS AND VESTED INTERESTS IN REFLEXIVE ENGAGEMENT

Archer's central thesis is that through the activation of the inner conversation that people have with themselves and significant others, the individual deliberates and ponders upon where to invest his/her time, energy, efforts, and resources. Subjects have their own constellation of concerns, which are an outcome of the process of socialisation of the individual. Archer (1995) explains that this process happens at the intersection of three dimensions of social life (illustrated in figure 3): the natural dimension that has to do with the natural environment and the physical well-being of the individual; the practical dimension relates to performance and achievements, it is the realm where the individual plays different roles and experiences different emotions attached to those roles (being a teacher or a student could constitute such roles); and the social dimension that has to do with the social relations with other individuals from which an individual's self-worth arises.

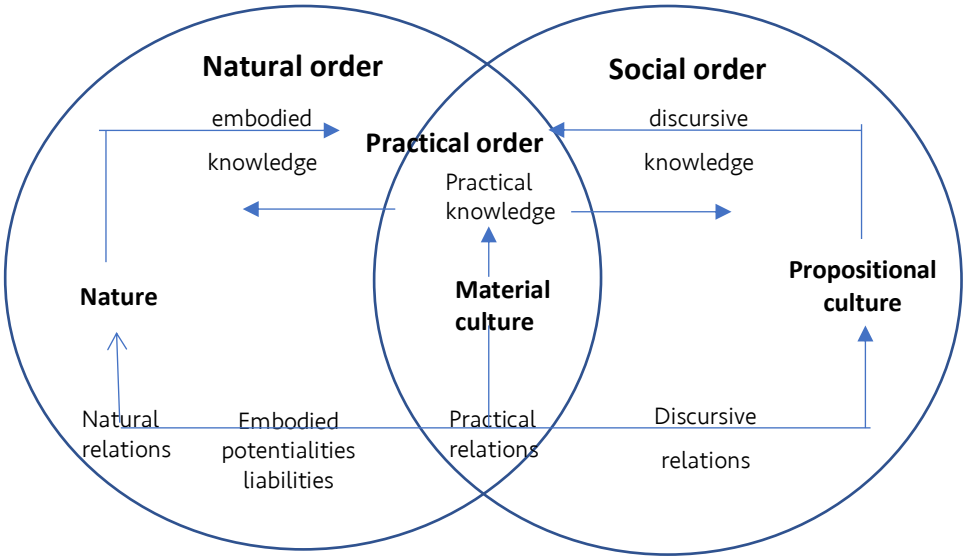

Figure 6:Three orders of reality and their respective form of knowledge (Archer, 2000, P. 162)

It is through individual's constellation of concerns, the personal projects (projects are any goal and interests entertained by social agents) and courses of actions that individuals undertake, that they find out who they are and what is their mission in life, an idea that Archer takes from Frankfurt (1988). This mediation between individuals' major concerns - what they care about- and what they want to invest and forgo, is what constitutes the mediation mechanism that links the powers of structure to agency (Vandenberghe, 2013).

In the light of the above a concern about students' process of mediation arises, namely what happens in the case that acquiring a more sophisticated digital practice is not a major concern for students. This concern is partially answered by Frankfurt (1988) when he explains that "patterns of interests (...) may be manifestations only of habits or of involuntary regularities of some other kind, and it is also possible for them to develop merely by chance." (p. 83), that is, there is a possibility to change those habitual actions.

One condition needed for the personal powers of the individual to become activated so that he/she is able to mediate social and cultural structures, is the fact that she/he reflexively deliberates what are the possible courses of action to undertake to achieve the personal project. These actions are structured or shaped through constraints and enablement, that is, they are a response to overcome these constraints or to harness the opportunities present in the social structures, but only if the powers (constraints, enablement) are related to the personal project (goals and interests) of the individual (Archer, 1995), that is, structures only exert effects when they bump against an intentional goal set out by the actor, the agent. In addition, individuals engage in social practices in which they occupy certain positions. Smith and Seward (2009, P. 223) argue that "a person's relative position in society subjects them to the causal mechanisms that constrain and enable behaviour." Therefore, the exercise of constraints and enablement as causal powers is dependent on the agency with which the project is embraced and the link between individual agency and social structure is to be found in positioned-practices. By personal project, Archer means one that an individual has deliberately thought about in the context of his/her major concerns, which refers to the ideas that people have about their future, how they see themselves in that future, where they want to be, and what they want to become. Archer expresses this in the following way: no project, no constraints or enablement. This implies that individuals are determined but only to the extent that they determine themselves and choose a project that is relevant to them. It is through the reflexive deliberation about the feasibility of that project and the courses of actions, in given circumstances, that they actively choose a *modus vivendi* as a living compromise between the actual and the possible; what they imagine as their future. This internal deliberation takes a dialogic form of an internal conversation between the 'Me' (past self), the 'I' (present self), and the 'You' (future self) (Archer, 1995). An example of a major concern for young people could be what they want to be as professionals and what

pathway to choose to achieve it. So, if they have decided that they would like to become a teacher, this choice, Archer suggests, is the product of the intersection of the three dimensions depicted in figure 6, then she/he needs to deliberate reflexively and discern what the courses of actions he/she needs to pursue to become one are. Hence, going to university and pursuing a degree in Education Studies could be one such project. But within this project, some different smaller projects and goals need different courses of actions to become an educator.

In the process of mediation, enablers and constraints, which derive from structural and cultural properties, have the generative power to impede or facilitate projects that have been set up by agents. This means that if the individual is vested in a particular project that is vital for her/his current concern, then she/he will actively engage in internal deliberation about how she/he can circumvent or overcome the constraints or find strategies to harness the opportunities that will allow her/him to accomplish the project. In the words of Archer (2007): "courses of action are produced through the reflexive deliberations of subjects who personally determine their practical projects in relation to their objective circumstances." Transformative reflexivity and action are what individuals bring to the social context in order to enact or materialize change. One of the essential differentiating powers of people is their intentionality – their capacity to entertain projects and design strategies to accomplish them independently if they are going to be successful or not. Figure 7 illustrates the elements and stages of the mediation process devised by Archer that takes place in the morphogenetic cycle (illustrated further in the thesis in figure 17.

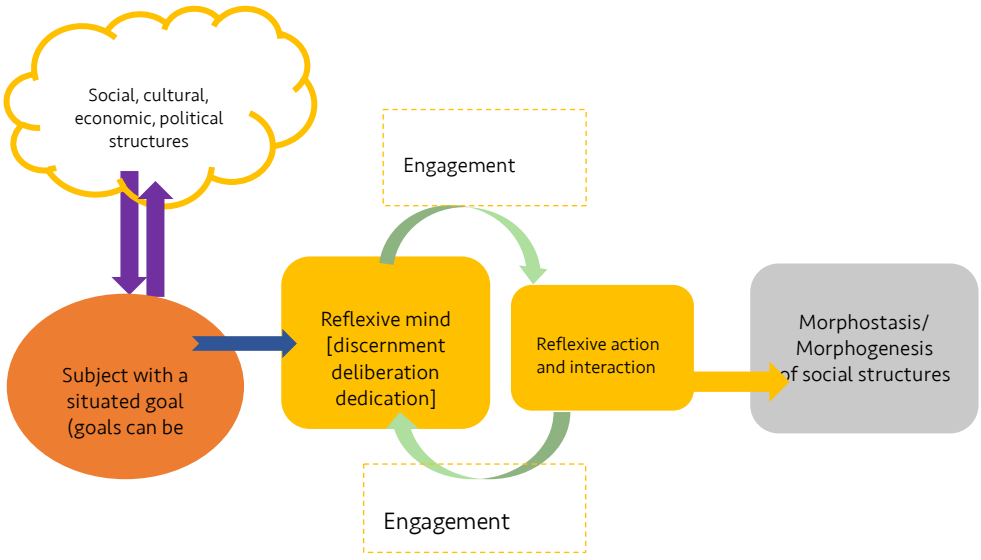

Figure 7: (First order/personal) engagement as reflexive agency (Donati, 2013, p. 133)

This engagement Donati (2013) defines as first order reflexive engagement of the subject with the world. The process of reflexivity conceptualised by Archer (1995) understands engagement as a complex result of agency in which individuals through an inward process of reflexive thought deliberate, evaluate and decide upon their personal projects that are an important part of their ultimate concerns and courses of actions. The process depicted in figure 7 represents the reflexive engagement of the self with the world; it is an exercise of individual agency towards an object/goal (something that the individual wants to achieve usually in the practical world). Reflexivity is concerned, Donati (2013) continues, with (a) the relation between the subject and the context (object) in which she/he operates (subject/object → student/digital practice), (b) it entails the internal mental activity (internal conversation) (subject/subject → student-student), (c) it includes the elements of the reflexive process of agency and (d) it includes the outcomes in terms of the elaboration (morphogenesis) or reproduction (morphostasis) of the structures (object/object→ students' elaborated/reproduced digital practices). It can be inferred from this that social structures do not act upon individuals without being mediated by the individual through conscious negotiation, that is, the inner conversation. Sayer (2009) argues that key to Archer's proposition is the fact that individuals are not passively moulded by the context but instead the effect of such context will be determined by the individual's active mediation on their situation.

In Archer's theory, Donati (2013) observes that the subject can change her/his situated goals and also, her/his main concerns. This can lead to a shift in fundamental values, in particular, because of the questioning that goes on through the internal conversation. This view allows the individual some kind of freedom to take ownership or responsibility of her/his life, or at least for some of the choices she/he is confronted with. This is desirable in educational terms, in particular, when students are confronted with the task of crafting their digital practices for which they need to engage reflexively with tools that they need to choose for themselves.

Donati (2013) observes that the means that are selected to achieve the goal are conceptualised as opportunities. This means that they are not pre-given, and thus, the individual, in line with norms, goals and values, decides which means are the adequate ones to mediate a particular task. In other words, under this perspective, it is held that an individual can guide the design of her/his practice and the means to mediate it. This

reflexive engagement can be morphogenetic, if it leads to change or morphostatic, if it has no impact on the structure, that is, reproducing it instead of changing it. What is novel in this model, Donati (2013, p. 134) points out, is that the relational character of engagement is cyclical across the different and usually parallel projects, that a subject has opened in her/his life.

Important for what I aim to explain next, is the fact that each shift or change in a cycle is seen in relational terms (Donati, 2013), where subjects act relationally, within themselves and externally with others. Of salience in Archer's idea of reflexive engagement is the fact that engagement is concerned with both its object and the situated **relational setting** (e.g. clients, stakeholders, teachers) in which it needs to be accomplished. This implies that engagement has to do with the context in which it happens and with the relations that are implicated in the engagement. Social positions (that are attached to given social rules) then, constitute the underlying social structure that facilitates or constrains human agency and social practices.

3.3.3. THE SOCIAL DIMENSION OF REFLEXIVE ENGAGEMENT

I introduced reflexive engagement in section 2.5, in this section what I will do is to expand the personal take on reflexive engagement explored before, adding a social dimension to the concept and explore what Donati (2013) proposes as a useful model to create meaningful context, what he calls, the 'we-context', to collaborate and create relational goods.

Donati recognises the value of the more personal take on reflexive engagement (as an articulation of agency) that Archer (1995) has proposed (figure 7). Nevertheless, he suggests that the social dimension of the engagement is missing in Archer's account in that it mostly involves the inner process of the subject in relation to an external self-selected object. Donati explains that Archer's take on this does not address the process of the self, that is concerned with the relations between the actor/agent involved in a particular situation.

However, to explain this, Archer maintains that in her account of reflexive engagement the subject consults the outcomes of her/his actions in the real world, whilst the orientation of the engagement is more towards the self. This is considered a limitation and has been

challenged by different scholars (Sayer, 2009; Burkitt, 2015; Caetano, 2015), arguing the importance of the external conversations people have in different social contexts to explain how humans behave. Caetano (2015a) suggests that, together with reflexive deliberation, external conversations are a part of our process of defining what we prioritise in life and what we do to make it happen. It is not only about our inner dialogue, but also, that with the outside world. Sayer (2009) adds to this his concern about the influence of other factors in an agent's actions and interactions with the world. He suggests that although this is a matter that still has not been clarified, it is a problem for contemporary social science. He also comments on the fact that Archer does not include the concept of habitus[16] in her explanation of how people interact with the world. Sayer is of the view that given reflexive deliberations through inner conversations are key to interacting and making our way through the world, it would be difficult to imagine that all what individuals do is only guided by individual reflexivity. He believes that it is more a combination of both habitus and individual reflexivity.

Archer would argue that different individuals adopt different types of reflexivity, leading to different types of engagement that will shape their lives and social trajectories over their life courses. Moreover, people always check with the outside world in order to see whether there is any change needed in their course of action. Despite the limitations of Archer's conceptualisation of the inner conversation, there is value in understanding that there are differences between how people actually achieve their personal projects. That is, people have different strategies to cope with structural and cultural constraints that will depend on different factors. To explain how these differences come about Archer (2007) devised four types of reflexivity, which I will briefly describe.

Communicative reflexivity is the type where the inner conversation, the reflections, are shared with others, and it is in that sharing of their internal thoughts that individuals make sense of their particular situation and take action (Archer, 2007). As Archer explains 'the

[16] Habitus lies at the heart of Bourdieu's theoretical framework. It is defined as a system of dispositions to certain practices, is an objective basis for regular modes of behaviour, and thus of the regularity of modes of practice, and if practices can be predicted (…) this is because the effect of the habitus is, that agents who are equipped with it will behave in a certain way in certain circumstances (Bourdieu, 1990, p. 77).

need to share these thoughts to conclude their deliberations' is a distinctive element of the communicative mode of reflexivity (Archer, 2007, p. 102). In this sense, trust in others is the driver for these individuals. She adds that the sharing with others is sometimes driven by a lack of knowledge or experience in a particular area of life. **Autonomous reflexivity** is the type that involves sharing less with others and relies more on the individual self when deciding about a course of action. Those taking this path tend to rely upon their own resources, they are confident in handling contextual discontinuities (Archer, 2003), that is, contradictions between what they know and the experiences they encounter in the context. They like challenges and seize upon every opportunity to 'move on' (Archer 2007, p. 208); they are strategic and instrumental. This type of reflexivity responds to the question, what should I do? (Al-Amoudi, 2017, p. 72). **Meta-reflexivity** is the type of reflexivity where individuals reflect upon both their inner-conversation and the views of action that are effective in society. They ponder about the moral value of their projects, and they reflect upon the worthiness of undertaking any project. This type of reflexivity is concerned with the question "what matters to me and my view of the good society?" (Al-Amoudi, 2017, p. 72). **The fractured reflexive** refers to the type of person that gets disoriented and stressed instead of engaged with their inner conversation; they have difficulties using their reflexive powers. Individuals tend to adopt one form of reflexivity, as Archer describes in her work (2007), but that does not mean that they pursue only one. There are different degrees to which these types can be manifest in individuals, thus generating different ways of engagement with the questions, what matters to me? and what could I do about it to make it happen? The powers of reflexivity are not evenly distributed, and they are not a definite and immutable feature in people. Instead, and as Al-Almoudi (2017) suggests, they can be nurtured or damage depending on the social context they find themselves in.

Reflexive engagement, as Archer describes it, addresses mainly the personal dimension of engagement, but this seems for Donati (2013) to be incomplete. He thinks that there is another layer to engagement, namely a social dimension. Donati's work, which is close to that of Archer (Archer and Donati, 2015; Donati and Archer, 2015b) explores the role of social relations in the configuration of society. For Donati (2015), these relations are the connectors that mediate between agency and social structures. To explore the social dimension of reflexive engagement Donati considers that meta-reflexivity is critical

because it is the type of reflexivity that allows the individual to be more detached from the self, thus being able to take up the perspective of the other more easily. Donati (2013) affirms that the social dimension of reflexivity is key due to situations where social relations become a pre-requisite for the engagement (p. 135), an example of this case could be a working relationship, a marriage relationship, a caring relationship, or an educational relationship. This social aspect, he continues, tends to manifest when the production of relational goods is involved. A relational good refers to the communal object that has been set in communal agreement. Communal, in Donati's (2013) view, is defined in a 'we' context instead of a more personal setting, which is the setting in Archer's conception of reflexivity. An example of such a 'we' context could be the lecturer-student or student-student liaison. This is second-order reflexivity, according to Donati (2013), where the individual includes in the social relation the external environment (her/his social network for example) thus making the engagement not simply self-referential, but rather, more socially oriented. Donati's model for this kind of engagement is illustrated in figure 8.

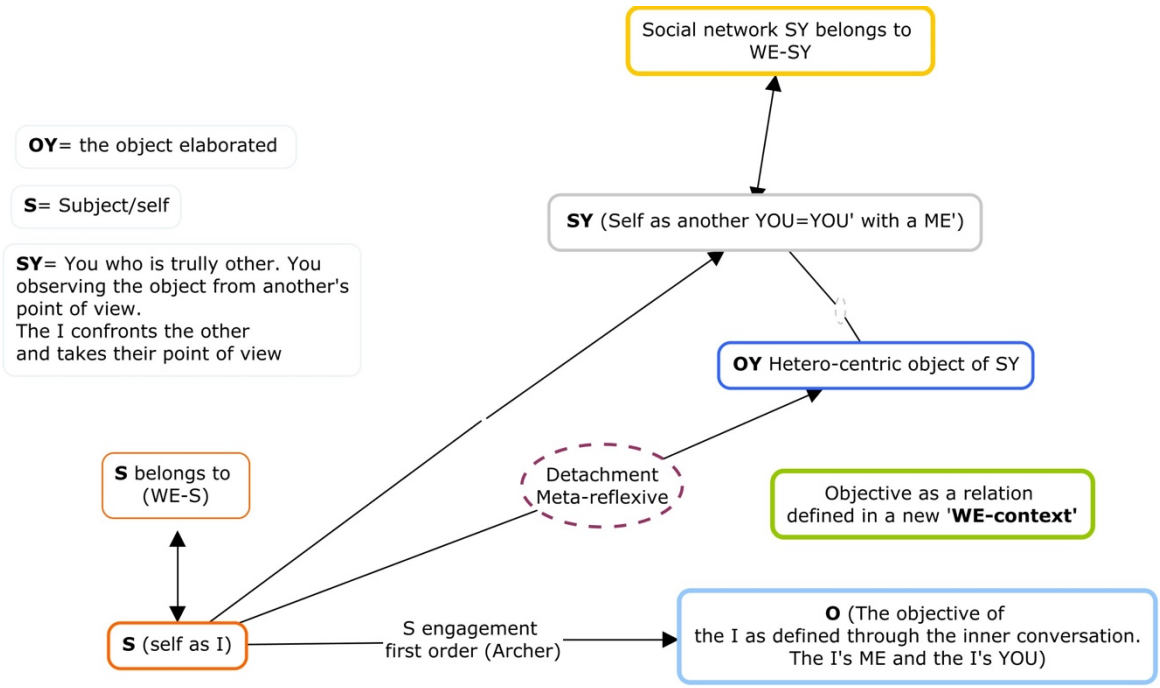

Figure 8:Engagement as meta-reflexive agency, according to the relational approach (Donati 2013, P. 139)

In this model, Donati depicts his conceptualisation of the second order engagement. He explains: "while the Objective (O) is internal to the subject (that is, the Object is seen by S, according to his or her own reference system), OY [the object elaborated as a relation] is

seen from another point of view, SY -that is it is centred on the relation to the Other." (p. 140). It can be, and it normally is the case, that there are conflicting views of the Object, not necessarily there always is an agreement. However, if the subject is interested in developing a relationship with the other, it will not be possible to go back to the subject's inner conversation. Donati argues that "it is apparent that the 'other' (SY) point of view is a 'third' viewpoint which stimulates the Self to redesign his projects again and again, by overcoming the doubts and uncertainties arising in his/her internal conversation." (p. 141). The examples of 'Other' that are relevant to the model depicted in figure 8, could be a colleague at work or the doctor in a medical visit. Nevertheless, he then extends what he has explained in the model depicted in figure 8 adding someone else to the relationship that participates actively, say a partner in a couple relationship, or a lecturer in an educational relationship. This more complex relationship where there are two sides of the subject, namely the two people of the couple is illustrated in figure 9 with a concrete example Donati sketches out about Helen and David. What this depiction does is that it includes both meta-reflexive engagements, that is Helen's and David's.

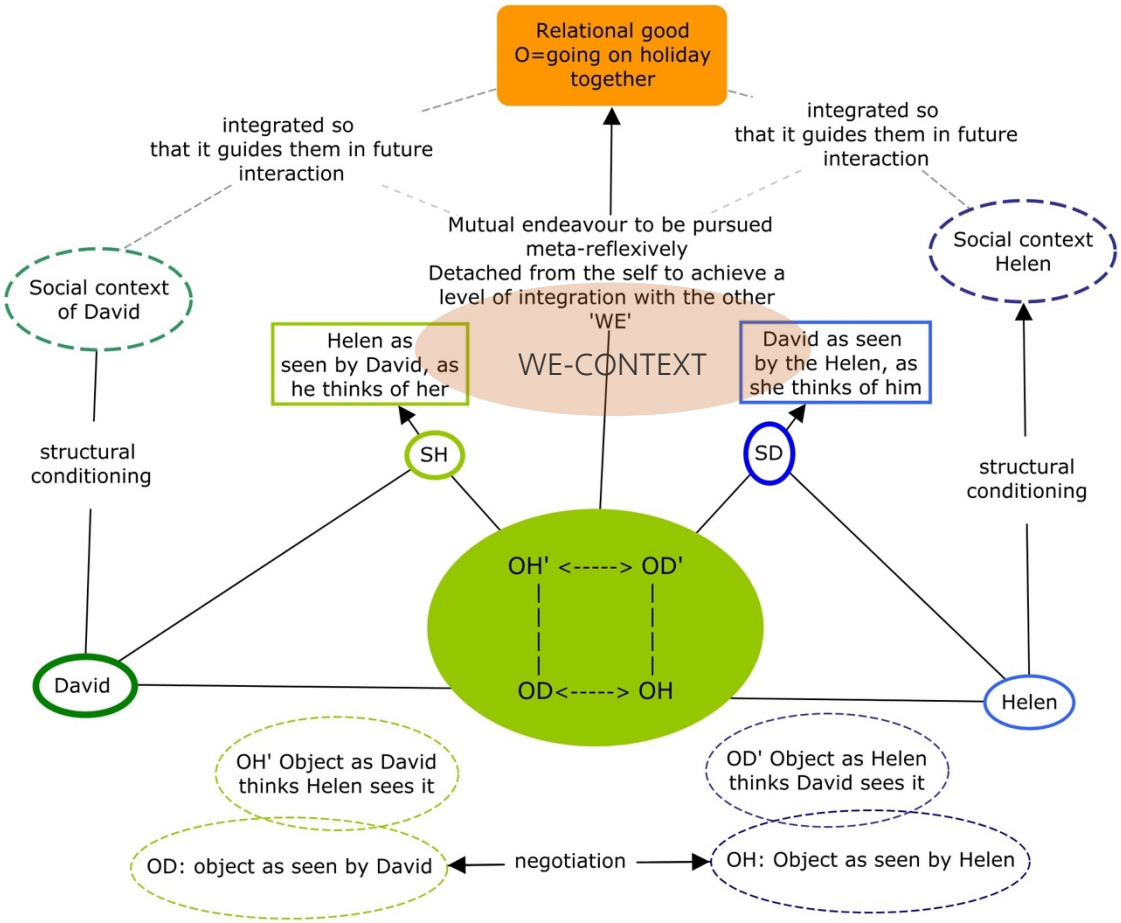

Figure 9:The We-relation (relational good) of a couple (David and Helen). (Donati, 2013)

- RG: → Relational good as we-relations
- Object (the couple -Helen and David- as a we-relation in action, generating a relation good, for example going on holiday together in this particular case
- SH→ Helen as seen by David (as he thinks of her)
- OH' → The Object as David thinks that Helen sees it
- OD→ The Object as seen by David
- SD → David as seen by Helen (as she thinks of him)
- OD' → The Object as Helen thinks that David sees it
- OH→ The Object as seen by Helen

As figure 9 illustrates, instead of having an individual enterprise/project as in Archer's reflexive engagement model (figure 7), there is a mutual endeavour. It is also important in Donati's model how each of those involved think about the other; this is part of the discussion that needs to be had in the process of agreeing to the relational good that they are going to pursue in the 'we-context' this time made out of two people, Helen and David, but as Donati (2013) explains, it can be extended to different relationships, e.g., education. In this model negotiation, co-operation, trust, and agreement are a critical part of the communal enterprise. The model also stresses the importance of strong bonds, robust relationships which is a point that Bryson (2014, p. 8) also suggests as paramount for student engagement (engagement here is meant with the learning experience), he states that "there is a need for staff and students to have a stronger discourse between them and thus, a shared understanding."

This social dimension developed by Donati is an idea that is not entirely new. Heidegger's understanding of 'being' also has a social dimension whereby "*Dasein*" always refers to a being with others. *Dasein* is a German word that has implicit the presence of the other: 'being there for', and there is no other way of 'being there for' than being there for someone else. This is how Nicolini (2012, P. 36) explains it in the context of practice, "we find ourselves within a given, collectively sustained horizon of intelligibility and action (...)." Heidegger adds an important element present also in Donati's model of relational engagement, i.e. emotion, the affective tone that will lead to meaningful social bonds. Emotions are a key element for engaging, not only in social relations, but also with our personal projects and the efforts that achieving them entails. In addition, Sen (2006, as

cited in Smith and Sewer, 2009) argues that being part of a group can be a powerful driver for action.

The relational good, which is the joint objective of the engagement, is taken as the starting point, and it stems from their (those involved in the engagement) mutual reciprocity (Donati, 2013). There are an exchange and a negotiation needed between how each of them thinks the other sees the Object and how they see the Object to set the goal as a common enterprise, "so that the unity of the relational goal is a plural entity where the agreement is about what is shared between the different definitions of the relational goal."(Donati, 2013, p. 146). However, the relational good becomes part of the individual context of the participants, guiding their future interactions. It can be said then that the relational good affects the mutual relationship, for example, the educational relationship, but at the same time, it shapes and orients them in their future interactions. There is a risk, Donati (2013) argues, of an imbalance towards one side of the liaison, and such asymmetry in the relational goal can produce what Archer and Donati call evils. Considerations will need to be taken, Donati advises us, not to abuse the power that is inherent in any role and position the individual occupies. Donati explains, how this implies a certain detachment from their subjective role as figure 9 clearly indicates, requiring the effort to connect with the other subject that is in the relation. How can this be negotiated in a manner that both sides feel included and favoured? Here is where that reciprocity mentioned earlier comes into action. Reciprocity is what opens both parties to embrace engagement as a relation that is satisfactory for both (Donati, 2013, p. 145). The feedback from the relational good to the internal conversation of the parties involved makes the relational good more reflexive. As Donati explains, they add to the quality of dedication towards and investment in the relational good at stake. This is because both parties need to change the way they think about themselves to adhere to their commitment to form a 'team'. This is what Archer and Donati call the morphogenesis or the change in shape of the relationship.

The fact that there is a relational good, an ideal objective that is set in a shared context that emerges from a 'we' relationship, entails a collectively sustained horizon for meaningful action. The relationship that is at stake, as said before, can be varied. In the case of the business relationship, what must be generated is a 'work' relationship, but not in terms of functional performances, Donati suggests. The relation that is going to be built is a specific reality. A business relationship can be different in nature according to the

subject's concerns, and that drives Donati (2013) to ask how the Object can be understood in a relational sense? To answer this question, he has created an analytical framework to define the Object as a relationship. The framework is illustrated in figure 10, and Donati denotes it with the acronym AGIL (Donati, 2013, p. 154). The model considers the different dimensions of engagement as a social relation which he argues, is contextual and has specific properties. These properties are activity-dependent upon the actions of the subject, but it goes beyond them as it is emergent. Donati (2013) argues that social relations differ according to the context. "What results from this is a view of society as a differentiation of social spheres, where such differentiation has a relational character both within the different spheres and between them." (P. 152). What is relevant, he continues, is that "social relation is seen as having a structure which has an ontological reality. (...) the structure of a social relation consists in being an emergent effect of inter-action, that is, A←relation→B. Engagement is, therefore relational, (...) which arises, develops and can be successful or unsuccessful (...) in the different social spheres". (p. 152). The dimensions of Donati's model are sketched as follows (p. 152):

G The **goal** of engagement. The identification of a situated interest, goals, and concerns. Setting the goals involves reflexivity, which Donati states is autonomous reflexivity; it is focused on the achievement of the goal(s).

A The **instrumental dimension** of engagement. The identification of the means to achieve the goal. Reflexivity here is centred on choosing the appropriate instruments to reach the goal. Communicative reflexivity is in display on this dimension.

I The **normative dimension** of engagement. This dimension can be seen as a regulation of the other aspects. This is related to the norms and rules that relate to the other components of the engagement. Relational reflexivity is the one at stake for this dimension.

L The **ethical value dimension** of engagement. This dimension is about the care of a relations as a value and as a carrier of value that engagement embodies as a particular relation (if it is the patience-doctor relation, it would be health; if it is the teacher-pupil relation, it will be education, and so forth).

Donati clarifies that engagement is situated in a particular context and a particular project or endeavour. In every dimension the subject evaluates (according to an ethical criterion, that is, geared by values) what is they are aiming at; this they do by "giving different values to each dimension of engagement or combining them in different ways" (p. 152). So in the goal dimension, the ethics of engagement is defined as intentional; in the instrumental dimension the ethics of the engagement is conceptualised as a means of adjustment; in the normative dimension it is seen as relational responsibility; and in the ethical value, the ethics of engagement is characterised as care of the relation.

The idea with Donati's conceptualisation is to illuminate a different logic of engagement that is more present in current times; a logic that has shifted the attention from engagement as focused on the acquisition of material objects and conditions to one that focuses on opportunities and quality of life. That quality of life, he continues, is evaluated for the quality of the social relations it can offer. This shift is because in society things change very fast, a phenomenon Archer (2007, as cited in Donati, 2013) defines as unbounded morphogenesis. In such a society meta-reflexivity is the prevailing mode of reflexivity. There is then a shift from "engagement as an individual enterprise to engagement as caring for social relations" (p. 156). Donati warns us about the difficulty of handling the object of a reflexive engagement and about the need of a meta reflexivity in those participating in the reflexive engagement.

Both orders of reflexivity are conceptualised as engagement (one at a personal level, figure 7, and the other one at a social level, figure 9), thus what is exactly engagement needs to be conceptualised and contextualised according to the social reality at stake.

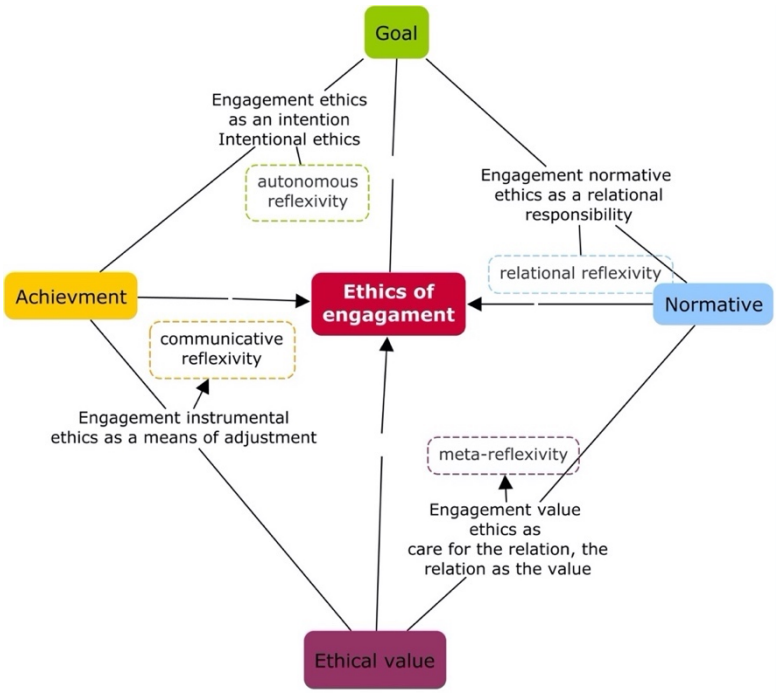

Figure 10: The different ethics of engagement, their possible combination, and the connection with different forms of reflexivity (Donati, 2013, p. 154)

3.4. APPLICATION TO THE THESIS

By using CR, I aim to explore and analyse students' narratives and the arrangements of their digital practices to work towards a realist understanding of the generative mechanisms that shape students' reflexive engagement/lack of with open educational practices. Through the use of analytical dualism and the morphogenetic cycle (Archer 1995) I am in a position to challenge deterministic accounts of students and technology use. Archer's approach to social change resolves the problem of the displacement of the human subject and the celebration of the power of social forces -digital technologies, and educational institutions, to shape and to mould each structuring activity (downward conflation). Instead, Archer argues that social life emerges from human beings and not the other way around. That is, humanity is influenced but not determined by the emergent social forces of structures. She suggests an approach that integrates the interplay of structure, culture, and agency to explain social phenomena, which she has conceptualised through the morphogenetic cycle. It is this interplay which I will explore in this study. I will make use of the concept of emergent causal powers to identify and define which are those powers, the generative mechanisms that emerge in the interaction that students have with the

structural conditions and have potential explanatory power to shed light to the phenomenon under investigation. The concept of ontological depth will enable me to explore the deeper layers of students' digital practices so that invisible causes that shape students' engagement or lack of with open and participatory tools can be uncovered and explained.

CR has not been widely used in educational research (Oliver, 2011); nevertheless, there are good examples of how it has been adopted, in most cases, to uncover how hidden generative mechanisms shape what students/lecturers do in (open) educational practices (Czerniewicz, Williams and Brown, 2009; Case, 2013, 2015). More than anything, CR has been used to explore the complexities of learning and teaching (Ashwin, 2008) or in studies where the interest is not so much about the motivations of students' engagement/non engagement with tools and platforms, but rather, to explore how they interact in online courses where engagement is assumed to be a given (Li, 2016; Kahn *et al.*, 2017).

In this study, reflexive engagement and the reasons for such engagement/non engagement are investigated. Archer's account of reflexive engagement combined with Donati's more social take on reflexive engagement, both updated for the technological and morphogenic society, are key concepts to be explored in the data and further theorisation. There is a gap in relation with the understanding of individual agency in digital practices and this thesis both, uses and elaborates upon this gap through a humanist take of the individual and its reality. Archer's theory is a pillar to investigate agency and the individual's actions and interactions with the context and its structures.

I illustrate below the intersections of theories I draw from to articulate the framework, thus, to think about the collected data and the generative mechanisms. The use of these theories will make more sense while reading chapter 5 where the process of data analysis is described in detail as well as an initial exploration of another theory and why it was rejected.

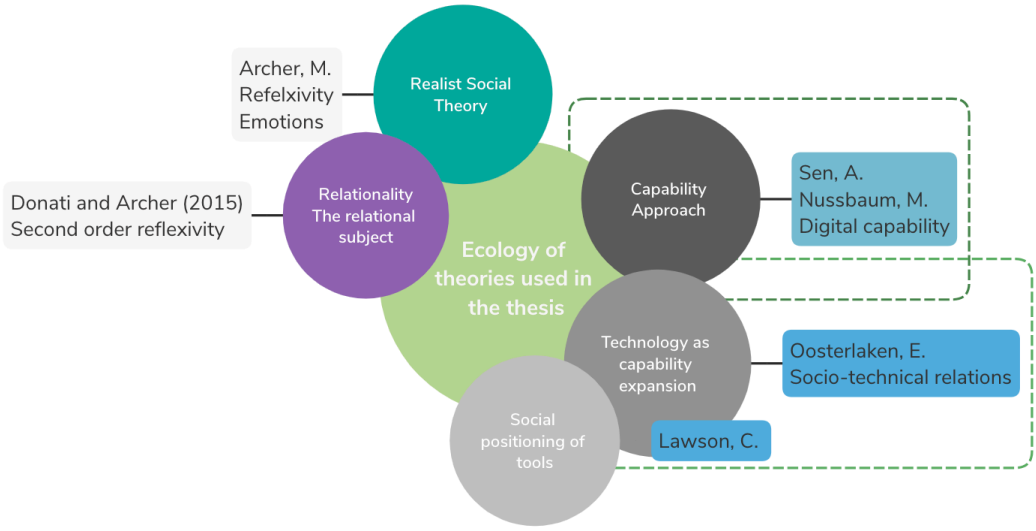

Figure 10: The ecology of theories used in the framework and further data analysis

The following chapter moves on from describing the theoretical underpinning of the study to explaining how the study aims to address the research questions, describing the design and methodology used for that purpose. It is worth mentioning to the reader that whilst the theoretical framework seems to be set out from the beginning this was not the case for this study as I have noted in the introduction to this chapter and will further explain in chapter 5. As explained at the beginning, the process of articulating the theoretical framework was a dynamic journey that started out not with CR and RST but only with constructivist grounded theory (Charmaz, 2006). In the next chapter, I will describe the stages of this journey, explaining how I got to the already described theoretical framework in this chapter.

CHAPTER 4
METHODOLOGY

"Critical realism is an ongoing research programme within the human sciences, and particularly in their theoretically and politically contentious border areas. It is certainly not a completed system which can simply be applied in these fields, to solve all problems: on the contrary, by treating scientific projects as exploration of realities with inexhaustible depth, it helps to keep those projects open for self-criticism and development."

(Collier, 1994, p. 236)

INTRODUCTION

In the previous chapter, I gave a detailed account of the theoretical and conceptual framework that guides this investigation. I described critical realism (Bhaskar, 2008) and its ontological position and Archer's (1995) morphogenetic cycle, both working in tandem to generate an explanation of what are the constraints and enablers that shape students' digital practices in personal and institutional settings. I also drew on Donati's (2013) model for social reflexive engagement and Archer's concept of first order reflexive engagement, both being used to understand students' reflexive engagement with digital tools and platforms.

However, I did not arrive at this framework (described in chapter 3), i.e. CR and RST at the beginning of the study. It was a dynamic intellectual journey that developed as I was trying to make sense of the data collected. This dynamic journey I will describe throughout this chapter where I turn to the methodological choices I have made, explaining how the study was designed at the beginning, what were the changes I had to made, and what I did to propose the research questions and address them.

This study is qualitative in nature, and it started out being framed under constructivist grounded theory (CGT) (Charmaz, 2006) to collect and analyse the data. Once I collected the data and started to do the analysis (which I explain in chapter 5), I realised that CGT fell short to account for the structural conditions within which resources are made available to agents and actions are pursued. Hence, I began to search for other theories that could assist me in uncovering the hidden and invisible structures that were shaping students' digital practices. The outcome of my search was a more complex theoretical framework, namely, one that was guided not only by CGT but also by CR and RST, as described in detail

in chapter 3. To arrive to this framework, I had to find a theoretical bridge that allow me to combine CGT with CR and RST, which I did, and I explain the process in chapter 5, where I analyse the data.

In section 4.1, I explain how constructivist grounded theory frames the field work and how it has been adapted to provide a practical way to investigate social reality. In subsection 4.1.1. I justify the need for critical theory and in subsection 4.1.2 I explain in more detail the main tenants of CGT. In section 4.2. the research design is illustrated and described listing the three research questions that this study sets out to address. The rest of the section gives detailed account of the research site (4.2.2), discusses the ethical considerations (4.2.3) and describes how trustworthiness has been approached (4.2.4). In the reminder of the chapter, I explain, in detail, the two stages of the study, an exploratory stage (4.3.) and in-depth stage (4.4.), giving for each the context, the methods and the procedures by which the data has been collected. For the exploratory stage, the data is analysed and presented in this chapter, whilst for in-depth stage, the data is described in preparation for deep analysis guided by CR and RST in chapter 5. In the chapter summary I review the stages completed and provide an outline of what is to come in the following chapters.

4.1. GOING TO THE FIELD

In relation to the philosophical position for this research project, which ended up being a social realist examination of students' experience engaging/not engaging with digital technology (as explained in the introduction of this chapter), the actual process of identity construction is prioritised, rather than assuming a set one. The adoption of CGT as a framework to begin the data collection allows the study to focus on participants' meaning making process as the starting point of the investigation. As Charmaz states, the existence of multiple realities "recognizing the mutual creation of knowledge by the viewer and the viewed, and aim[ing] toward an interpretative understanding of the subjects' meanings" (Charmaz, 2015, p. 250). This perspective underpins the investigation regarding how the participants re-constructed their social realities, namely, their digital practices, with a particular focus on their academic digital practice. An example of emphasising the subject's meaning can be taken from Charmaz's (2000) account of her work with illness (Charmaz, 1990), where she starts by viewing the topic of pain as a feeling, that is, subjectively, and can take a variety of forms. In line with her view, she asks, "What makes pain, pain?" (ibid.).

With this question, she aims to understand what is essential to the phenomenon, as defined by those who have experienced it. Charmaz advocates a mutual relationship between the researcher and the participants, where the primary output of the research is not a concept, as is the case in GT, but the creation of a shared reality. For Charmaz, "Constructionist grounded theorists emphasise abstract understanding of empirical phenomena and contend that this understanding must be located in the studied specific circumstances of the research process" (Charmaz, 2008, p. 398).

4.1.1. THE NEED FOR A CRITICAL PERSPECTIVE IN EDUCATIONAL RESEARCH

The tendency to address young people from a deterministic stance, putting them into fixed boxes with set characteristics that are attributed to the technologies they are immersed in, leaves little room for social change. Moreover, it strips the agency out of the person and confers his/her power to the technology (M. Oliver, 2011). This demands attention and shows the need to approach research in educational technology with a critical stance (Selwyn & Facer 2013), or as Winner (1980) suggests, with 'political teeth'.

The intention behind this endeavour is to consider the broader sociological and political context of education (Biesta, 2006). By applying a critical lens, I challenge deterministic and reductive ideas, being those discussed in chapters 1 and 2. Regardless of the labels assigned to young people (e.g. digital natives, the Net Generation), the main problem is that the agency and the engagement that happens in students' digital practices is overlooked. This attempt to homogenise a particular group of people ignores the reality that to learn something and experiment with the change resulting from that learning, requires a reflexive and deliberate effort. As Trowler (2013) argues, in any engagement there is effort and relevant resources invested by both students and the institutions that they are part of. A deliberate and reflexive relationship with technology has often been neglected, as Hartman et al. (2008) reported in their study when asking one of their participants what is technology to him, with the answer he gave being:

> *Reformatting my computer system and installing cutting-edge software that* ***allows me to do what I want,*** *when I want,* ***without restrictions, ...and the rules of Bill Gates.*** (p. 3.2, emphasis is mine)

Friesen (2008) states that all knowledge, even the more '*commonsensical*' (p. 1), is historical and political in nature, which is what is often ignored. The central argument for critical theory, Friesen (2008) argues, is to destabilise 'commonsensical' knowledge and to "make problematic what is taken for granted in culture." (p.1). Challenging this idea of unproblematic and apolitical knowledge is what is pursued in this study using critical theory. Munck (2010) suggests that any social theory is critical insofar as it seeks human emancipation, that is, "to liberate human beings from the circumstances that enslave them" (Horkheimer, 182: 244 as cited in Munck, 2010, p. 36). Such theories seek to explain the circumstances that constrain human beings and provide the normative bases for social enquiry that will, potentially, decrease domination and increase freedom in all its aspects.

Criticality in social science, Sayer (1997) argues, and as adopted for this study, consists, among other things, of being able to find the explanation for why certain false beliefs are held and, if possible, what produces them. He contends that in some cases the false beliefs help to perpetuate the circumstances that generated them. This criticality gives social science a potentially emancipatory character (Bhaskar, 1986), which I consider to be vital, if the aim of social science research is to offer some kind of social improvement.

Accordingly, the position adopted for this study is that of co-constructing data with the participants, instead of assuming a fixed and deterministic view of them and their social reality. To do this, the research is guided by a qualitative methodology. It considers how their experiences and performances are shaped by the context in which they develop as students. Within this qualitative methodology, a constructivist grounded theory approach pioneered by Charmaz (2006) is adopted.

4.1.2. CONSTRUCTIVIST GROUNDED THEORY

This study is explorative in nature thus, what I would encounter in the field work was unknown but also relatively unexplored in the field of educational technology given the focus on students' digital agency in institutional digital practices. Therefore, I decided to use constructivist grounded theory (CGT) as established by Charmaz (2006). There are different approaches to CGT, one suggests that the researcher should go to the field with no predetermined theory so that themes can emerge more freely from the data instead of pre-imposing a particular framework. The other approach is to define a theoretical

framework and code with that theory in mind. As the aim of this study was to explore something unknown, I was uncertain of what I would encounter but in addition there was little literature of such field work available; thus, I decided to go to the field without having a preconceived theoretical framework.

Grounded theory, in general, offers an avenue to find out more about the contexts under investigation and as such, generates middle-range theory. Middle-range theories are, in the words of Charmaz (2006), those with limited scope, that integrate theory and empirical research to explain a specific set of phenomena grounded in data, instead of explaining them at a societal level. Under this lens, it is believed that humans have agency to influence their own behaviour and their social worlds (ibid.), which is an important aspect of the inquiry in the current study. Charmaz differentiates herself from classic GT in that she refrains from thinking about theory as being discovered. Instead, she argues that the researchers, are part of the world they study and from which they collect data. This involvement is what leads to us constructing the grounded theories through our past and present relations and interaction with people, perspectives and research practice. In so doing she defends the idea that what a researcher can offer is just an "interpretive portrayal of the studied world, not an exact picture of it" (Charmaz 2006, p. 10).

Inherent in her idea is the fact that there are different interpretations of the social world and hence, the impossibility to get to its 'truth' or essence. So, all that the researcher can do is strive for a fallible and historical explanation of that social world. There are different interpretations of Charmaz's constructivist orientation (Mills, Bonner and Francis, 2006; Breckenridge et al., 2012), thus I consider it pertinent to cite her own position to avoid the potential misinterpretation of others. In chapter 20 of the Handbook of Constructionist Research (2008), she writes:

> *The form of constructionism I advocate includes examining, (1) the relativity of the researcher's perspectives, positions, practices, and research situation; (2) the researcher's reflexivity; and (3) depictions of social construction in the studied world.* (p. 398)

She notably adds that:

> *My use of constructivism* ***assumes the existence of an obdurate, real world*** *that may be interpreted in multiple ways. I do not subscribe to the radical subjectivism assumed by some advocates of constructivism.* (2008, p. 409)

It follows that Charmaz's CGT stems from a realist ontology, that is, the world exists and what varies is how it is interpreted as well as how individuals make sense of their experience in it; individuals re-construct or re-present what has already been presented, namely, the real world.

4.2. RESEARCH DESIGN

In general terms, design is related to the different ways in which the components of a whole are planned, constructed, and interconnected to one another. In the research design, the researcher maps out the links between the research questions, the goals (intellectual, practical and personal), the conceptual framework, and the methods chosen to address those questions (Maxwell, 2013). This will generate the different outputs that will, in turn, contribute to achieving the main goals of the project. For the present study, I have chosen Maxwell's (2013) interactive design model, which is illustrated in figure 11 and will be explained in more detail next.

In qualitative studies, there should not be a rigid research design, as this would fail to reflect the messy and unpredictable process involved in such research (Yin, 2003; Maxwell, 2009). In the model used, the main principle is that the components that are included are connected, which means that they affect and be affected by one another. In the model, there are five components that address different issues regarding the coherence of a research project (Maxwell, 2013):

- Goals: the reasons for which the study is worth doing,
- Conceptual framework, what the researcher draws from to understand the reality under investigation,
- Research questions: stating the specific problem the researcher wants to learn more about and understand through the study,
- Methods used to collect the evidence and how do they constitute an integrated strategy,
- Trustworthiness: relating to the question of how might the results and conclusions be wrong? Why should the results be trusted? What are the mechanisms used to guarantee a robust answer to the posed questions?

A research design under a qualitative approach does not presume any particular order for the components, or any directionality of influence (Maxwell, 2008), but what is expected is a coherent connection between the elements. There are decisions that I have made throughout the study, which I will describe and justify in the different sections of this chapter. I have organised the rest of the chapter by using the research questions as the guiding theme, as White (2011) recommends; he sees this way as a helpful one for the reader to make sense of the study. I will describe each of the research questions in chronological order as they were addressed in the project. For each of them, I will give a detailed account of the setting, the intervention, the participants, the methods for data collection and the analysis process.

In the concept map below, it can be seen in the theoretical elements of the design that I have divided the theoretical framework into two subsections. The first corresponds to the framework with which I started my fieldwork, i.e. CGT. The second subsection corresponds to the framework I articulated after I had collected the data. This responds to the limitations I experienced when analysing the data with no theory at hand. CGT is guided mainly by the data regarding the generation of theory, falling short to account for social structures, which became the main limitation for using CGT in this study. Maxwell's (2013) model allows incorporating changes like this in the design. His premise is that qualitative studies need to have a flexible design so that the changes that occur while doing the research can be incorporated and logically connected. Thus, it was possible to include, at a later stage, the complementary theoretical framework

I will explain in detail in chapter 5, how did CR come into the framework and in that chapter, I will also explain how it framed the analysis of the data.

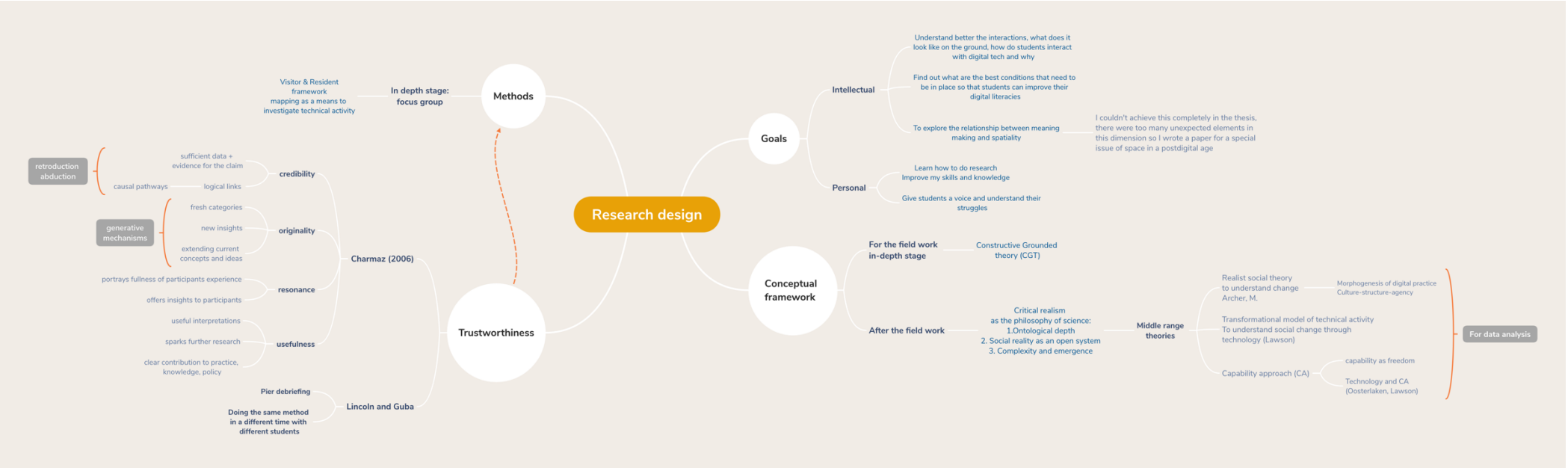

Figure 11: Research design for the study inspired in Maxwell, (2013)

4.2.1. THE SCOPE OF THE STUDY AND THE RESEARCH QUESTIONS

The study was undertaken in the School of Education (former Institute for Education) of a small post-92 university (these were colleges that were granted degree-awarding powers) with students taking the Education Studies course. I began the research interested in exploring their perspective and experience of educational technology use. I was puzzled with the idea/myth that young people are expert users of technology and that they are always excited to use technology no matter the context they are in. I was not sure if this was the case. Thus, I decided to explore this systematically such that I could understand better students' reality. This is what became the first stage, or the exploratory stage of my study, which is explained in detail in section 4.3., where I give the details of the sample, the data collection and analysis. Given the results of my exploration, I decided to follow up with a deeper investigation of students' daily entanglements with digital technology in their personal space and also, in their academic setting. Moreover, I became interested in what they were struggling with when trying to interact digitally for academic purposes, which was deemed germane to the inquiry. I was also interested in finding out how students make sense of the space where the engagement takes place. I set out to challenge deterministic accounts of how young people relate to and use technology in their formal setting, that is, at university. The second in-depth stage is described in detail in section 4.4.

Exploratory stage:

> R.Q.1. What is the student's digital profile? (Which tools they use, hardware they own, technological infrastructure they have access to, and the like)

In depth stage:

> R.Q.2: Why and how do undergraduates in Education Studies engage with digital technologies and platforms in personal and institutional contexts? This question is divided in two sub-questions:
>
> 2.1. Why do undergraduates in Education Studies engage/not engage with digital technologies in personal and institutional contexts?

2.2. How do undergraduates in Education Studies engage/not engage with digital technologies in personal and institutional contexts?

R.Q.3: How do undergraduates make sense of the environment where the engagement happens?

4.2.2. THE RESEARCH SITE

This study unfolds in the institution where I was undertaking my PhD study and where I also worked as an associate lecture: Bath Spa University, England. In what follows is a detailed description of the research site. I will describe its research and teaching, issues with respect to institutional policy regarding the digital practices. This description will aid later analysis of students' agency in digital practices concerning the cultural and structural context of the university.

In relation to the cultural and structural context, this institution is a post-92 university, whereby the college at that time was granted degree-awarding powers, having already adopted the name Bath Spa University College in 1997. In March 2005, the institution was granted university status, becoming Bath Spa University in August 2005. The university is teaching and research focused offering undergraduate and postgraduate degrees from three schools[17]:

- The College of Liberal Arts (this college includes the schools of humanities, science, business, performing arts, and business)
- School of Arts and Design
- School of Education

Bath Spa University is considered a small university with approximately 8,000 undergraduate students and it is mainly teaching focused although research is also considered an important endeavour of the university. The School of Education (SoE) has

[17] This study started in 2014, at that time this was the structure of the university. In 2019 the university underwent a structural change. The new structure can be found here: https://sulis.bathspa.ac.uk/display/HR/Organisation+charts?preview=%2F8396538%2F17247428%2FUniversity+Wide+Organisation+Chart+20.06.01+%282%29.pdf

243 members of staff, with 37 Associate Lecturers and 106 salaried members of staff[18] (87 are permanent and 19 are fixed term). The SoE is the umbrella for five undergraduate programmes (early childhood studies, education primary and education secondary, education studies, and educational psychology) a variety of postgraduate courses and the Teacher Training programme (Postgraduate Certificate in Education).

When it comes to policy regarding digital literacy, at the time this research was conducted the university envisioned in its mission and vision statement the importance of fostering digital literacy as a graduate attribute, considering it a crucial attribute in the profile of the future professional. At that time (2014/15), the university was working on the improvement of its provision for digital literacy focusing on institutional tools and centrally managed IT systems. To this end, the library team produced a guiding document (appendix 2b) with the main ideas for best practice and ways to increase digital literacy across the curriculum. The university decided to bring more expertise into the field, so that digital literacy teaching could be incorporated into the academic skills portfolio. The resulting digital literacy training was put on the VLE for staff to take part in. The programme focus was on tools, such as Blackboard Collaborate, Google Meet, Grade Journey, Panopto and Blackboard Ally[19]. Other support was also made available for staff to become acquainted with the university IT systems, such as Turnitin, Google applications, and Microsoft Office.

The policy and guidelines regarding digital practices that were in place to assist lecturers at the SoE were mainly concerned with standard guidelines about how to organise the content in the VLE, what are the accessibility considerations, what are standard labels and tabs that every module should include, and the like. This has been pursued through an institutional process that comes from the Teaching and Learning unit that is managed at the university level (this serves not only the SoE, but also, the other schools at BSU). Regarding institutional structure and culture with respect to openness at the time of this study, there were no policies or strategies related to open and participatory technologies

[18] Data provided by the Human Resource department of the university

[19] For the interested reader, the detailed digital development programme is available from https://sulis.bathspa.ac.uk/pages/viewpage.action?spaceKey=STDEV&title=Digital+Learning+Development

or OER (open educational resources). Since the start of this research study (2014), this has changed, particularly in relation to open access publishing.

4.2.3. ETHICAL CONSIDERATIONS

To comply with the ethical principles that are required for undertaking research in the social sciences, I adhered to the guidelines provided by the British Educational Research Association (BERA)[20]. The basic ethical consideration in any research is to do no harm and to acknowledge the autonomy, privacy, diversity, values, and dignity of the participants of the study (BERA, 2018). The mandatory institutional requirements have been complied with, through the approval of my ethics application by the Research Ethics Committee of Bath Spa University. Following the BERA (2018) guidelines, three key ethical considerations were addressed, namely consent, transparency and anonymity, each of which is considered below.

Consent

For any ethical research project, informed consent from the participants must be obtained (British Educational Research Association (BERA), 2018). For the focus groups, I sought to gain consent through the preparation of an information sheet for the participants with the details of what the project was about, and a consent form that they had to sign. Before each focus group, I gave out both documents, allowing sufficient time for potential participants to read and then, if willing, to sign them. As part of that briefing I informed them that the right they had to withdraw from the project with no need to give any reason as to why they had decided to do so.

Transparency

As explained previously, the research was driven by the interest of the researcher in understanding students' digital practices. I had no personal interest in the enquiry other than hearing their voices and struggles they faced, which I made clear to the participants.

[20] Ethical guidelines for educational research, BERA 2018 (available here)

Anonymity

I invited any student in the Institute of Education through announcing the study in the different talks I gave in the lectures and seminars that students attended regularly. I presented them with an overview of my project and invited them to ask questions. I informed them that their participation was completely independent from the teaching space. Every single person interested in participating in this study was welcomed, irrespective of gender, age, race, religious orientation, or ethnic group. In particular, I made sure any potential participant from a particular religious group would feel comfortable if their deciding to take part. Regarding which, I had one participant who was from a religious group that did not allow her to be filmed, which I addressed by turning the camera away and only recorded that group's voices. She felt comfortable with this and opened up with confidence.

Focus groups are complex spaces of discussion, where some people can feel overwhelmed or uneasy or even threatened due to comments made by other participants or owing to unforeseen issues that can arise. I paid particular attention to ensuring that all the participants were given equal voice and opportunities to express their thoughts as well as making sure that they felt confident enough to comment. This went well and no issues arose during the process.

In relation with these ethical considerations exposed above, I would like to state my positionality as a researcher that also teaches at the institution where the research is being carried out. I decided to conduct the study at Bath Spa University in England, where I am registered to do my PhD and also have a teaching role, which meant access was less problematic. Nevertheless, I am aware of the potential risks and challenges of being a lecturer and a researcher at the same time. In my case I had to be very careful with those participants who chose to be part of the study and who, at the same time, were my students. There was an implicit possibility that students would join the project due to a feeling of obligation in that they might have thought that, if they were my students, they would be expected to take part. Hence, at every opportunity when talking to potential participants in the lecture hall I made it very clear that they were under no obligation to

participate due to our student-teacher relationship. I used the core modules as the forum to talk to students about my project and to invite them to participate, thereby opening up the offer to participate to many students that I did not know. In sum, it is important to make one's position transparent and carry out the research with the best ethical stance possible (Lincoln and Guba, 1985; Mercer, 2007).

4.2.4. TRUSTWORTHINESS IN THE RESEARCH FINDINGS

Trustworthiness in qualitative research is about the quality of the research findings and it consists of different processes that the researcher puts in place to mitigate the risk of threats in the quality and credibility of the findings. The ontological frame of realism does not sit comfortably with the positivist position of the notion of 'trustworthiness'. Porter (2007) puts forward that realists do not acknowledge a unique and unproblematically valid representation of a phenomenon, but rather, 'multiple valid descriptions and explanations of the same phenomenon are always available' (Hammersley 2004, p. 243 as cited in Porter 2007).

From a critical realist point of view, issues of rigour should be judged by the criteria of the methodological approach used. In alignment with this, I adopted Pawson et al.'s (2003) three criteria and those of Charmaz (2006), which she adapted from the work of Lincoln and Guba (1985).

- **Credibility:** Enough data to support the claims; logical links are in place;
- **Originality:** Fresh insights and the ability to extend current ideas and concepts;
- **Resonance:** The study portrays the fullness of the participants' experience; it offers insights into it;
- **Usefulness:** The interpretations are useful, spark further research, and a clear contribution is made.

Each of these has a set of techniques that the researcher should consider including when designing the study. Some of them are, according to Lincoln and Guba (1985), as follows.

- Peer debriefing: Exposing the analysis to a colleague or critical friend, to check with them whether the hypothesis is sound and/or whether the emergent the emergent themes are grounded in the data.
- Thick description: This consists of providing sufficient detail of the phenomenon, such that other researchers can conclude that aspects of the research outcomes are transferable to other times, contexts, situations and people (Maxwell and Chmiel, 2014). Thick description means that the researcher provides the reader with a full and purposeful account of the context, participants, and research design so that the reader can make their own determinations about transferability (Given, 2008, p. 893).
- Reflexivity: This relates to the systematic attention to the context of knowledge construction. According to Sayer (2000), as explained earlier, knowledge is gained through concepts, experience and the researcher's worldview. Hence, making explicit those beliefs, values, assumptions and the position taken throughout the research is important.

Given (2008) adds to this list the triangulation of sources and methods as another possible technique. This concerns gathering data through multiple methods and sources. When designing and conducting research, qualitative researchers often combine methods, such as interviewing, surveys, and observation across variable times and in different places in order to collect data about their research phenomena from multiple perspectives and in different contexts. In the case of the exploratory stage, this is what I did; I collected data from different sources and through different methods. In the exploratory stage, I used the Learner Profile Survey to collect quantitative data from a group of students in Education Studies and then, I collected qualitative data from the conference organised by students, this time students were from across the university allowing me to capture the view of a broader range of students that were in different schools and at different levels.

I asked a critical colleague with a wealth of experience in open education and who works with digital literacies at her institution, to look at my analysis of the in-depth study and see whether she agreed that the themes and codes of the empirical level were grounded in the

data. She is an experienced qualitative researcher, has participated in European research projects and is a lead researcher at ILDA (Latin American Initiatives for Open Data).

As the students' voice conference was aimed to inform the Academic Board in their work and strategy of the Graduate Attributes for the refinement of the Strategy 2020 document, there was a dedicated team of people analyzing the data from the different tables of the different Graduate Attributes that were addressed during the conference. This allowed the group to check their work with other members of the group that were involved in the forum, e.g. staff that led the different discussion tables. My notes were shared with the group. We read each other's analyses and generated the final report.

Such procedures do not guarantee absolute validity, but they do provide the vehicles for bolstering confidence about the degree to which "an account accurately represents the social phenomena to which it refers" (Hammersley, 1990, p. 57). These techniques were incorporated into the design of the study and the details are described as they arise in the stages of the investigation.

4.3. EXPLORATORY STAGE

I made an initial exploration of the research issue. Newby (2010, p. 129) suggests that to unfold an issue one can combine methods. He advises, inspired by Petter and Gallivan's (2004) work cited in Newby (2010), three situations where exploration or unfolding is appropriate:

1. Refining the research, for example, using interviews to shape questionnaires;
2. Looking at issues that are different from what was expected or at unusual or extreme results;
3. Expanding our investigation to expose and assess more issues and factors at work.

Inspired by the last two points and wondering whether young people are all digital natives, I started my exploration. At this stage I was mostly interested in exploring students' habits when they are online: what are the things they do online and what hardware and software do they use daily. To do this I posed the following question:

R.Q.1: What is the student's digital profile?

I also wanted to gain an insight into the voice of students not only in the School of Education, but more broadly, this would allow me to have a broader vision of the phenomenon and provide me with useful insights. Therefore, I decided to explore this systematically, thus being able to capture better students' reality and have a broader array of perspectives. In what follows, I will explain what I did to address this question and I will then move to the in-depth stage.

4.3.1. CONTEXT AND THE SAMPLE

The setting in which this research question was investigated was a group of 66 students from different years of the Education Studies Programme. The sample was of mixed gender, with an uneven balance towards female (62 out of 66). The average age was 22 years, although there were two mature students (38 and 52 years-old). The sample was a self-selecting one; the invitation was made to the students that participated in the Education Studies programme (n=±220) and those who wanted to participate signed up. The survey was carried out by hand by each participant. The data was transcribed and analysed using descriptive statistic in Excel. The analysis is in appendix 3.

4.3.2. THE INSTRUMENT: LEARNER PROFILE SURVEY

The Learner Profile survey was developed in a project led by Jisc[21] (2013) aimed at exploring the digital experience of student and published under the CC BY 4.0 licence[22]. When publishing any work under a public license it means that it is granting use rights by any third party, making reference and attribution to the original license while respecting the conditions stated in the license, which is non-exclusive and royalty-free, unrestricted in terms of territory and duration, so is irrevocable, unless a new license is granted by the original author or rights owner, after the work has been significantly modified. In the case of the materials used, the license granted by JISC is CC-BY, which means that JISC allows

[21] http://repository.jisc.ac.uk/5572/1/JR0006_STUDENTS_EXPECTATIONS_EXEC_SUMMARY_v2.pdf

[22] https://creativecommons.org/licenses/by/4.0/

the users to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. I did not make any adaptations, I used it as it was originally designed.

The survey has been used in various studies (Beetham and White, 2013), with the most recent one being Sharpe et al. (2019). It is utilised to explore different patterns of technology engagement in further and higher education colleges in the UK. More particularly, the Digital Student project (Jisc, 2014), which used and developed the Learner Profile survey, informed the digital literacy guidelines produced by the university's digital literacy team to enhance students' digital literacy (the guide can be found in appendix 2b). Given the context for which the survey was developed, i.e. the UK and HE institutions, the instrument is a good candidate to be used in my study. I reviewed other surveys, e.g. those available in the Pew Research Centre[23], a nonpartisan fact tank that informs the public about pressing issues in the world. At the time of this study, they had an interest in digital technology and young people, but they were mainly US oriented and their interest at that time, was more geared towards Internet use, mobile phones and social media. I considered this not to be well aligned with the interest of this study and thus, I chose the Jisc survey. In addition, the Jisc survey speaks to the literature I used, i.e. DiMaggio and Hargittai (2001).

The questionnaire addresses different elements of technology use and ownership, practice and expectations. Knowing these aspects would provide me with an understanding regarding the degree of sophistication of student digital practices (DiMaggio and Hargittai, 2001) and whether students are more on the consumer side or that of the producer when they are online. These two aspects are related (DiMaggio and Hargittai, 2001; Sharpe and Beetham, 2009) in the sense that individuals who demonstrate sophisticated digital practice tend to contribute more than their less accomplished counterparts, by generating content, sharing and remixing things, amongst other activities on the Web.

The Learner Profile comprises 21 questions including learner demographic information and reported technology use including: access to a networked computer and internet,

[23] More information of the Pew Research Centre is available at: https://www.pewresearch.org/about/

frequency of computer and internet use, ways in which learners customise their computer, ownership of technology, expectations of technology use on campus as well as personal, social and educational uses of technology. The survey has been intensively trialled for readability and ease of response, as explained above. In addition, it builds on resources, such as the Jisc/National Union of Students digital student experience benchmarking tool[24], which was designed in collaboration with the National Union of Students and the Student Engagement Partnership (TSEP), which champions and develops student engagement practice in the English higher education sector, having delivered projects on behalf of Quality Assurance Agency (QAA) and the former Higher Education Funding Council for England. This gives the tool strong validity, thus making it a robust choice to explore the digital profile of students.

4.3.3. ANALYSIS AND PRESENTATION OF THE DIGITAL PROFILE DATA

In this subsection, I present a summary of the findings and for the interested reader the detailed analysis with charts is available in appendix 4. I decided to exclude from the analysis the demographic data, because I was not looking at the relationship between age, gender, or degree of study with the tools they engaged with or not. I was exploring in a broad manner how true the digital native myth is in this small sample (more detail in subsection 4.3.1). The survey comprises a comprehensive report of the digital experience of 66 undergraduates. Regarding the tools and platforms they have used and things they have done online for their personal and social life, only thirty per cent of students used a wiki, a blog or any other online network. Just seventeen per cent said they used or downloaded podcasts as a tool to consume content and twelve per cent reported that they had participated in online discussion groups. When it came to uploading video or photos onto the internet, sixty per cent confirmed that they did this, but only five per cent reported that they maintained a blog or a website.

With respect to the task of searching for information on the web, all participants reported that they used Google as their search engine to find information or to answer their

[24] Available from: https://repository.jisc.ac.uk/6140/1/Jisc_NUS_student_experience_benchmarking_tool.pdf

questions. Fifty-three per cent said that they used web forums or any other social space to find out about a particular subject. Whilst only three per cent of the participants said they used online materials, such as tutorials, e-books, and lecture notes, thus indicating that these sources of materials were unpopular.

When asked about specialised software, the responses showed that the popular tools students used were Word as their word processor, and PowerPoint for the presentations they gave in class. The use of spreadsheets was prevalent amongst them, with sixty-two per cent responding they used them. However, more specialised software, such as design tools or modelling/simulation packages (GeoGebra, geometry software, 3D graphics), was generally eschewed by students.

The answers to these questions reveal how more traditional tools, such as Word, PowerPoint, Excel, or their Google version, are familiar to students. When it comes to using web-based tools, such as wiki, blogs, or any other webpage to present their academic work, thirty-eight per cent reported that they did use such tools. Online portfolio and online CV tools were less popular for only thirty-eight per cent of students reporting using them.

Analysis of the survey responses found that the main means of communication with lecturers by students was email. Only seventeen percent said they used video or audioconferencing as a tool to communicate or share knowledge, whilst fifty-eight percent used online discussion forums to share ideas with peers. However, regarding the discussion forum that is sometimes enabled in a module using the VLE as a tool to mediate activities, only twenty-four percent of students reported making use of it. Moreover, only fifteen percent accessed learning via mobile phones or tablets. In general, ownership of and access to technology was high.

It also became evident from the Learner Profile survey that the participants were more on the side of passive consumers of the web, with not much expertise in the use of open and participatory tools, thus contributing to the web was rare. The survey findings are consistent with prior studies about ownership of and access to technology by undergraduates (Jones and Czerniewicz, 2010; Margaryan, Littlejohn and Vojt, 2011). That is, they reveal how undergraduates access and use technology either at home or at their

institution. What can be seen through this survey is how most students consumed rather than produced digital content. It is notable how practices that would seem to be simple and something that many young people do, such as downloading podcasts, were rarely reported in this sample.

Newby (2010) argues that an unfolding research process has implications, one of which is that an entire plan of action is not possible at the outset. "Stage by stage, new decisions are taken to move the project forward in ways that are informed by results already obtained or questions that arise" (2010, p. 129). Hence, the qualitative in-depth exploration. I realised that it was important to dig deeper and explore in more depth the meanings and motivations of students (non)engagements with digital technology.

Whilst the onus is on the researcher to plan the study with care and attention to detail, there are situations that are not possible to foresee, i.e. new opportunities can arise once the project has been designed that the researcher identifies as potential sources of valuable data that will enrich the view of the phenomenon under investigation. Incorporating this new information will serve the study in a positive manner, offering a broader range of meanings and interpretation of the object of study. In this regard, Newby (2010, p. 131) advises that having flexible designs that can respond to unexpected findings and contingencies around the collection of data is preferable, as different methods being utilised will render a robust body of data and strong results. Moreover, the study can be enriched by taking advantage of unforeseen opportunities. Such an unanticipated opportunity arose when I was invited to participate in a conference organised by the university undergraduates: 'Students' Voice and the Graduate Attributes: the future of Bath Spa', in December 2015. I present next the results of the data collected during the conference and then, I subject these to analysis.

4.3.4. THE CONFERENCE: DATA COLLECTION AND FINDINGS

This conference's main goal was to foster fruitful discussion between students across the university and senior members of staff about how the Graduate Attributes can become manifest throughout the years of the different degrees undertaken. To put these in context, the Graduate Attributes are the way Bath Spa University (and many others) has framed its

vision for 2020. The institution has conceptualised eight attributes that encompass the vision of the university: "The attributes are recognisably ours and brought together they bind together and drive the elements of our strategic planning to 2020" (Bath Spa University Strategy 2020[25]). One of those attributes is to be 'digitally literate', which will enable students to work at the interface of creativity and technology (BSU strategy 2020).

This conference was organised by the Student Union. I shared with them (the president at the time of the study) my study and discussed, at a very initial stage of the study, the possibility to recruit participants through the SU. Although I discarded this option as I consider it not being viable for the study, the president of the Student Union considered that attending to the conference would be an excellent way to have a broader view on students' perception of the digital literacy dimension of the Graduate Attributes that were an integral part of the university 2020 Vision and a key focus of my study. The conference was organised in such a way that all the participants - students from different schools - could contribute with their vision, ideas, and experiences to all the tables standing for all eight graduate attributes. The table representing digitally literate students was led by a member of the library staff and myself. Ethical consideration about the use of the data was raised with students, who agreed with providing me the opportunity to use in an anonymous manner the outputs of the day. The conference outputs were intended to be shared with the Academic Board to explore new routes towards a better implementation of the Graduate Attributes across the university. During the conference, different groups of students spent thirty minutes at our table sharing their different views regarding digital literacies and commented on their experiences about their academic digital practices, how they saw the university was educating them digitally and what were the difficulties that they faced in acquiring this attribute. The group discussions were recorded and transcribed, with the data being analysed using thematic analysis, thereby giving new insights about the issue under investigation, but this time from a wide-ranging audience, namely, students from all the colleges of BSU. At the table we took extensive notes using 'post-it notes' to register all that they were sharing. Each group session was recorded so that I could compare

[25] available from: https://issuu.com/bathspauni/docs/strategy_2020/7

these notes and the recordings in case something was missing, as well as to remind myself as to where the notes fitted during the interaction. I then gathered our notes and the ones taken by the students who were in charge to produce the report for the university's Academic Board, that is, we jointly generated the document, which can be found in appendix 5. What I set out below are the main issues that could shed some light on the thoughts and the position students had in relation to their digital experience at the university.

The main findings for the digital literate table are listed below:

1. In relation to the training digital skills students reported:
    a. There are not enough embedded workshops in our programmes;
    b. We do not have enough time to learn digital skills;
    c. There is a lack of resources online. They can be delivered through YouTube channel when it comes to basic tools;
    d. Minerva could provide info. about tools used on the course before starting, e.g. Prezi, Mendeley, Blog, etc.;
    e. Creating a space for people to work it out for themselves would be a way forward;
    f. The integration of skills and coursework needs to be strengthened;
    g. A baseline of digital literacies needs to be established; prior knowledge and understanding cannot be assumed;
    h. A pathway to learn these skills is important.
2. Regarding the role of staff (lecturers and tutors) in fostering digital literacies:
    a. They should motivate students to want to learn and this can be done through a community of practice;
    b. They should explain the meaning and need for digital literacy and consequently, teach it;
    c. The teachers should be the role models; they should inspire us;
    d. Engagement needs to be encouraged;
    e. They should embed technologies at stages in the degree where it does not impact negatively on the grades;
    f. Seeds of digital skills should be sown in the first year and built upon throughout the time students are at the university.

From these ideas that the students shared, it can be seen that there is a gap between what they aspired to and what they perceived they were getting. They wanted to know more

about what digital literacies are, their importance and relevance for the workplace, and to be taught accordingly. During all the discussions we had with the different students, it became clear that they aspired to attain a more sophisticated digital practice. It also became clear that the vast majority were far from being expert users of digital technology at the university. Instead, it became evident that they wanted to be motivated and encouraged to engage with digital tools in a more proficient manner, in their words, the integration of digital skills and coursework needed to be strengthened.

The findings of this first stage were intriguing as they gave a strong indication that students, not only those from the School of Education, were far from being digital natives. Rather, they made it clear that a need to work towards a better integration of digital literacies in the curriculum was timely. Hence, a more thorough investigation of students' engagement with digital technology seemed to be important and so the in-depth stage was designed.

The findings from this conference are relevant to the study in that they have shown that there is a contradiction between what is believed amongst most lecturers at the university regarding the expertise students have with digital technologies for academic purposes and what students themselves consider they can do with digital technologies and thus, what they perceive they need. The findings of the exploratory stage by no means inform or shape the research outcomes. What these findings have shown is that there is a need to investigate students' digital practices closer to understand what shapes their agency, thus, practices which is what I will explain in the next section.

4.4. IN DEPTH STAGE

As I explained in the previous section, the survey and the student's voice conference, gave me an indication that students' digital practices could be explored more closely thus from a qualitative perspective. There was an indication that there are elements from students' digital practices that could be looked at in more detail to find out what shapes students' digital practices, what are the struggles they are confronted with, what works and what does not work for them. For this matter I considered that an in-depth discussion with a

smaller group of students could shed some light on what are the conditions that shape students' digital practices.

Triangulating evidence and having different perspectives on the same topic gives the researcher a better appreciation of the issue (Newby, 2010). One data source cannot necessarily validate another, but they can reinforce each other, thus providing a different perspective and a different source of evidence (ibid.). What is important and of value for obtaining robust results is that data sets can talk to and inform each other. In the case of the current study, the results from the survey were explored further using qualitative methods, i.e. discussions with different groups of students across the university in the context of the conference described in subsection 4.3.4. The findings from both these methods of data collection are combined to provide rich insight into the phenomenon of interest. All the data sets are in an 'organic conversation' (Newby, 2010, p. 129) informing the phenomenon under investigation from different perspectives, nevertheless, they are all part of the same context, namely, Bath Spa University.

4.4.1. RESEARCH QUESTIONS FOR THE IN-DEPTH STAGE

The outcomes from the exploratory stage helped me to gain an initial picture of students' experience with digital practices, however they did not shape the outcome of the study, this was achieved with the in-depth stage of the study and its research questions that I will describe in this section. The exploratory stage, however allowed me to understand some of what students' concerns were regarding the way the institution was enabling or constraining them from becoming digitally literate/capable, as expressed in one of the Graduate Attributes to be found in the University Strategy 2020. This led me to the view that it was important to explore more in depth the root causes as to why students were consuming more than producing for the Web, and how they were reflexively engaging or not with digital practices. I was motivated to explore how they were making sense of the digital environment and how was their process of sense-making shaping their digital practices. It became clear to me that there was a need to explore beyond what is obvious, with a commitment to finding the root causes that produce the phenomenon. For this study, the phenomenon under examination was the students' engagement/non

engagement with digital practices. In order to probe this, I posed the aforementioned research questions and the corresponding sub-questions:

R.Q.2: Why and how do undergraduates in Education Studies engage with digital tools and platforms in formal and informal settings?

2.1. Why do undergraduates in Education Studies engage/not engage with digital technologies?

2.2. How do undergraduates in Education Studies engage/not engage with digital technologies?

R.Q.3: How do students make sense of the engagements and the space where they take place?

4.4.2. SETTINGS AND THE CONTEXT FOR THE IN-DEPTH STAGE

The setting for this, in-depth, second stage of the study was the School of Education (former Institute of Education) at Bath Spa University. It is the same as that described in subsection 4.2.2., where the first exploratory stage of the inquiry was carried out. This setting was the location where I recruited the students to participate in the focus group, which was my chosen approach to the data collection for this stage of the study.

4.4.3. THE SAMPLE FOR THE FOCUS GROUP

To select the participants for a focus group the researcher should consider gathering people that have some characteristics in common, whilst also including enough variety so that an accurate portrayal of the group's collective opinion can be obtained (Krueger and Casey, 2015). After having presented the project to the cohort of students (n=±220) to invite them to participate in the study, twenty-two participants were self-selected for the focus group. All the participants were from Bath Spa University, enrolled on Education Studies courses, at different levels of the course (there were students from Y-1, Y-2 and Y-3) and they had varying entry routes to their degrees. Some came directly from secondary school, whilst others had followed the further education route and were completing the last year of their course at the university. The sample was also mixed in terms of age and gender, with two

female mature students (38 and 50-years-old) along with 17 women and three males. The number of focus groups the researcher must organise can vary. Bryman's (2016) advice, which is in line with that of Charmaz (2006), is that when no new themes are emerging it is sensible to bring data collection to an end. In CGT, sampling is not necessarily (or not only) driven by attempts to be representative of some social body or population, but rather, by the theoretical interests that have emerged in the provisional analysis (Clarke, 2003). Such theoretical sampling is geared towards finding new data sources (persons or things) that can best explicitly address specific theoretically interesting facets of the emergent analysis (ibid.).

For this study, six focus groups were organised, with the number of participants in each varying from six to three. Krueger and Casey (2015) suggest that, if the issue to explore is complex and a deeper conversation is the goal, the group size needs to be restricted. Toner (as cited in Gibbs, 2007), who has used as few as two participants for focus group studies, argues that small groups exhibit typical group development and hence, can be analysed in the same way as a larger one. The aim of this study was to examine students' motivations to engage/not engage with digital tools and platforms. That is, the purpose was to reflect upon the barriers and enhancers of those engagements as well as the meaning making process, which necessarily entails in-depth and detailed discussion. Given this aim, I took the view that small sized groups were ideal. Moreover, the issues discussed in the focus group can be sensitive or even embarrassing for some of the participants, in which case a small group is preferable, as it potentially makes participants feel safe to open up about their concerns and show their vulnerabilities (Gibbs, 2007).

There are elements that are beyond the researcher's control, as Newby (2010) indicates, one of which being the level of participant commitment. In one case during the focus group data collection, three students failed to show up and so, I decided to transform the session into an open and unstructured, in-depth interview with the participant who came. She completed the V&R map so that there was consistency in the method used, but the discussion after it was a non-structured interview. There were two reasons for doing so, to show respect to the participant who came and secondly, as explained below, I considered her to be an important informant for the study. She was a student representative for the

School of Education, taking the Bath Spa Award (a programme that is open to students and support them to gain recognition for their achievements and experience, thus enabling them to develop skills in key areas that employers look for). Depending on which award the student takes some Graduate Attributes will be more stressed than others. In this particular case, the Graduate Attribute of being digitally literate was stressed and hence, I considered her as being a key informant. Given that we used the V & R map and she then accounted for her choices , through an open discussion, the process was very similar to the one used in the other focus groups. What was missed was the group discussion, the moments were participants agreed with each other or maybe disagreed, but the nature of the information shared was the same as the rest of the focus groups.

4.4.4. THE METHOD -THE FOCUS GROUP

A focus group is about establishing and facilitating an intentional discussion and not guiding an interview. The goal is to gain better understanding about how people feel or think about an issue, idea, product or service (Krueger and Casey, 2015). Bryman (2016) suggests that the aim of a focus group is to examine how individuals in conjunction with one another interpret and make sense of the topic under investigation and construct meaning around it. In this sense, focus groups reflect the processes through which the participants create meaning and with little direction by the researcher. It is in this sense that Bryman (op cit.) suggests that it can be regarded as naturalistic. Moreover, Newby (2010) considers a naturalistic inquiry one that obtains data in a natural setting, as far as is possible. That is, he believes, in contrast to Bryman, that the focus group requires a certain degree of separation of subjects from their natural world, thus imposing an artificial situation on the participants. In this respect, I consider Newby's standpoint more in line with my experience and hence, would have preferred to probe students' motivations when they were engaging with digital tools, such that they would have been recording them whilst this was happening. This could have been possible using methods such as 'The Day Experience', which I explain in more detail in the paragraph below. This delay can be considered a potential disadvantage of the method chosen, but for this to be possible, more resources would have been needed to engage students more intensely in the study.

There are various methods that can be deployed to gain an understanding of students' motivation when engaging with digital tools while the engagement is happening. 'The day experience', is one of these, being a method designed by Riddle and Arnold (2007) in a joint effort between the University of Cambridge and the University of Melbourne. The aim is to use students' mobile phones to prompt them to make a record of the activity they are engaged in at a particular time of the day. I did explore this possibility, as I considered it to be a more naturalistic approach, in line with Newby's (2010) perspective. Students would not have had to recall, but rather, they would have had to document, which often provides more reliable data (Bryman, 2016). However, it turned out that this method was unviable for two reasons, one, as I explained above, because there were not enough resources available to implement such an intensive method, and two, in informal conversations I had with students in the school, it came to my awareness that students were reluctant to commit to that level of engagement. Moreover, some of them did comment that students could perceive it as an invasion of their private space. The combination of both issues proved enough for me to choose the focus group over the day method. I also believe that the ethical commitment of the researcher comes into play and that respect for the participants must come first. I will dedicate the next section to a detailed account of the ethical considerations I was confronted with throughout the in-depth stage of the research process.

To come back to the focus group, which was the chosen method to collect the data of the in-depth stage, one of its advantages is that it encourages self-disclosure among participants (Rennekamp and Nall, 2008). Moreover, people pick up on what others say and feel encouraged to talk openly about the topic, thereby enriching the dialogue in a way that could not be achieved through a one-to-one discussion. In a focus group, it is desirable that the researcher has a non-directive role, such that the emphasis is placed on getting in tune with the reality of the participants.

Focus group is one of many methods to conduct qualitative research, one could also use different methods such as in-depth or semi-structured interviews or some ethnographic method, but given the nature of the phenomenon under investigation, having a group with whom to share the constraints and struggles provides a conducive environment for the

participants to take on the point of others to share his/her own point of view and experience. It opens the space for discussion, which is something that I considered useful for the sample.

4.4.4.1. THE VISITOR AND RESIDENT FRAMEWORK: THE INSTRUMENT TO GATHER THE DATA IN THE FOCUS GROUP

The focus group was organised around the Visitor and Resident framework (White and Le Cornu, 2011b; White *et al.*, 2012, 2014). The idea of the authors with this method was to propose an alternative to more the deterministic views on young people and technology use, such as that proclaimed by Prensky (2001a) (see section 2.3.). White and Le Cornu (2011) suggest that tool and place/space are the metaphors that best represent the engagement with current online technologies, rather than the learning of language, which was the basis of Prensky's metaphor (ibid.).

Certain platforms on the Web fit neatly into the metaphor of tool, whilst others are closer to place/space. A tool is more functional, whereas place/space is more social; nevertheless, there is an overlap between the two (White & Le Cornu, 2011). A clear example is Google Docs, a functional tool for creating documents and sharing them with others. Whilst the individual is working alone, Google Doc remains a tool, but as soon as someone else joins in to participate in the creation of a document, a social place is created. Hence, tool and space/place describe the experience of computer users in a world where social media is more prevalent. In table 2, White et al. (2012) present a summary of the characteristic of each mode is given.

The Visitor and Resident metaphor (White and Le Cornu, 2011) takes into account the way people engage with the Web as a continuum instead of a binary opposition, thereby allowing for a more flexible depiction of participants' engagement with digital technologies. The visitors, the authors suggest, understand the Web as a tool workshop. People have a task to perform, they go into the workshop, pick up the tool, finish the job, and bring the tool back to the shed. For them, the important thing is to see some progress in the task they are undertaking, i.e., they like to see some sort of benefit from the use of the tool or platform. They rarely have an online identity that they project. They are usually

not interested in leaving any social trace and they do not have a sense of belonging to the medium, simply using it for their convenience and in whatever way they can. Residents, in contrast, see the Web as a place/space, in which they find friends and colleagues who they can approach and with whom they can share information or even learn from them. They have an online identity and consider the Web as a place to express opinions and where relationships can be formed. For residents, contributing to the Web is important; they feel at home and very comfortable being online. In table 2, White et al.'s (2012) summary of the characteristics of each mode is provided.

Visitor	Resident
a. see the Web as an untidy tool shed b. defined goal or task select most appropriate tool for task c. need to see a concrete benefit from use of a platform d. relatively anonymous e. try to avoid the creation of digital identity f. caution: identity theft, privacy the sense that online social networking is banal and potentially a time waster g. will use technology to maintain relationships h. Web offers set of tools to deliver or manipulate content (including conversations) i. tendency to respect (and seek out) authoritative sources j. thinking often takes place offline k. users, not members, of the Web l. see no value in 'belonging' online	a. see Web as place (park, building) where clusters of friends and colleagues meet b. live out a proportion of their life online c. distinction between online and offline increasingly blurred d. sense of belonging to a community e. have a profile in social networking platforms f. comfortable expressing their identity online g. Web is a place to express opinions h. aspect of their persona remains once logged off m. see Web as networks or clusters of individuals who generate content/opinion n. no clear distinction between concepts of persona and content

Table 2: Visitor & Resident characteristics (White et al. 2012). Available fromhttp://www.webcitation.org/6Q7keERqI

The key advantage of this framework is that people spread out across the continuum and can be visitor and resident: they could be a visitor when they engage with the virtual learning environment at their institution, but a resident when they engage with Facebook

in their personal social space. The modes are not mutually exclusive, but rather, one can complement the other. Individuals, according to what they want to achieve, can select one or another mode. In the words of White (2016), "each facilitates an ever-expanding role of the digital in contemporary life, work and study." Another methodological advantage of this framework is that it offered an opportunity for students to reflect on their digital practices. The method also presents some disadvantages, for example, students have to recall what they did in the past, this is not necessarily entirely accurate, but there is available research (reference) showing that the advantages of the methods make it a trustworthy one as cited by Connaway et al. (2017):

> *This framework is based on empirical evidence across several different studies in multiple countries, which strengthens the applicability and replicability of our data collection and analysis tools and findings*

In addition, this framework has informed a highly regarded study done by JISC, the digital student, which in turn informed the digital literacy policy of different HEIs (Jisc, 2014), including the digital literacy initiative at this institution (see appendix 2b).

The Visitor and Resident framework has been widely used, not only in the UK, but also elsewhere by different HE institutions, with different aims in mind. At the University of Oxford, it was used to explore how students use technology. The university was looking at how to improve the take up of the online services offered to their students (Le Cornu and White, 2017). A more international project (White et al., 2014) between the University of Oxford, OCLC Research (a global library cooperative, which provides shared technology services, original research and community programmes for its 120 country members) as well as the University of North Carolina, Charlotte, US, involved collaboration on a Jisc (Jointly Information System Committee) project. The aims were to understand how students engage with online services, to find out how educational services and systems can attract and sustain a possible new group of online learners and to make sure they provide value for money. This last project had various outcomes, including more efficient provision

of digital services, improved student experience and support for the development of relevant Graduate Attributes (White et al., 2012)[26].

The framework has also been used at the University of Copenhagen in the context of finding explanations for the use of a digital resource, in this case, an e-book (Engelsmann et al., 2014)[27]. That is, the aim was to use it to explain the use of the e-book and gain insight into users' motivation. One of the outcomes was a better understanding of the difficulties that users encounter when interacting with an e-book. The limitation of the method, the authors agreed, is that it could not predict user behaviour in relation to the e-book. The method was also used in a mixed methods approach to investigate how health care online students use online resources (Druce and Howden, 2017).

The cases presented above shows how the framework has been used in different contexts, cultures and with different objectives in mind, thus rendering useful outcomes in the projects. Furthermore, it is a framework that links strongly with the aims of the current research project.

4.4.5. GATHERING THE DATA

For the present study, the framework described above was utilised to gather information on the participants' engagement with digital tools and platforms. It served as the starting point for a deeper discussion in the focus groups. I organised six focus groups that each had between six and three participants. In each, the framework of Visitor and Resident was introduced (refer to table 2 above) and the participants were asked to map their different engagements with tools and platforms in terms of whether they identified with a more visitor mind-set or a resident one (Figure 12 illustrates the map the participants were given). This activity lasted for no more than twenty minutes and after the participants had mapped out their engagements with tools and platforms, each of them was asked to explain their map in detail. They were asked for reasons explaining what they had drawn and what they

[26] available from: http://www.oclc.org/research/themes/user-studies/vandr.html

[27] available from: http://www.informationr.net/ir/19-2/paper623.html#.WVYfO8aZPJE

had reflected upon while constructing the map. One key element of this discussion, where they described their maps, was to take the time to ask 'why' questions more than once. This was so that the students could go beyond stating the obvious and get below the surface when possible, and in so doing reflect on what were some of the barriers/enablement they could identify in their own digital practice.

In the Visitor and Resident framework, space is a metaphor used by the authors (White and Le Cornu, 2011). The Web is experienced as a place,

> *The web is experienced and conceptualised as a place, somewhere to go in order to be co-present and to engage with others, to the point that at times individuals feel immersed in the location: it is truly a place where they live out dimensions of their lives. (Le Cornu and White, 2017, p. 2).*

The map used is divided in four quadrants or grids, identified in figure 12 as Q1 to Q4: each grid is the combination of a mode of engagement (visitor or resident) and a space (personal or institutional).

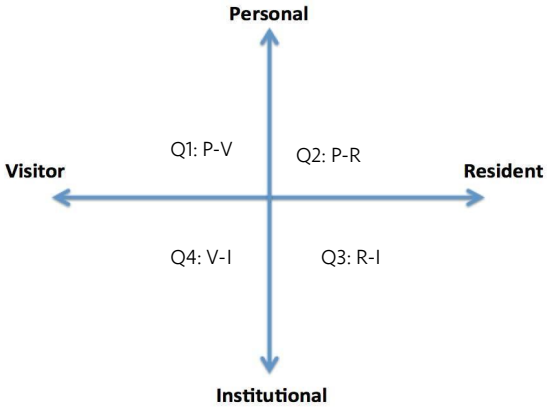

Figure 12: Visitor & Resident map (White & Le Cornu 2011)

The maps of students' online engagement depict the topography of their digital practices. Topography is a concept I borrow from geography, and it makes reference to the arrangements (*graphos*) of natural or physical features of an area or space (*topos*). Topography is also understood as a technique of creating images and it is in this sense that I am referring to it in this research. The maps that students created are images that capture how they arranged (*graphos*) the tools and platforms they engaged with (the features) across their personal and institutional landscape (*topos)*. The possible landscapes for which students could map their engagement are categorised as personal, that is, their social life

and institutional, which represents their university life. They do not have to be situated or studying within the university campus, for this category refers to the tools they engage with for study matters. In the figure below I give a timeline of all the data collected for the study.

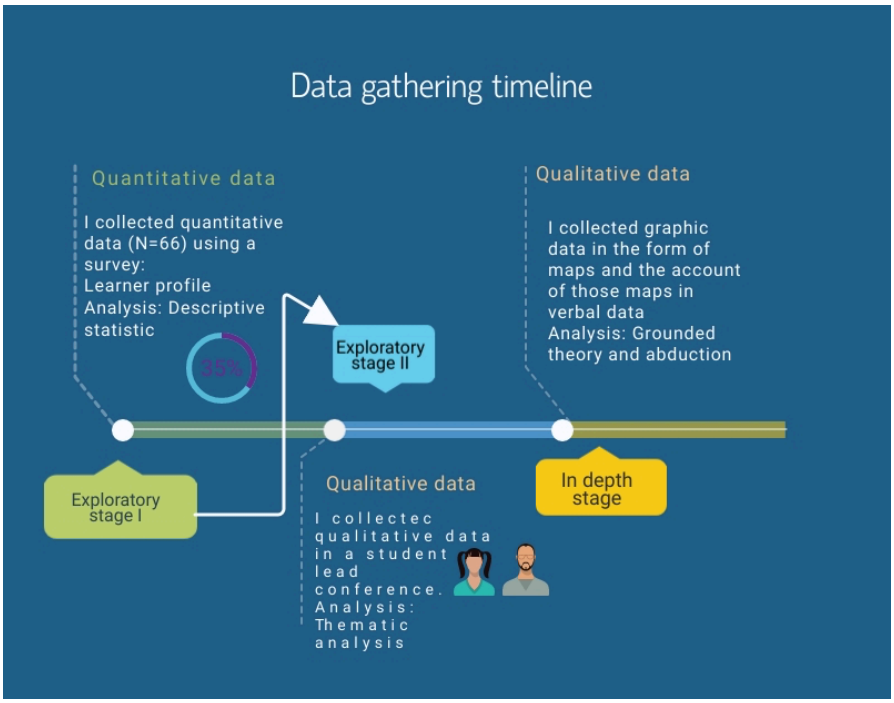

Figure 13:Timeline of the data collected in the exploratory and in-depth stage of the study

4.4.5.1. THE DATA FROM THE FOCUS GROUPS

The data obtained with this method, i.e., the Visitor and Resident map, is verbal and pictorial. The pictorial or visual data is represented through the map of each participant (six examples are given in figure 14) and the verbal data consists of students' accounts of their maps. The verbal data was recorded and then transcribed for further analysis (see chapter 5). The data collected corresponds to the empirical level of social reality (CR has a deep ontology -subsection 3.2.1.1., as illustrated in figure 4).

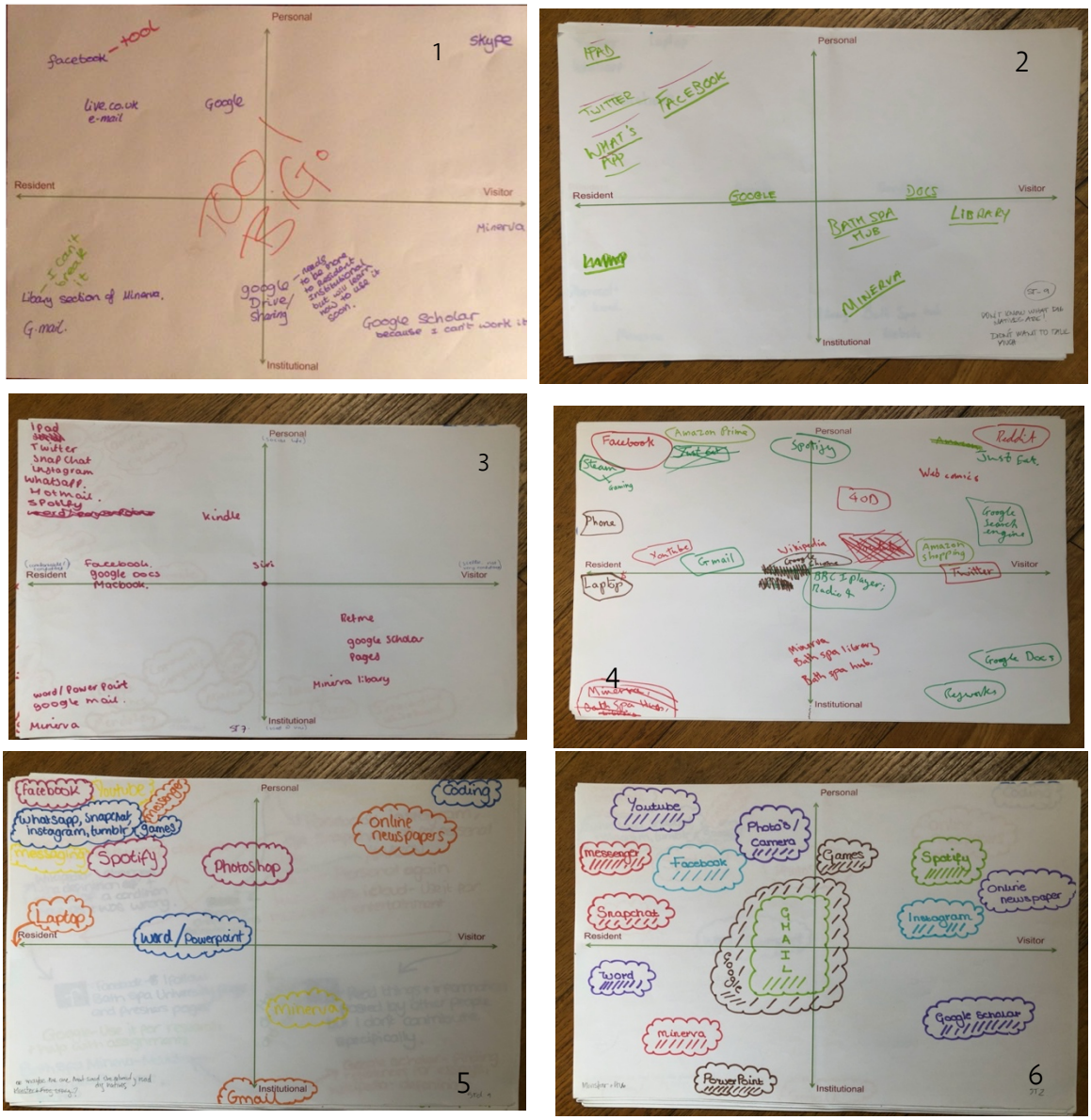

Figure 14:Six examples of students' maps

4.4.5.2. VISUALISING THE VIRTUAL SPACES OF STUDENTS

Visualising digital engagement using the maps helped students to make sense of their different practices when online. As White and Le Cornu (2011) argue, mapping encourages participants to create a geography of their online spaces by giving a visual location to different modes of engagement. What can be seen in the collected visual data, i.e., the maps, is how individual students arranged their digital spaces differently, individually

shaping each quadrant/grid/location (refer to figure 12). Nevertheless, some patterns/tendencies were observed. One of the salient tendencies observed in most of the maps, is that the personal space was more populated with an array of tools and platforms than the institutional space, as can be seen in the six maps gathered in figure 14. Some of the participants, while discussing their maps, decided to annotate them in terms of documenting their ideas and comments. This is the case for the first map (1 in figure 14), where the participant (a 19-year-old student) said that the Web was too big and confusing for her. Accordingly, she wrote 'too big!' in the centre of the map. She continued by sharing how she felt so distant from those described as digital natives. Instead, she felt she was part of the forgotten generation, because in her time at school the teachers did not know much about digital tools and now at the university, everybody expects her to be a digital native. Even with Google drive, what seems to be a common tool for all the participants, she annotated on her map how she would learn how to use it, because at the moment she had not done so. She also added that she felt safe in the VLE, because she could not break it. Her map, in general terms, is an empty one, depicting a desert topography in all four quadrants and along with this is her feeling about her practices, which in her words is described as "we are bumbling along." Another interesting tendency, as can be seen in map 3 and 4 (figure 14), is that the personal space (in both modes: visitor and resident) is densely populated with a variety of open and participatory tools, such as WhatsApp, Kindle, YouTube, Google search engine, Twitter, BBC apps, and the like. In contrast, in the resident-institutional grid of map #4 the only tool mapped is the laptop, in map #3 it is PowerPoint, Google scholar, and Minerva, whilst in map 5 only Minerva and Gmail are depicted, all of them being institutional tools provided by the university. A general tendency clearly emerges from the maps, i.e., that the institutional space has, in a general sense, a desert topography. Students engage with few tools, and they are mainly closed institutional ones (Minerva, Google Suite and the digital library, but not all the tools of the G Suite). It seems that searching for other tools is not something the participants thought of doing for themselves. There was an exception to this tendency of engaging only with institutional tools, observed in five maps, i.e., participants engaging with Mendeley. This a referencing tool that is not institutional, being catalogued as an open and participatory tool. All the participants that engaged with it explained that it was because they had a tutor who

supported them in the use of the tool and even so, it was not actively used by all students. They did engage with it, but the majority did not use it for their final essays. They felt this could detrimentally affect their grades and so they would rather utilise the usual copy and paste, as one student said: "I did my references wrong once and now I do copy and paste; you can't trust tools." It seems that the fact of doing things not always right is associated with distrust instead with the natural learning process.

4.4.5.3. GIVING MEANING TO THE GRIDS: LOOKING AT STUDENTS' PERSPECTIVES

These quadrants depicted in figure 14 could be understood as fixed empty containers with Euclidean properties that are filled with objective things, empty boxes where humans act (Stock and Vöhringer, 2014). In contrast, Dodge and Kitchin (2011) sustain, in line with others (Soja, 1989; Lefebvre, 1991; Massey, 2001, 2005; Gulson and Symes, 2007; Cresswell, 2009; Rohkrämer and Schulz, 2009; Hubbard and Kitchin, 2010; Hung and Stables, 2011; Merriman *et al.*, 2012; Stock and Vöhringer, 2014) that "space is not a container with pregiven attributes frozen in time; rather, space gains its form, function, and meaning in practice" (p. 172). Space is "constituted through social relations and material social practices." as Massey (2001, p. 254) would say. Thus, spaces are not essences but processes, and therefore they do not look the same for every participant as can be seen in the six maps that are presented under figure 14. As Gustafson concluded in his study, "Places become meaningful because of the respondents' relations with people -friends, acquaintances, relatives – living there, and the sense of community that such relations create." (Gustafson, 2001, p. 1338). Hence, space is shaped by a range of forces, relations, negotiations, practices of engagement and power in all its forms (Massey, 2005).

Referring back to the grids, one thing that becomes clear is that those spaces, the institutional and the personal, are socially constructed. Each of the participants crafts them, each and every one decided, given certain circumstances, which are the tools they engage with arranging their grids in a personal fashion. Particular spaces offer material

opportunities and restrictions and also shape through its 'atmosphere'[28], human emotions. Topographies or the organisation of space are not separate structures with their own laws of inner transformation, but rather, they are the expression of a set of relations embedded in a broader structure such as the social production of knowledge in the case of the institutional space (Soja, 1989).

I find that there is an interesting and fertile line of inquiry that could be pursued using critical theory of space to explore the social construction of digital spaces. This idea of exploring space from a critical perspective is something that emerged unexpectedly while looking at the very different topographies of both the institutional and personal digital spaces of the participants. Hence it falls out of the scope of this thesis, but it opens new windows to explore the political dimensions of space.

SUMMARY OF THE CHAPTER

In this chapter, I have presented the methodology used to generate the data that is used for addressing the research questions. Constructivist grounded theory methodology was used to explore the social reality under investigation, i.e., students' reflexive engagement with digital technology in formal (academic) and informal (personal) settings. In this context, and in line with the theoretical framework described in chapter 3, constructivist grounded theory was used to explore the empirical level of the phenomenon. The deeper levels will be explored using different social theories that are illustrated in figure 15. These two deeper layers of the phenomenon under investigation will be analysed and explained in more detail in chapter 5. I will explain the process of abduction and retroduction that I engaged with. The abduction process was supported mainly by realist social theory (Archer 1995) and the capability approach (Sen, 2003a; Smith and Seward, 2009; Oosterlaken 2015), and the retroduction process, whereby the interactions of the candidate generative mechanisms with the contextual conditions that offer an explanation of the outcome will be described and explained.

[28] This word is taken from the German work *Atmosphäre* (Böhme, G. Frankfurt am Main: Suhrkamp, 1995), which in German relates to the emotional feeling that can be sensed in a space.

This study is comprised of two stages, stage 1 included the collection of both, quantitative data that was aimed at exploring students' digital profile, and qualitative data gathered in a conference organised by students that took place in the institution where this study was conducted. The data collected in this first stage did not serve to answer the main research questions, but it exposed the need for a more in-depth exploration of the phenomenon. The in-depth stage of the study was designed using the Visitor and Resident framework (White and Le Cornu, 2011) to gather students' reasons and motivations to engage or not with digital technology and the modes of engagement which will oscillate between the visitor mode and the resident mode.

The analysis of the verbal data will be undertaken in the next chapter where the approach for analysis will be explained, in this chapter some data has been presented to set the scene for further analysis, which is what will be addressed in detail in chapter 5. In the subsequent chapter I will build on the findings and share the theoretical models developed guided by realist social theory. In sum, in chapter 5 I will discuss the general findings that emerged from the data analysis. Chapter 6 explains, using the morphogenetic cycle (Archer, 1995) as an explanatory framework, the reasons why and how students engage or not engage with (open and participatory) digital tools and platforms in formal and informal settings.

In chapter 5 I will describe the journey that led me to expand my theoretical framework from CGT to CR and RST with which I analysed the data. This journey was ongoing, that is, while I was making sense of the data, I realised that a theory that could aid me to make sense of those empty grids that students depicted in their maps (as shown in figure 14) was needed. A theory that was able to uncover that what was invisible in the maps, hence CR and its commitment to ontology was a good choice for that task.

CHAPTER 5
DATA ANALYSIS AND PRESENTATION OF FINDINGS FOR THE IN-DEPTH STUDY

In this chapter, I will describe the process of analysis as well as presenting the emergent themes and broader theoretical constructs that have been derived from the in-depth stage of the study. The study comprises two stages, an explorative stage where I collected quantitative data that was analysed using descriptive statistics (detailed analysis can be found in subsection 4.3.3.) and qualitative data subject to thematic analysis (detailed analysis of this data can be found in subsection 4.3.4.). In this exploratory stage, it became clear that students' digital profile was one of passive consumers of the Web, rather than active producers and that students' online engagements with open and participatory tools were scarce. On top of that, I realised that they had little awareness and knowledge about the meaning of digital literacies, but nevertheless, were eager to know more. All of this galvanised my decision to undertake a second stage, where I could explore students' digital practices more in-depth in a qualitative manner to understand why and how they engaged or did not engage with digital tools and platforms. The data that I collected in the in-depth stage is visual (the maps described in subsection 4.4.4.) and verbal (the accounts students gave of their maps and the discussion that arose from these). The verbal data is that which will be analysed in this chapter.

I have decided to use a narrative approach to present the findings, as suggested by Maxwell (2004, p. 256). However, Sayer (1992: 259–62) notes that narratives have specific dangers: their linear, chronological structure tends to obscure the complex interaction of causal influences; and their persuasive storytelling can avoid problematising their interpretations, thereby provoking criticism. To address this risk, I complement the findings presented in this chapter with a detailed account of the different generative mechanisms that interact to produce the observed outcome, namely the lack of reflexive engagement in open educational practices. This will be the content of chapter 6.

This chapter starts with an introduction, providing some contextual details of the study and it then explains the process of analysis followed (section 5.2) for that I explain how I

engaged with CR and RST to articulate the final theoretical framework that I explained in detail in chapter 3. It was during the phase of data analysis (chapter 5) that I realised that CGT was not enough for the data at hand, therefore, I searched for a theory and a philosophy of science compatible with CGT that allowed me to go beyond the empirical level of the data and in so doing being able to generate the causal pathways (subsection 5.2.3) that will guide the answer of RQ2 and RQ3 (chapter 6). I describe in subsection 5.2.1 the coding process and the identification of tendencies at the empirical level. I then describe the process by which the categories and themes emerged (subsections 5.2.1.1., 5.2.1.2, 5.2.1.3). In the next subsection (5.2.2), I explain in detail the process of abduction that allows for the exploration of the real level of the social reality investigated. I then, in section 5.3., describe in detail each of the generative mechanisms that emerged after undertaking the abduction: emotions (5.3.1), digital capabilities (5.3.2), students' socio-technical relations (5.3.3). I conclude the chapter by preparing the ground for the morphogenetic cycle of students' digital practices that will be presented in the next chapter.

5.1. INTRODUCTION

The character of this study is tentative and explorative, given that I knew little about what I would encounter in the field (Maxwell, 2004). This explorative and unknown nature of the work brought me to the decision of going to the field with no predetermined theory as I explained in chapter 4. This approach is suggested by Charmaz (2006). I used constructivist grounded theory (Charmaz, 2006) to sample, collect the data and analyse only the empirical level of the phenomenon I set out to investigate. The data was generated through a focus group that used the Visitor and Resident (V&R) (White and Le Cornu, 2011b) framework, where students mapped their digital engagement with tools and platforms onto an A3 sheet of paper (figure 12) and then, they gave a detailed spoken account of their map. Hence, the data I collected comprised two forms: pictorial or graphic, and the verbal accounts. It is the verbal account that I set out to analyse in this chapter.

Data analysis began with the search for tendencies at the empirical level of reality (section Subsection 3.2.1.1), which served as an entry point to deeper levels of reality, namely, the

actual and the real level (explained in section 3.2.1.1). These tendencies were identified at the empirical level (refer to table 3) using the coding process described in CGT, which is consistent with the ideas of different scholars that have used CR (Carter and New, 2004b; C. Oliver, 2011; Fletcher, 2017; Bunt, 2018). After I transcribed the focus groups' discussions and obtained a first and very tentative glimpse into the data, I looked at what theories could assist me in making sense of the maps and the verbal accounts. I explored socio-cultural activity theory (SCAT) (Engestrom and Miettinen, 1999; Engestrom, 2016) as it is widely used in the field of educational technology (Barab, Schatz and Scheckler, 2004; Ruckriem, 2009; Murphy, 2013). SCAT stresses the socially mediated nature of human activity, and it offers, as RST does, a contribution to the understanding of the relationship between the individual and the social through a materialist and relational ontology, with a strong emphasis on practice (Archer, 1998; Wheelahan, 2007). Despite the link of SCAT with CR and the efforts made by Engestrom and Miettinen (1999) to explore the relationship between human agency and society, it falls short in providing analytical tools to analyse this interplay. SCAT puts the stress on tool/artefact mediated human activity as the basis for social reproduction/change, and the basis for the development of knowledge (Engestrom, 2015). I have found that, whilst their work provides interesting insights, i.e. the activity system, which is the analytical tool SCAT offers, it does not allow for exploring individual agency and even less, the interplay with structure and culture.

I realised I needed a theory that could explain the empty grids in the participants' maps (figure 14), the absences. What was underlying the lack of engagement with digital tools was needing an answer. There was something to do with agency/lack of in those spaces. Realist social theory was a suitable candidate as the main tenant is that individuals are neither passive recipients of certain powers nor completely free from the influence of the context and the circumstances that are acting in a particular moment in time. RST brings to the fore the reflexive capacities of the individual and her/his power to effect change to break with reproduction of many times invisible structures of domination (Vandenberghe, 2016, p. 105). Through this reflexivity, the individual can change the structure because of his/her self-transformation. However, RST is based on a realist ontology (explained in section 3.2.2.1) which has further implications which I have addressed approaching the

study under a CR philosophy. Hence, RST and CR formed the basis of the theoretical lens (extensively explained in chapter 3) that guided the data analysis. This framework is suited for answering why and how questions, because both are concerned with the search for generative mechanisms that create the relational links accounting for how and why something happens, (Carter, 2004a). CR and RST are deemed appropriate for the current study, because under these perspectives, social reality is understood as much more than what is only observable and empirically accountable. That is, the empirical level is the gateway into a deeper and complex reality that needs to be explored and explained with the guidance of social theory, hand in hand, with the researcher's experience in the field of study. In her theoretical work, Oliver (2011) and Fletcher (2017) amongst other, set out to explore how grounded theory can be adapted for use within a CR perspective acknowledging that CGT falls short to account for the structural conditions within which resources are made available to agents and actions are pursued. CGT explain a specific phenomenon grounded in data, instead of explaining them at a broader societal level. Thus, there is a need to complementing the analysis in further stages with other logics of discovery such as abduction and retroduction that I will explain further in this chapter.

In general, the role of CGT used in tandem with a CR stance serves to explore the tendencies or patterns that are at the empirical level. This is achieved by following the classic procedures used in CGT and then, deepening the levels of analysis by probing aided by social theory, the wider structures involved in the social phenomenon under investigation. What follows is a detailed and theoretically informed account of the analysis prosses used in this study and the limitations I encountered while performing the analysis using the approach.

5.2. PROCESS OF ANALYSIS OF THE IN-DEPTH STAGE: THE VERBAL ACCOUNT

Research that is guided by CR is concerned about what theory and concepts are required to understand the data at hand and to bring to the fore the mechanisms or processes that are at work (Ackroyd and Karlsson, 2014). Moreover, the world, for CR, is stratified, that is, it does not merely comprise events that are empirically grasped, for it is also driven by the underlying mechanisms that, although not empirically observable, are real and make things happen within it: they are the substance of the real level of social reality. To do this, CR

proponents suggest that, first, the researcher needs to identify the tendencies or demi-regularities (tendencies are explained in subsection 3.2.4) that are observed at the empirical level. In order to capture the tendencies or rough patterns, CGT was used as it is considered an appropriate approach by critical realists (C. Oliver, 2011; Fletcher, 2017; Bunt, 2018). Under CR, the focus is not on generating themes and concepts that are grounded in the data, but rather, on uncovering and understanding socio-cultural processes, i.e., how these come about, what the mechanisms and structures are that make things work in the way they do and not otherwise. The goal of CR is, therefore, the theoretical identification of things and their causal power.

The principal logic of discovery in CR is guided by two processes, abduction and retrodiction (Ackroyd and Karlsson, 2014), also called retroduction by Danermark et al. (2002) and others, which is then followed by a process of contextualisation. The process of discovery happens after the regularities/tendencies have been identified at the empirical level. Abduction is the process of theoretical re-description, whereby the tendencies or demi-regularities that were observed and coded at the empirical level are re-described in terms of structures and mechanisms using meaningful theoretical terms. This is done with the intention of transcending the merely empirical or concrete account of a phenomenon and to interpret it using a set of ideas and concepts at a higher level of generality (Danermark et al., 2002; Ackroyd and Karlsson, 2014). Abduction becomes, thus, the means of obtaining knowledge about "how various phenomena can be part of and explained in relation to structures, internal relations and contexts which are not directly observable." (Ackroyd and Karlsson, 2014, p. 92). The purpose is to interpret and re-contextualise the particular phenomenon within a conceptual framework "to understand something in a new way by observing and interpreting this something in a new conceptual framework" (Danermark et al., 2002, p. 80). The strength of this process is that it provides guidance for the process of interpretation by which meaning is ascribed to events in relation to a larger context, using a broader sociological frame of reference (Danermark et al., 2002). This allows the researcher to transcend the obvious and in so doing challenge 'commonsensical' ideas. The limitation is that the process entails the researcher's ability to be creative and form new associations of phenomena (ibid.). This process of abduction was undertaken in this study

by means of RST (Archer, 1995, 2002; M Archer, 2007) and the capability approach of Sen (Sen *et al.*, 1999) and other thinkers that have included the technological dimension in it (Smith and Seward, 2009; Oosterlaken, 2015).

Retroduction/retrodiction is a second step in the process of discovery, whereby the researcher sketches out all the possible explanations, that is, identifying and selecting the candidate generative mechanisms (already conceptualised through the abduction process) in the particular context, finally choosing those that have the strongest explanatory power regarding the outcome observed. The aim of this process is to answer questions such as, how is X possible? Or what causal mechanisms are related to X event? Hence, the aim throughout retroduction is that once the generative mechanisms are identified in the abduction process, a description of their interactions is provided that can explain the phenomenon under investigation (Blom and Morén, 2011). For Danermark et al. (2002), the core of retroduction is to "seek to clarify the (...) conditions for social relationships, people's actions, reasoning and knowledge." (p. 96). As Bygstad and Munkvold (2011) suggest, it is in this phase where the researcher will focus on how the power of social entities (e.g. institution and students) interact with the causal powers of socio-technical entities (digital technologies embedded in a context) to produce the observed outcome (students' engagement/lack of with digital tools). That is, I seek to theorise causal pathways that would explain how structures impact the event in question, i.e. lack of reflexive engagement. The researcher needs to adhere to practical adequacy (Sayer, 2000), that is, choosing the best argument that fits the context informed by her/his experience in the field and the reality that is being addressed (Porpora, 2013). The core task for critical realists is to find the best possible explanation that fits the given context. Sayer (2000) is of the view that the reliability of the conclusion lies in the experience of the researcher with the phenomenon under investigation to choose the theory that fits best, keeping in mind that theory and knowledge are transitive and contingent. It is, therefore, acknowledged that explanations are fallible and open to different re-interpretations.

A process that unfolds in parallel with retroduction is the process of contextualisation (Danemark et al. 2002). The aim with this is to examine how the mechanisms that were identified during the abduction process are materialised in concrete situations – in the

specific context, as well as, ascertaining how the mechanisms come to be expressed in the context of study. The last process in a CR methodology is testing, which entails the adjustment of our theories through comparison and further empirical and theoretical observations. The intention is to see if the retroduction makes sense across different situation attending to the different settings. It aims to identify if the structural dynamics that we have proposed at the retroduction stage hold true. This process was not undertaken in this study, I will explain this in further detail in chapter 7 when I address the limitations of the study.

My process of analysis began with the empirical data, which is comprised by the maps (6 examples are compiled in figure 14) and the verbal accounts of these maps during the discussions in the focus groups. Trends and tendencies were observed at the empirical level using two types of research methods, extensive and intensive (Sayer, 2000). An intensive methodological strategy was chosen for this study because as Sayer (2000) explains, this is focussed on revealing the root causes of the phenomenon studied. However, an explanation that is generated in one context is limited to the situation being studied. In addition, and in accordance with Porpora's (2013) advice provided above, I will draw on my long experience in the field of education and my previous master's research done in the field of educational technology. I will therefore be in a position to provide a tentative explanation that is temporary, open to scrutiny, and inviting further interpretation. I present in figure 15 the ecology of theories that I used in the data analysis. I included Socio-Cultural Activity Theory although I decided not to use it as I explained in section 5.1.

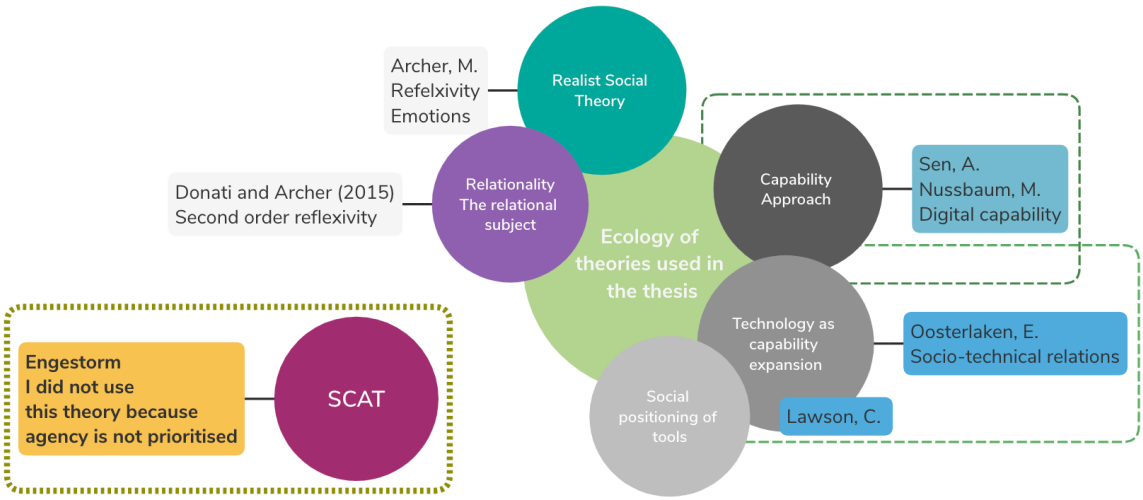

Figure 15: Ecology of theories used and not used in the thesis

5.2.1. DATA CODING AND IDENTIFYING TENDENCIES AT THE EMPIRICAL LEVEL

As explained in subsection 4.4.5., data collection for the in-depth stage of this study was achieved through the focus groups that were centred around the Visitor and Resident framework (White and Le Cornu, 2011b; White *et al.*, 2012; Le Cornu and White, 2017), explained in detail in subsection 4.4.4. All the focus group sessions were video recorded and transcribed as soon as possible after their completion. Once the transcriptions were ready, I started to process the data in an iterative manner, making use of the CGT concepts of coding, which involved moving from open to focused coding and then, to the consideration of theoretical codes (Charmaz, 2006). I did the process by hand; the first coding map is illustrated in the picture below (this map went through different iterations, and all were done by hand).

Figure 16: initial open coding map

5.2.1.1. OPEN CODING

Coding for Saldaña (2009) is a heuristic, a technique for problem-solving that has no formula to follow. It is a process that leads the researcher from the data to the idea, which then, depending on the researcher's theoretical orientation, will be refined through the lens of the framework. I started by undertaking open coding, as suggested by Charmaz (2006), which consists of labelling data segments. The first stage involves a close encounter with the data, a line-by-line reading of it, thinking about the meaning of each segment and every sentence. The intention in this first stage is to look for the social processes that can be observed in the data. After following this process, I found a number of emergent codes, some of which I have listed below (a full list can be found in appendix 6):

- Not knowing another way than copy and paste for doing the bibliography
- Feeling distrustful towards tools
- Feeling afraid of getting it all wrong
- Needing support from the lecturer

- Feeling confusion with the abundance of resources (don't know what to choose)
- Feeling an aversion to risk the grades
- Lack of understanding of how it all works
- Wanting more awareness regarding digital literacies
- Feeling amazed at the possibilities for collaboration
- Feeling frustrated because the web is too scattered
- Feeling anxiety because the web is too big
- Aspiring for a better practice
- Feeling anxiety when exploring new things

Whilst I was carrying out the in-depth stage of this study, whenever I thought an issue/thought/idea was important for the interpretation of the data I wrote a memo. Memo writing is an important element in CGT (Charmaz, 2006), being a technique that supports the researcher in understanding the data and also, in becoming aware of her own position and assumptions. Memos are notes to oneself and are used to capture tentative meaning, things that can be affecting the participant, inconsistencies, assumptions and biased associations. Below are two examples of the memos I wrote during the focus groups:

> *In general terms, I can see that there is a huge gap: She doesn't know what digital literacy is, but she thinks it is important, how does she arrive to that conclusion? I should ask this in other groups. This came also out in a conversation I had about digital literacy, they did not know what dig lit is but one student said: "well I don't know what it is but if I need to learn a software I just go and do it and I know I will be able to" This indicates there is an intuitive knowledge about it, a right association to what digital literacy really is. What does this mean for later analysis? She wants more information and more inputs in relation to digital literacies. She said she would like to be exposed to tools that could help her in her dissertation, will she be wanting to do the effort? Not sure... (26th February 2016)*

> *I saw a relation between someone who is very interested and has ideas about the digital and a dense map. Many of the participants of this group were saying it is very hard for them to think deliberately about the Internet, they have never done so. This comment was also made by 2 girls in other group What theoretical implication could this have? David White and Group 52 talk about the post-digital era, defining it as an era where tools are not the focus of attention instead the attention has shifted to the relationship individuals have with those tools and what can be transformed through the use of them. Tools are disappearing in a digital ecosystem of abundance. Abundance of resources, of tools, of people. Students already are not questioning if they use Google to start their research, or if they use Word to write an essay. These tools are becoming part of their default toolkit and they are becoming, I would say, not questionable, like they don't question the use of a pen or a colour or a piece of paper to write. In any case, students assume as "normal" or commonplace thus, unquestionable some of the tools they use in their everyday. Important would be to make some notes about limitations that those tools, e.g. Google bring with them, so it is their choice to work despite the limitations they bring. Are they aware of these limitations? Are*

they interested in questioning them? Google is disappearing into use! Some tools, the most used, are becoming invisible. As it is happening with the phone, not entirely but slowly more and more. It becomes difficult for students to talk about it. Conclusion: There is a transition between the analogue and the digital. (6th June 2016).

5.2.1.2. FOCUSED CODING

I then continued the coding process of the in-depth stage, progressing to a more focused coding, whereby I arrived first at the categories and later at the themes, both listed in table 3. The process of focused coding for CGT involves constant comparison, the core of data analysis in CGT. It is a process where the more abstract concepts and theories are generated using an inductive process of comparing data with codes, codes with codes, codes with categories, etc. In this stage, I edited and grouped or regrouped codes going deeper in the data.

This study, as explained at the beginning of this section, was exploratory in character (Maxwell, 2004) as I did not know what I would encounter in the field; I did not know what possible concepts would be useful. The process I followed in the data analysis, at the empirical level, was aimed at allowing the data to talk to me. I was looking at what could be possible meanings behind the codes, but my intention was not to create concepts grounded in the data. Rather, I was looking at what were the meanings that the arrangements in the maps had for the participants in order to produce the initial categories and subsequent themes that would be the springboard for the next process, namely, the abduction.

Once the codes were sorted and organised, they were associated with particular categories (listed in table 3), which were then subsumed into the themes (listed in table 3). All codes were considered important, nevertheless, the more dominant ones in shedding light on the phenomenon were used to identify the demi-regularities or tendencies that were organised into themes. I then found theory against which I could expand the understanding of the emergent themes. In the next section, I will summarise each of the initial themes that emerged at the empirical level, that is, using the experience, perceptions, meanings and feelings of the participants. This is in preparation for the next stage of the analysis.

5.2.1.3. EMERGING THEMES FROM THE CODIGN PROCESSES

A theme captures something important about the data in relation to the research question and as Braun and Clarke (2006) point out, they represent some level of patterned response of meaning with the data set. (p. 82). The authors argue that the importance or relevance of a theme does not depend on quantifiable measures, for instance, it does not need to be present in 50% of the data items to be relevant. Instead, what is important is whether it captures something of relevance to the research question; something that sheds light on the problem under investigation. Accordingly, I selected and listed the codes I thought represent a particular theme, I continued with focused coding, and as a product of that, I rearrange the codes thinking over their meaning in relation with the themes. I did not use the criteria of prevalence, but rather, the criteria of relevance of the code and theme to capture something important for the understanding of the phenomenon under investigation. The themes presented in table 3 are the first attempts to make use of the empirical data, including the utterances of the participants in terms of what they felt, did, and perceived, while describing their maps. This is thus the first level of analysis of this study. The second level of analysis, i.e., abduction, is described in the next subsection (5.2.2), whereby the analysis is aimed at re-describing the themes using relevant theory that allows for integrating in the broader assumptions, structures and mechanisms.

Initial themes	Categories	Codes
Emotions Digital practice as struggle	**Confusion / frustration**	1. We are the **forgotten generation**, in school they did not know how to explain the new stuff and now they think we are natives, but we are not 2. Confusion with the abundance of resources; **don't know what to choose** 3. I feel overwhelmed with so many tools and accounts 4. The effort is pointless; there are too many tools 5. There are **too many tools**, too many accounts, too many things, I don't use it 6. Feel uncomfortable with **too many accounts** 7. The web is too scattered; there is no unifying factor

		8. The web is too big; I don't understand nothing 9. It is too messy 10. I don't use it because it is very confusing 11. Exploring the web feels overwhelming 12. It's a waste of time and time costs money 13. I struggle with Mendeley, so I don't use it
	Anxiety / fear	1. Anxious about where my stuff is 2. It is **the new stuff** that puts me off, that worries me 3. I almost died 4. I am scared to lose all my work 5. I am scared to do it wrong; I just try not to use technology 6. Losing all my information scares me. I don't understand the cloud 7. I am so scared to lose everything that I just use Word
	Rejection	1. Don't like it, but I use it because the university forces me to do so 2. Don't wanting to engage 3. It feels like you can't do anything 4. Hating social media 5. Being a technophobe 6. Feelings of rejection towards the VLE
	Surprise/excitement	1. I can't believe you can do this. 2. I have just discovered this; it is like magic 3. It is amazing! 4. I understood how to do it! WOW!! 5. Amazement about the possibilities

Digital literacies	Understanding and background knowledge	1. I don't understand the cloud 2. I don't understand the web 3. I don't know how this works 4. We are naïve we don't know all the uses the internet has
	Know-how	1. I didn't know I could do this with this tool 2. I don't know how to get to the cloud 3. It is not intuitive, it is too complicated, don't get it 4. I don't know how this tool works; it is not intuitive 5. I email myself everything, so I can have it in my device 6. I didn't know that this tool existed 7. I don't know what social bookmarking tools are. I use 'favourite' in my browser 8. I don't know how to use Google docs; someone has to teach me
Social support *Some thoughts during the coding - Institutional culture, an epiphenomenon of the false idea that students are natives*	Guidance, scaffolding, support	1. If I would not have had the support of my lecturer, I would not have used Mendeley 2. It is the support what I need 3. I would like to have someone explaining me this like a granny 4. If I would have support, I would use it more 5. We need support to learn this stuff 6. It was the support I had from my teacher that made me use Mendeley 7. I only did it because I had the support of my lecturer

Risk averse / culture of assessment *Messing the assessment is one source of the conflicting emotions*	Particular institutional norms and rules around assessment *The emotion is generated by the importance of passing the module. It is in that context that these O+P tools cause anxiety and fear; the fear is to make things wrong; not to use the tools as such. There is also fear about the messiness of the www.*	1. I don't want to risk my grades 2. It went wrong once; now I don't use it anymore 3. It is the new stuff that puts me off 4. I don't trust tools 5. I stick with what I know (fear of the new) 6. I will not risk it anymore (it went wrong once)
Perception of no real need →*Normative structure of the institution / culture of assessment* This is reinforced by the **positionality** of the tool in the context of interdependencies	Norms and rules (tacit ones) The need is defined by what is required in the module *If O+P tools are not positioned in the institution, then they do not have a social identity and they are not appropriated; included in the possible tools used to mediate the tasks*	1. I don't need more than what I have 2. Google is all I need 3. I use RefMe; it does what I need (positive version) 4. I don't see the point. I don't need more than what I use This shows the importance of what students perceive as what is needed to achieve their major concerns. It shows that the vested interest is in passing the module.
There is a real need	This is in students' personal space	1. I use twitter for my work 2. I use a lot of tools for my health issues (calendar, timekeeper, NHS apps) 3. I am disabled, so I use the Internet to find help and support with my problem 4. I connect with others in a specialised forum to know more about my health-related issues

Aspirational Sophisticated digital literacies as aspirational. Reflexive engagement as aspirational	*This is useful to document that there is will. Students acknowledge that having a sophisticated digital practice should be a major concern*	1. I don't use the tool as I should 2. I would love to learn how to do my reflective diary online 3. I know I need to be better at this 4. We have to learn this, because we are going to need it in the workplace 5. I love that tool; I would like to know more about it 6. This is amazing; we need to know more of this 7. Wanting more awareness regarding digital literacies; I don't know what it is, but I know it is important 8. I am very proud of myself when I know how to use a new tool
The VLE	*A general dislike regarding the design but a sense of obligation; no possibility not to engage with the VLE*	1. A safe space where I can't break anything 2. I feel confident in Minerva 3. I like it because there are all my readings NEGATIVE REACTIONS 4. The VLE is boring 5. The VLE is awful 6. I don't feel identified with the VLE, but I have to use it 7. The VLE is not appealing; it is boring, but I am forced to use it

Table 3:Initial emerging themes from the focused coding process

There are seven emergent themes: emotion, digital literacies, social support, perception of no real need at the institutional level, digital literacies/practices as aspirational, and students' relationship with the VLE. Braun and Clarke (2006) explain that after this initial proposal of identifying candidates, there is a refinement process, for it is possible that some of these turn out not to be really themes (e.g. there is not enough data to substantiate them), while others might be subsumed into others (e.g. two or more apparent different themes end up being only one). After refining the themes and rethinking the meaning of the codes, three themes remained, which were to be subjected to the process of abduction.

5.2.1.3.1. Emotion

In this section, I consider the theme of emotion and explain the four different clusters of this theme that emerged in students' narrative, namely, anxiety/fear,

confusion/frustration, rejection, and excitement, and the associated codes. I have added a new column, where I indicate in which stage of the morphogenetic cycle (developed in the next chapter) the evidence is used.

Theme	Category	Codes	Place in the MM
Emotion Digital practices as a place of struggle	Anxiety/fear	1. Anxious about where my stuff is 2. It is the new stuff that puts me off 3. I almost died; I lost everything 4. I am scared to lose my work 5. I am scared to do it wrong; I just try not to use tech 6. Losing all my information scares me. I don't understand the cloud 7. I feel safe in the VLE because I cannot break anything 8. I don't want to risk my grades 9. It went wrong once; now I don't use it anymore 10. I don't trust tools 11. I stick with what I know (fear of the new) 12. I will not risk it anymore (it went wrong once, and I almost died)	$T_2 - T_3$
	Confusion / frustration	1. We are the **forgotten generation**. In school they did not know how to explain the new stuff and now they think we are natives, but we are not 2. Confusion with the abundance of resources; **don't know what to choose** 3. I feel overwhelmed with so many tools and accounts 4. The effort is pointless; there are too many tools 5. There are **too many tools**, too many accounts, too many things. I don't use it 6. Feel uncomfortable with **too many accounts** 7. The web is too scattered; there is no unifying factor 8. The web is too big; I don't understand nothing 9. It is too messy 10. I don't use it because it is very confusing 11. Exploring the web feels overwhelming	$T_2 - T_3$

		12. It's a waste of time and time costs money 13. I struggle with Mendeley, so I don't use it	
	Rejection	1. I hate the VLE 2. I struggle with Minerva, but I have to use it 3. I don't like the VLE, but the university forces me to use it 4. I hate social media 5. I hate tools; I am a technophobe 6. I don't trust tools 7. I don't want to risk my grades, so I don't mess with tools	$T_2 - T_3$
	Excitement amazement	1. I can't believe you can do this 2. I have just discovered this; it is like magic 3. It is amazing! 4. I understood how to do it! WOW! 5. Amazement about the possibilities	I did not use these

Table 4:Emotion and the associated codes

Emotions is one of the strongest themes, it was prevalent in almost all the narratives of the participants. Emotions emerged from students' relationship with their practical order, that is, the material context for action, i.e., the different technologies and platforms they attempt to engage with. They are the participant's commentary to the practical concerns that arose when engaging or trying to engage with digital technologies in the institutional context. Students expressed emotions that were associated with anxiety and fear, this was the case when they felt anxious when trying to engage with a technology, they were not familiar with (more examples of students' experiences can be found in section 5.2.1.3.1.).

The majority of them were related with negative feelings and emotions denoting some kind of conflictive relationships when engaging or thinking about digital tools and/or digital spaces, mainly in relation to their learning experience at university. For some participants, the emotion emerged as anxiety. They felt anxious because they did not know how to choose tools by themselves in the institutional space, or because they feared they would lose all their 'stuff'. A common thing many participants said is that they feared risking their grades, giving this as a reason to not engage with tools that where not safe for them. Confusion was another emotion that emerged quite often, and they felt confused for different reasons. It could be because they did not know how to make a tool work or that

they did not understand technologies, such as the cloud, which made them feel quite reluctant to store anything "up there", as some of them shared. For many students, engagement was experienced as a space of struggle. This was evidenced in different comments students made when they were describing their maps, such as "the cloud scares me, I don't understand the cloud" or "I am such a technophobe, I only use Word I am so scared to lose everything" or "The web is too big, I don't understand nothing." This lattermost comment can be interpreted as a lack of understanding, thus pertaining to the theme of digital literacy. This participant also said that she felt as she was forgotten: "We are the generation that people have forgotten that the teachers didn't know how to teach and at university people assume that I am the generation that was brought up with it". She even wrote on her map (figure 14) the words 'too big' and 'I don't understand nothing', this she did with frustration as well. After this particular focus group, I wrote a memo about my thoughts in regard to this student, where I identified two things that I considered very relevant to the phenomenon I was investigating (this memo can be found in appendix 8).

In this second stage of coding, looking closer at the codes and categories, I found codes that were categorised under the initial theme, risk averse. Looking at these transcripts again and contrasting these codes with the themes, I realised that they were really expressing an emotion that related to aspects of their module and thus, I relocated them in the theme of emotion. There were codes like "I don't want to risk my grades", "It is the new stuff that puts me off" or "I stick with what I know; I don't want to mess my grades".

5.2.1.3.2. Digital literacies

Digital literacies was another strong theme that emerged from the data. It is related with the know-how, the background knowledge and understanding regarding an individual's interaction with the practical world, i.e. the technological infrastructure, the tools.

Initial theme	Category	Codes	Place in the MM

Digital literacies	Understanding background knowledge Know-how	1. I don't understand the cloud 2. I don't understand the web 3. I didn't know that this tool existed 4. I don't know how this works 5. I didn't know I could do this with this tool 6. It is not intuitive; it is too complicated; I don't get it 7. I don't know how this tool works, it is not clear to me 8. We are naïve we don't know all the uses the internet has 9. I didn't know I could do this with this tool 10. I don't know how to get to the cloud 11. I don't know how this tool works; it is not intuitive 12. I email myself everything so I can have it in my device 13. I didn't know that this tool existed 14. I don't know what social bookmarking tools are; I use 'favorite' in my browser 15. I don't know how to use Google docs; someone has to teach me 16. For referencing I do copy and paste; I don't know any other way to do it. I get confused with it, I don't know how to do stuff.	$T_2 - T_3$ $T_2 - T_3$ $T_2 - T_3$

Table 5:Digital literacies and the associated codes

The majority of students at some point said that they did not know how to manage a particular tool, e.g., Mendeley, Google Document, Sheet, Diigo, etc. In one discussion group a participant was talking about how she used Mendeley (a referencing tool), because she had the support of a lecturer and another participant reacted to that comment saying that she was not able to put Mendeley to work and that she decided to do her list by copying and pasting, although "it was a pain" (using her words). The lack of know-how was one of the factors that determined her lack of engagement with the tool.

In some of the groups, I decided to ask the participants if they knew what digital literacies are, and the majority of participants said they did not know. Others said that, whilst they knew they were important, they did not know really what they meant, with some making utterances about e-books. Many also commented that they did not know what a particular

tool was about; what it allowed them to do. This lack of understanding created a general feeling that the participants did not see the point of engaging with different tools, particularly those that were not encouraged for use at the institutional level. Many said such things as, "It is not intuitive, it is too complicated, don't get it", "I don't understand the web", "I don't know how this tool (Google docs) works; it is not intuitive" or "I don't understand the cloud, where is my stuff? One student even looked at the ceiling when she was saying something similar, depicting an expression of feeling like an alien in the world of cloud technology.

In general terms, this category was associated with the lack of know-how and background understanding of the knowledge regarding the operation of digital tools (knowing their function, understanding how they work, understanding their affordances, what tasks can they mediate, etc.) There is a curious thing happening regarding digital literacies, whereby students were aware, so they said, of the importance of these literacies for functioning in the future workplace, but the majority were not able to define what they are, not even in general terms, as I said before.

5.2.1.3.3. No real perceived need to expand the digital practices

Many students did not see the point of engaging with different tools and the reasons they gave for this was that they do not need more than what they had. This came up as an answer when I asked students why some spaces on the map (e.g., can be seen in figure 14) were empty. This contrasted with some of the maps, where the personal space was filled with tools that had a professional use, thus demonstrating that these students perceived a real need to engage with a particular tool, e.g., twitter.

Perception of no real need →*institutional culture* This is reinforced by the **positionality** of the tool in the	Norms and rules (tacit ones)	1. I don't need more than what I have 2. Google is all I need 3. I use RefMe; it does what I need (positive version) 4. I don't see the point. I don't need more than what I use These codes were subsumed into digital capability

context of interdependencies		
There is a real need	Personal space	1. I use twitter for my work 2. I use a lot of tools for my health issues (calendar, timekeeper, NHS apps) 3. I am disabled, so I use the Internet to find help and support with my problem

Table 6:No real need to use different tools and the associated codes

5.2.1.3.4. Sophisticated digital practices as aspirational

I was interested to see the high proportion of the participants who reported how they had an aspiration to improve their practices. They either had a positive experience and shared this with the group, adding that they enjoyed when they feel they could do so and that they would keep on the pursuit of improving their literacies. Other participants had a more pessimistic reaction, blaming themselves for their digital practice being very poor and with the expressed wish that they would like to learn more. Aspiration and intentionality are real, as mechanisms they can make things happen in relation to digital practices. In the table below are the codes included in this theme

Theme	Category	Codes	Place in the MM cycle

Aspirational Sophisticated digital literacies as aspirational Reflexive engagement as aspirational	Aspiring to something better	1. I don't use the tool as I should 2. I would love to learn how to do my reflective diary online 3. I know I need to be better at this 4. We have to learn this because we are going to need it in the workplace 5. I love that tool; I would like to know more about it 6. This is amazing; we need to know more of this 7. Wanting more awareness regarding digital literacies; I don't know what it is, but I know it is important 8. I can't believe you can do this! 9. I have discovered this just now and I am going to keep on learning	All are used in T_4

Table 7:Sophisticated digital practices as aspirational and the associated codes

5.2.2. ABDUCTION, A LEVEL DEEPER INTO REALITY: FROM THEMES TO GENERATIVE MECHANISMS

Science is work that requires creative intelligence, and there can be no mechanical surrogate for that.

(Bhaskar, 1979)

In this subsection, the aim is to re-describe the tendencies that were found at the empirical level, and identified as themes in table 3, using meaningful terms drawn from established theory. For each mechanism, I provide a table where I give a summary of the theories and accounts of concepts that are candidates for explaining the tendencies observed at the empirical level (the tables can be found in appendices 9, 10, 11). It is important to be reminded that the process of abduction is the means of obtaining knowledge about how the phenomenon is embedded in and relates to structures and contexts that are not necessarily observable (Danermark et al., 2002; Ackroyd and Karlsson, 2014), thus it moves

beyond the data because data for CR is just the starting point of the analysis but also of the process of theoretical explanation. The starting point is the theme on the left side of each table, which will be re-described and conceptualised as a generative mechanism that is part of a broader context. In each table I present just snippets of the theory to give the reader a glimpse into the concepts and authors I have chosen, whilst at the end of each table I give a summary of the definition of the generative mechanism. A consequence of this process of redefining the theme as generative mechanisms, is that the codes will be relocated to one of these three mechanisms, something which will be explained, if and when it occurs in each of the sections.

As social reality is an open system (explained in subsection 3.2.3.) events are triggered by the interactions of a multitude of mechanisms, some of which cannot be determined, whilst others, despite having been identified, may stay dormant due to the counter effect of other mechanisms and different structural conditions that influence at a particular moment in time. These mechanisms or powers described here are going to be used in the next chapter to craft the students' morphogenetic cycle of their academic digital practices. For this, potential hypotheses are crafted in regard to the arrangement of the contextual conditions and students' emergent mechanisms to explain the outcome of this interaction.

5.2.2.1 EMOTION AS A GENERATIVE MECHANISM

As I wrote before, emotion was a strong theme that emerged from the coding process, with four different types arising from the data: anxiety/fear, confusion/frustration, excitement and rejection. Most of the codes related to negative and conflicting emotions, i.e., those denoting some kind of conflictive relationships with digital tools, and/or digital spaces, and practices.

Emotions play an essential role in our lives (Damasio, 1994; Archer, 2000; Nussbaum, 2001; Sayer, 2011; Lamb-Books, 2016), emerging, as Archer (2017) explains when actors interact with the different orders of the social world (see figure 6). Moreover, they are "the stuff of life" (Archer, 2000, p. 194) and hence, we cannot ignore them. They are the "fuel of our inner conversations, and this is why they matter." (Ibid., p. 194). They are a sense of our situation; **a reaction to events we cannot make sense of.** As Archer (2000) suggests, we

have an active role in those concerns with the capacity to modify them. She argues that emotions are inextricably linked with reasoning and hence, they have the power to shape people's actions. Archer (2000) contends that emotions do not emerge without being noticed by the individual and reflected upon, being articulated, and transmuted through what Archer calls emotionality. Emotionality is, thus, our reflexive response to the world, thereby linking emotions with human agency. This is further supported by Nussbaum's (2001) statement that "a theoretical account of emotions has consequences for the theory of practical reason" (p. 4). Emotions, Nussbaum maintains, are discriminating responses to what is important to us. Moreover, Sayer (2010) contends that as emotions have "cognitive and motivating properties, they influence practical reason, that is, how we act" (p. 114), but equally, they can also drive us to complete failure (Sayer, 2010).

Each of these orders of the social world (natural, practical, and social) has associated different clusters of emotions. Thus, each emotional cluster represents a different type of commentary on individuals' preoccupations (Archer, 2000, p. 209). In the practical order of performative achievements, where the individual deals with object/subject relations, the source of emotions develops through "the commentary which our competence supplies on our doings. (...), it is as it were, the object's judgement of competence or incompetence upon the subject's dealings with it." (Archer, 2000: p. 209). If the particular performative achievement is a strong concern of the subject, "then emotions occur at junctures where pre-formed plans and expectations have not worked." (2000, p. 212). This dissonance between expectation and outcome can be solved through a new performance, but it can also persist. If this is the case, and we constantly fall short on a particular performance or task, because we are not able to meet a particular standard, frustration, boredom and/or depression kick in as potential emotional commentaries to that particular concern (Archer, 2000), leading as Lamb-Book (2016) explains, to the abandonment of the performance, what he also terms inaction. That is, we abandon the task to avoid frustration or any other emotion that arises from that situation. On the contrary, if we perform well in that particular task, a feeling of satisfaction and joy emerges, encouraging further activity for the improvement of specific competencies that are associated with the performance. Whatever our commitments are, they will be the soundboard for the emotions.

Experiences, Lamb-Books (2016) suggests, have emotional force; they reveal what matters to people in a particular situation.

It seems that the majority of students could not progress to a second order of emotionality (Archer, 2000), that is, they were not able to mediate or reflect on the emergent emotions and deliberate alternative strategies and new courses of actions to overcome the gap. Instead, students were taken by these emotions (frustration, confusion and also fear) which lead them to inaction, that is non engagement, which is one of the effects that these kind of emotions can have on the individual as indicated by Lamb-Books (2016) and Archer (2000).

In the social order, in turn, the concerns are all about subject/subject relationships. In that realm "the most important of our social concerns is self-worth, which is vested in certain projects (career, family, community, etc.). (...) It is because we have invested ourselves in these projects that we are affected by emotionality in relation to society's normative evaluation of our performance in these roles. Our behaviour is regulated by hopes and fears, that is, anticipation of social approbation/disapprobation". (Archer. M., 2006, p. 269). In this study, the social order is framed within higher education institutions, where how students are being judged and valued plays a key role in their further development.

It can be seen from the above that emotion is a generative mechanism; a personal causal power that emerges at the intersection of the individual and the practical dimension of her/his social world, which can have the effect, in this case, of frustrating students from trying out new tools affecting their engagement with these tools. Lamb-Books (2016) argues that, whilst emotions can trigger courses of actions to address the concern at stake, they can also impede a person's reflexivity. This observation stands in contrast to Archer's argument that we always mediate emotions through our inner conversation, that is, reflexively. In this regard, Sayer (2010) is of the view that actions are not just informed by reflexivity, but also sometimes by habitual action, by ways of doings that we are not necessarily always aware of, nevertheless, they can be reflected upon in a later stage of the process. This is the case when students comment "I don't use it because it is very confusing.", or "I went wrong once, now I don't use it anymore; I won't risk my grades."

Positive emotions have the tendency to foster continued practice, whereas negative ones predispose one towards stopping it. These tendencies exist and are real, in the CR sense, independently of their actual activation (Lamb-Books, 2016, p. 3) because they operate in an open-system that is full of potentially counter-acting mechanisms.

In appendix 9, I provide to the reader a table with a brief account of the relevant concepts and authors I have chosen and a summary of what a generative mechanism is. This process is in preparation for chapter 6, where these generative mechanisms will be used to craft the morphogenetic cycle of students' digital practices.

5.2.2.2 FROM DIGITAL LITERACIES TO DIGITAL CAPABILITY AS A GENERATIVE MECHANISM

Literacy is one of the most important capabilities recognised by Sen (2003b) and Nussbaum (2000). In the realm of digital practices, digital literacy is a rich field of study that has pointed to the need to broaden the scope of literacy, given the array of new media available that affords different ways of reading and writing the world as well as interacting with it. The conceptual move from digital literacies to capabilities has already been proposed (Beetham, 2015; Dore, Geraghty and O'Riordan, 2015). I draw on this work and note how some previous scholarship seems to assume that students always have a vested interest in achieving this form of capability. In this section I describe and justify the rational for the shift from digital literacies, as identified in chapter 4 through the thematic analysis of the data, to proposing digital capability as a candidate generative mechanism.

The concept of capability is linked to freedom and is defined by Sen (2003a) as "a person's ability to do valuable acts or reach valuable states of being; [it] represents the alternative combinations of things a person is able to do or be" (p. 30). Hence, capabilities are opportunities and possibilities with respect to the ability to achieve what an individual reflectively considers valuable. The possibilities may or may not be actualised given the particular combination of personal and social circumstances. Under a capabilities analysis lens (CA), a functioning is a valued goal that has been achieved, whereas the capability refers to the ability to achieve it (Sen, 1987). Functioning relates to forms of social practices and the embodiment of personal identities that an actor considers worthwhile pursuing

(Maddox, 2008). Moreover, Nussbaum (2000) makes an analytical distinction between internal and external capabilities. Internal capabilities pertain to the internal state of the person, namely, capacities, skills, knowledge (know-how, knowledge, and understandings of practices). External capabilities refer to opportunities and constraints embedded in the individual's social context. This refers to dimensions outside of the individual and form part of the context where the phenomenon explored happens. Nussbaum holds that a combination of both forms is needed for the exercise of functioning.

The capability approach is a normative framework for assessing individual well-being in social arrangements, being used for promoting social change in society and evaluating policy (Robeyns, 2003). The underlying tenet of capability is freedom, with the main idea being to replace the control of circumstances over the person to a situation where s/he captures the reins (Sen, 2003a). This aligns with the concept of reflexivity proposed by Archer (1995) (explained in detail in subsection 3.3.2). It addresses the individual's ability to reflect on her/his constellation of concerns (valued goals) and discern those courses of action through which it is possible to achieve them. Having a set intention in a particular project opens up the possibility for constraints and enablement to shape the person's agency in achieving the valued goal, as Archer (2003) has explained. Hence, for a capability to transform from potential and possibility to a functioning, that is, to 'being and doing', requires a vested interest.

Beetham's work with Jisc (Beetham, Littlejohn and Mcgill, 2010; Beetham, 2015; Jisc, 2020) has been pivotal in terms of recasting digital literacies as capabilities and thinking about how these can encompass aspects of identity and the well-being of students and staff. Dore et al. (2015) have built on the Jisc Digital Capability Framework (Beetham, 2015) to create a national framework for Irish HEIs entitled: *All* Aboard (Dore, Geraghty and O'Riordan, 2015). They expanded upon some of the ideas in the Jisc framework to include the fluid landscape of digital technologies and the need to incorporate emergent understandings about new media as well as their potential for use in education.

It is possible to consider the Jisc Framework from a CA perspective as providing a set of desirable functionings that are necessary for interacting effectively in a digitally mediated

society. The problem with current approaches to digital capabilities, as I see it, is that they do not necessarily consider the social aspects of capabilities, that is, the acknowledgement of how social structures and individuals together constitute capabilities. I remind the reader that structures are the underlying conditions of possibility that make things happen, that is, that enable the achievement of a phenomenon. It would seem that in the framework for conversion of capabilities into functionings, once the former is acquired the latter will inevitably transpire. However, the data collected for this study indicates that many students do not necessarily have their interest vested in achieving more sophisticated digital practices. What is more, for many it is not even on their radar, because among other things, most of the participants (in stage one and two of this study) did not know what digital literacies are in the first place. What this means is that the transformation of capabilities into functionings is not available yet, because there is no immediacy on the part of the students to acquire these capabilities (digital literacies) given their priorities lie in achieving good grades, among other things. A comprehensive approach is to conceptualise digital capabilities under a CR lens so as to include the social position of the individual relative to other people and artefacts (Lawson, 2010, 2017) as well as the concomitant interests derived from that position. At this point I want to remind the reader the main point Archer (1995, 2003, 2007) makes, namely that vested interests are that upon which our mediatory mechanisms will work, and they are embedded in socially structured positions, they are thus, objective features of the situation an individual finds him/herself in.

The conceptualising of digital capability as a generative mechanism builds on previous work by Martins (2006), Smith and Sewer (2009), Oosterlaken (2013, 2015), and Lawson (2008, 2010, 2017). These scholars have contributed to the conceptualisation of capability as a causal power and have applied a capability approach to technology (Lawson, 2010; Oosterlaken, 2013, 2015).

To develop the notion of digital capabilities it is necessary to understand them as relational. In this regard Smith and Sewer (2009) hold the following view,

> *Within a relational conception of society, a particular capability is the outcome of the interaction of an individual's [personal] capacities and the individual's position relative to others in society. (p. 214)*

Porpora (2013) has argued that it is the position of the person that drives their interests and interest in turn, drives action. Vested interests are that upon which our mediatory mechanisms will work, and they are embedded in socially structured positions, they are thus, objective features of the situation an individual find him/herself in. In addition to the individual's position relative to others, Oosterlaken (2013) has identified another relationship that she considers crucial: relations with technological artefacts. She considers that not only people, but also technology, forms an important constituent part of social structures, as reflected in the term the socio-technical system. Recognising the need to include technologies as constitutive elements in the relational ontology of capability (Oosterlaken, 2013), it can be said that, "the very capabilities that people have depend upon the relation in which people stand both to other people and to things." (Lawson, 2010, p. 211).

In light of the above, it becomes clear that the notion of capabilities includes not only individual capacities, but also, social causal mechanisms (Smith and Seward, 2009). Thus, the notion of capability is interpreted "as a particular specification of the ontological category of causal power" (Martins, 2006, p. 672). In this regard, human choice is determined by certain factors, such as social norms, values, rights and/or obligations, and habitual action as well as social commitment. In addition, by interpreting capability in the light of critical realism structural ontology (Lawson, 2004), Martins (2006) demonstrates that structural transformation is what enables capability enlargement, that is, the transformation of commodities (material structures) into functioning (being and doing -agency-). In this way, capability can be understood as a causal power that emerges by virtue of psychological, biological and social/cultural structures, including digital artefacts. These facilitate or constrain a particular achievement or functioning (Martins, 2006). Building on the work of Martins (2006), Smith and Sewer (2009, p. 218) define capabilities as:

> *structures with particular internal relations from which their causal powers (mechanisms, i.e., the potential to perform a functioning) emerge. Functioning is the realisation (outcomes) of the activations of these causal mechanisms. Thus, the structures are what*

constitute a capability and the mechanisms provides the instrumental ink between this capability and the associated functioning.

One key benefit of the capability approach is that it puts the focus on the contextual conditions that enable individuals to take decisions based on what they have reason to value. This makes digital capability a good candidate generative mechanism to use in the next stage of this current study, when the potential explanations for the outcomes are presented and explained. The capability approach points to the fact that individual decisions are shaped by structural/cultural conditions, being the position that the individual occupies relative to others and to technological artefacts central in the decision-making process. Hence, the interplay between structure, culture, and agency comes to the fore, avoiding the false idea that simply engaging with digital technology guarantees digital capabilities. In addition, the capability approach captures the social complexities of human activity, allowing for thinking in non-determinist ways about how people engage with digital technology. Specifically, with respect to educational contexts, Walker and Unterhalter (2007) advise that "we must evaluate freedoms (capabilities) for people to be able to make decisions they value and work to remove obstacles to those freedoms, that is, expand people's capabilities." (p. 2).

Digital capability is put forward as a candidate generative mechanism with explanatory power. It aligns with Donati and Archer's conceptualisation of the relational subject and a relational society (Archer, 2015a; Donati, 2016) (see subsection 3.3.3). This perspective proposes that social relations are real, irreducible to individuals, and that relations, not only with other people, but also, with digital artefacts, have emergent causal powers. Within this relational conception of society, a capability is the outcome of the interaction of the capacities of the individual and his/her position, relative to others in society and relative to technological artefacts. Social position and socio-technical relations are determinant in the achievement of digital capabilities. Based on this, it appears that material conditions can only be transformed into functionings under relevant contextual conditions (external capabilities) and with appropriate individual abilities and capacities (internal capabilities).

The aforementioned work of Porpora (2015) reminds us that the vested interest is a function of the social position the individual occupies, in this case, students. Comments from the study participants include statements such as: "Google is all I need", "I don't need more than what I have". "I don't see the point of all these tools, why bother? I don't need more than what I use." These can be associated with students' apparent lack of vested interest/a valued goal in achieving more sophisticated digital practices that might include using open and participatory tools. These comments relate to the students' maps that recorded a desert like topography for the institutional quadrants (see subsection 4.4.4, with examples illustrated in figure 14). Achieving more sophisticated digital practices is something that, under the current conditions, students do not apparently consider one of their major immediate concerns or in Sen's terms, a valued goal to pursue. Moreover, they appear not to invest much in transforming the commodity/material condition for action (available digital technologies) into sophisticated digital practices (the achievement).

However, some evidence was collected during the fieldwork that documented students' positive inclination towards more sophisticated digital practices. One participant commented:

> *I don't know what digital literacy is more or less, that's the point, I do believe though that it is important!*

Another participant said:

> *we need some generic skills to approach these new tasks, because tech is ever evolving, and you need to understand how you can apply it in academics…*

Other participants confirmed their aspiration to improve their digital proficiency:

> *I know I need to be better at this,*
>
> *I would like to know about this tool (she refers to Google docs)*
>
> *This is amazing- we need to know more of this,*

Nevertheless, Smith and Sewer (2009, p. 220) point out that "one's position vis-vis others does not just result in a unique perspective and reasons, but also provides objective resources that enable and constrain particular activities regardless of the beliefs of the individual." This would thus suggest that despite the students above having expressed the

desire to improve their internal digital capabilities (digital literacies) other factors have been hindering them from doing so and/or their priorities lie elsewhere.

As Oosterlaken (2013) and Lawson (2010, 2008) have pointed out, capabilities are not only reliant on the position that people occupy relative to other people in the network, but also, in relation to the tools and at the same time, relative to the position the tools occupy in the network of use. The importance of these relations is what drives the proposal of the third candidate generative mechanism: students' relations with the socio-technical system.

5.2.2.3. THE SOCIO-TECHNICAL RELATIONS OF STUDENTS

The socio-technical system points to the interplay between people and things (Leonardi, 2012). It refers to the entire organisation of work, i.e., the system. A useful definition of socio-technical system is provided, as follows.

> *The recognition of a recursive (not simultaneous) shaping of abstract social constructs and a technical infrastructure that includes technology's materiality and people's localized responses to it.* (Leonardi, 2012, p. 42)

This definition recognises the importance of people's responses to the technological artefacts that are deployed in the institution of which they are part, in a particular moment in time. Moreover, there is acknowledgement of the causal efficacy that tools have in shaping the different practices of people, thus their capabilities. As technology is ubiquitous in our daily lives, having a social conceptualisation of technology is important so that the relations that arise between individuals –students in this particular case- and the institutional technological infrastructure - the university's - can be taken into account. For this reason, I explore students' socio-technical relationships as a candidate generative mechanism.

Artefacts, specifically technological artefacts, cannot be understood in isolation, but rather, only in accordance with the network of relations in which they stand. As Lawson affirms, people do not use technical objects in isolation, but as part of a system, that is, "people use or deal with systems of technical objects." (Lawson, 2008, p. 52). In these

systems of technical objects there is technical activity going on, i.e., students' engagement with digital tools and platforms. Lawson (2008) contends that this will transform the user's capabilities but only in respect of the network of use, that is, within the socio-technical system where these technologies are enrolled. Using tools is "primarily concerned with identifying objects [tools] with particular capacities and powers and inserting (or enrolling) them into particular networks of social and technical interdependencies." (p.53).

The bicycle serves as an example of what Lawson sustains in that the different powers that it can realise for the user depend on the socio-technical system within which it is embedded. A bike in the desert is of little use and very few of its powers will be realised, whereas in the Netherlands, where there is a well-designed infrastructure, (i.e., a context of use), it realises a range of capabilities for the rider. In turn, the rider can extend her/his capabilities, for example, in terms of mobility, hence, contributing to independence. The network of use has an influence on the causal powers of the technological artefact shaping the practices of the people, e.g., Dutch people use the bicycle as a main means of daily transport. This example shows what Lawson (2017, p. 75) has discussed, namely, that "artefacts, like people, are organised into totalities or systems within which certain powers and capacities are realised."

From this example, it is apparent how the practices that people undertake reproduce the position of the artefact. In this instance, it reinforces the social identity that the bike has in the Netherlands. It can be said that "the position it [the artefact] occupies is reproduced through action(...)" (Lawson, 2017, p. 75). This is referred to as the artefact's positionality. In this respect, Lawson (ibid.) affirms that "when something is positioned as a bank note or a hammer, [the bicycle] that something receives a positional identity in much the same way a lecturer or firefighter receives a positional identity." (p.75).

This idea can be applied to digital technologies in educational settings, because for a technological artefact/tool to be used, thus, for students to engage with it, it needs to be enrolled in a technical network, such as a system of working devices (wi-fi, access to the software if needed, a computer that can run it, etc.). At the same time, it needs to be part of social relationships, that is, a particular social network of use with particular norms and

rules: a context of use. Hence, different digital technologies have the potential capacity to extend human capabilities, such as: communication, co-creation of knowledge, sharing, collaboration and extending one's network. This will only occur if these tools are enrolled in the socio-technical network of interdependencies of the system/institution, i.e., a social network of use. Thus, the social network shapes the function/role of the technology and also the ability of the individual to harness the powers/capacities of the tool to extend her/his own capacities.

All of the above leads me to conclude that we cannot treat digital technologies in isolation, because, to do so, renders them meaningless. For instance, a hammer is only a hammer to the extent that people (the social) use it (the technical). A hammer, nails and wood only become a ship to the extent that it is being used as a ship. Tools have positions, as agents have in social structures, but the practices that reproduce the tool's sociality are undertaken by the users of the tool (Lawson, 2010). This position or enrolment of the tool shapes its social identity and how it is perceived and used in the institution. In the present study, this pertains to how students relate to digital technology in the institution. This relationship is, in turn, shaped by students' relative position in the institution, as explained in subsection 3.3.2. This is significant because it stresses the importance of the causal power of the positioning of tools in a socio-technical system. The causal power emerges from the positioning of the tool and is not in it as such.

An example that illustrates the casual power of the positioning of a technology is WordPress (a web content manager that is popular for blogging). The functions and affordances of the WordPress tool do not exist in isolation. If it has poor sociality, that is, it has a weak social identity in the system with little or no presence in the context of use of an institution, then its causal powers stay dormant. As a consequence, the capabilities that could potentially be harnessed with the use of WordPress and its capacity to be a powerful mediator between the user - in this case, students - and the digital world will not be materialised. In other words, the causal powers of this tool will not be realised.

An example that illustrates the causal powers concerning the sociality of tools is the relationship that was reported by student participants regarding the VLE. The majority of the study participants said they did not like it for a range of reasons. However, they were

engaging with it because it has a strong sociality. That is, it is central to all those students do at the university and to the work of lecturers and staff carrying out the administration of students' learning experience. Students shared their feelings regarding their relationship with the VLE during the focus groups, as follows: "I don't feel identified with the VLE, but I have to use it" and "The VLE is not appealing, it is boring, but I am forced to use it." It can be argued that this high level of use, despite the students' reporting their dissatisfaction, is shaped by the sociality of the platform. The sociality shapes the relationship students have with the platform, at least in terms of engagement. This relation is also shaped by the social element of the socio-technical system, namely, the social relations and the position that students occupy in that network of interdependencies. Therefore, use involves enrolment in two (analytically separable only) networks, the social and technical. This helps to explain the causal power of the positioning of tools and how this impact upon the relationship between the user and the tools that are available. Complementing Lawson's ideas, Verbeek (2016) holds that technological artefacts serve as mediators for they "help to shape relations between human beings and the world." (Verbeek 2016, p. 190) In effect, technological artefacts are not merely functional objects, but rather, mediators of human practices and experiences, where the individual holds the desire and there exists an intentional project that needs to be mediated.

This generative mechanism has been defined at a high level of generality. As with the previous two candidate mechanisms, it is deemed appropriate to return to the original fieldwork data and reconsider some of the thematic codes that emerged from the initial thematic analysis. Under this mechanism, I assign all the coding that was first placed within the theme of emotions when describing students' responses to the VLE. In light of the above consideration of students' relations with the socio-technical system, it appears that the codes align strongly with this mechanism.

The conceptualisation of these three candidate generative mechanisms brings the process of abduction to an end. The process of retroduction, the potential arrangements of the interactions of these emergent generative mechanisms with the contextual conditions of the institution and the socio-technical system is now the focus of my attention.

5.2.3. RETRODUCTION: THE TWO CANDIDATE ARRANGEMENTS PRESENTED AS THE CAUSAL PATHWAY THAT OFFER A TENTATIVE EXPLANATION FOR THE LACK OF REFLEXIVE ENGAGEMENT WITH OPEN AND PARTICIPATORY TOOLS

Retroduction is another step in the logic of discovery during the data analysis process recommended for researchers adopting a CR approach. The process, as explained in section 5.2., is one of discovery, whereby the researcher sketches out possible explanations. This involves identifying and selecting the candidate generative mechanisms (as above) conceptualised through the abduction process and selecting those that have the strongest explanatory powers. The aim of the retroduction step is to account for the generative mechanisms and their interactions, so as to explain the phenomenon under investigation through drawing up potential casual pathways that combine contextual conditions, students' interactions with them and the emergent personal powers (from students) that arise from the interactions. By so doing, I seek out a generative model of complex interacting causal forces, rather than relying on a singular narrative (Decoteau, 2017) account of students' engagement/lack of engagement with open and participatory tools.

I initially came up with three potential causal pathways, as can be seen in Figure 17. I elaborated upon them continually, while revising the literature and theories. Ritz (2020, p. 458) argues that "if there are good reasons for believing that transfactual conditions for the truth of a hypothesis are untenable then that hypothesis can be reasonably set aside at the outset". When thinking about the third hypothesis, I came to realise that I was not able to address policy issues as these fell outside of the scope of the study. Furthermore, the beliefs that tutors have about young people being digital natives was part of staff's culture, which is, to some extent, independent of the institution, but at the beginning of the theorising process I associated both, policy, and the false beliefs. I also realised that these false beliefs were, in fact, a causal power, so I decided to separate them from the policy of the institution. In addition, I realised that the effect of the belief that students are digital natives is reinforced by the fleeting nature of the constraints afforded by the emergent and dynamic tools. This characteristic of the constraints was stronger than the issues of design which I have thought initially but nevertheless, the aspect of design had an effect, so I

included it in the second hypothesis. For these two reasons and in the light of the structural conditions of the study, I thought that the third hypothesis was not useful to pursue. In addition, and In line with what Ritz (2020) calls the economy of research, namely, having fewer causal pathways, but with stronger explanatory power I decided it was in the interest of the explanatory power of the generated theory to work only with two hypotheses.

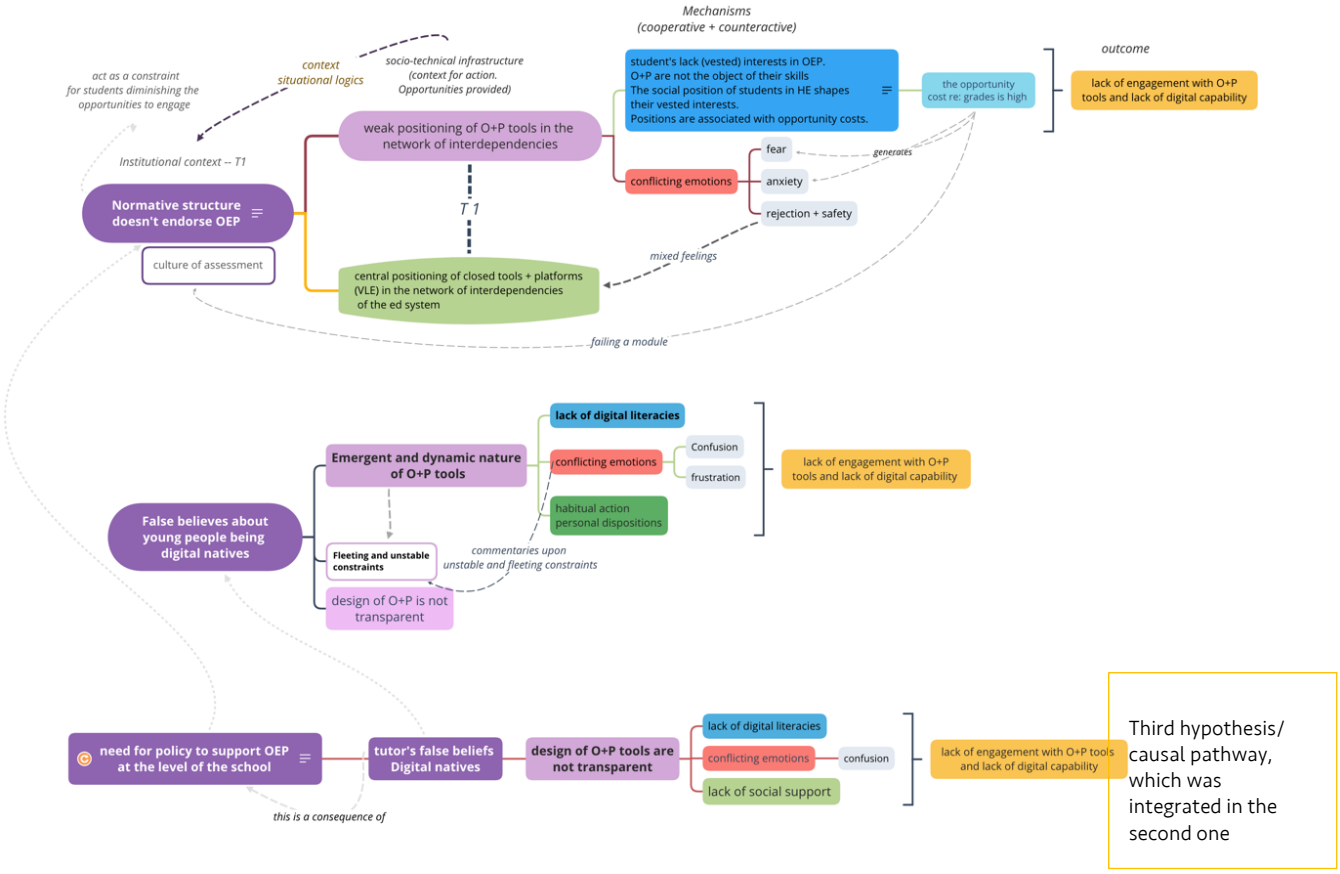

Figure 17: the three potential causal pathways

Hence, what I present below in figure 18 are the final candidate arrangements, i.e., the causal pathways (summarised in more detail in figures 21 and 22) that offer an account of the lack of reflexive engagement with digital technology in the institutional context. Each is described and justified in the next chapter. Using the arrangements proposed I show how the generative mechanisms are manifest in the specific context of this study.

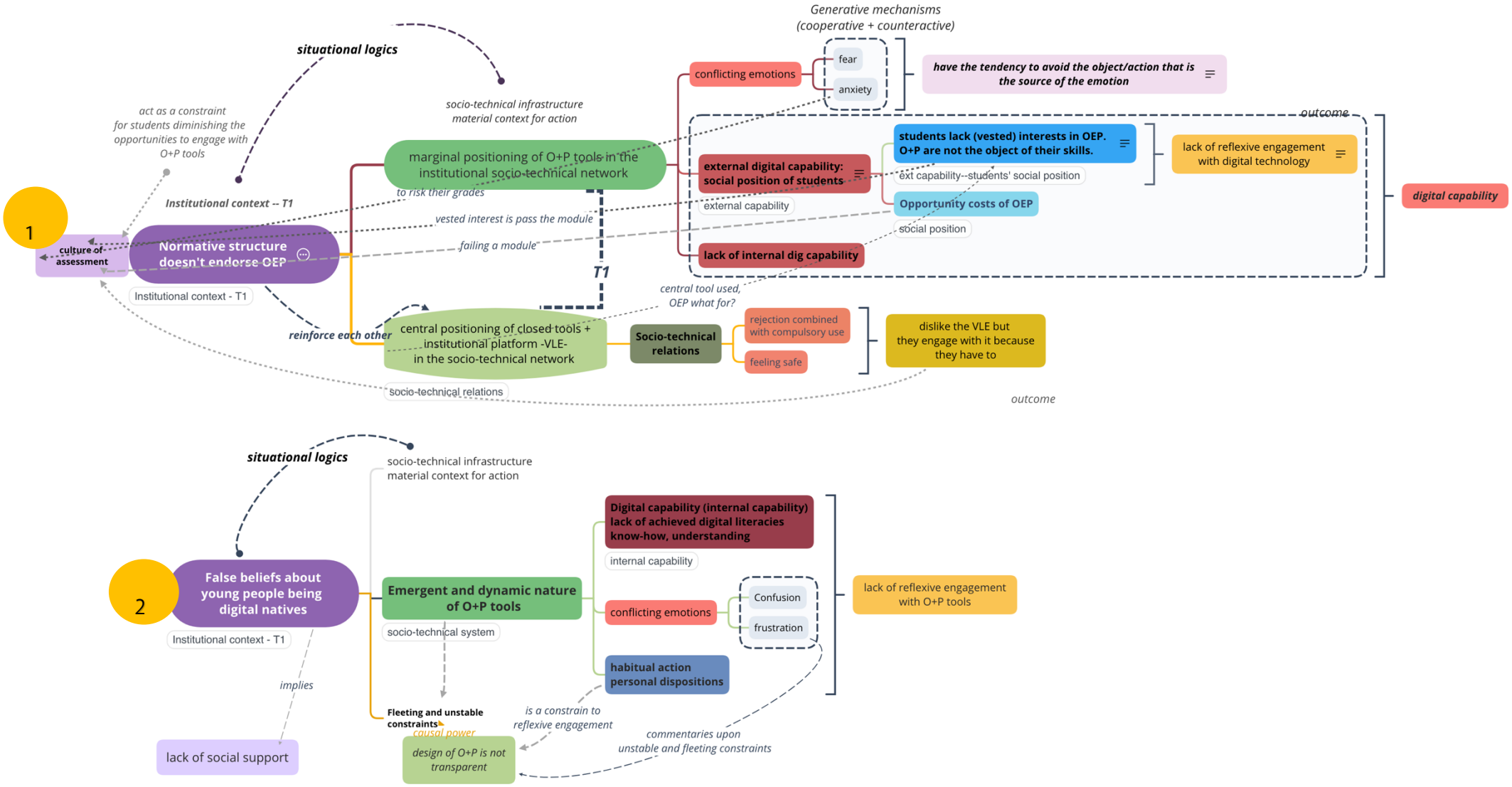

Figure 18:The two arrangements -causal pathways- proposed to explain the lack of reflexive engagement with open and participatory tools

CHAPTER 6
DISCUSSION AND ANALYSIS
THE MORPHOGENETIC CYCLE OF STUDENTS' DIGITAL PRACTICES AT THE INSTITUTIONAL LEVEL

Theorising requires a disciplined creativity in which the imagination is channelled into finding solutions that are compatible with observed data.(Costa, Hammond and Younie, 2019)

This study is explorative, as I explained in chapter 1, aimed at countering deterministic takes on young people and how they use digital technology. I set out to explore the daily entanglements of students with digital technology. The main goal is to discover what happens in students' daily life with technology, so as to reveal the enablement and constraints they are faced with. Therefore, the aim is not seeking to test the proposed interactions/arrangements, the causal pathways, against new data and theory. However, this process I consider as very fertile terrain where new insights can be made regarding the structures that are shaping students' agency in digital spaces. There are two configurations -causal pathways, presented and explained in this chapter.

The present study aims to address three research questions. The first pertains to the digital profile of undergraduates in Education Studies (chapter 4, section 4.3, and the findings were presented in subsection 4.3.3.). This revealed some interesting contradictions that necessitated a more in-depth exploration. Regarding the in-depth stage, the second question, RQ2, was posed as: why and how do undergraduates in Education Studies engage or not with digital technologies and platforms in the institutional and personal contexts? And the third question, RQ3, asks how do students make sense of the environment where the engagement happen?

The data to address these questions was collected using the Visitor and Resident framework (White and Le Cornu, 2011a), with details of this process having been provided in chapter 4, subsection 4.4.5. Following the guidelines of a critical realist analysis, I devoted chapter 5 to the analysis of the verbal data, that is, the transcripts of students' verbal accounts of their maps. The main outcomes of chapter 5 are the candidate

generative mechanisms that emerged from the empirical data (subsection 5.2.1.). These were further conceptualised through the process of abduction (subsection 5.2.2.) using as a guide realist social theory (Archer, 1995), Sen's capability approach (Nussbaum, 2000; Sen, 2003a; Smith and Seward, 2009) and Lawson's theory about the social positioning of technology (Lawson 2020, 2017) as well as the work of Oosterlaken whose work concerns the integration of technology in the capability approach (Oosterlaken 2013, 2015). The three emergent generative mechanisms are: emotions, digital capability and students' socio-technical relations. The mechanisms are the building blocks for the two configurations - causal pathways- proposed at the end of chapter 5 aimed at exploring the proposed interactions of the structural conditions (at the institutional level and in relation with the socio-technical system) and students' emergent generative mechanisms to explain the outcome, namely, the lack of reflexive engagement with more sophisticated digital practices in the institutional context. The proposed interactions, also called arrangements, configurations, or causal pathways, are illustrated in figures 20 and 21 and an overview of the elements involved in the morphogenetic cycle is illustrated in figure 19.

I want to remind the reader about the fact that CR demands of the researcher making big leaps that allow for transcending of the concrete nature of the empirical data collected. This is because once the data has been analysed at the empirical level and the process of abduction finished, the next step is to explore the interactions between the candidate mechanisms and the structural-cultural emergent properties that are the real strata of the reality, i.e., proposing the potential arrangements of the interaction of the mechanisms with the structural conditions that explain the observed outcome. For this process, the researcher needs to draw from her/his experience in the field as well as the proposed theoretical framework. The limitation is that the process entails the researcher's ability - which comes with experience - to be creative and form new associations of phenomena (Danermark et al., 2002). Whilst this is my first-time using CR, I am drawing on twenty-five years of teaching experience and the insights gained through my two masters dissertations, both of which were in the field of educational technology; one aimed at prospective teachers and the other one at students. I feel confident that, although there are leaps to be made, they are not taken blindly in the dark. On the contrary, they are enlightened by my solid and thorough professional experience and theoretical background.

I have chosen to address the research questions using Archer's (1995) morphogenetic cycle (explained in subsection 3.3.1) depicted below in figure 19 as the explanatory framework, which she suggests should be treated as a flexible template. The idea with the morphogenetic cycle is to offer an analysis and explanation of what are the structural conditions (that is the structural and cultural properties of the context) that students will arrive at in their educational institution (T_1); explore the possible interactions of students with those structural conditions (T_2-T_3) and analyse the outcome from those interactions (T_4). The outcomes can be the elaboration – morphogenesis - or reproduction – morphostasis - of the process that is being studied and the subjects involved in the process.

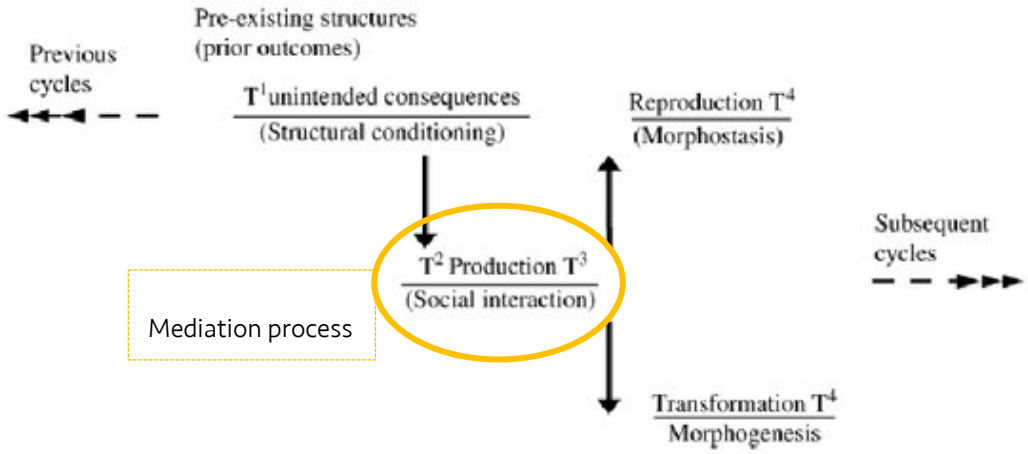

Figure 19: The morphogenetic cycle, Archer (1995)

Analysing these stages as if they are independent from one another is possible due to what Archer (1995) defined as analytical dualism, as explained in subsection 3.3.1. It is important to note that actual events (students' engagement with digital technology) are multidetermined, that is, there is not one cause or mechanism that is able to explain their occurrence. Different things can happen, causal powers might not be exercised; the powers maybe be exercised, but not observable; or the causal powers are exercised, but they do not affect the outcomes. The lattermost may occur because their effect is countered by other mechanisms or circumstances that are at play but might not be visible. Social reality is complex and nuanced, and the morphogenetic cycle allows for analytical separation (only for the purpose of research) of agents from structure and culture to provide insights into the complexities of their interplay. Due to the complexity of social reality, an event can

have multiple explanations and indeed, proponents of CR suggest that there should always be competing explanations, so that the 'best', the most 'practically adequate' explanation can be identified.

OUTLINE OF THE CHAPTER

I begin the chapter by sketching out in figure 19 the details of the different stages in the morphogenetic cycle, which illustrate the particular circumstances of this study. I then continue by explaining each stage in detail. In section 6.1., the general contextual structural conditions that comprise T_1, that is, the situational logics that students will encounter when they arrive at the institution are explained. The main elements of the structural conditions are constituted by the institutional culture and its normative structure, as well as the socio-technical system. That is, the technological infrastructure that is available to students at their institution is considered in this study as being the cultural material context for action. In section 6.2., the socio-cultural interactions of students' mechanisms with those structural properties (T_2-T_3) are introduced. These interactions are schematised in two configurations that depict them, as illustrated in figures 20 and 21. In subsection 6.2.1., I explain in detail the first arrangement (figure 20, 1b and 1a) through the development of practical theory (Archer, 1995). This arrangement includes the normative structure of the institution with its culture of assessment (subsection 6.2.1.1.) and the socio-technical system aligned with that structure (subsection 6.2.1.2.). In subsection 6.2.1.3., I explain students' external digital capabilities, namely, their social position in the institution and their concomitant vested interest (see 5.2.2.2). This brings section 6.2. to an end, with a brief summary of the first arrangement (figure 20) in subsection 6.2.1.4.

In the next subsection, 6.2.2., I introduce the second arrangement, as illustrated in figure 20, which is constituted by the institutional culture and the emergent and dynamic nature of the open and participatory tools interacting with students' mechanisms, i.e. emotions, internal capabilities, which I consider alongside things people do routinely. I start by explaining in subsection 6.2.2.1. the impact of the tutors and the institution, more specifically, false beliefs and ideologies regarding students' digital practices. In subsection 6.2.2.2. the dynamic and emergent nature of open and participatory tools is explained, and this is followed by consideration of the emergence of conflicting emotions of students, the

effects of the lack of digital capabilities and the tendency of habitual action (subsection 6.2.2.3). I then provide a brief summary (subsection 6.2.2.4) of the main elements presented in the second arrangement (figure 17). I end this subsection (6.2.3.) with a general conclusion of the socio-cultural interaction stage (T_2-T_3) regarding both arrangements.

The last stage in the morphogenetic cycle is the outcome of the process under investigation. Archer (1995) states in that the outcome of a morphogenetic cycle can be either the elaboration or the reproduction of the process that is under analysis, i.e. students' digital practices at T_4. The outcome of this study is explained in section 6.3. Whilst the institutional structure and culture can be transformed by the actors, this study's focus is students' perspective, it looks at their experience with digital technology, therefore, what this study will look into is not the transformation of the structures but how the outcome, namely, the lack of reflexive engagement that is observed in students' maps came about. Therefore, the focus in T_4 will be mainly in the transformation of what I call the technological subject and the technological object.

In this study, context (T_1) is defined as the spatial and institutional sites of social situations together with the norms, beliefs, values, and interrelationships between the different positions and their practices (Pawson and Tilley, 1997). All of these elements will condition students' socio-cultural interactions (T_2-T_3). The context is identified as T_1 and consists not only of the institution and its culture, but also, the socio-technical system students encounter there. That is, the open and participatory tools that are available via the Web and the learning management system used by the institution together with the traditional proprietary tools that students have access through the university account (this is what I will refer to when I mention the VLE and traditional tools) constitute the material context for action.

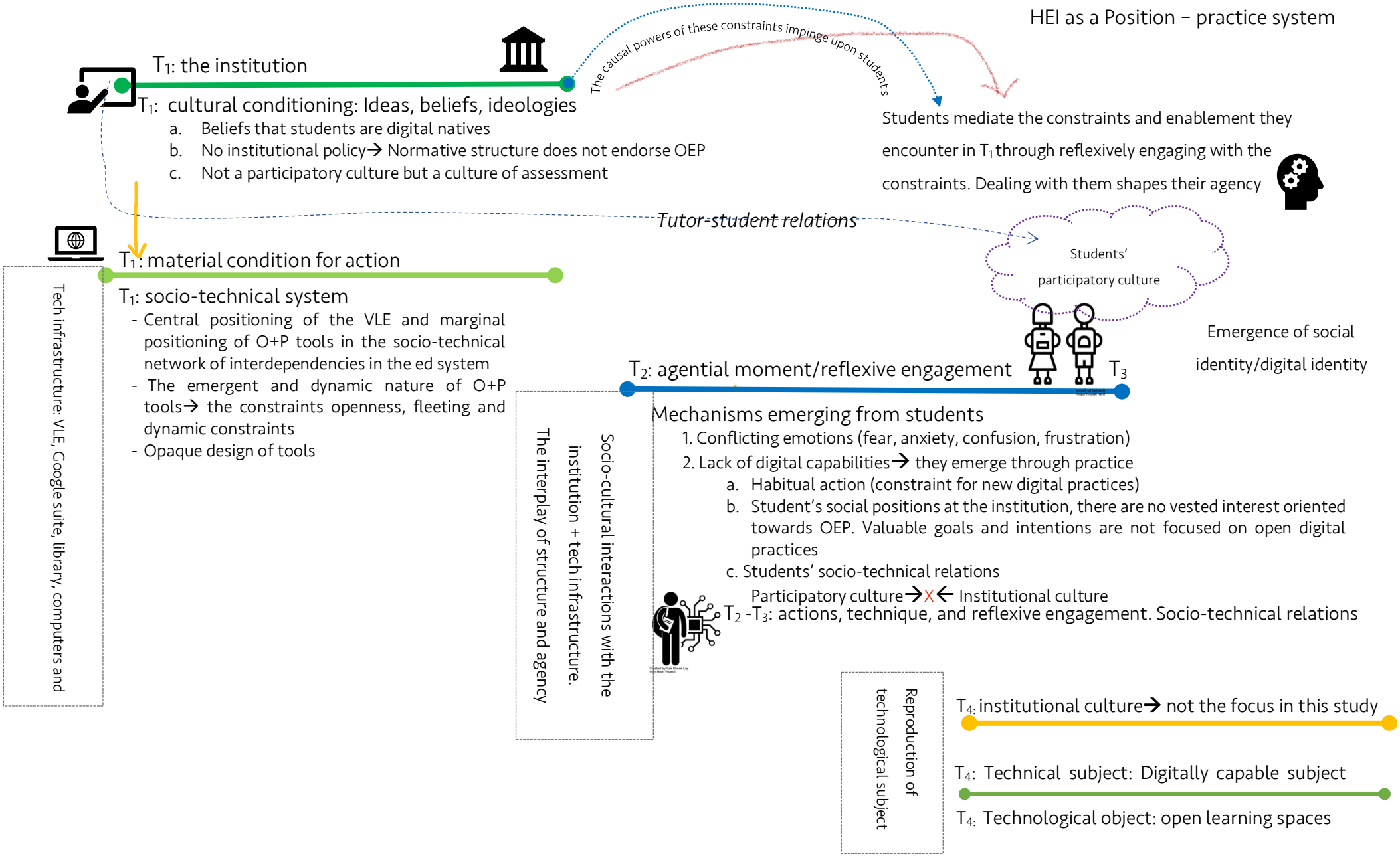

Figure 20:Morphogenetic cycle of students' digital practice

6.1. STRUCTURAL AND CULTURAL CONDITIONING

The first stage, T_1, is the structural and cultural conditioning in the context of the HE institution, being that which predates any socio-cultural interactions of students with their institution. This means that students meet the course they are enrolled on as a structural condition at time T_1. At this moment in time, the institution creates configurations and situational logics made of material distributions and positions that entail particular rights and responsibilities along with certain rules and norms that guide their behaviour. The context is also conditioned by the institutional culture, which is constituted by the ideas, beliefs and ideologies that underpin the normative structure of the institution (Archer, 1996); all of which shape practical situations, daily experience and events where students take part (T_2-T_3). The institutional culture is a broad dimension, but for the purposes of this study it will entail aspects that are related with its aims, i.e. student engagement with digital technology. At the same time, the socio-technical system needs to be considered as part of the cultural and material conditioning students encounter. The socio-technical system contains the material conditions for actions (Archer, 1995; Lawson 2017) as well as the social relations that go with it. For this study, the focus is on the open and participatory technologies described in section 1.6 and the institutional learning management system called the virtual learning environment (VLE). It also includes the more traditional tools that are available to students through their university account (The Office 365 bundle) and the relationships that they have with them according to their position at the institution.

Archer (2005) states that the socio-cultural realm at stage T_1, "(...) is concerned with the effects of holding ideas that stand in particular logical relationships of contradiction or complementarity to other ideas." (p. 26). Constraining contradictions exist when there is an internal or necessary relationship between the ideas (A) advanced by a given group (an inward-looking culture of assessment at the institutional level) and other ideas (B) that are lodged in the cultural system (participatory culture), where (A) and (B) are in logical tension. Because the relationship between (A) and (B) is a necessary one, their tension could not be evaded by the simple renunciation of (B). That is, students and lecturers must interact. Furthermore, lecturers are in a position of power in their relationship with students, whereby they are the ones that make the important decisions concerning the

learning experience, including how it is going to be assessed, an important element of the learning experience for students, if not the most. In addition, part of the institutional culture is constituted by the beliefs and ideas and more generally, the ideologies in which they are embedded, thus shaping the different practices, e.g. the teaching. As explained in section 2.3, it is a widely held belief in HE that young people are digital natives (as I showed in section 2.3 of chapter 2) thus it is assumed that they do not need any support regarding their digital education. Whilst this false belief about young people's use of technology is just an idea, as Newman (2017) argues, ideas, whether right or wrong, have a causal role in social reality, they make things happen. Furthermore, Lanclos (2016) and Webster (2017), as mentioned earlier, (section 2.3), hold that these ideas and false beliefs not only shape teachers' attitudes towards students' need for improving their digital capabilities, but also the institution is affected in terms of shaping the choices they will make at the policy level in, for instance, the teaching and learning strategy.

At the normative level, there is a contextual incongruity between the institutional culture and students' social and participatory culture, as I have explained in subsection 2.4.3. The institutional culture differs from the participatory culture (Jenkins *et al.*, 2009; Jenkins, Ito and Boyd, 2015); at the institutional level, digital practices are more traditional and relatively inward looking, that is, they are to be deployed within the institution and not so much out in the open web. Digital practices are mainly mediated by closed and institutional technologies, such as the VLE and traditional tools, available from the G-suite that students have access to from their university account.

As Archer indicates, at the institutional level there is a stable reproduction of ideas among positions, i.e., members of staff, which generates an ideational environment that is conducive to structural and cultural reproduction. Thus, practices at the institutional level, remain based on traditional assessments, like essays and presentations, that are mainly mediated using closed and more traditional tools, such as a word processors and slide show programmes, where sharing and co-constructing knowledge, more often than not, is not necessarily a key part of the assessment culture. These tools are being provided by the university as part of the provision that students receive, which means that they do not need to search for them on the 'World *Wild* Web'. It is all provided to them, and these tools are

at the centre of the socio-technical network of interdependencies of the system, in this case, the institution. In contrast, open and participatory tools, those that are emergent, are not provided to students and more often than not they are ignored. These tools do not always have institutional recognition and thus, little support is available for staff, with their adoption being a matter of personal choice, hence being the exception rather than the norm.

There is an established policy and guided support at the institutional level to standardise and optimise the deployment of the VLE. This results in the practices involved in its use and management recognised by the institutional community, including students. These practices embody routine actions that are coordinated and reinforced through 'how things are done', thus strengthening a certain degree of stability and predictability of the practice. All of this gives the VLE a strong institutional identity, making it the socially accepted and pervasive learning management system for the institution (Phipps, Cormier and Styles, 2008; O 'rourke *et al.*, 2015; Mcavinia, 2018). But this positioning of the artefacts does not happen randomly or by chance, it depends on a number of complex mechanisms, as Lawson (2017, p. 77) affirms, "Artefacts can be positioned in different ways, with different factors being more or less important in different contexts.", giving context an influential role when it comes to the use and positioning of digital technology. He continues explaining that technologies are always inserted or are part of a socio-technical network of interdependencies within a system (Lawson, 2017). These socio-technical infrastructures, Lawson argues, have their own built-in politics and asymmetries, which will depend in turn, on the institutional structure and the socio-cultural system they are part of. He goes further and contends that "technologies provide the context for action, changing what is possible, expected and desired." (p. 107). He adds that:

> *Not only is the positionality of technological artefacts reproduced and transformed through use, along with other features of the core-social, but technological artefacts form the material conditions and consequences of such actions, where material conditions serve not only to enable and constrain, but also constitute the action and actors involved. (p. 108)*

Archer (1996) argues that ideas once produced form a body of interrelated propositions that form what she calls situational logics. As Mutch (2010) shows in his work, these logics frame particular uses of technology, encouraging and privileging some uses of technology,

thus making them more appropriate than others, as is the case with the VLE. Reinforcing this, and as part of the structural conditioning, the VLE functions not only as a content manager, but also, as the central assignment repository for students through which they receive feedback. In addition, they are also monitored through the system, whereby tutors and lecturers can check the last time any student has engaged with a particular module's content. This shows another reason for which this platform has a central role in learning, teaching, and monitoring academic engagement at the institutional level. These aspects serve to endorse the use of this platform and the concomitant practices in a tacit manner. Given all of the above, its structure is quite stable, thus making the constraints also so, as well as the habits formed. Hence, there is likely to be a reproduction of the practice (closed and inward looking) instead of an elaboration. In contrast and possibly as a consequence of this stability, the positioning of open and participatory tools in the same socio-technical network of interdependencies is marginal and left to the discretion of its users, as shown in different studies (Hodgkinson-Williams, 2010; Cox, 2016b; Cronin, 2018). In sum, these open and participatory tools do not play a role in digital practices at the institutional level.

Lawson (2017) argues (as explained in subsection 5.2.2.3.) that technical objects (like structures) "have a role in shaping the capabilities and competences of those engaged with some technology (...)"; (...) but more importantly, they involve extensions of [human] capabilities by the positioning of artefacts in particular systems; these systems consisting in relations of interdependencies." (p. 105). These socio-technical infrastructures depend, in turn, on the institutional structure and the socio-cultural system they are part of. Lawson combines these two ideas to argue that technical activity should be conceived as the activity that harnesses the causal capacities and powers of the artefacts. In the case of the VLE, the capacities at stake pertain to the administrative capacities needed to manage the learning experience on a large scale and the capacity to deliver and manage knowledge efficiently. The aim is to extend human capabilities (the capability to manage an educational business and as part of that to manage learning), that is, the 'doings', via some kind of positioning in the existing socio-technical system of the institution (Lawson, 2017, p. 110). He continues by claiming that "an artefact becomes positioned as an artefact because of the pre-existent conceptions agents have of what is and what is not a tool, hence new tools undergo certain struggle to become positioned within an institution."

(p.77). This idea is complemented by the work of Veletsianos (2010), who has explored in depth how emerging technologies can be defined. Among the features that defines a technology as emergent, Veletsianos claims, is the fact that they are in a state of continuous change and redefinition. There is constant improvement of different aspects of the tools and thus, the concomitant practices have not yet reached a state of maturity. Emerging technologies, Veletsianos asserts, are not fully researched and not yet completely understood, thus making their pedagogical implications somewhat confusing. The meaning they have for learners is not clear, neither it is what they mean for lecturers/tutors and the institution, thereby making it difficult for them to be positioned at the centre of the educational digital practices. All of the above implies that the potential that emergent technologies have "to transform practices, processes and institutions, is both enthusiastically welcomed and ardently opposed" (Veletsianos, 2010, P. 16). In addition, this dynamic nature of digital technologies, in particular, open and participatory tools, makes the constraints and enablements of those tools unstable and fluid (Carrigan, 2019), challenging the habits individuals form through their use. Hence, the practices regarding digital technologies are not stable. Another structural aspect of digital technology to address is that the design embedded in the technology is not immediately evident to the user; it is not transparent (Lawson 2017). On the contrary, it implies cognitive labour from the user to be able to make sense of the design of tools and harness their affordances, which implies a constrained openness about what people make with them. The skills, the knowledge, and the know how (the internal digital capabilities, explained in subsection 5.2.2.2) emerges from the interaction with tools and these interactions represent a constraint, more often than not, impacting on the emergent literacies of such open practices.

To summarise, the key elements that describe the structural and cultural conditioning at T_1 (this includes the institutional culture and the socio-technical infrastructure), with which students engage in at the institutional level are as follows.

a. The belief that teachers/lecturers/tutors and involved staff hold about young people being digital natives and the consequences this has in the design of policies and

strategies that are related with digital capabilities associated with open and participatory tools.

b. The normative structure of the institution that does not endorse open educational practices, that is, practices that are mediated by open and participatory tools (defined in subsection 1.6), thus falling short of engaging in a participatory culture, as defined by Jenkins et al. (2015), hence generating a contradictory situational logic.

c. The central positioning that the VLE occupies in the socio-technical network of interdependencies of the institution not only for teaching and learning, but also, encompassing the administrative processes related to productivity and efficiency.

d. The marginal positioning of open and participatory tools in the socio-technical network of interdependencies of the institution.

e. The emergent and dynamic nature of open and participatory tools is unstable, and thus the constraints associated with them are fleeting and unstable as well. Hence, the dynamic and unstable nature of the practices that emerge from the use of these tools.

6.2. STUDENTS' SOCIOCULTURAL INTERACTION → T_2-T_3

This section will address the socio-cultural interactions of students with the practical order of their social world, i.e. the university, which are conditioned by the structural and cultural properties depicted in T_1. This interaction is represented in the second stage of the morphogenetic cycle identified as T_2-T_3 in figure 18. What I will do to develop this stage is to illustrate students' interactions through what I call 'strings', which refer to the arrangement of different elements of the context interacting with students' emergent generative mechanisms that leads to an outcome, i.e. T_4. This combination that comprises elements of the context, generative mechanisms and the outcome was established by Tilley and Pawson (1997). The authors remind us that "(...) the relationship between causal mechanisms and their effects is not fixed, but contingent" (p, 69). Furthermore, Archer (1995) suggests that all structural influences work through shaping the situations in which people find themselves. It is the situations to which people respond or not, which are mediatory, because they condition (without determining) different courses of action (i.e. engaging or not with open and participatory tools and/or closed and institutional tools), depending upon the social position actors occupy, by supplying different reasons to them.

This is in part a consequence of what Porpora (1989) argues, namely, that people's interests are directly related with the social position they occupy. Further, Porpora contends, this position is a personal emergent mechanism, with causal efficacy shaping her/his interests.

In addition, the mediation of the conditions described in T_1, Sayer (2010, p. 7) argues, is done through a combination of habitual actions and reflexivity. "(...) circumstances need to be interpreted by individuals if they are to have an effect, and their effect will depend on how they are interpreted, and this in turn depends upon how individuals relate them to their subjectively defined concerns. Thus, our internal conversations enable us to make our way through the world." Archer (2007) stresses that for this mediation to happen, individuals need to be vested in a particular project that is important to their current concerns. In turn, the subjectively defined concerns are shaped by individual interests that relate to the position occupied by the individual.

In this study, the context pertains to the institutional locations of social situations, together with the norms, values, and interrelationships unfolding within them (Pawson and Tilley, 1997). The context is also referred to as the prevalent beliefs, cultural and social norms, regulations, informal rules, the culture of the organisation/institution, resource allocation (material structure), leadership, and local priorities (Macfarlane, 2011). The aim of the arrangement depicted in the two different configurations is to explore what happens to whom (students), under which circumstances (those described in T_1) and what outcomes are produced (elaboration or reproduction of the practice, T_4) as a consequence of students' socio-cultural interaction. This process is part of the retroduction phase, which I have explained in section 5.3 of chapter 5. Retroduction entails the building of a model of complex causal forces, which is what the strings (figure 20 and 21) are and what is exposed here is a potential explanation of how the components of the string interact.

6.2.1. THE FIRST CONFIGURATION OF STUDENTS' SOCIO-CULTURAL INTERACTIONS WITH THE NORMATIVE STRUCTURE OF THE INSTITUTION

What follows is the explanation of the first configuration of the socio-cultural interaction of students' generative mechanisms (emotions and digital capability) with the contextual conditions to explain the outcome, i.e. the lack of reflexive engagement with open and participatory tools (see figures 19a and 19b below). In this arrangement, the elements of the context that are at play are, on the one hand, the normative structure of the institution in particular, I am referring to the dimension of the culture of assessment at play and on the other, a dimension of the socio-technical system, namely the central positioning of the VLE and its ancillary tools and the marginal positioning of open and participatory tools in the network of interdependencies of the system, that is, in the context of use. In this configuration, as can be seen in figures 19a and 19b, I present two stages, the first image (19a) depicts digital capabilities generally but does not differentiate between the two components of such capabilities, as explained in subsection 5.2.2.2. These two forms are the internal capability (the developed state of the person in regard to skills, knowledge, competencies, etc.) and the external capabilities. The latter refer to the opportunities and constraints that result from the social context where people are functioning, in this case the social position of students at the institution.

FIRST CONFIGURATION OF STUDENTS' SOCIO-CULTURAL INTEREACTION WITH THE SITUATIONAL LOGICS

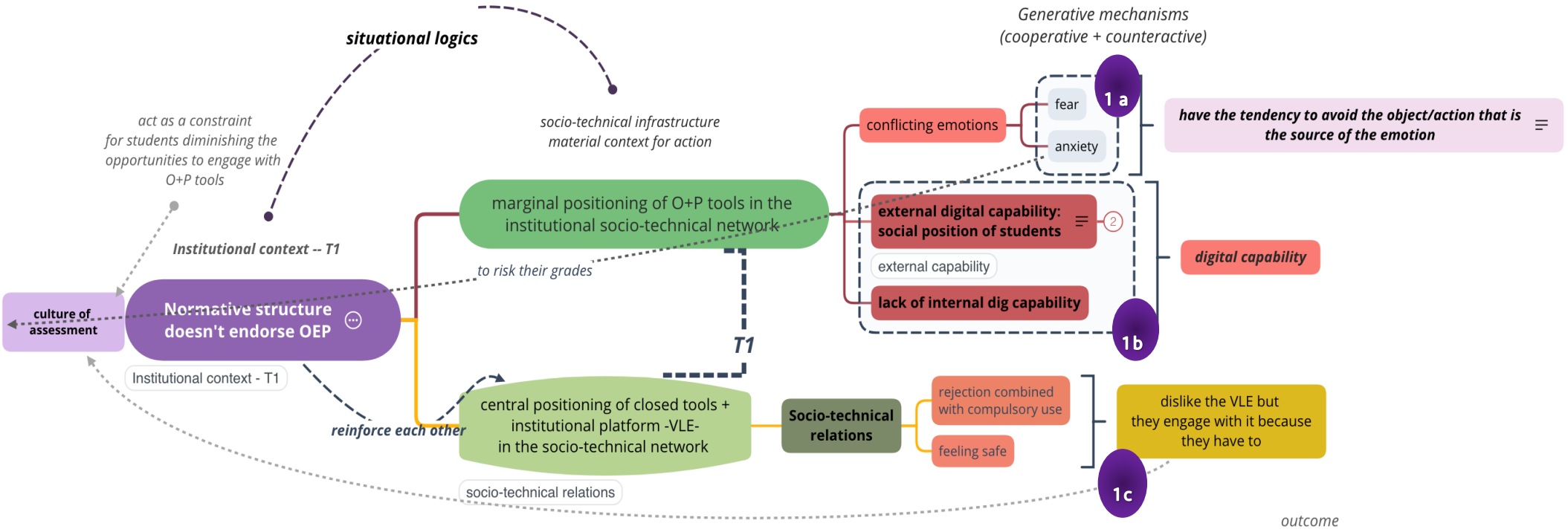

Figure 21: First configuration of students' socio-cultural interactions with the structural conditions

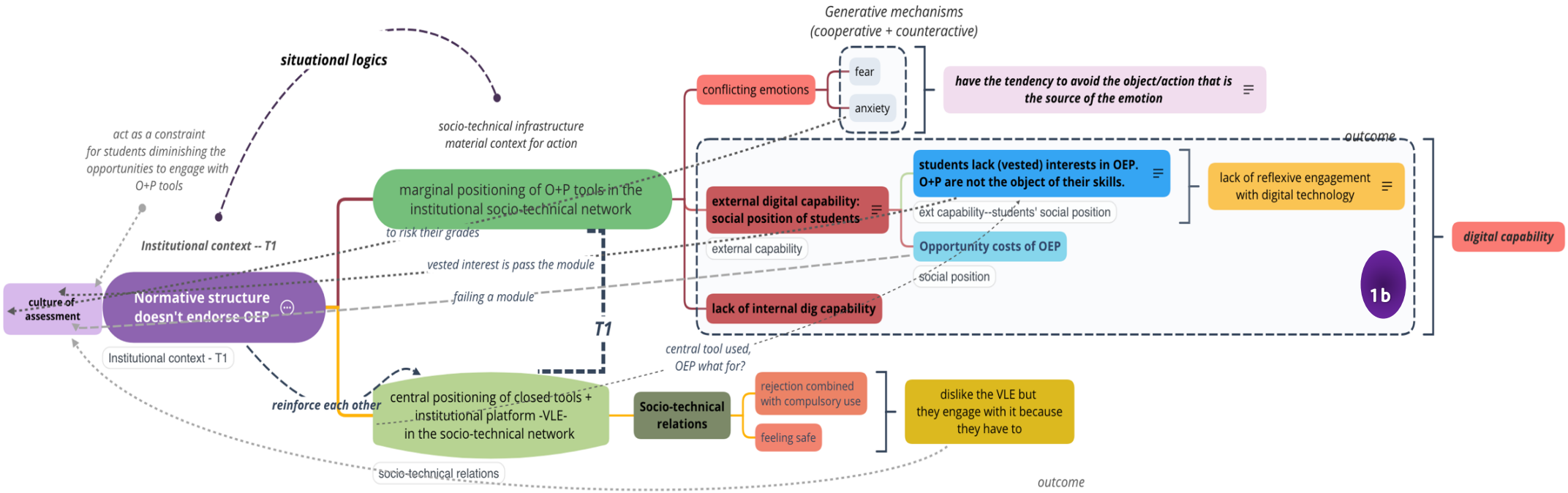

Figure 21: Details of the section 1b of the first configuration

6.2.1.1. STUDENTS INTERACTIONS WITH THE NORMATIVE STRUCTURE OF THE INSTITUTION, I.E., CULTURE OF ASSESSMENT AND THE EMERGENCE OF CONFLICTING EMOTIONS (SITUATIONAL LOGIC, T_1)

In this subsection, I analyse the first of the interactions depicted as 1a in figure 20. That is, how students' emotions emerge from the interaction with the culture of assessment at the institution. Before I go into further detail, I want to clarify that, for simplification purposes, I cannot deal with all the complexities and nuances of these components. This is the case, for example, of culture of assessment, which in itself is a field of study. Hence, I am not addressing all its complexity, what I am doing is using the term as a shorthand way of expressing all that I want to capture. In order to be able to say something about the outcome, the model of reality needs to be simplified. There are things that are lost in that simplification, but there is also the possibility to shed light on one aspect of that reality, in this case, that of the lack of reflexive engagement with digital practices.

Within the described structural conditions explained in subsection 6.2.1., there is an element of the normative structure that is relevant in students' journey, i.e. how they are assessed. Students are enrolled on different modules, some being core ones and they are compulsory for all students, whilst others are chosen by them. The assessment of each module is highly relevant for students as the main (valued)goal they have is to pass them so that they can complete their degree, which they believe will grant them the opportunity to get a good job. Hence, passing their course is a key project to achieve their major concern. There are differences in how students approach their learning, as explained in section 2.3., where it was explained how some are deep learners and look for exploring further to understand the meaning of ideas and connect them to the broader picture. There are surface learners, whose intention is to achieve the highest possible grades, thus being always alert to assessment criteria. The comments of some of the participants expressing fear and anxiety to mess their grades illustrate how important these are for many. These comments arose as a response when I was exploring why they did not engage with certain tools in their institutional space (figure 14). In the core modules, the assessment is mainly based on essays and presentations that are mediated through traditional and closed tools, such as word processor and presentation software (evidence for this can be seen in the different

module descriptors available in appendix 7). In addition, the assessment and students' feedback are mediated through the VLE, using an ancillary platform, which checks plagiarism issues and also manages all the tasks relating to the student's grade journey.

Imbued in this dynamic, where passing their modules is one of the most important aspects in a student's learning experience, it is reasonable to assume that students do not want to risk their grades. The causal effect that assessment has for students' courses of actions is important to acknowledge, as for some participants, it has a negative impact in their motivation to engage with open and participatory tools that are most of the time unknown to them, such as referencing managers, or blogging platforms, to mention a few. Additionally, and complementing the former, students acknowledged that there is no real need to engage with different tools than a word processor or a presentation software to get their assignment done. In this regard, Elder-Vass (2010) notes that individuals not only monitor their activities, for they also monitor different aspects of the context (social and physical) in which they move. In this case, students observe that there is not a real need to engage with open and participatory tools to mediate their assignments (their major preoccupation), thus such tools are not the object of their skills. They perceive they can do well enough engaging with traditional tools that they know how to operate and feel confident with. New practices are left unexplored, thus avoiding conflicting emotions and fear of the unknown. As one participant said, "it is the new stuff that puts me off". Another example is illustrated by a student who shared that "I don't' use Mendeley anymore, because in one essay I did it all wrong and I got bad grades for it, so I will not risk it anymore." Instead, she chose to do the bibliography by copying and pasting the references in her essay. As conceptualised in subsection 5.2.2.1. and according to Nussbaum (2001) and Lamb-Books (2016), these emotions are discriminating responses regarding what is important to the individual, for example, the students' feelings of anxiety and/or fear to risk their grades (grades are very important). Archer (2000) suggests that emotions are a sense of our concerns and our situation, a reaction to events we cannot make sense of, with individuals having an active role in those concerns and the capacity to modify them. She concurs with Nussbaum that emotions are inextricably linked with reasoning and hence, they have the power to shape people's actions. In addition, Sayer (2010) suggests that emotions have motivating properties influencing how people act. They do not emerge without being

noticed by the individual and reflected upon. That is, we articulate and transmute them through what Archer (2000) calls emotionality. However, what was observed was something different, whereby the students struggled to elaborate upon their emotions, such as fear of risking their grades. Instead, they were taken up by the emotion and decided to not engage with any tool that could imply a risk. This is line with Lamb-Books (2016), who affirmed that emotions can lead to inaction as a strategy to avoid the object/action that generates the conflict.

Emotions, as Archer (2006) has described, emerge from the interaction that the person has with the natural, practical and social order of social reality. In the case that I am describing here, emotions not only pertain to the practical world that is concerned with the subject/object relations (students-digital technology), but also, to the social world of students, where the relations that take place are subject/subject relationships. As Archer contends (2006), one of the projects where people's self-worth is vested is in their career. The anticipation of social approbation/disapprobation regulates students' behaviours through emotions like hope and fear. Failing their degree, a project that students are heavily invested, is something that affects their self-worth. This shows how failing their grades is something that is heavily influenced by emotions, not only in the practical realm, but also in the social.

The prevailing culture of assessment is a competing mechanism for more sophisticated digital practices, as it has the tendency to keep students away from an explorative mindset that could potentially lead to sophisticated digital practices. The normative dimension of the context shapes and is shaped by actors. It defines what prevailing ideas inform the actions of individuals and what actions and outcomes are possible. Dominant ideas and the ideation have the capacity to inform action, because they have pre-existing logical relations that operate in the form of costs and benefits for an individual or groups of individuals, who may choose to adopt specific ideas over others (Willmott, 2000, p. 108).

6.2.1.2. THE SOCIO-TECHNICAL SYSTEM: THE POSITIONING OF THE VLE AND OPEN AND PARTICIPATORY TOOLS IN THE CONTEXT OF USE. THE MATERIAL CONTEXT FOR ACTION (SITUATIONAL LOGIC T_1):

In this subsection, I explain in detail the other constituent of the context, namely, the socio-technical arrangement at the level of the institution, that is, the positioning of the different tools - VLE and the ancillary tools as well as open and participatory tools - in the network of interdependencies of the socio-technical system.

In the current normative institutional structure, the VLE is the tool that plays the central role (as explained in section 2.2. and in T_1). That is, it is centrally positioned in the socio-technical network of interdependencies of the institution, shaping the collective practices of the community. The practices related with such platform are standardised at the managerial level, providing staff with guidance, support and templates[29] for that purpose. In so doing, they guarantee a level of efficiency and effectiveness for teaching and learning, whilst also ensuring a certain level of student satisfaction, which, given the marketised nature of HE, is a powerful force that drives some of the institutional decisions. Lawson (2017, p. 40) illustrates this point eloquently when he argues that collective practices tend to coordinate behaviour in this way. That is, they provide detailed guidance of how things ought to be done and in so doing, some degree of stability and predictability is achieved. Predictability is highly regarded nowadays in the new marketised HE models, as I explained in section 2.2.

As Lawson (2017) recognises, these practices do not need to be legally enforced, but they are recognised by the community in which they operate. He argues that,

> *A central feature of capable human activity is that it draws upon a range of collective practices. These practices, such as a driving on one particular side of the road, wearing particular clothes, turn-taking in conversations, etc. are maybe not legally enforceable but they are collectively recognised by the grouping or community in which they operate.*

The fact that they are collectively recognised means that, whilst all the members of the community might not agree to the practices, or are not positive about them, as many students shared in the discussions (I will come to this point in the next section), the community recognises them as the way things are done in a particular context. All of this

[29] All the information about the minimum expectations for the VLE and the guidance given to staff can be found here: https://sulis.bathspa.ac.uk/display/LT/Minerva+Minimum+Expectations

shape, in a very subtle and invisible manner, the digital practices that are possible in this setting.

In contrast, when it comes to open and participatory tools things are different. These operate outside of the institutional control, for they are part of a bigger digital ecosystem, and their use is barely recognised for any educational purposes as Veletsianos (2010) demonstrates. Hence, these more open tools and platforms have a marginal positioning in the socio-technical network of interdependencies in the context of the institution. Consequently, there are no set and established practices, let alone guidance and support and even less institutional recognition. This makes it difficult for individuals to know how they ought to behave and how to mediate specific tasks using these tools and thus, such practices are not adopted by students. This reality leaves staff and students at the mercy of their own knowledge and judgment, which is a recognised problem in the field of open educational practices, as acknowledged by Cronin (2017) and Cox (2016), amongst others.

So far, I have explained the structural components (institutional and socio-technical) of the first arrangement, the normative structure and its culture of assessment and the positioning of digital technology in the socio-technical system. I will now explore the interaction of the external digital capabilities, those that refer to the positioning students embody at the institution with the structural conditions.

6.2.1.3. EXTERNAL DIGITAL CAPABILITIES AND STUDENTS' SOCIAL POSITION IN THE INSTITUTION AND THEIR SOCIO-TECHNICAL RELATIONS

This subsection considers the interaction of two generative mechanisms defined in chapter 5 subsection 5.2.2.2, i.e. external digital capability and students' socio-technical relations (subsection 5.2.2.3). In particular, I explain students' relation with the VLE (illustrated as 1b in figure 20) and with open and participatory tools (1a in figure 20). Recalling Nussbaum's (2000) definition of capability as being composed of internal and external capabilities, external capabilities are those capabilities that depend on the social conditions (subsection 5.2.2.2.) making students' position at the institution and their vested interest part of the external capabilities. In what follows, I explain how the external digital capabilities and students' socio-technical relations interact with the socio-technical system and the

normative structure of the institution. Whilst I am explaining this interaction as if it would be a different story than the first arrangement regarding emotions, this only holds true for the sake of analysis, as Archer explains through her idea of analytical dualism (subsection 3.3.1). In reality, all these things happen in parallel and at the same time, thus revealing how social reality is an open system that is complex and nuanced. As Decoteau (2017, p. 16) puts it, "they [our theories] will never be capable of ultimately capturing the 'structured messes' of social reality ."

I will describe the situation of students at the institution and how that position has causal powers when it comes to setting their major concerns or valued goals. The starting point will be the position that students embody at the institution, where they objectively regulate the force of the enablers and constraints as well as their vested interest derived from that position. There is a combination of external and internal causes that are linked.

Position has important implications, for as Archer (2020, p. 144) argues, "To characterise an interest as a vested one is to associate it with a particular position (...)." Porpora (1989) similarly explained that interest is a function of the position an individual occupies in the social structure; thus, people act driven by their interests. Consequently, interests have generative power driving students' actions and interactions. Interests are built into the social positions by virtue of the relationship of that position to others in the institution (Archer, 2017) and different positions will imply different opportunity costs. Opportunity cost refers to something that might be given up achieving something else, since every resource (time and effort) can be put to alternative uses and this situation exerts influence upon which projects are feasible to entertain.

The position students embody in HEIs is mainly a position of subordination, where they, most of the time, comply with the normative structure they encounter. The power relationship between lecturers/tutors and students is shaped in a particular manner, with the lecturers holding the power to design the module as well as how it will be taught and assessed. All of this happens before students are enrolled, it is related more with traditional practices in HEIs, and so there is little interaction between lecturer and student in this respect. Elder-Vass (2010) states that "the conformance with norms may sometimes be a consequence of prudential behaviour in the face of unequal power relations rather than

consensus over the value of the norm." (p. 127). This explains why it is rare to find students arguing against the norms that are already established. Most of the time, they act in their interests, which, amongst others, is to pass their modules, as explained in the previous subsection 6.2.2.1.

For students, the costs of exploring new tools to mediate their learning imply a high chance of making mistakes (at least at the initial stage), thus potentially affecting the quality of their work and so, their grades. Passing a module with a high grade is a powerful incentive for students' actions, since grades have strong causal power, being the main avenue for achieving their major concern, i.e. obtaining their degree. As Archer (1995, p, 206) argues, "nothing determines that agents act to promote their vested interests, but costs are involved in not doing so." Not engaging with traditional practices and hence, possibly risking students' grades influences which projects students will entertain participating in. However, there is the potential opportunity cost of engaging in safe, already known and socially accepted practices, in that the benefits of employing open and participatory tools and hence, more sophisticated digital practices are foregone. The central concern of students is not exploring new tools to find new ways to mediate their learning, but rather, to adhere to the institutional practices, and to achieve the mark they need which has more sway in their constellation of concerns. As different participants shared, "I don't need more than these (the ones they depicted in their map) tools". "With what I have it's enough", "Google is all I need." "I don't see the point! I don't need more than what I use". These comments where shared in the context of a question I raised when discussing the maps about why they did not record more tools in the institutional space on the Visitor and Resident diagram.

For digital capability to be achieved, that is, to convert the material context for action into achieved functioning, a valuable goal needs to be in students' landscape. This is what Archer calls the major concern, which will be the driver to overcome constraints. As I have explained so far, for students, the vested interest or the valued goal is to pass their modules and get their degree. The lack of vested interest is reinforced by the central positioning of the VLE and the tools they have access to through the institution, as I explained in detail in subsection 6.2.1.2.

There is a curious relation between students and the VLE, as I noted in table 3. That is, it emerged from the findings that students have a conflicting relationship with it, with some going so far as to 'hate it'. Most of the participants felt a certain amount of rejection towards the environment due to its design, functionality, organisation, and the lack of participatory engagement it affords. However, all of them felt it was necessary to engage with the VLE as they perceived there was no alternative for accessing the content as well as the feedback of their assignments. Moreover, two participants manifested feeling safe in the VLE saying things like, "I cannot break it" or "I can't do much wrong", but that sense of feeling safe could indicate an anxious emotional reaction to engaging with unknown open and participatory tools. The fact that students do not engage systematically with open and participatory tools, but more with closed and 'safe' spaces, affects the quality of their digital capability. Archer (2000, p. 7) points out that "practice is the fulcrum of knowledge" and hence, failing to extend digital usage beyond what is "safe" would appear to imply that students are missing out on opportunities to extend their understanding and appropriation of these media. Archer (2017, p. 119) explains that activities, such as working with a computer, using a software, or writing a letter, are examples of practical knowledge which involve an active process of doings. The knowledge and skills, i.e. literacies, emerge from the "affordances and resistances presented by objects and assimilations of and accommodation to them on the part of subjects." If this practice does not take place, for all the reasons explored so far, it will be unlikely that the knowledge, skills, and attitude, i.e. internal digital capability, as well as an explorative mindset will emerge. As explained above, open and participatory tools are marginally positioned and hence, an extension of the digital capabilities afforded by them will not materialise in the current landscape. It can be observed that the conflicting emotions arising from the fear and anxiety of failing the modules and the central positioning of institutional and more traditional tools have in the socio-technical network of interdependencies are mutually reinforcing the lack of reflexive engagement with open and participatory tools.

6.2.1.4. WRAPPING UP THE FIRST CONFIGURATION

To conclude, in this configuration the contextual elements involved are the normative structure of the institution, where one relevant dimension is the nature of traditional

assessment mainly based on essays and presentations with its concomitant norms, rules and practices. The other contextual element is the material culture for action, namely the socio-technical system. Within that system the dimension that is addressed in this configuration is the positioning of the VLE as compared with open and participatory tools in the socio-technical network of interdependencies of the institution. That is, the VLE is centrally positioned in the socio-technical network of use, whereas the open and participatory tools are marginally positioned in the same network of use. The interaction of these elements of the context, in conjunction with the external capability, i.e. the lack of vested interest in the use of more sophisticated digital practices and the conflicting emotions that have the tendency to lead students to inaction, drive the lack of reflexive engagement with open and participatory tools and thus, more sophisticated digital practices. This situation accords with students' habitual actions reproducing those traditional practices, rather than producing some kind of change through experimentation with new forms of technology.

At the same time, their vested interests are such that open and participatory tools and their practices are not the object of students' skills. This, as well, has the effect that the capabilities that are developed when students are learning something new will not emerge. In short, the consequence of all this is the lack of reflexive engagement with the constraints and enablements of open and participatory tools and hence, the failure of more sophisticated digital practices to emerge.

The central positioning of the VLE also contributes to the lack of reflexive engagement with open and participatory tools, because technical activity, in this case, the employment of closed tools, and the normative structure of the institution, encourage the reproduction of more closed and less open practices. This is reinforced by Lawson who argues that "technical activity is simply a subset of social activity, capably getting by in conditions not of our choosing [students have not chosen their educational practices], involving, amongst other things, the *reproduction and transformation of our conditions for action.*" (Emphasis is mine) (P. 73). He goes on arguing that "artefacts, like people, are organised into totalities or systems within which certain powers and capacities are realised." (P. 75).

SECOND CONFIGURATION OF STUDENTS' SOCIO-CULTURAL INTERACTIONS WITH THE SITUATIONAL LOGICS

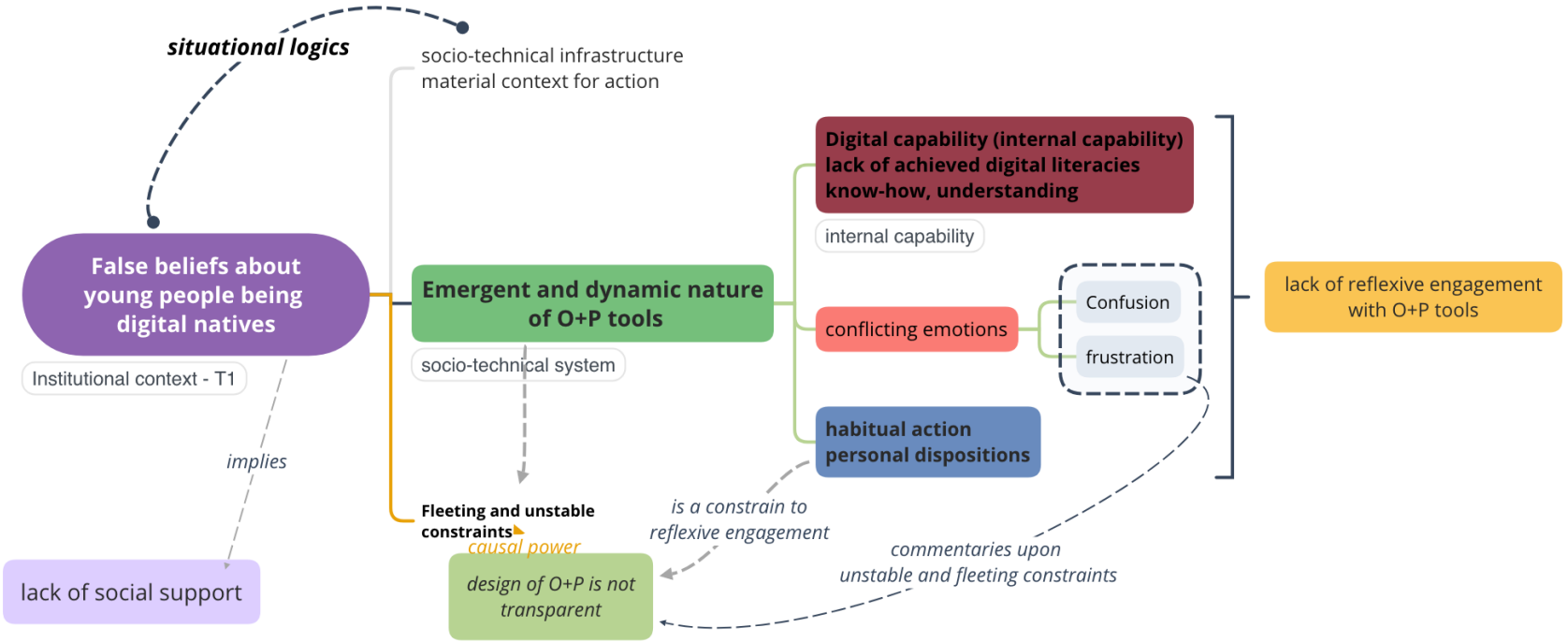

Figure 22: Second configuration of the students' socio-cultural interactions

6.2.2. SECOND CONFIGURATION OF STUDENTS' SOCIO-CULTURAL INTERACTIONS WITH THE FALSE BELIEVES ABOUT YOUNG PEOPLE AND HOW THEY USE TECHNOLOGY AT THE INSTITUTIONAL LEVEL

In the second configuration depicted in figure 21 the contextual factors that are involved regarding the institutional culture are the false beliefs that lecturers and other members of staff have about young people being digital natives (this phenomenon is documented in the literature and explained in detail in section 2.3). For the socio-technical system, the elements involved are the emergent and dynamic nature of open and participatory tools and the consequently fleeting and unstable constraints of those tools, and in addition, the fact that the design of web-based tools is not transparent. The students' generative mechanisms that are involved in this arrangement are the conflicting emotions that emerge when they encounter these contextual conditions and the lack of digital internal capabilities, they need in order to engage effectively in sophisticated digital practices with these tools. What follows is a detailed explanation of the interaction of all these components in the student experience.

6.2.2.1. THE INSTITUTIONAL CULTURE: FALSE BELIEFS ABOUT YOUNG PEOPLE'S USE OF TECHNOLOGY, THE MYTH OF THE DIGITAL NATIVE

The false belief that most teachers/lecturers/tutors have about students being digital natives, which I have documented in chapter 2, entails different problems. One of them relevant for this configuration, is the wrong idea that young people do not need any support when it comes to building digital capabilities (internal capabilities). The idea that young people are native speakers of the digital language and that they do things differently in any given context, due to the exposure to ubiquitous technology, has been shown in the literature to be misleading. On the contrary, the reality of students is that few are native speakers in a digital world, as evidenced in the data analysis (chapter 5, subsection 5.2.1.3, table 3). As one student put it, "it is the new stuff [the cloud] that worries me, especially it is about people thinking we are tech savvy." Some students feel overwhelmed and helpless when it comes to use tools they have not yet explored for academic purposes, as one participant affirmed, "I don't understand nothing, this is too big and too messy." Students

say that one of the determinant factors to be able to embrace a new tool for their studies is the support they receive from the lecturer/tutor, as one student said, "If I wouldn't have the support of my tutor I would not have used Mendeley", which was the case for all of those who engaged with this particular tool.

One element that makes this issue (the false belief) so relevant is the fact that the beliefs are completely invisible for many, they are not tangible and more so, they are engrained in the way of thinking about young people and technology use that the majority of people have. Even some of the participants had this idea, as is evidenced in one comment, "people ask us, how do you use the cloud? And we really don't know. My daughter knows maybe better than me how to use the cloud." This invisibility owing to its intangibility makes this belief hard to unpack and yet, this plays a dominant role in shaping the nature of students' digital practices.

6.2.2.2. SOCIO-TECHNICAL SYSTEM: THE DYNAMIC AND EMERGENT NATURE OF OPEN AND PARTICIPATORY TOOLS

Students must deal by themselves with the dynamic and fluid nature of open and participatory tools, as explained above in more detail when discussing T_1. As Veletsianos explains, "emerging technologies are evolving organisms that exist in a state of coming into being." (Veletsianos, 2010, p. 13). Evolving, for Veletsianos, means technologies are in a state of continuous change and the concomitant practices are in a permanent state of improvement and refinement, thus being dynamic rather than stable. These emerging tools are not completely understood, and their pedagogical implications are also not entirely clear. The meaning they have for learners is also not clear, which is evident in the conflicting emotions students reported when drawing their maps. Emerging technologies are not yet fully researched, Veletsianos (2010) claims and thus, "the potential to transform practices, processes, and institutions, is both enthusiastically welcomed and ardently opposed." (P. 16).

Because of this emergent and dynamic nature of tools the constraints that arise are fleeting and unstable, thus making it difficult for students to work with them and to appropriate the tools effectively. As Carrigan (2019) explains:

> *The ontology of our relationship with them [emergent tools] is substantially different because their constraints and enablements are dynamic. The dynamism ensuing from this poses a profound challenge to embodied incorporation. The fact that modulation is ubiquitous means the embodied habits we build around our devices are unstable. (para. 11)*

The habits people consolidate around the use of material artefacts are challenged, because the material artefacts are non-stable objects, as Carrigan (2019) suggests, thus adding a layer of difficulty for people in dealing with this fluidity. This situation reinforces the reproduction of traditional digital practices, because, as explained in subsection 3.2.3., it is in dealing with these constraints and/or opportunities that either impede or facilitate courses of action that people shape their agency, realised in this context, by reflexive engagement. In this particular case, these constraints and enablement are so fluid and unstable that courses of action for dealing with emergent tools are highly challenging to put in place.

To engage with unknown/new tools, skills, know how, background knowledge, and motivation, i.e. internal digital capabilities, are needed to overcome the different constraints that students encounter. However, these open and participatory tools are not centrally positioned in the context of use and in addition, they are not part of students' major concern (as explained in subsection 6.2.1.3.). They are not the object of students' skills, so there is not the deliberation and motivation to engage with the fleeting and unstable constraints of these emergent tools. Overcoming the constraints that these tools can have for learning is unlikely to happen and as a consequence, students' agency in open digital spaces stays dormant. In this regard, it was interesting to hear one participant who had just discovered the functionalities of Google Docs, where she pointed out how difficult it was for her to find out by herself how the tool works. When asking her how she felt about this, she seemed very confused and said, "I don't understand how it works". I continued to ask her why that was the case and she answered: "the web is too big, too open, too messy, and people assume that I am the generation that grew up with it. But I am not. I am the generation that people have forgotten, that the teachers didn't know how to teach, so we are the ones that don't know." This comment about the tool being new to her, the confusion that she experienced regarding the working of the tool, how it functions and the associated difficulties that arise with that, are all important aspects of the experience of students. It serves as evidence of the existing gap between the habitual (actions that arise

from the use of traditional tools, such as Word or PowerPoint) and reflexive action. To bridge this gap, an inner conversation about how to overcome a whole new set of constraints should arise so that a relevant strategy is thought out, and a course of action put in place to overcome the arising constraints. By so doing, the students will mediate the structural constraints and thus, agency, as a personal emergent power, is likely to emerge (Archer, 1995). In the current scenario, agency in open digital spaces remains dormant, nevertheless, it is present in the individual and ready to emerge when the conditions are favourable for the student.

6.2.2.3. CONFLICTING EMOTIONS IN STUDENTS' INTERACTION WITH EMERGENT AND DYNAMIC TOOLS

The lack of know-how, skills and background understanding, in short, lack of internal digital capabilities, to be able to engage reflexively with these emergent and dynamic tools and the constraints they afford, generated in many of the participants a conflicting emotional response, thus leading to frustration and confusion. In addition, the idea that their inexperience working with these tools can impinge on their grades makes them anxious and fearful. These emotions are recognised by Archer (2017) as those that arise when individuals interact with the practical order, where they are connected to human praxis emerging from performative relations. In this study, the conflicting emotions emerged from the unsuccessful interactions - performative relations - with emergent and dynamic digital technologies.

Emotions like frustration or confusion, Archer (2000) affirms, are a reaction to events the individual cannot make sense of, which is what many of the participant described when explaining what happened when they attempted to engage with certain technologies and tools, e.g. the cloud or Mendeley. Such emotions are interpreted by Archer as commentary on an individual's practical concerns, which become materialised in students' comments, such as those described previously. In addition, there is also confusion and frustration emerging from the abundance of tools available on the Web. This is evidenced in a comment that a participant made in this respect, "it is like all separate entities without a unifying factor, I don't think it is worth it." This commentary denotes some difficulty in

making sense of the Web and the use of tools that are available. When some of the participants were dealing with unfamiliar technologies that are very fluid, e.g. the cloud, they became anxious. They felt that with what they knew, i.e. internal digital capabilities, they could not make sense of the cloud and how it functions, thus shaping their decision regarding how they would engage with that technology. That is, they were trying to avoid it as much as they could, thus confirming what Lamb-Books (2016) argues, namely, the abandonment of performance. Lamb-Books contends that, whilst emotions can trigger courses of actions to address the concern at stake, they can also impede a person's reflexivity. In this regard, Sayer (2010) is of the view that actions are not only informed by reflexivity, as Archer insists, but also, sometimes by habitual action, which are ways of doings that we are not necessarily always aware of.

The confusion and frustration expressed by the majority of the participants, together with the lack of vested interest in achieving sophisticated digital practices (explained in subsection 6.2.1.3) reinforced one another and had the tendency to keep students away from reflexively engaging with the constraints of different open and participatory tools, as can be seen in students' maps (figure 13). This tendency for inaction is frequent with conflicting emotions, whereby they are generative mechanisms with causal powers, as explained in subsection 5.2.2.1. Emotions, thus, have special tendencies that, in this configuration, have the propensity to lead to inaction (Lamb-Books, 2016). The negative emotion distances the individual from the source of anxiety or confusion, particularly if there is not an opportunity to engage in the emotions and transform them, through a process of reflection, thereby engaging in what Archer (2000) defines, emotionality, a second order process of reflexivity whereby the individual acts upon the source of emotional concern.

Here is where social support, as an important source of motivation (DiMaggio *et al.*, 2001), could help students in this reflexive process. However, given the false beliefs that the institution has regarding young people and their use of technology, this social support is not likely to be available. Study participants who engaged in the use of a reference manager tool were encouraged by one tutor who offered them social support. This, for these students, was the factor that made the initial engagement and led to success in utilising

the tool (not in all cases). The participants commented on this with phrases, such as "if it wasn't for my tutor support, I would not have used the tool" and "It was the support I had from my teacher that made me use Mendeley".

One condition needed for the personal powers of the individual to become activated so that he/she is able to mediate conflicting emotions, is that she/he reflexively deliberates upon what are the possible courses of action to undertake to achieve the set goals and intentions of her/his personal project. These actions are a response to overcoming or circumventing the constraints or alternatively, harnessing the opportunities present in the social structures in regard to digital technology. However, this will occur only if the powers (constraints and opportunities) are related to the personal project that matters to the individual (Archer, 1995) (for a more detailed explanation see subsection 3.3.2). More sophisticated digital practices are not part of students' personal projects and instead, they opt for habitual action, which involves drawing on what they already know. As a consequence, their agency stays dormant; it does not emerge in this particular condition as a mediator. As Verbeek (2015) reminds us, "people have intentions and goals that they want to realize in a particular way and that is the driver for choosing tools"; which is reinforced by Donati (2013), who contends that what mediates the goals, namely, the means, is something the individual chooses contingently and thus, they represent potential opportunities.

6.2.2.4. WRAPPING UP THE SECOND CONFIGURATION

In the current configuration, students interact in a context where they are considered to be digital natives. This false belief has causal powers, namely, the assumption that they do not need any support, guidance or education concerning digital practices. This assumption, as explained by Lanclos (2016) amongst others, has implications at the institutional level that translate in different ways, including the absence of policy that supports staff with the development of more sophisticated digital practices, with open educational practices, being one of these. This has an effect on students, who are not natives, but confused learners without the new literacies - digital capabilities - needed to embrace the emergent and dynamic nature of open and participatory tools, which among other things, have a

design that is not transparent. As a result, the constraints afforded by these emergent tools with opaque design are fleeting and unstable. These two conditions - false belief and its implications, and the fleeting and unstable constraints afforded by emergent and dynamic tools - reinforce one another, thus making it difficult for students to incorporate these tools into their practices. If they were able to do so, they are likely to shift their habitual action into something more creative that would ultimately transform their current digital practices. In addition, the fleeting and unstable constraints paired with the lack of digital capabilities and the little support students have at hand, trigger in them conflicting emotions, such as confusion and frustration, fear and anxiety. These in turn, will have the tendency to pull students away from reflexively engaging with these newer tools and their concomitant practices.

Following Lamb-Books (2016), and as explained above, emotions can have the effect of inhibiting the individual to act (reflexively engage), bringing the individual to avoid the object that generates the conflicting emotion. Here, it becomes evident how the causal power of emotions becomes actualised and manifest in the lack of reflexive engagement with open and participatory tools. Archer's argument is that the individual always mediates emotions through an inner conversation, which was not the case for these participants, for emotions for them affected the process of individual reflexivity. Sayer (2010) suggests that actions are sometimes informed by habitual action and not so much by reflexivity. He suggests that they are governed by ways of doing that the individual is not necessarily always aware of. When exploring the experience of some of the participants, it can be observed that they tended to avoid engaging with the object that generated the conflicting emotions. The tools are not isolated from the digital capabilities needed to put them to work, so what happens is that when they become confused and/or frustrated, because they do not have the adequate capabilities and they have sporadic social support in place, they abandon the engagement, or they even avoid engaging completely. They just find alternative ways to mediate the learning tasks.

6.2.3. GENERAL CONCLUSION OF THE TWO CONFIGURATIONS FOR STUDENTS' SOCIO-CULTURAL INTERACTIONS STAGE T_2-T_3

Sociocultural interactions are structured or shaped through constraints and enablement, that is, actions and interactions are a response to overcome these constraints or to harness the opportunities present in the social structures, but only if the powers (constraints, enablement) align with the personal project of the individual (Archer, 1995). Thus, the causal power of structures only exerts effects and generate change in human agents when they bounce against the intention of human agents. In both configurations (figure 20 and 21) there is something in common, namely, that the interactions that are depicted all lead to the same outcome, i.e., the lack of reflexive engagement with sophisticated digital practices. Students are most of the time concerned with the consequences that their actions and interactions could have over their most important concern, the grades and the achievement of their course. The way in which mechanisms make this happen can vary. There are multiple other interpretations that can be crafted with the data, because as Danermark et al. (2002) argued, the process of abduction and retroduction requires taking leaps to imagine things in a new manner. A fundamental structural issue that influences the outcome, i.e. lack of reflexive engagement, is the lack of a personal project relating to digital capabilities, as explained in subsection 6.2.1.3. It is this that I believe needs to be taken forward, because there is evidence that students perceive digital capabilities as something they aspire to. Major concerns, Archer (1995) suggests, refer to the ideas that people have about their future, how they see themselves in the future, where they want to be, and what they want to become. Individuals are determined, but only to the extent that they themselves choose a project that is relevant to them. This aspiration that students have, given conducive structural conditions, can be transformed in regard to their major concern, the valued goal they will set out to achieve.

6.3. OUTCOMES: STRUCTURAL REPRODUCTION OR ELABORATION OF STUDENTS AND THEIR DIGITAL PRACTICES → T_4

The third stage of the morphogenetic cycle is the network of outcomes (T_4) of students' interaction (T_2-T_3,) with the context for action (T_1). As Archer indicates, "groups vie with

one another to shape some social form, organisation, or practice (…)" (Archer, 2020, p. 142). This study is exploratory in nature and the aim was to investigate and explain the reasons and motivations that students had to engage or not with digital technology and platforms. Although the questions addressed both personal and institutional spaces, the focus of the analysis is on the institutional space. The driver of the investigation was to find out what was influencing their engagement and therefore, I was not tracing long-term change. Instead, in this study, the morphogenetic cycle serves as the explanatory framework used to shed light through the development of practical theory, on how the lack of students' reflexive engagement has come about, what are the potential interactions and how they are arranged (figure 20 and 21) so as to lead to the outcome.

The configurations I have proposed to explain the outcome are tentative and have yet to be tested against more empirical and theoretical observations such that it would be possible to see whether they make sense across different, nevertheless, familiar contexts. This stage where the hypotheses/configurations are tested, would allow for ascertaining whether the causal dynamic that are proposed here hold true, keeping in mind that we are always embedded in open systems, where social phenomena are multidetermined. There are two elements that I depicted in figure 18 that I would like to explain in this section, because they do entail some kind of transformation, namely the technological subject and the technological object, as I have called them, acknowledging that I am not reducing the subject to the technology, but I am describing the transformation that he/she experiences through the interaction with technology.

By the **technological subject**, I refer to the subject transformed in the interaction with technologies and which in turn, could potentially transform the structural context for action, namely, the technological object, thus experiencing what Archer (2015) defines as double morphogenesis. The technological subject is represented in Figure 23 as the vertical expansion of the spiral. The transformation of the technological subject in the context of this study is directly related with the student's digital capability enhancement. I would like to remind the reader that (digital) capabilities emerge among other things, by virtue of underlying structures constraining or facilitating certain achievements, with the latter most in this context referring to the functionings or achieved digital capabilities

(subsection 5.2.2., chapter 5). It is also held that a capability is the outcome of the interaction of the capacities of the individual and her/his position relative to others as well as to technological artefacts. From T_2-T_3 (string 1a, figure 20) it became clear that open and participatory tools are marginally positioned in the socio-technical system, that is, the context of use (the institution), which has an effect on the use of such tools. Therefore, the concomitant practices are unlikely to emerge, hence the digital capabilities will not be transformed into achieved functionings. Hence, the technological subject will not be transformed as the causal powers of the functionings will stay dormant. This is reinforced by the fact that, for students, sophisticated digital practices are not a concrete valued goal, that is, it is not their vested interest. Thus, constraints are not bumping against an intentional subject with a clear goal, and consequently, digital capabilities are unlikely to emerge. These two situations are reinforcing one another. Nevertheless, the potential is there.

The quality of people's agency is contextual: if the conditions are not right, the potential powers embedded in the structures will not be meaningful constraints that students consider they need to overcome. Accordingly, the personal emergent powers, amongst others, reflexive engagement with more sophisticated digital practices, will not be fully realised, thus resulting in the reproduction of the configuration and current nature of their digital practices. As I said along this chapter, events are multidetermined, this is only one of the multiple events that are happening to students.

The complementary dimension of that technological subject is the **technological object** (which is represented in Figure 23 as the horizontal expansion of the spiral). With this I mean the digital open learning space that students configurate and arrange in the practices they engage with during their time at university, this space can be interpreted as the context for action (Lawson, 2010, 2017). Through the different interactions depicted in T_2-T_3, it became clear that students engage mainly with a closed socio-technical infrastructure comprising the institutional learning management system - the VLE - and the ancillary tools they get access to once they start their course. Some participants mentioned how they perceived the VLE as a space where they could not break things, thus making them feel safe. However, the VLE is an environment that is enclosed and already has an embedded

dynamic of power and possible practices. Hence, this digital environment is one that students are not able to transform, that is, the technological object - the learning environment - cannot be changed. As Lawson (2017) argues, technical activity is concerned primarily with discovering the functional capabilities and powers of artefacts (digital technology in this case) and then, harnessing them. It is in the activity of finding the right artefact with the adequate capability to mediate different tasks that students configurate their digital learning environment, as they do in their personal digital socialising space. In the current landscape, the participants have a very limited learning environment that is made up closed and institutional tools, as can be seen in their maps, thus their digital practices are unlikely to be transformed. I consider it relevant to point out the strong causal power that the central positioning of the VLE in the context of use has in shaping students' engagement with that platform, they are able to overcome all sorts of feelings, such as those described in table 3, chapter 4. This shows what Lawson argued, namely that the sociality of a tool has a strong causal power in shaping the use of the tool.

The difficulty of engaging with the relatively new, emergent, and dynamic digital technologies such as open and participatory tools, is something that is not unique to this situation described in this study. New, perhaps more sophisticated practices must show their application in the practical order, before they can displace established ones, as Archer affirms and thus, the resistance is not merely a cognitive resistance of students. The impact of any advancement of science is the materialisation of social and scientific development, which has a time lag and it is, therefore, indirect and delayed (Archer, 2017, pp. 125–26). As I said in section 2.4.4., open and participatory tools are emergent and dynamic tools, for which new rules, norms, behaviours need to be developed, understood, and appropriated; time is one key component of any social change when it comes to technology.

In figure 21 I illustrate the process of capability enlargement, digital capability for the sake of this study, combining the technological subject (student's agency) and the technological object (material context for action). The metaphor I chose is a spiral because it is a figure that emanates from a central point -student's agency- that has the possibility to move away from that initial point, expanding in both directions, horizontally and vertically. This expansion re-presents the potentiality of the capability expansion/enlargement of the

subject in tandem with the object, achieving in that process of expansion a double morphogenesis that shapes both, the student (their digital capability) and their (open) learning space, that is, their material context for action. The vertical direction of the expansion represents the subject, which I have called, for this exercise, the technological subject (not meaning with this that subject is reduced to the technology it uses but focusing on the influence that the use of technology has in the expansion). With that I mean the subject that expands in the process of reflexively engaging with open and participatory tools, achieving the digital functionings, that is the capability expansion, enabling him/her to 'do and be' in the world. The horizontal expansion is represented by the technological object (explained above in para 5). That object for this exercise, is the open learning space arranged by students in the process of mediating their learning experiences. The red dots represent the different technologies/tools that students potentially reflexively engage with, they are not fixed but contingent and always in flux, representing as Donati (2013) suggests, opportunities. Thus, the technological object is organic instead of fixed, and it adjusts to the learning situation at stake. The background of the figure is the socio-technical system where students are embedded in a particular moment in time, that is, the structural conditioning. The explanatory power of this metaphor is that there is no limit to the possibility of expansion of the self and her/his context for action, i.e. the technological object. It shows the interplay of structure, culture and agency that takes place in the learning experience of students related, in this study, with educational technology use.

For that expansion to happen some structural conditions need to be in place. In my study they are related with the culture of assessment and the consequences of a deterministic stance on technology and how young people use it. Whatever the structural conditions are, what is important is that they are conducive to the emergence of positive emotions that will have the tendency to drive the individual towards action, thus, engagement, hopefully, reflexive engagement. The conditions also need to afford a context where students are able to have a valued goal that is concerned with sophisticated digital practices, so that they are able to act upon the inherent constraints and opportunities of those practices and expand their capabilities as a consequence. The vested interest which is a function of the position of the individual relative to others but also relative to digital technologies is what I have

defined in section 5.2.2.2 external capability (Nussbaum, 2000), the social conditions that influence the achievement of the capability. And last, the conditions need to be so that students can establish a proactive relationship with the socio-technical system. With that I mean that open and participatory tools need to move from the margins to the centre of the context of use so that it is possible for students to engage with them by default and in so doing, they are likely to enhance their digital capabilities through harnessing the powers that those technologies offer (Lawson, 2010).

In short, the spiral re-presents the process of double morphogenesis, which Archer (2015) explains, "results from agents (the technological subject in this study) succeeding in introducing structural and/or cultural transformation (student's open learning space, the technological object) but being transformed themselves (digitally capable students) and transforming other agents in the self-same process." (P. 145). The process of double morphogenesis is potential at this moment in time in the study.

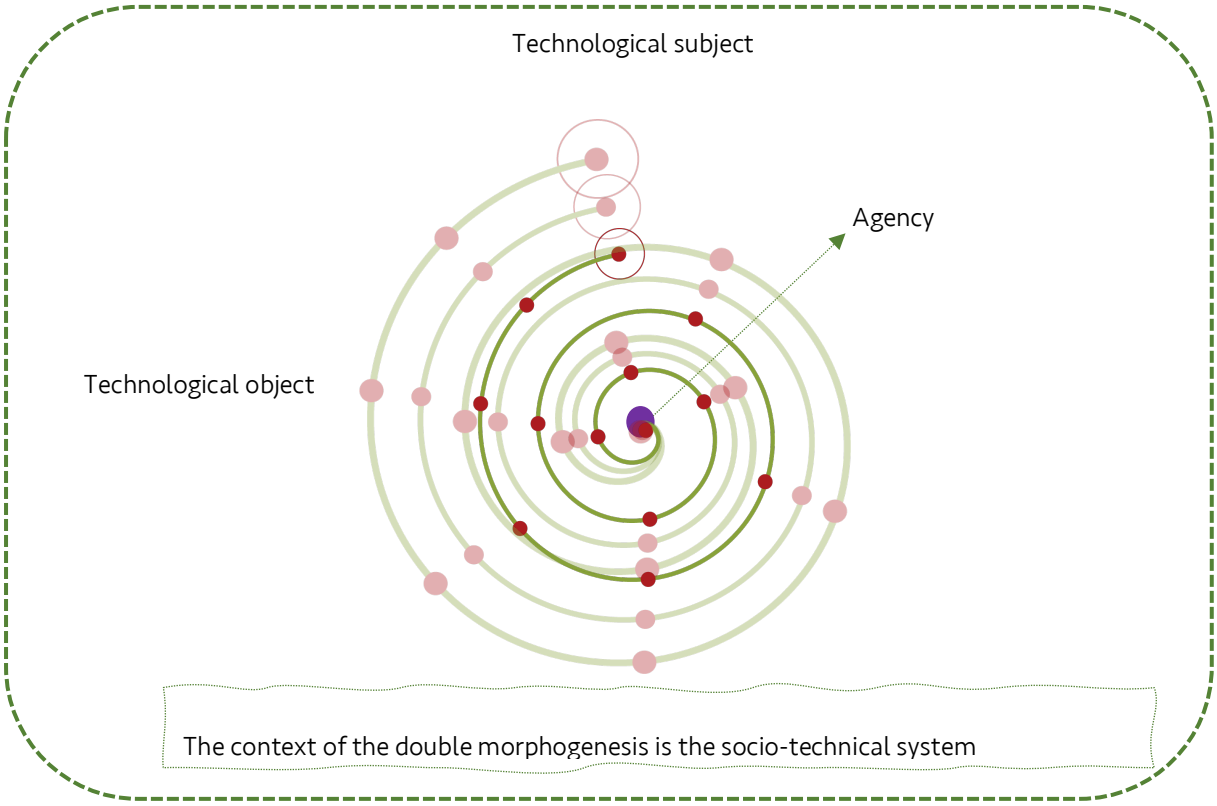

Figure 23:The expansion of students' digital capability, the double morphogenesis

Finally, regarding the institutional culture at stage in T_4 the conditions for substantial social change are found in the relations between systems (HEIs) and social (students) integration

(Archer, 2015, P. 136). It can be observed in the diagram of the morphogenetic cycle, depicted in figure 18 (in page 181), that there is a contingent contradiction between the institutional culture and the culture students enact in their personal/social world, which has been described widely in the literature as a participatory culture (Jenkins *et al.*, 2009; Jenkins, Ito and boyd, 2015). That contradiction is partially responsible for the outcomes observed in T_4. From the literature it can be inferred that the culture of young people -participatory culture- (Jenkins *et al.*, 2009), is one that is geared towards sharing, with a relatively low barrier to social engagement and the tendency to a kind of informal mentorship, where experienced participants share their expertise with novices as they believe that their contribution matters. The normative structure of the institution has a culture that is still very much inward oriented centring the institutional practices mainly around closed and institutional tools, a culture that is mainly geared towards individual assessment that serves only the internal normative requirements of the module, where sharing and co-constructing knowledge with a broader community outside of the institution is not the norm, and as a consequence, the feeling that students have considering their contribution being important, is likely to be lost in the process. Hence, the integration of both cultures has not yet been accomplished and as a consequence, morphostasis of the institutional culture and its normative structure, from this (students) point of view, is the outcome. But as Archer suggests, it is in contradictory conditions where the possibility of change exists. Morphogenesis is more likely to happen in spaces where a contingent contradiction is to be addressed. These processes of structural change are slow and require many generations of people introducing small changes, that will in the long term materialise in cultural and structural change.

6.4 REFLECTING ON THE RESEARCH QUESTIONS

In the initial stage of this study, namely, the exploratory stage, I addressed RQ1: what is the learner's digital profile? I addressed this question in chapter 4 section 4.3. The findings of this stage are discussed in subsection 4.3.3. This led me to consider the other RQs which required a more in-depth investigation, and what follows are the summary of the findings of RQ2 and RQ3. In chapter 6, I give a very detailed explanation of what are the causal

pathway that led to the outcome, but I consider given the complexity of the answer it would be helpful to provide a summary of the key points as well as to address RQ3.

WHY AND HOW DO UNDERGRADUATES ENGAGE WITH DIGITAL TECHNOLOGY AND PLATFORMS?

In this chapter I have extensively explained what I propose as the possible structural dynamics or causal pathway that explain the reasons for the lack of reflexive engagement with open and participatory tools and platforms in the institutional context. This is what the RQ2 asks, i.e., why and how do undergraduates in Education Studies engage/not engage with digital tools and platforms in formal and informal settings? The response to this question is not straight forward, because the social world is an open system, complex and nuanced with events being multidetermined, but for the sake of making research in the social world possible, we simplify the social reality using models, with the morphogenetic cycle being one of these. Having developed the morphogenetic cycle, some reflections can be made as to why students engage or not with digital technology and following that some conclusions can be made as to how do students engage or not engage with these tools.

When digital practices are not something students consider a valued goal, thus excluding them from their constellation of concerns (I have explained the reasons for this in subsection 6.2.1.3.), then it is unlikely that a reflexive process will emerge. This is because vested interests are that upon which our mediatory mechanisms will work. The vested interest can be seen as the object against which the constraints and opportunities will act. Hence, the same structural conditions are constraining for some and enabling for others (Archer, 1995, p. 198). This idea framed within this study means that constraints and opportunities of digital practices only exert their influence if they bump against an individual who holds a set of intentional goals to purse a more sophisticated digital practice. It is contended (Archer, 1995; Sen, 2003; Nussbaum, 2000) that valued goals or intentional projects are what subjectively regulates the intensity or force of constraints and/or opportunities. Agency emerges in the act of mediating these concerns, whereby the individual puts the inner conversation into action to deliberate and discern what is the constraint that is not allowing the achievement of the valued goal. Once this has been

discerned, then s/he sketches out a plan or some kind of course of action to overcome it and in so doing, internal capabilities are transformed, which constitutes exercising agency.

Opportunities to engage with open and participatory tools that live outside of the institution are scant due to, on the one hand, what I have explained above, i.e., the lack of a vested interest from students in open educational practices, but on the other hand, the marginal positioning of these open and participatory tools in the socio-technical network of interdependencies of the institution has also an effect on the lack of reflexive engagement with open and participatory tools and platforms. This marginal positioning has different implications, one of which is the lack of open educational practices with scaffolded opportunities designed by the institution. This leaves the student with little support to overcome the slippery and dynamic constraints explained in subsection 6.2.2. All of this happens in very subtle ways making it almost imperceptible to the different actors involved. Hence, how can students be aware that open and participatory tools are not centrally positioned in the context of use? Or how could they be aware that their digital practices are mainly mediated by the institutional learning management system and the ancillary tools, and how will they know that this has consequences in the enlargement of their digital capabilities? Most of the participants of this study were not aware of any of this. This became evident while the participants where drawing the maps and commented that they had never done anything that made them reflect so deliberately upon these issues.

Being characterised as a digital native has implications in the design of the learning experiences, as I have explained in section 2.3 of chapter 2 and subsection 6.2.2.1 of chapter 6. This is also largely invisible for most of the actors of the problem under investigation. False beliefs are hard to identify and yet, they would appear to shape actions at the micro level of the classroom and the meso level of institutional policy. To summarise, there is a lack of vested interest from the side of students in achieving more sophisticated digital practices, they are invested in passing their modules and finishing their degree. The vested interest is a function of students' social position in the institution. And second, the marginal positioning of open and participatory tools in the context of use makes the task of engaging with them unlikely, let alone, engaging reflexively. All of this explains, partially,

why students engage or not with digital technology. This answer has a direct consequence for students, i.e., that students will not enlarge their digital capabilities. This consequence relates, in turn, to answering the question of how students engage with digital tools. The degree to which someone can undertake a task is the degree that he/she feels capable to do so, that is, how far or how much the person has realised the capability and achieved the functioning that will enable her/him to engage with the task. In table 3, it can be seen how students felt uncapable to address the constraints that technologies such as the cloud afford given they knew what the cloud's function is (many did not know what the cloud is and what it is for). This lack of capability among other things, in turn, brings conflicting emotions to the fore and students are not able to elaborate on them, thus, the tendency is to not engage looking for alternative and more familiar ways to mediate the tasks. The degree to which some students engage with the cloud is cero. In conclusion how students engage with digital technology is shaped by students' digital capability as explained in section 5.2.2.2.

HOW DO UNDERGRADUATES MAKE SENSE OF THE ENVIRONMENT WHERE THE ENGAGEMENTS HAPPEN?

In chapter 5 and in this chapter, it was revealed that the digital space, in particular the institutional one, is consider for many of the participants a 'space of struggle'. Participants feel unsafe, threatened, troubled, shy, and even forgotten. In short, a space where conflicting emotions emerge for different reasons explained in detail in chapter 5, subsection 5.2.1.3.1. To link this to students' process of meaning making, it is pertinent to remind the reader that emotions are a sense of our situation; a reaction to events we cannot make sense of; this was made clear in the data when some students shared that it was difficult for them to make sense of different dynamics regarding how to put tools to work, how to choose the right one for the task at hand, how to cope with a space that has not clear boundaries, and the like. But there is an added element to this, namely that emotions have the tendency to distance the person from the object/experience that generates the conflicting emotion (lamb-Books, 2016, Archer 2003), which is what was observed in the case of many participants. This in turn, shapes the process of meaning making as it was hard for many participants to feel at ease and familiar in that space. In

addition, given that students do not have a vested interest in more sophisticated digital practices for learning-studying purposes the process of elaborating the emotion so that the constraint can be overcome, and the project achieved, did not happen. Instead, the majority of students walked away and direct their attention to get their grades right to pass their modules.

On the other hand, and, adding to the emotional dimension of the process of sense making, we know that human practices are always conscious and intentional (this is the core idea for CR and RST) and it is that what makes meaning arise. The lack of an intentional and valued goal, a vested interest in more sophisticated digital practices shapes the process of meaning making. In addition, the frame of reference that we have regarding the situation we are trying to make sense of is pivotal in the process. The frame of reference is related with what has been experienced and thus we are able to relate to. These experiences are framed within particular norms of signification that operates within a particular area of discourse (Harré and Guillet, 1994), to which the individual needs to conform and be able to recognise. The re-cognition of the norms and rules of a particular practice are essential when the individual is trying to give meaning to a particular practice. As explained in section 6.1, these more sophisticated digital practices afforded by open and participatory tools - open educational practices- are quite new, they are still, as Veletsianos (2017) argues, emergent and dynamic; these tools are not mature entities yet and in an educational setting even less. We are still understanding how to connect these practices to the teaching/learning experience, finding out how to use them meaningfully, what are the rules and norms that should govern or guide such practices. What is their frame of reference is not yet clear and thus, not available to students? An example that illustrates this given by Elder-Vass (2008) can aid in finding the answer. Social practices such as the use of money and institutions like banking as well as the rules of the interest system or the convention that you repay the money you have borrowed are what they are in virtue of what they mean to the members of society, the frame of reference they (people) have elaborated along their lives. If they had a different meaning or no meaning at all, nobody would perform any action related to them. We are in the process of shaping open educational practices which are conducive to more sophisticated digital practices. It was only in May 2019 that the draft of the OER (Open Educational Resources) Recommendation text had been approved. We

know from section 2.4.4. that open educational practices include the use of OERs, but it goes beyond the use of resources introducing open practices and open pedagogies. The work is in the making!

CHAPTER 7
CONCLUSSIONS AND STEPS FORWARD

In this last chapter, I will review the research study, giving a summary, followed by consideration of the contribution this study makes to knowledge and practice. I will also consider the limitations I encountered while developing the study and recommend areas for future research, before concluding with my final reflections.

7.1. SUMMARY OF THE RESEARCH STUDY

I began this study with a main interest in students' perspectives and views concerning their digital practices at the university. I was curious to know their struggles and interpretations when they engaged online as well as what tools they were drawing upon and for what reasons. I posed (in the in-depth stage) two research questions to find answers to my queries, i.e., why and how, do undergraduates engage or not with digital tools and platforms? Moreover, how do students make sense of the environment where the engagement happens? I believe that the answer to these questions can support us in better understanding the structural conditions that shape students' reflexive engagement with more sophisticated digital practices. It also helps in identifying what are the potential generative mechanisms, i.e., the causal powers that emerge when students interact with the contextual dynamics (constraints and enablement). This has allowed me to uncover some implications for knowledge, practice. The study has been positioned in the intersection of different broad areas of study, determinism in education and technology, which I have approached from a more philosophical stance, the changing landscape of HE, and an increasingly open and participatory culture. From the intersection of these areas, I propose an alternative vision of a more holistic and humanistic education, namely one grounded in *Bildung*, that I perceive can foster open educational practices contributing to the flourishing of students.

7.2. CONTRIBUTION TO KNOWLEDGE

In this thesis, I have made a theoretical contribution to the field of educational technology and open education by uncovering and defining three generative mechanisms that have emerged from students' socio-cultural interactions, these being: emotion (subsection 5.2.2.1), digital capability (subsection 5.2.2.2.) and socio-technical relations (subsection 5.2.2.3.). These mechanisms are emergent causal powers that shape students' reflexive engagement/non engagement with open and participatory tools. We need to bear in mind that social reality is defined for CR as an open system with multiple factors acting in parallel. The figure below illustrates how the mechanisms relate to each other, with each of them making different things happen (chapter 6) when it comes to students' digital practices.

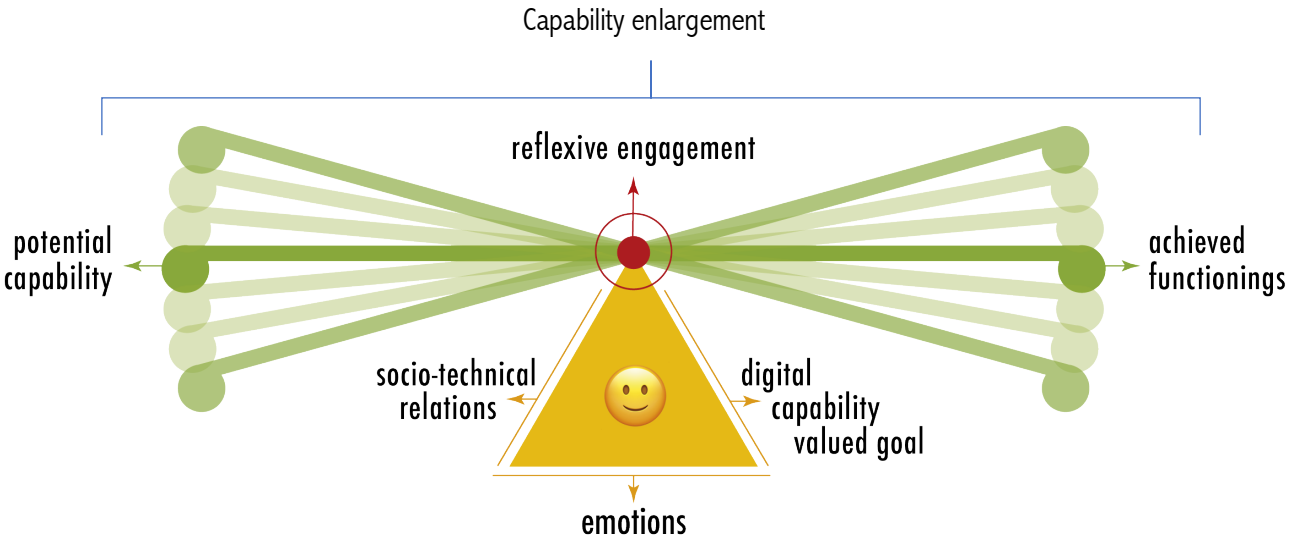

Figure 24: The three generative mechanisms together with reflexive engagement shape students' capability enlargement

The three mechanisms emerge from different structures that are explained throughout chapter 6 and from the interaction (T_2-T_3) students have with the structural dynamic depicted in (T_1). Reflexive engagement acts as the mediatory link between structure (the socio-technical system and the institution, i.e., social and technical relations) and agency. It is, as it were, the link that articulates the system; the cog that makes the machine move, which I have depicted in the figure, using the metaphor of a seesaw. The structural dynamic in which students find themselves in T_1 in the morphogenetic cycle (explained in section

6.1.) foster or not reflexive engagement with more sophisticated digital practices and it is this reflexive engagement with these practices which has the tendency to shape the achievement of the functioning, that is, the enlargement of digital capabilities (as defined in chapter 5, subsection 5.2.2.2.). I have placed reflexive engagement as a potential instrumental link that will action the lever in different directions (figure 24), depending on the situation (structural conditions), thus indicating that the enlargement of the capabilities is achieved or not, according to the movement of the seesaw. The details of how the emergent causal powers of students interact to shape the outcome was explained in detail in throughout chapter 6. What the figure indicates is that the conditions (internal and external to the student) need to be such that they foster in students the ability to engage reflexively with more sophisticated digital practices, in which case capability enlargement is likely to occur.

There is a continuous tension in this process, and that is where the possibility for change lies. The neutral lever indicates the lack of human activity. This state, I believe is not possible, because where there are humans there is activity. Of particular importance is to consider that these are mechanisms that are not evident nor obvious to many and thus, they tend to go unnoticed, which makes it difficult for people to act upon them.

I believe that these findings shed light on an important element regarding the use of technology, namely that problems concerning educational technology use are not only centered around the technology, for they involve a combination of cultural, social and technical dimensions. The technical dimension is not related with a particular tool either, but rather, it is concerned with the social identity, thus positioning of the tools and artefacts in the socio-technical network of interdependencies, the context of use. It is that social dimension of the tool that, among other things, shapes students' capability enlargement. Hence, to address issues regarding educational technology use, all dimensions need addressing.

In more general terms, using a CR lens to explore how people engage or not engage with digital technology, that is, looking into the structural dynamics of the social reality where the phenomenon unfolds offers a different perspective on the use of technology; one that

includes the different causal forces/structures that interact to mediate reflexive engagement, successfully or not, and not only the technology. In so doing, it lays bare the interplay of structure, culture and agency, thereby allowing the researcher to have a more holistic picture of the reality at stake. This can foster designing learning interventions that are more likely to generate social change.

Two peer reviewed journal articles have been published on the basis of this study. One was based on the empirical level of the data and the other, on the study of technological determinism that I covered in the literature review (appendix 1). This last work gives a critical analysis and perspective about the use of technology in education. In addition, a book chapter that is forthcoming (2021) is drawn from my research on critical approaches to participation in online learning experiences.

I also have shared my work widely with my personal learning network, receiving invaluable feedback, whilst also contributing to the discussion on issues concerning students' perspective around open education and digital practices. As part of these fruitful scholarly conversations and discussions, I was invited to give a keynote address at the Open Educational Resources International Conference (2019). This keynote was published as part of the book *Open at the Margins*[30], contributing to the growing body of knowledge in the field of open education. Through this, I believe that I am not only making a one-off contribution with the findings of my PhD thesis, but rather, see it as an ongoing process of sharing and enriching my perspective and that of others regarding issues in the field. As part of this wider work, I have been an active participant of the Global OER Graduate Network of open education researchers (GO-GN)[31] organised by the OER Hub at The Open University. This has been invaluable as it has offered a plethora of opportunities to gather together with likeminded scholars, novice and experienced ones, face to face and online, to discuss a variety of issues around open education and educational technology use. In addition to formal conference presentations and articles, I have engaged in innumerable conversations, where I have been able to contribute my nascent knowledge and theoretical

[30] Open at the Margins, available from: https://press.rebus.community/openatthemargins/front-matter/introduction/

[31] GO-GN: http://go-gn.net

understanding about how can issues in the use of educational technology be approached from a CR perspective, thus making a theoretical contribution to the field. For example, I was invited in 2018 by the GO-GN network to give a webinar on my theoretical perspective[32], i.e. CR and RST, to research issues in technology engagement. Not only did I get invaluable feedback that shaped my research, for an open Q&A session arose from the webinar through which I continued to engage, answering questions and having fruitful discussions online after the webinar. This proved to be very useful for people in the audience, and it was recognised by the webinar moderator as an exemplar of open scholarly practice. This event and other things led me to receiving the 'best open research practice' award for 2019 that recognised my contribution with the following words: "Caroline Kuhn embodies open practice throughout her research and has been one of the most active members of the GO-GN community." As part of the academic work of the GO-GN network a Research Methods Handbook has been published where my contribution has been included.

The contribution to the knowledge in the field has been reciprocal. I have shaped my knowledge and understanding through the different activities I have participated in, the articles I have written and the feedback I have received. In that process, I have contributed to the knowledge and theoretical understanding of issues in open education, in particular, in shedding light on the importance of students' perspectives and voice.

Methodological contribution

The step-by-step methodology and framework for analysis that I have developed for the field of education technology use was presented at a conference focused on qualitative methodology[33], this allowed me to gather useful feedback to improve and refine some aspects of the process. This refined version presented in chapter 4, can guide other researchers interested in exploring issues in this field from a non-deterministic perspective, i.e. from a CR stance. This I consider particularly useful because, for as I have explained in

[32] Available from: https://go-gn.net/webinars/webinar-personal-open-designs-and-closed-artefacts-in-he/

[33] Qualitative research symposium, university of Bath, 2019: Myth, methods, and messiness: insights from qualitative research analysis.

chapter 5, CR offers broad guidelines for conducting research in the social science, but more specific ones are scant. It also provides practical examples that offer step by step guidelines for empirical research that are somewhat lacking in the field of educational technology.

7.3. CONTRIBUTION FOR PRACTICE

> *Imagination, she notes, carries us beyond routine and static possibilities; it synthesizes things that were previously disconnected, spawning new pathways, new possibilities, hopes and dreams.*
>
> (Critical Thinking, bell hooks)

There are limitations as to the recommendations that can be derived from small scale in-depth studies with a moderated scope, as is the case with this one. Such studies are not a strong basis for developing far-reaching recommendations about education policy or professional development design, but they may well be appropriate for theory building with explanatory power, which has been the case in this study, as can be read in chapter 6. This theory building and its explanatory power offers new understandings of events, meaning making, and social practices, i.e. digital practices and the critical role of reflexive engagement, setting the foundation for new studies that could be broader in scope and mixed in terms of methods.

The small contribution to practice is based on the reimagination of a different set of situational logics to the current ones, as depicted in the arrangements presented in chapter 6. This exercise of reimagining different structural conditions could feed into institutional decision making as well as concrete socio-technical developments to support a critical practice regarding a meaningful integration of technology into the curriculum.

"One of the most important differentiating powers proper to people is their intentionality – their capacity to entertain projects and design strategies to accomplish them (which may or may not be successful)." (Archer, 1995, p. 198). This shows that students do have the potential capacity to entertain projects and one such project, in the context of this study, could be the elaboration and transformation of their current digital practices to more sophisticated ones. This begs the critical realist question of what would the context for action, i.e. the conditions needed for this to be the case? There could be many answers to this question under a CR understanding of the social world. The one I will give stems from

my investigation, whereby I proposed two potential arrangements or causal pathways addressing the lack of reflexive engagement with sophisticated digital practices. It is based on this perspective, that I am proposing how I believe the context for action could look like for sophisticated digital practices to be the case, this being the main contribution to practice of this thesis.

It has been established in subsection 5.2.2.2. that for students to enlarge their digital capabilities, we need to look at both, their internal capabilities, that is, the individual capacities, and the external capabilities, that is, the contextual social/cultural structures that have the potential to enable these capabilities. The individual capacities are skills, competences, knowledge that students need to have so that they can engage in sophisticated digital practices. These capacities can be taken from any framework that one considers robust, some of which I reviewed in subsection 5.2.2.2. However, these competencies are not enough by themselves; they need to be accompanied by external conditions. Digital capability as a generative mechanism, as explained in subsection 5.2.2.2., pertains to the position students occupy in relation to others and technical artefacts in the socio-technical system (open and participatory tools in this case), which are key to shaping students' vested interest, one that is a key ingredient to achieve such digital capability. These socio-technical relations have a strong causal power (Donati, 2013, Lawson 2017, Oosterlaken 2013) providing the resources and reasons for the realisation or enlargement of digital capabilities. Recall the importance that the positioning that technology has in the network of use to enlarge human capability, as explained in section 6.1. and subsection 6.2.1.2.

Once these conditions are identified we need a theory that can explain how these powers namely the mechanisms (those that emerge from the structures) will enable the realisation of the associated digital functioning, that is, realise the enlargement of digital capabilities. The theory chosen will be a matter of the practitioner's choice and it will be related with his/her professional experience, understanding of the social world and the theoretical as well as pedagogical preferences. However, my suggestion having undertaken this investigation is that Donati's (2013) theory of the relational subject and his model of the second-order reflexive engagement (illustrated in figure 9 and explained in detail in

subsection 3.3.3.), that is, social reflexive engagement, is a powerful theory that has the potential to enable the realisation of the digital functioning. Donati's proposal is to draw upon causal powers of social relations, which is the key element in his model.

Donati and Archer maintain that social relations are the connectors that mediate between agency and social structures (Archer, 2015b; Donati and Archer, 2015a; Donati, 2016) (subsection 3.3.3). In Donati's model of social reflexive engagement (figure 9, chapter 3), the key element is the social relations that emerge from the interaction between people, students and lecturers, in this particular case. These social relations are real and hence, causally efficacious. The social relations stemming from the interaction is what Donati (2015) calls the 'We', termed the corporate agent by Archer (2000). Furthermore, these authors affirm that there is added social value that emerges from the relations, which potentially leads to the enhancement of social subjects (Donati and Archer, 2015). What I am proposing is that the relational good that can potentially emerge from the we-context, also called by Elder-Vass (2008) 'interest group', is the technological object explained in section 6.3. In the process, the enhancement of the social (technological) subjects will be achieved and thus, capabilities enlargement will occur, amongst other things. Recall, social reality is complex and multi-layered, thus many other things will emerge from the we-context, but for the sake of this study and to make this research possible, I am abstracting one element of the complex learning experience.

Given the findings of this study, in particular, the lack of student's vested interest related with the social position they occupy, as explained through the two strings in chapter 6 (section 6.1, and subsection 6.2.1.3), Donati's model covering the we-context could contribute to enabling the realisation of digital capabilities, that is, the transformation of the potential capabilities into achieved digital functioning, and in so doing, fulfil the morphogenesis of students' open educational practices. Reflexive engagement is understood in this study, as a complex result of agency in which individuals through an inward process of reflexive thought deliberate, evaluate, and decide upon their personal projects (the valued goal) that are an important part of their ultimate concerns and course of action. To summarise, I consider that Donati's social reflexive engagement offers some pointers that I consider useful for addressing the difficulty students have in reflexively

engaging with more sophisticated digital practices, due, among other things, to the absence of a valued goal, a vested interest in more sophisticated digital practices. The main element being the causal power of social relations, namely, the power Donati sees emerge from a meaningful relationship. The model is illustrated in chapter 3, figure 9 and it is explained in detail in subsection 3.3.3. Hence, I do not see it necessary to explain the model in detail in this section but point out the advantages I think it has for practice.

In the model the key element is the relational good (RG), which is what emerges from the we-context (relations between students and lecturer as well as between students and students). It is the communal endeavour that has been negotiated as part of the we-context, and that emerges from the social relations. The object (O) is what I referred in section 6.3 as the technological object and the technological subject. The rest of the elements of the model describe how the student and the tutor have to be able to see and understand the viewpoint of the others in the relationship. There is an assumption for the model to work, which is the presence/need of/for meta-reflexivity (explained in subsection 3.3.3.) by the participants. It implies the need to take into consideration the view of the other person or persons that are part of the we-context. This means that the we-context is based on a relation of reciprocity (Donati and Archer, 2015a), because as both authors argue, the 'we' arises from the commitments that people make as a product of the relation. It is that reciprocity what opens both parties to embrace reflexive engagement as a relation where students and the lecturer have the potential to be fulfilled. The model also stresses the importance of strong bonds and robust relationships, which is a matter that Bryson (2014, p. 8) also suggests as being paramount for student engagement (engagement here refers to the learning experience). He states that "there is a need for staff and students to have a stronger discourse between them and thus, a shared understanding." In short, the we-context is a space of mutual reciprocity where valued goals are potentially going to emerge and thus, collective agency, that is, not only will the individual realise her/his personal powers, for there are new powers that can emerge due to the relation that has been created. It can be said thus that the relational good affects the mutual relationship, for example, the educational relationship, whilst at the same time shaping and orienting the parties in their future interactions and it is in this last aspect of the we-relation that I see the potential.

What has been described so far is that the technologies/tools (whilst they should be open and participatory, they can be any tool that serves the purpose of the task at stake) are the least important element in the story. What is paramount are the social conditions that are in place such that students' interactions with the context for action are conducive to capability enlargement. In addition, it is critical that students have a valued goal, an intentional project that they are invested in and that they share in a community -the we-context-. For, this is what will allow them to enact different strategies to overcome constraints and harness opportunities, and in doing so, as I have explained in chapter 3, particularly in subsection 3.3.2., they will enlarge their digital capabilities. This valued goal will emerge as a relational good, according to Donati's model of social reflexive engagement. That relational goal, in this particular example, will be sophisticated digital practices, or the technological subject and object I addressed in section 6.3, i.e. T_4 of the morphogenetic cycle depicted in figure 20.

The relationship from whence the interactions derive is key for digital capabilities to be realised. Whilst the social relations emerge from inter-actions, they are much more than the inter-action, for they are sui generis emergent powers. Strong bonds, reciprocity, spaces of care where emotions are not conflicting, in short, appropriate spaces for individual as well as collectivity and agency, are phenomena that I consider vital for any humanist learning experience. In sum, solidarity, trust, care and reciprocity seem to me values that are worth cultivating among our students and teachers.

As a closing remark on the contribution to practice that I have made to the field and through building on the theoretical understanding I have acquired through this study, I have been awarded a grant from the EPSRC (EP/R045178/1 Human Data Interaction: Legibility, Agency, Negotiability / GU project reference 301671)[34] to develop an Open Educational Resource that addresses critical data literacy and digital capabilities, the resource being directed at educators and students across four different countries.

[34] Human Data Interaction Project: https://gow.epsrc.ukri.org/NGBOViewGrant.aspx?GrantRef=EP/R045178/1

7.4. LIMITATIONS OF THE STUDY

In the course of my study, I have encountered different limitations, most of them related with the methodological aspect of the project. I went to the field without having a set theoretical framework as I explained in chapter 3, 4 and 5. Although it is held by some researchers, including Charmaz (2006), that not having a fixed theoretical framework will allow the data to 'talk' freely, particularly when the investigation is explorative in nature, which was the case of my study, it did confront me with some hurdles during the process of analysis. Once the data was collected, I started to think about which theory could support me in the interpretation of the data, and after reading various theories I decided to use critical realism (CR) in tandem with realist social theory (RST). I perceived this as being a robust combination that could offer a strong framework to understand and explain the root causes of students' lack of engagement with digital technology in the formal context. However, I was not dealing only with a new theory, i.e. RST, but also, a whole philosophical position that has a particular understanding of social reality as existing independently of the knower and with ontological depth. So, I had to find my way through the deep ontology of CR and how it is an intellectually coherent match with CGT, which is the approach I used to collect the data, both of which I did successfully in the end.

After having carried out the investigation, I can see that I would have needed more varied data than that which I did collect. This would have allowed me to navigate easier the levels of reality. I also realised at the end of the process of retroduction that I could have refined the proposed configurations (figures 21 and 22) by testing and contextualising the strings. However, for this to be possible I would have had to undertake a second round of data collection. If CR would have been part of my research design, I would have planned for that in advance. Nevertheless, I acknowledge that the strings proposed as a potential explanation of the outcome can be the starting point of a new study, where the testing process would be initiated with these.

In relation to the collection of data, I did find it hard to engage participants for this study, I invested almost five months in getting everybody on board. And even then, some

participants did not show up to the focus group, thus having to change the format from focus group to an in-depth interview. I could accommodate to the changes that were needed, and I could make good use of the in-depth interview I undertook, nevertheless it did imply that I had a round less of data to draw upon. In the exploratory stage, I attended to the student's voice conference, a conference organised by the Student Union by students (section 4.3.3) where I collected data about students' perceptions regarding the university strategy for digital literacy. Although the data was valuable and allowed me to reflect on the importance to explore students' engagement with digital technology more in depth, I consider that a limitation of that event and the data collected was that it did not include the perception and vision of staff. This would have given me a broader perspective of the issue complementing my understanding.

Sibeon (2004) is of the view that, sometimes, while the researcher is analysing the data, something unexpected comes as a surprise, and he/she realises that there is something new to think about. This is what happened to me after having thought in depth about the pictorial data, namely the maps. The notable difference between how students arrange their institutional spaces in contrast with their personal one caught me by surprise. I did some research within CR and although they support the idea that the objects people are trying to interpret and make sense of, namely, the digital environment, "are influenced by the material circumstances in which they exist and the cultural resources that provide actors with ways of making sense of their situations" (Maxwell, 2012, p. 21), CR does not propose any particular theory of the relationship between material (context and social relations) and ideational phenomena (meaning making). Therefore, I had to find a theory that did link them, and I did, namely critical theory of space, in particular the work of Lefebvre (1991), Soja (Soja, 1980, 1989), and Massey (2005; 2009) was very useful, as I briefly explain in section 4.4.5.3. I discovered through the work of these scholars that space is not a given, an empty container where things happen in a vacuum. Instead, it is socially constructed, as Soja (1989) explains so clearly and thus, political in nature. This means that there is a whole layer of complexity that needs to be explored further if the intention is to understand further the reasons behind the arrangement of students' digital spaces. I did not imagine encountering this when I set out to undertake this study. As I did not foresee this theoretical complexity to be able to make sense of the data in this respect, I

believe I fell short in explaining the difference between both topographies from a critical perspective.

Nevertheless, what I am proposing in this study is by no means a final and closed explanation. It is my initial interpretation guided by the theory I had at hand and the limited knowledge I had regarding the political dimension of space. That is, this is only a starting point; it serves as a spotlight to illuminate ways into a more in-depth investigation about students' entanglements with the socio-technical system. It is an approach to explore the social construction of digital spaces, that, open interesting lines of inquiry into areas of study that remain relatively unexplored.

In addition, during people's socio-cultural interactions the causal factors are mediated through beliefs and dispositions of the actors, i.e. students. Nevertheless, we need to be concerned that students may be unaware of or unwilling to reveal them, with the result that empirical cases face further obstacles to uncovering reasonably complete explanations. However far we extend the analysis and however carefully we investigate the motivations of the participants of this study there will always be some factors that we have missed and perhaps some significant ones. In addition to this and following Maxwell (2013), there is a gap between the behaviours that an individual values or claims to engage in, and those that they actually engage. Thus, our understanding of the social reality will be only partial and always incomplete.

7.5 FURTHER LINES OF INQUIRY: RESEARCH CONTRIBUTIONS

Given the main limitations but also the findings and discoveries that emerged from the study, I consider that there are at least two potential interesting lines of inquiry for future research. The first concerns the social construction of digital spaces. As I explained in my limitations, I did not have the space and the scope to go into more depth with this, but as far as I have explored, critical theory of space offers fertile ground to undertake research in which the organisation of space is understood as inherently social, that is, socially produced space is a created structure comparable to other social constructions. In this critical stance towards space, the relations of production, knowledge production is the context that I am

interested in, are at the same time social and spatial. Given this, I have considered some questions in relation to students' perspective, for example, what shapes and drives students in the production of their digital spaces? Do virtual spaces emerge dialectically (socio-spatial) from the inter-action of culture and the individual? If so, what is the role of culture in the shaping of the space? And how does culture shape the process of meaning making of such space? The use of critical theory of space offers a highly interesting perspective for shedding light on how students organise their digital spaces. In short, understanding virtual spaces as political, socially constructed by individuals, as the outcome as well as the medium, can contribute to finding different ways to co-design with students' digital spaces for learning purposes. Spatiality has the potential to offer new understandings of what shapes students' digital spaces, how they arrange the space and in so doing it can be a means by which meaningful learning places can be co-constructed with students. The spatial dimension of technology has sparked the interest of the educational community, making different calls for special issues, e.g. the call for a contribution to a special issue in the journal Postdigital Science and Education: "The post digital spaces in Higher Education" (forthcoming), where one of the themes addressed is learning spaces in a postdigital world.

The other area of research that I also consider can be further explored is testing the strings, as I explained in section 7.3. This will deepen the understanding of the different factors that shape students' reflexive engagement with open and participatory tools and the concomitant process of capability enlargement. In addition to that, and given the outcome observed, namely the lack of reflexive engagement with open and participatory digital technology, under the conditions in T_1, an interesting exercise would be to propose a set of different conditions and design an intervention to find out the outcome.

7.6. A PERSONAL REFLECTION: MY RESEARCH JOURNEY, REFLECTING BACK AND FORWARD

The journey of this PhD has not been an easy one for different reasons. I have experienced many changes to my circumstances during these seven years of my part-time study, which have taught me that being flexible is a key skill to have for a researcher. I am grateful for

all the people I met along the journey, because each and every one of them has taught me something different, and all of these experiences have made me the researcher I am today. Of great importance in this journey has been the GO-GN network, for they have been my community of practice; the people I feel I belong to and the people with whom I would like to keep in touch no matter what I do. The people with whom you share your research endeavors have an impact on who you become and the GO-GN has had an outstanding impact on who I am today.

When I started my journey in 2011, not in England, but in The Netherlands, I envisioned what has been part of the outcome of this thesis, but I have come to realise that ideas need time and deep intellectual work to mature and crystalise. At the very beginning of this work, I was very naïve, innocent and I would say also ignorant, for only now I can see how little I knew compared with what I know today, although the journey of learning is a never ending one. This work has left me with far more questions than answers, and this is another thing I have learned from this journey, asking good and challenging questions is fundamental if the aim we have when doing research is to bring problems to the light problematising what is seen as natural and 'commonsensical' by exposing hidden assumptions. As Biesta et al. (2019) would say it is not so much about solving problems but creating new ones, and there is where the challenge for educational researchers lies.

I started my professional life as a maths teacher with a very pragmatic outlook towards the social world. Having undertaken this research and having learned all I have about CR and RST has profoundly changed me and how I understand the social world. It has equipped me in terms of not only being able of carrying out research, but also, in the way I view the world and in the nature of the solutions I envision for social problems. I can say confidently that I am now more capable of grasping the complexities and nuances of the social reality. I am definitely a different person overall.

I would like to add a final note about how the context of this study has changed dramatically due to the pandemic. When I started the study, 2014, I never imagined the current scenario we are experiencing now. It has become evident more than ever that being able to engage reflexively with digital technologies is and will increasingly be, at the core

of blended learning: a combination of face to face and online learning that is used in almost all our modules and courses. The world will not be the same; there is no new normal that we can go back to, and this will also be the case with education. Digital technologies have been critical for being able to continue teaching and they will continue to have a role to play in the aftermath of COVID-19.

l also want to acknowledge that this study being a part-time study has lasted seven years. During that time, the school of education and the university, more generally, have experienced profound changes regarding digital literacies. I started this study in 2014 and in 2019 the university went through a dramatic restructuring of the organisations of its schools and the managerial structure. Therefore, the School of Education changed its structure having new arrangement and new roles which have implied changes with an impact on the digital provision, but these changes could not be reflected in the study given the chronology of the processes of the research study.

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APPENDICES

APPENDIX 1: PUBLICATIONS BASED ON THE PH.D RESEARCH STUDY

1.a) Kuhn, C., Adam, T., and Pete, J. (2020). Open Praxis: Three perspectives, one vision. In (eds.) Bali, M. Cronin, C., Czerniewicz, L., DeRosa, R., and Jhangiani, R. *Open at the Margins. Critical Perspective on Open Education.* Available at: https://press.rebus.community/openatthemargins/chapter/open-praxis-three-perspectives-one-vision/

1.b) Kühn Hildebrandt, C. (2019). Whose interest is educational technology serving. Who is included and who is excluded? *RIED. Revista Iberoamericana de Educación a Distancia*, Vol.22(1). P.p. 207-220, ISSN 1390-3306.
Available at: http://revistas.uned.es/index.php/ried/article/view/22293/18660
doi:https://doi.org/10.5944/ried.22.1.22293.

1.c) Kuhn, C. (2017). Are Students Ready to (re)-Design their Personal Learning Environment? The Case of the E-Dynamic.Space. *Journal of New Approaches in Educational Research*. Vol. 6(1) Pp. 11-19. ISSN 2254-7339.
Available at: https://naerjournal.ua.es/article/view/185
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1.d) Kuhn, C. (2017). (Un)dividing the digital? The power of narrative research to uncover the hidden complexities of students' digital practices. In *Proceedings of the European Distance and E-Learning Network 2017 Annual Conference Jönköping*, 13-16 June, 2017 ISBN 978-615-5511-18-9

APPENDIX 2A: LEARNER'S PROFILE SURVEY

[survey redacted from the digital version of this thesis, pp.266-267]

BATH SPA UNIVERSITY

THINK DIGITAL:
A GUIDE TO IMPROVING STUDENTS' DIGITAL LITERACY

Why is digital literacy important?

As 90% of new jobs will require excellent digital skills, improving digital literacy (by which we mean those capabilities essential for living, learning and working in a digital society) is a key component for developing effective and employable learners. But many learners enter further and higher education lacking the required skills...universities can help to develop students' digital literacy to help with academic research, writing and critical thinking, supporting vocational and professional development or as a way to showcase achievements (JISC, 2013)

What is the aim of this guide?

to help learning and teaching practitioners ensure that students attain high levels of digital literacy

Who is this guide for?

everyone who supports learning and teaching at BSU, including lecturers, programme and subject leaders, learning development advisors, librarians, staff and educational developers, learning technologists, and technicians

BATH SPA UNIVERSITY DEFINITION OF DIGITAL LITERACY

A digitally literate person has the confidence and capacity to manage information and solve problems in technology-rich environments - that is, to access, evaluate, analyse, communicate, and create information through the use of digital devices and applications.

Approved by Learning & Teaching Committee March 2014

IMPROVING DIGITAL LITERACY IN THE CURRICULUM

1. Be strategic

Students experience university at programme, not just modular, level (Gibbs, 2007). Work with your colleagues to build digital literacy into the curriculum across the programme in a progressive, spiral manner. For help with curriculum development, you may want to contact the Centre for Learning and Teaching Development. Don't simply be led by the latest technological fads, start with a pedagogical rationale and find the right tool.

2. Motivate with aligned assessment

Assessment motivates students (Ramsden, 1992). Develop assessment criteria that explicitly mention relevant aspects of digital literacy and design assignments that require students to be digitally literate. Remember to teach anything you assess and align assessment to national, institutional, programme, and module learning outcomes and standards. Use the BSU digital literacy definition to show students what you expect.

3. Meet students where they are

Take a constructivist approach. Experts advise us to find out what students are already doing with digital technology and build on that when designing learning, teaching, and assessment activities.

4. Use active learning

Active engagement can improve learning. Provide opportunities for students to practice the behaviours you are teaching and assessing by designing 'hands-on' learning activities. Remember to factor in the time it takes to learn new skills (JISC, Responding to Learners Guide 2: 3) when planning your scheme of work.

5. Invest in your own continuing professional development

'Learners still rely to a great extent on their lecturers for guidance' (JISC, Responding to Learners Guide 2: 1) when it comes to developing digital literacy. Set a good example by improving your own digital literacy so that you can help students solve problems. Discuss this with your line manager as part of your annual Staff Development and Review to ensure that you have the time and support required.

CASE STUDY

Ian Gadd's Level 6 students create mini-websites based on Shakespeare's plays, with links to scholarly, web-based resources. This helps students become more confident and relates to the module's learning outcomes of technical proficiency, critical evaluation and use of resources. The assignment enables students to produce more creative and better informed responses to literature.

6. Be authentic

Students find it inspirational to have relevant examples (Bradley et al, 2014). Where appropriate, align learning, teaching, and assessment of digital literacy to professional standards in fields related to your subject. Explain to students the relevance of digital literacy to their university work and their potential employment.

CASE STUDY

Heritage, History, and GraphicCommunication students worked together to create an app for No. 1 Royal Crescent in 2013. Kristin Doern says the assignment raises confidence in using and being able to talk about technology. It also links finding and managing information with professional presentation of solutions and outcomes.

7. Aim high

Digital literacy is about more than just skills. Support students to use higher order cognitive skills such as analysing, evaluating, and creating with digital technologies. But also build in 'quick wins' to increase confidence.

8. Seek expert help

There are a range of experts available at BSU to help you and your students. See the Getting Help section of this guide for more details and let your students know where they can seek support for their individual needs.

9. Engage students as partners

'Studies have consistently shown correlations between engagement and improvements in specific desirable outcomes' (Trowler and Trowler, 2010). Get students involved in designing the curriculum. Engage digitally fluent students to be leaders, set an example for other students, and/or help you deliver sessions. Consider working with the Literacies Development Framework to help students assess their own digital literacy (you could use the BSU digital literacy definition as the vision).

10. Have fun!

Remember that we are a 'creative' institution. Don't be afraid to make mistakes or to let students make mistakes in a safe environment. Keep a positive and open attitude about digital technology (students notice when you don't!). Where relevant, you may consider using games to enhance learning.

CO-CURRICULAR - GETTING HELP

Library and Learning Services

Your subject librarian can provide tailored sessions on digital information literacy and advice on which digital resources best suit your needs. The Writing and Learning Centre offers hands-on digital literacy workshops for students. Sessions may focus on a particular application or addressing a learning issue by using digital technology.

Learning Technologists

Each School has a Learning Technologist who can help you with practical matters and curriculum design. They can also offer tailored sessions for you and your students.

Centre for Learning and Teaching Development

Staff can register for accredited learning technology modules, attend a workshop or eLearning Day, or simply ask for advice on curriculum and assessment design.

Careers

Bath Spa Careers helps students build an online presence for their career development. They run workshops on creating digital portfolios, using LinkedIn and other social media as professional tools for research, networking and finding job opportunities, and understanding how best to use search engines for career research and job searching.

IT Training

Book on to a workshop to develop your proficiency in a range of applications and software packages.

References/Further Reading

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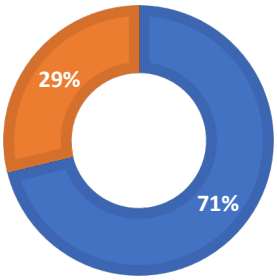
Working Group

Alison Baud, chair; Joelle Adams; Tom Davidson; Neil Glen; Andrew Hugill

APPENDIX 3: DESCRIPTIVE STATISTICS OF THE LEARNER PROFILE SURVEY

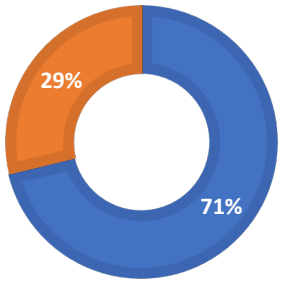
Don't use advance functions on the smartphone (GPS, browser, email, social media app)

Use advance functions on the smartphone)GPS, Browser, email, social media app)



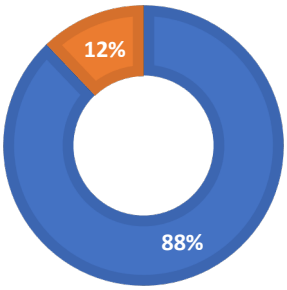
Don't use wiki/blog/onlline network

Use wiki/blob/online network



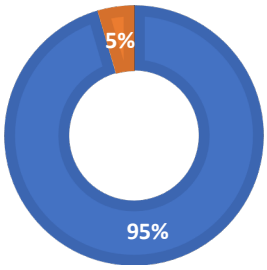
Don't participate in online discussion groups

participate in online discussion groups



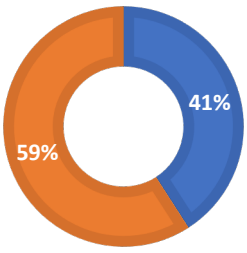
Don't use social networking websites(Twitter, Faceb,whatsapp, Google+)

Use social networking websites

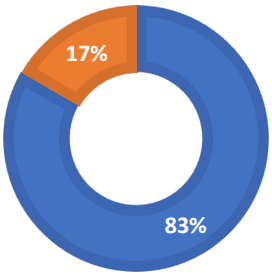


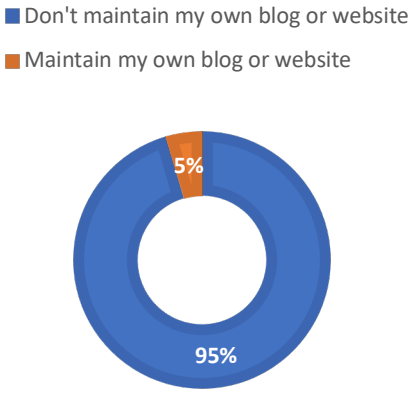
Don't upload video or photos content onto the internet

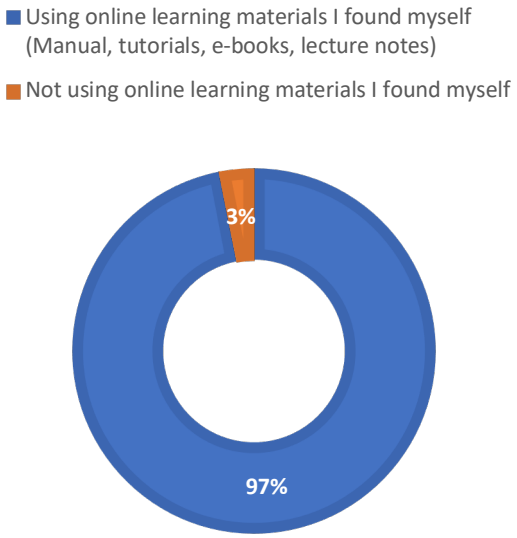
Upload video or photos content onto the internet

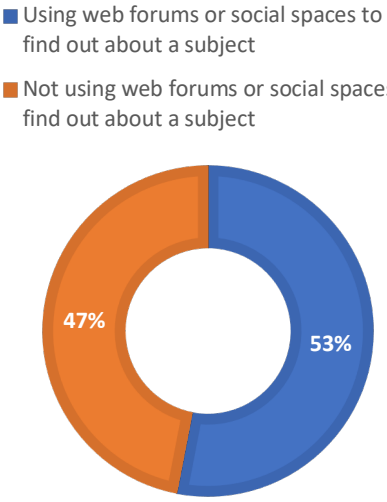


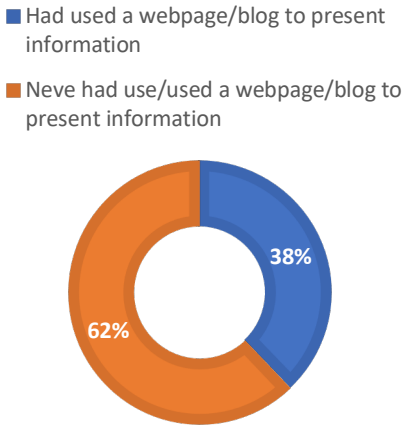
Don't download podcast download podcast

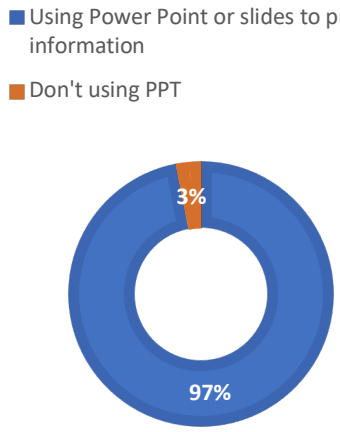


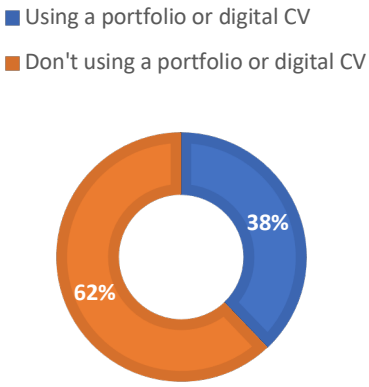

Don't maintain my own blog or website
Maintain my own blog or website
5%
95%

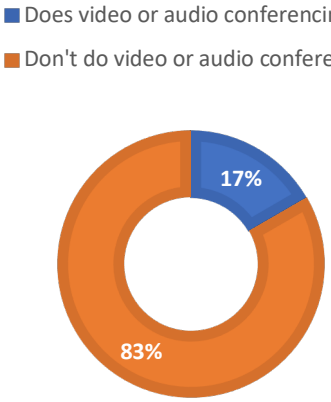

Using online learning materials I found myself (Manual, tutorials, e-books, lecture notes)
Not using online learning materials I found myself
3%
97%


Using web forums or social spaces to find out about a subject
Not using web forums or social spaces to find out about a subject
47%
53%


Had used a webpage/blog to present information
Neve had use/used a webpage/blog to present information
38%
62%


Using Power Point or slides to present information
Don't using PPT
3%
97%


Using a portfolio or digital CV
Don't using a portfolio or digital CV
38%
62%


Does video or audio conferencing
Don't do video or audio conferencing
17%
83%

APPENDIX 4: THE STUDENT'S VOICE CONFERENCE DATA AND FINAL DOCUMENT FOR THE ACADEMIC BOARD

I am including in this appendix the notes taken from the discussion and the elaborated document that was generated from those notes collected at the conference of students' voice at Bath Spa University in December 2015.
There are 8 graduate attributes thus there were 8 tables, I am copying the notes and conclusion of the table I co-lead, i.e., digitally literate graduates.

Raugh notes of our discussion with the different groups at the table

Graduate Attribute 4: They will be digitally literate: able to work at the interface of creativity and technology

- Co-facilitated by Richard Swales (Deputy Director, Library & Learning Services) & Caroline Kuhn (PhD Rep for Institute for Education)

- Not enough outside workshops → Training
    - Failing students and the university
    - Not enough time to learn digital skills → design of the course
    - Not enough self-taught resources → Lack of resources → Digital literacy provision
- Lack of resources online
- Minerva could allocate info about tools that are using in the course before starting, e.g. YouTube tutorials for learning new tools
- Creating a space for people to work it out for themselves
- YouTube Channel for basic tutorials
- Not enough DYO resources –

Institutional culture

- Minerva is poor – we need top of the range software → Infrastructure is outdated
- Motivate students to want to learn → Staff duties
    - Explain the need for digital literacy
    - Teach it
- Lectures should tell students available for the work
- Lecturers use software to the very basic
- Everything – teaching processes – is the teacher
- Part time lecturers are annoying as they cannot commit fully

- Working at the interface of technology and how can we embed this – need basic knowledge and skills – what about master's students?
- We need to stress how important it can be for students the skills they need → staff encouraging the engagement with dig lit
- Engage with social media – basic tools are enough
- Engagement needs to be encouraged → Staff in their lectures
- Engagement is key → students' side
- Practice makes perfect → encouraging more use of tools
- First Year:
    - effective use of technology → Staff training
    - Teach in first year so you can learn before you need it , e.g. Prezi
- Journey to learn is important → Path to learn (Curriculum)
- Integration of skills and coursework is weak. Use of the programme frequently.
- Prior knowledge – prior skills needs to be informed to students (Prior knowledge)
- Timeline needed to where you are in the necessary skill set
- Why bother? → Embedded in the curriculum and assessed. Create Co-Practice
- Are we supposed to be a commodity by the end of three years? Is there enough time to gain the skills? Could this be implemented with Wednesday free? Path to learn (Curriculum)
- Digital Literacy module in the programme:
    - Teaching basic research skills is needed
- Baseline needs to be established
- Generic? Course specific? Courses and digital skills are equal
- Digitally based Drama – compulsory? Disciplined dependent
- Digital skills are course dependent
- Education – no support from the uni
- Class dedicated to research. Digital skills need to be developed → A need to be proactive from the university
- Commercial Music is fine – industry software is used in the course
- Drama – digital literacy orientated → Good practice, community of practice encourages the use of social media tools (Twitter, blog) to promote the artist. Self-promotion is the practice, if you don't promote yourself no one will do it
- Access only in the uni and that is difficult when there is much you need to do by yourself
- How important are the digital skills in the future form the students' side?
- Commitment side from students' side
- Not enough time in uni to learn digital skills
- Soft skills – software

General notes made after going through the data

Graduate Attribute 4: They will be digitally literate: able to work at the interface of creativity and technology

> Co-facilitated by Richard Swales (Deputy Director, Library & Learning Services) & Caroline Kuhn (PhD Rep for Institute for Education)

Aspects that are hindering the implementation of the attribute:

In relation with training digital skills students said:

- Not enough workshops
- Not enough time to learn digital skills
- Lack of resources online, it can be through Youtube channel for basic tools
- Minerva could allocate info about tools that are been used in the course before starting, e.g. Prezi, Mendeley, Blog, etc.
- Creating a space for people to work it out for themselves

Aspects related to staff level of proficiency and confidence with digital skills so that they are able to encourage the use of digital tools hence digital literacies/capabilities.

- Staff should motivate students to want to learn (Encouraging students creating a Community of Practice)
    - Explain the need for digital literacy
    - Teach it
- Everything that has to do with teaching processes has to do with the teacher (the role of the teacher as a leader in the process)
- Lecturers use software to the very basic
- Lectures should tell students available for the work (Student-staff partnership)
- Working at the interface of technology and how can we embed this – need basic knowledge and skills – what about mnaster's students? (embedding the literacies in the curriculum)
- We need to stress how important it can be for students the skills they need (staff encouraging the engagement with digital literacies)
- Engage with social media – basic tools is enough (staff encouraging the use of it)
- Engagement needs to be encouraged → Staff in their lectures
- Practice makes perfect (they need to be exposed all the time to these literacies)
- First Year:

    - effective use of technology in this year as it is not counting towards the grades
    - Teach in first year so you can learn before you need it (e.g. Prezi)

Digital literacies are course dependent

- Digital skills are course dependent, in the sense that it depends on the school if they encourage and embed the use of them within the curriculum
- Example of good practice is the digitally based Drama course. The use of some tools is compulsory. Digital literacy oriented. It is also the case with commercial music.
- In the School of Education this is not yet the case. There is a lack of engagement in digital literacies

Digital literacies need to be embedded in the curriculum:

- In a module dedicated to research, digital skills need to be developed (this is key)
- Journey to learn is important → Path to learn
- Integration of skills and coursework needs to be strengthened
- Use of the programme or tool needs to be done more frequently.
- Prior knowledge needs to be informed to students (Prior knowledge)
- Baseline needs to be established
- Timeline needed to where you are in the necessary skill set
- Why bother? Is an expression frequently heard among students? If they think why they should bother it means they do not see the need to do the extra effort of engaging with something new which necessarily implies struggle as the majority of learning new things does. To avoid this, embedding the skills and literacies in the curriculum and assess them through the module could be a good option. Creating a community of practice where students see the value in engaging with the literacies.
- Are we supposed to be a commodity by the end of three years? Is there enough time to gain the skills? Could this be implemented with Wednesday free? Path to learn (Curriculum)
- Digital Literacy module in the programme:
    - Teaching basic digitally research skills is needed
- Some students access the technologies only in the university and it gets difficult when most of it is left to do by the students in their time.

General comments:

- There is a need to create a community of practice so that students feel the value to be part of this community. This is not the case in the school of education.
- Lecturers are the ones that need to encourage the use of digital tools and show good practice. That is what students have said, not only in this conference but, also in the literature related to the topic.
- There are other schools (Drama, Media, History, Biology) where the literacies are embedded within their curriculum and lecturers assess the module through the use of digital tools (reflective writing through an online tool, professional identity through websites, etc.) and students who could be averse to the tools need to go through the process of struggle and learn the structural functions of the tool. Later, when they then see the positive effects in their learning and lives, they feel happy to have done the effort.
- Generating online resources, students consider, is only a partial solution as it will impact the kind of student that is able to learn through this type of resource. Therefore, there is a question if generating online resources will have a positive impact on students as all the tools out there have their respective online tutorial, help-desk, manual, etc. which does not mean, as we have seen in the conference, that students are using those tools. Maybe what is needed, as it is already happening in some schools, is to expose students to different options of tools by their lecturers and encouraged to use them in a meaningful way within their course, considering in the assessment these new demands of mediating a task with digital technology.

Caroline is running 6 focus group and one thing that students say in all the discussions is that they don't know that this or that tool existed and once they discovered it, they are amazed, and they will use it. They will benefit of having support in that process.

APPENDIX 5: EXTENDED LIST OF EMERGENT CODES OF THE IN-DEPTH STAGE

Not knowing another way than copy and paste
Feeling distrustful towards tools
Feeling afraid of getting it all wrong
Needing support from the lecturer
Feeling confusion with the abundance of resources (don't know what to choose)
Feeling frustrated towards the abundance of tools
Feeling aversion to risk the grades
Feeling aversion with the new stuff (that puts me off)
Lack of understanding of the underlying working of the Web
Lack of understanding of how it all works
Feeling surprised towards new tools
Not understanding the Web (It is not intuitive, it is too complicated, don't get it)
Feeling overwhelmed by the abundance of tools
Feeling there is no need to have more tools
Feeling anxious about where my stuff is
Wanting more awareness regarding digital literacies
Feeling uncomfortable with too many accounts
Choosing the practical thing
Feeling amazed with the possibilities for collaboration
I didn't know this before
Feeling surprise with what I can do with the tools
Feeling frustrated because the web is too scattered
Not making sense of the Web
Feeling safe using the VLE (it is not so big as the Web and I can't break it)
Feeling overwhelmed towards the openness of the Web, I don't understand nothing
Feeling confused with those tools I don't understand
Wary to lose all my information in the cloud
Being suspicious of tools
Aspiring for a better practice

APPENNDIX 6: ASSESSMENT TYPE FOR THE DEFINITE PROGRAMME OF SOME OF THE MODULES OF THE COURSE.

Coursework					Practical Project			Written Examination		
Dissertation	Essay	Journal	Portfolio	Report	Practical Project	Practical skills	Presentation	Written Examination	In-class test (seen)	In-class test (unseen)
	1x						1x			
				1x	1x					
	1x			1x						
	1x				1x					
	1x						1x			
	1x			1x						
				1x		1x				
		1x		1x						
	1x			1x						
				1x		1x				
	1x						1x			
				1x	1x					
	1x				1x					

Coursework					Practical Project			Written Examination		
Dissertation	Essay	Journal	Portfolio	Report	Practical Project	Practical skills	Presentation	Written Examination	In-class test (seen)	In-class test (unseen)
	1x						1x			
				1x	1x					
	1x				1x					
	1x				1x					
	1x						1x			
	1x			1x						
				1x		1x				
		1x		1x						
	1x			1x						
				1x		1x				
				1x			1x			
				1x	1x					
	1x				1x					

Dissertation	Essay	Journal	Portfolio	Report	Practical Project	Practical skills	Presentation	Written Examination	In-class test (seen)	In-class test (unseen)
	1x						1x			
				1x	1x					
	1x				1x					
	1x				1x					
	1x						1x			
	1x			1x						
				1x		1x				
		1x		1x			4			
	1x			1x						
				1x		1x				
				1x			1x			
				1x	1x					
	1x				1x					

APPENDIX 7: MEMO

This focus group was quite shocking for me. In particular there was one participant that seemed so upset but at the same time I felt that she was also very disappointed, her comments were charged with a lot of frustration, she stood up when she was talking, and she raised her voice…she made the impression of someone that is struggling to find her way through the technology. What stroke me was the fact that she, being so young, felt she was the generation that was forgotten…I thought to myself, wow how will then people that are older than he (she is 19 years old) that had not had the social exposure to technology that she had would feel? But I then thought I am falling into the trap I am critiquing. The reality is that people are sometimes clueless when it comes to use technology, and that is what this study is all about. So I am glad that she has been part of my study.

I left the focus group thinking about her initial comment:" I don't understand nothing!" Was that really so? Or was this the product of her frustration? I did ask her what did she mean with 'nothing'? I asked her if she could extend on that aspect so that I can understand what is it that she does not understand. Her comments about a tool that seems so mainstream as Google Docs was the one, she chose to explain how much she struggles to put it to work. But she said something that surprised me even more, namely, that she discovered Google docs 'yesterday', this means that I am assuming something that is not true and it is that there must be so many students that do not have a clue about what tools are out there…I think this is what she was referring to when she said she was the forgotten generation.

In any case, there is lots of work to do in this field!

24th of February 2016

APPENDIX 8: EMOTION AS A GENERATIVE MECHANISMS

This table and the three that follow consist of the initial stage of the process of abduction, whereby I conceptualized each generative mechanism in the study

From themes to generative mechanisms	Potential theoretical meaningful terms/general structures and generative mechanisms
Emotions Confusion, anxiety and fear, and rejection are the negative or conflicting emotions that emerged while students were interacting with digital tools and platforms. These emotions lead students to inaction instead of action, which translates into lack of reflexive engagement with open and participatory tools. The structure from which the emotion emerges is the individual, the student in this case, and they arise in the interaction of students with the practical world, i.e., digital practices in institutional context. The four types of emotions are: • Anxiety/fear • Confusion/ frustration • Excitement • Rejection	• **Archer (2000):** personal emergent powers that emerge from the practical order, when students interact or attempt to interact with O+P tools. Emotions are considered one of the main constituents of individual's inner lives. **They are the fuel of the internal conversation thus of reflexive engagement**. The importance of emotions is central to the thing's individuals care about and to the act of caring itself. Different cluster of **emotions represent commentaries upon our concerns and are emergent from our human relationships with the** natural, **practical** and social **orders of reality**. Being the practical order the one that is relevant for this study. Emotions are intentional, they are about something in the real world. • **Lamb-Book (2016):** emotions are higher-level intentional phenomena that call for non-reductive analysis. Emotions are generative mechanisms **with special tendencies toward action, inaction, and communication**. I will claim this set of motivational dispositions fits how critical realists understand causal powers • **Damasio (1994):** Emotions and feelings. Feelings, along with the emotions they come from, are not a luxury, **they serve as internal guides**, and they help us communicate to others signals that can also guide them. And feelings are neither intangible nor elusive. Contrary to traditional scientific opinion, feelings are just as cognitive as other precepts. They are the result of a most curious physiological arrangement that has turned the brain into the body's captive audience • **Harre and Gillet (1994):** Emotions is not an abstract entity but an actual moment of emotional feelings and display. They have a role in the real-life episodes of individuals. They can be acts of protest, an expression of a judgment and the performance of a social act (p. 147).
Summarising the work of the different authors it can be concluded that emotions are personal emergent causal powers, generative mechanisms that are the fuel of student's internal conversation. They emerge in the intersection of student's interactions with the practical order (material culture/technological infrastructure) of their social reality, i.e., the institutional setting. They are an expression of a judgement, and they serve as internal guides to action or inaction as well as communication. They have a role to play in the life of students.	

Following Archer's (2000) conceptualisation of emotions as well as Lamb-Books (2016), emotions are always intentional, they are about something. Emotions appear as commentaries to our concerns and being real, they have causal powers. ***In sum:*** *Emotions are real causal powers that emerge in students' digital practices that manifest in a tendency that leads to not reflexively engage with digital technologies, more in particular, with open and participatory tools.*

Table 8: Emotions as a generative mechanism

APPENDIX 9: DIGITAL CAPABILITY AS A GENERATIVE MECHANISM

Digital literacies These are all about the understanding, the background knowledge, the know-how students need to have to be able to engage with digital technologies and their concomitant practices. What rule describes this pattern/demi-regularity? What is the pattern?	• **Lankshear and Knobel. (2015** *Nordic Journal):* Literacies as social practices (of reading and writing) that are influenced by people's values, the purpose they are pursuing, and so on (p. 13). People bring to the practices cultural ways of doing things rather and operational techniques. Digital literacies build and mobilise on what the individual know and acquire from their wider cultural participation and affinities. Digital literacies as diverse forms of social practice that emerge, evolve, get transformed into new practices and, in some cases, fade away and get displaced by new forms • **Gourlay, et al. (2014). New Media Literacies (NLS): S**ituated social practices. New forms of literacy emerge, they overlap and compete with pre-existing forms. They accumulate but they also fade away with time. "NLS emphasises informal learning in everyday practices (personal space) embedded in networks of support, and how this relates to formal educational context." • NLS is more concerned with an examination of the range of different ways that participants **make sense of the environment in which they are learning and making meaning.** • **Capability approach**: As the freedom, the option to achieve/pursue a life that is valuable. (Sen, 2003). • Capability approach in the educational context (Walker and Unterhalter, 2007): evaluate freedoms (capabilities) for people to be able **to make decisions they value** and work to **remove obstacles to those freedoms**, that is, expand people's capabilities. • Lawson (2017): Technology as extension of human capabilities. Technological artefacts extend human capabilities but only if the artefacts are positioned in a socio-technical network of interdependencies in the system, that is, in a network of use.
Summarising *Digital capability is a generative mechanism, a causal power that is contextual and relational, it emerges from the interaction of the individual with the practical order -technological infrastructure and the social/cultural structure. Capability is the outcome of the interaction of an individual's capacities, with the social and cultural structures, and the individual's position relative to others, and relative to technological artefacts in that structure. (Smith and Sewer 2009). Thus, the potential of working with capabilities instead of literacies is that capability includes social factors and therefore it has more potential and explanatory power than literacies. The idea of capability includes the reasons and resources provided by the social structure (HEIs) for the realisation of the particular capability. "(…) the external environment consists of social structures with differential causal impacts on individual's internal capabilities depending upon their relative position within that social structure." (Smith and Sewer, P. 225)*	

Table 9: From digital literacies to digital capability as a generative mechanism

APPENDIX 10: STUDENTS' SOCIO-TECHNICAL RELATIONS

Socio-technical system/relations	• Lawson (2017) Tools are the material context for action. Technological infrastructure consists not only of the artefact as such, say WordPress the blog platform, but all the interconnected and supporting elements that need to be in place for the tool to function (hardware, Internet, availability of time, social and technical support, etc.). Using tools is "primarily concerned with identifying objects [tools] with particular capacities and powers and inserting (or enrolling) them into particular networks of social and technical interdependencies."(Lawson, 2008, p. 53)" "(...) artefacts, like people, are organised into totalities or systems within which certain powers and capacities are realised. (...) The incumbent position sets the functions of the tool." (P. 75). The tools receive a positional identity in as much as a lecturer receives a positional identity. An identity is in relation with the position it occupies in the structure. Positioning contributes to the artefact's identity. Henfridsson and Bygstadt (2013) talk about generative mechanisms in tech infrastructure
Needed environment for using tools The positionality of the tool in the socio-technical context of interdependencies is key for enacting the possibility of extending human capabilities through the use of tools. **O+P tools are marginally positioned** in the socio-technical network of interdependencies, and in general in the context of interdependencies of the HE system. The identity of O+P tools is not clear at the institutional level. **VLE is centrally positioned**, not only for matters of teaching and learning but also for administrative tasks. The VLE has an institutional identity **The emergent and dynamic nature of open tools and platforms** produces fleeting, fluid, and unstable constraints that are hard to address by the individual.	
Summarising technological infrastructure *is more than the technology itself but the sociotechnical configurations in which it is embedded. Technologies are the material context for action, in this case they are the tools and platforms and the supporting artefacts and processes that are used to mediate different tasks at university* *The social identity of artefacts shapes how the artefact is positioned in the socio-technical network of interdependencies of the system.* *When tools are still emergent and dynamic the potential for education is not fully understood hence its deployment is still marginal.* *The title of this generative mechanism can be* ***socio-technical relations,*** *this would include the term relations which already are conceptualised as real and causal efficacious, but also the relation between the technical and the social, that is, students and tools, is implicit in the concept as I used it in section 1.2.3. taken from*	

Table 10: Socio-technical relations as a generative mechanism