Technological Partnership in Everyday Life: Exploring The User-Identities of Postgraduate Students in Technology-Related Courses

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Abstract

This study is guided by the underlying assumption that learning takes place through mediated processes. More particularly, learning is facilitated by the tools we use in everyday life. The rise of digital technology has led to new ways of examining and understanding learning as it occurs in both everyday life and across the life course. How one interacts with digital technology is likely to influence one's learning across different domains of life from school to work to leisure.

This dissertation explores the concept of the 'user-identity' to examine the ways individuals interact and make use of digital technology in their everyday lives. User-identities can be conceptualized through the 'digital mindsets' individuals hold towards digital technology, as these in turn shape the 'technological partnerships' they exercise in everyday life. In understanding the identities of individuals as users of digital technology, I argue, we may better understand the ways they learn with these technologies through everyday activities and processes with digital technology.

Using this innovative theoretical concept, I explore the user-identities of 18 postgraduate students in technology-related courses through semi-structured interviews. User-identities expressed by participants demonstrate that these were significantly influenced by their educational and occupational pathways, where digital technology were likely to play a formal part of their learning. The study also suggests that user-identities are shaped over time across an individual's wider learning life with digital technology and these develop across trajectories (education and occupational), identities (everyday users and specialists), and contexts (informal and formal) for learning and using digital technology.

With the increasing number of affordances in everyday life, users are given more flexibility and freedom over their technological activities. New ways of examining individual interactions with digital technology must be developed, as these now shape not only learning outcomes but also other life chances. I end with a recommendation of user-identities as an analytic concept for future learning and technology research. Such a concept may also be relevant in other fields such as new media research and digital sociology.

Contents

Introduction

This dissertation can broadly be placed within the sociocultural bases for examining and understanding learning. More specifically, it focuses on the *mediated* character of learning, thinking, and acting in everyday life (Wertsch, 1991, 1998). With the rise of digital technologies, human beings are now afforded with new ways of thinking and doing. As digital technologies reshape everyday social practices, they also transform the learning processes behind these activities and processes they facilitate. In order to understand how individuals learn in everyday life contexts, therefore, we must explore the ways they engage and interact with the tools they use (Vygotsky, 1978).

The specific nature of my investigation began with a personal inquiry towards the ways individuals make use of digital technologies in their own unique ways in everyday life. With the rise of multifunctional and affordance-rich digital technologies, individuals make use of digital technologies in increasingly idiosyncratic ways. This prompted me to reflect on my own use of digital technology and the ways I appropriate and domesticate digital technology in my own life. What digital technologies *mean* to me, I considered, are likely to be different from how my mother, sister, or best friend make sense of digital technologies in their own lives. In addition, what I use digital technologies *for*, as a result, are likely to be distinctly my own as well as shaped by my own individual needs and circumstances for using digital technology.

Exploring the literature, I noticed that few attempts had been made in the field of learning and technology to examine the ways in which individuals appropriate digital technology in unique ways in their own everyday lives. Goode (2010) explored the concept of a 'technology identity' to explore the individualized ways people used digital technology with the aim of shedding light on digital inequalities. I argue that the field of learning and technology may benefit from such concepts similar to that of technology identity. By exploring the identities of individuals as users of digital technology, we may examine the ways individuals are likely to interact and engage with digital technology. In doing so, researchers may have a better understanding of the motivations held by individuals towards learning and using digital technologies in their everyday lives.

Taking into consideration the paucity of theoretical frameworks in the field of learning and technology (Oliver, 2013), I established my own analytic concept to explore the ways individuals engage with digital technologies in their own idiosyncratic ways: 'user-identity'. Here, the linguistic shift from a 'technology' identity is intentional. As digital technologies become more ubiquitous in everyday life, increasingly becoming more and more multifunctional in nature, users are increasingly offered more flexibility and choice over their technologically-mediated practices and activities (Bakardjieva, 2005). As such, the concept of 'user-identity' allows us to conceptualize individual users as agentic and intentional agents, who appropriate digital technologies in goal-oriented ways for their own individual pursuits. By the same token, the user-identity emphasizes the socio-culturally mediated nature of learning (Wertsch, 1991, 1993) – that learning takes place through the psychological and technical tools we 'use' in our everyday lives which enable and facilitate our everyday activities (Vygotsky, 1978).

This dissertation sets out with the following aims: firstly, to establish the concept of user-identities in a rigorous and theoretical manner, by drawing on the sociocultural perspective as well as other related research in the field of learning and technology; secondly, to apply the concept of user-identities in an empirical and exploratory study of user-identities. In doing so, it aims to make a theoretical and methodological contribution to the study of learning and technology by developing a new analytic concept for understanding learners as users of technology. It also aims to make a substantive contribution to the understanding of the ways postgraduate-students in technology-related courses, whose user-identities I explore in this study, construct meaning around their user-identities as these are shaped over their wider 'learning lives' (Sefton-Green & Erstad, 2017) with digital technology.

The structure of this dissertation is as follows. Chapter 1 (Review of Related Literature) aims to establish the 'user-identity' as a formidable theoretical concept for understanding one's engagements and interactions with digital technology. I also introduce the research questions of the study as well as the group whose user-identities I explore in my research. In Chapter 2 (Methodology), I explain the overall research design of this study, as guided by its overarching constructivist position. Chapter 3 (Findings) showcases two groups who emerged from the study, whose user-identities were significantly shaped by their learning pathways with digital technology. In

Chapter 4 (Discussion), I discuss the ways our understanding of user-identities may be enriched by examining the learning lives of individuals, from where their user-identities are likely to emerge, as these were reflected by both groups in the study. I also examine their user-identities more in-depth and discuss what implications these may have for users of digital technology in the 21st century. Finally, Chapter 5 (Conclusion) summarizes the overall research endeavour and offers recommendations for future research which apply the concept of user-identities as an analytic lens in learning and technology.

Chapter 1 – Review of Related Literature

A. Learning as Mediated Process

Learning research has been conducted through a number of perspectives on what learning is and what counts as learning (Oliver, 2013). There have been different ways of conceptualizing the relationship between learning and acting in everyday life. On the one hand, analysing learning has been rooted in *empiricist* conceptions of learning (Schunk, 1991). These often imply that learning occurs through 'sense impressions' from one's external environment (ibid). This position is often linked to realism, which posits that knowledge is independent of people and therefore of an objective character (ibid). Most popularly linked to empiricism and realism is the behaviourist model of learning, where the hallmark model is the performance or expression of new behaviours induced through external stimuli (Watson, 1924).

On the other hand, the study of learning has also had *nativist* tendencies towards the conceptualization of the learning process (Säljö, 1999). Such approaches suggest that learning is the unfolding of our inherent capacities and that it is the role of our external surroundings (the school, our communities, or other resources) to bring out these potentials through psychological stimulation (Harasim, 2017). The nativist view is also often associated with idealism (Schunk, 1991), which posits that knowledge is distinct from reality itself and only exists in the form of abstract representations of the mind. One popular example of such perspectives on learning is the cognitivist view, particularly with its emphasis on 'schemas' of the mind as well as 'storing' and 'processing' information (Harasim, 2017). Here, behaving is seen as a matter of applying abstract knowledge onto one's practical environment.

My research is grounded on the *sociocultural* bases for examining learning and activity in everyday life, which argue that both of the aforementioned ways of conceptualizing learning neglect the socio-culturally mediated character of learning, thinking, and acting (Wertsch, 1993; Vygotsky, 1978). The sociocultural perspective argues that learning and activity are based on and facilitated by the sociocultural tools we use which mediated these processes, rather than being based on objective realities or intrinsic capacities alone. As beings who are 'uniquely endowed with consciousness and intentionality' (Disco, 2005, p. 30), we navigate our environments through the

tools we are afforded and these enable us to learn and manage our activities in everyday life (Vygotsky, 1978).

B. Cultural-Historical Perspective

Säljö (1999) argues that 'learning is not only inside the person, but in his or her ability to use a particular set of tools in productive ways and for particular purposes' (p. 147). In order to understand the learning process, therefore, one must examine the ways individuals engage with these tools. Wertsch (1993) argues that human beings 'cannot be reduced further than that of "individual(s)-operating-with-mediational means"' (p. 170). Learning, intelligent thought, and action are therefore facilitated through mediational means afforded to us by our environments (Daniels, 2008; Werstch, 1993, 1998). According to Vygotsky (1978), these tools may be psychological or intellectual (for example, when one learns new formulas to solve maths problems) or they may also be physical or technical (learning to use the Internet to find a piece of information). These means are not only socially and culturally constructed, they are also historical in nature (Vygotsky, 1978). For this reason, the sociocultural perspective is also referred to as the cultural-historical approach to learning (ibid).

According to this perspective, individuals learn and develop by using different tools which enable them to do different things in various everyday life contexts. As technical and psychological tools have developed over the course of human history and civilization, the possibilities for cognition and intelligent human activity have also transformed (Wertsch, 1993). The ability to write with pen and paper, for example, have transformed the ways learning, schooling, and intellectual activity have been delivered. Similarly, the rise of laptops, smartphones, tablets, and the Internet today continue to change what it means to learn and be learned in the 21st century (Facer, 2011; Pullen & Cole, 2010). As such, learning processes are shaped by the qualities of the sociocultural and sociotechnical milieu in which they take place.

Human activity can be seen as a dualism between action and mental processes (learning), which are enabled and mediated by sociocultural and historically situated tools (Daniels, 2008; Wertsch, 1991; Wertsch, 1993). Learning, according to Wertsch (1998), is the 'mastery' and 'appropriation' of psychological and technical tools afforded by one's environment. In other words, it is the individuals attempt to equip herself with 'tools for thinking' and 'tools for acting' (Wertsch, 1991) in everyday life

(Säljö 1999). The qualities of the tool shape the nature of mastery needed by the individual in order to appropriate it for herself. Writing with pen and paper, typing on a word processor, or creating a multimodal text, for example, all entail very different learning processes and masteries over different tools (Pullen & Cole, 2010), yet they may all have similar objectives of constructing a message for an audience. It can be argued therefore that the study of learning cannot be separated from the ways individuals make use of tools in their everyday lives, as tools shape human cognition as well as the possibilities for action in a socially-culturally mediated and historically situated world (Daniels, 2008; Vygotsky, 1978).

C. New Ways of Examining Learning

As the cultural and material artifices of everyday life change in the 21st century, there has been increasing interest in the conceptualization and theorization of what it means to learn and be learned in the Digital Age. Prensky (2011), for example, argues that intellectual activity is based on one's ability to exercise 'digital wisdom' 'in the way he or she accesses the power of digital enhancements to complement innate abilities and in the way in which he or she uses enhancements to facilitate wiser decision making.' (p. 20). Siemens (2005), on the other hand, argues that in digital times it is an individual's ability to form connections between nodes and networks of information in strategic ways that is key to exercising knowledge. Meanwhile, Pea (1997) provides a framework for understanding learning as systems of activity between individuals and the tools he or she uses in everyday life. Here, knowledge is seen to be manifest in activity systems, emphasizing the 'distributed cognition' shared between the agent and the artefacts they appropriate.

While each perspective offers a slightly different way conceptualizing learning and knowledge, they are similar in that they all emerge out of a sensitivity to the characteristics and qualities of digital technologies in relation to the things they afford the individual. Similarly, they all make assumptions about the ways learners must 'master and appropriate the mediational means offered by their surrounding environments (Bakardjieva, 2005, p. 27)'. As such, they consider the ways digital technologies have 'remediate(d) the structure of how we act' (Crook, 2013, p. 10), as these have in turn shaped the processes of learning and what it means to be learned in today's sociotechnical milieu. Examining learning, therefore, entails an analysis of the

sociotechnical characteristics of a certain sociocultural milieu in which learning takes place. For us to understand learning, we must examine the conditions in which it takes place.

The 'Digital Age' is often cited as a disruptive era (Gere, 2008), characterized by unprecedented changes in everyday life. It is often described and examined in relation to its 'networking logic' (Castells, 1996, 2004), made possible by the Internet and the World Wide Web (Bunz & Meikle, 2017). Selwyn (2011) describes this as 'the interconnection of people, objects, organizations, and information regardless of space, time, and place.' (p. 15) Here, systems of exchange are described as no longer being 'one-to-one' but now 'many-to-many' (O'Reilly, 2005). This networking logic has refashioned human activity in considerable ways, resulting in new forms of social practice which include instant messaging, file-sharing, blogging, e-learning, online business, and so on.

Digital technologies are distinct from their predecessors as they are characterized by a 'convergence' of pre-existing media, where they now enable the same things as print, radio, television, and computing (Jenkins, 2006; Stone & Schowen, 2010). This makes digital technology highly 'multifunctional' in character (Selwyn, 2011). As a result, 'mastering' digital technology by an individual is much more complex and multifaceted than previous analogue technology or tools. As digital technology facilitate more and more activities, they also facilitate a wider variety of learning processes (Mehlenbacher, 2010; Pullen & Cole, 2010). Convergence also leads to the blurring of lines between digital technology, as they increasingly begin to offer similar affordances with one another. For example, a smartphone may now be used for the same tasks as a tablet or laptop. While they may have slightly different affordances, these differences are less apparent than, let's say, a book and a bicycle.

Not only are digital technologies hailed for their powerful and wide affordances, they are also often cited for their 'ubiquitous' presence in everyday life (Bunz & Meikle, 2017; Selwyn, 2011). The pervasiveness of digital technologies, according to Bolter and Grusin (1999), results in the 'digital remediation' of everyday life. Digital technologies are seen to reconfigure, reshape, and remediate most social practices and processes, if not all (ibid). From the home to the school to work, digital technologies are reshaping everyday social practices in significant ways.

As they reconfigure the contours of everyday activity, they also in turn reshape the processes of learning that take place across various facets of daily life (Mehlenbacher, 2010). According to Mehlenbacher (2010), the rise of digital technologies have resulted in a convergence of the 'learning worlds' of work, education, and leisure. While learning has traditionally been considered distinct across these domains, they have now become increasingly integrated with one another through digital technology.

Not only does it transform learning processes in everyday life, it also reshapes the ways individual learn and are expected to learn over the life course. Individuals are now expected to be 'life-long' learners (Edwards, 2009) alongside digital technology, as these serve as catalysts for new forms of learning and activity across various domains of life (Mehlenbacher, 2010). As digital technologies increasingly become the bases for everyday social practice, individuals must continuously learn and master these technologies, developing the necessary skills, literacies, competencies, attitudes, and dispositions necessary to appropriate them (Cope & Kalantzis, 2000). Erstad (2013) argues that the pervasiveness of digital technologies in everyday culture in the 21st century allows us to analyse individual learning through a 'learning lives' approach, where digital technology 'becomes the catalyst for exploring learning as life-deep (studying identity processes), life-wide (studying learners across contexts), and life-long (studying learning as trajectories and timescales)' (p 1).

In shaping everyday social practices and processes, digital technologies become valuable loci for examining learning as it takes place in everyday life and across the life course through various forms of digitally-mediated activity exercised by the individual. Digital technologies serve as powerful catalysts for understanding both learning processes and the learner. As these technologies increasingly become the baseline for human activity and social practice in the 21st century (Bell, 1973), and are seen to continue to do so in years to come (Facer, 2011), we must develop new ways of examining and understanding the individual learner as a user of all these technology she is afforded.

D. Users and Digital Technology

Given the increasing multifunctionality of digital technologies, individuals are handed greater 'user-agency' and choice over their technological decisions

(Bakardjieva, 2005). As Selwyn (2011) argues, 'digital technologies and practices are seen to give more control and flexibility to the individuals who use them. (p. 12)' This enables individuals to appropriate digital technologies in highly individualized and unique ways, according to their needs, circumstances, dispositions, and motivations. The processes of learning and mastering digital technology are therefore highly distinct for different users of digital technology.

As digital technologies now reshape everyday social practice in many ways, these differential ways of appropriating digital technology now have implications for both learning and life outcomes across the life course (Bakardjieva, 2005, Erstad, 2013). In contrast to broadcast media, where users are likely to be *passive* recipients of information, with digital media individuals are more likely to be *active* users of these media, applying these in various domains of their lives in intentional ways (Horkheimer & Adorno, 1972; Bakardjieva, 2005).

Where learning in everyday life takes place through problem-solving activity (Rogoff & Lave, 1984), and digital technologies provide the mediational means to facilitate and deliver such processes (Wertsch, 1998), one must examine the ways individuals use digital technologies in goal-oriented ways and intentional ways (ibid). As such, there is a need to understand how the individual user makes sense of and use digital technology in her own everyday life.

According to Pinch and Bijker (1986), digital technologies have a rich 'interpretive flexibility'. This emerges as a result of their multifunctional affordances (Jenkins, 2006). This allows individuals to construct distinct functions, properties, or interpretations around digital technology (ibid). Thus, to understand the ways individuals interact with digital technologies, one must examine the unique and idiosyncratic meanings individuals construct around the digital technologies they appropriate in everyday life (MacKenzie & Wajcman, 1985). These meanings and 'subjective understandings' (Seidman, 2006, p. 10) serve as contexts and bases for acting and behaving with the technologies they use.

While acknowledging that digital technologies are socially-shaped, it is also important to point out that they also possess inherent qualities (Feenberg, 1995). These intrinsic properties may enable or constrain individual action and activity in considerable ways (Feenberg, 1991, 1999), depending on the nature of the user and the technological artefact. Technological affordances, according to MacKenzie et al.

(2017) refer to the 'the objective features of technologies [which] constrain the meaning and possible uses of technological artefacts. (p. 735)'. Therefore, while individuals are able to construct meaning their own unique meanings around digital technology, these are likely to be circumscribed within the horizon of possible meanings afforded by the inherent qualities of digital technologies (Gibson, 1979).

What individuals use digital technologies for, therefore, are based on the individual and subjective ways they appropriate digital technology in their own everyday lives as well as the inherent properties of digital technologies. In order to understand the ways in which learning processes are facilitated by one's engagement with digital technology, I argue, we must understand the ways they make use of digital technology. Goode (2010) stresses the need to examine one's 'beliefs about one's technology skills, beliefs about opportunities and constraints to use technology, beliefs about the importance of technology, and beliefs about one's own motivation to learn more about technology.' (p. 498). One's technology 'identity', she argues, can directly influence the ways individuals make use of digital technology (Goode, 2010).

In order to understand the ways individuals learn and master digital technology in their everyday lives, we must examine the ways in which they are likely to make sense of and engage with digital technology. Learning and technology research has yet to explore the possibilities of a technology 'identity' in understanding the ways individuals use digital technology for various means in everyday life.

E. Researching User-Identities: A New Analytic Lens

Taking these areas of research into account, I developed my own analytic concept which enables us to examine the ways individuals interact with digital technology in everyday life: 'user-identities'. Here, the linguistic change from a 'technology' identity is intentional. As digital technologies become more ubiquitous in everyday life and their affordances continue to increase, users are increasingly offered more technological choices and freedom over their technologically-mediated practices and activities (Bakardjieva, 2005). User-identities therefore allows us to conceptualize the individual user as agentic and intentional agents who appropriate digital technologies in goal-oriented ways for their own individual pursuits. Aligning this concept with sociocultural theories of learning (Wertsch, 1991), the concept also highlights the mediated nature of learning – that learning takes place through the

psychological and technical tools we 'use' in our everyday lives which enable and facilitate human activity (Vygotsky, 1978).

The goal of the user-identity concept is to examine the recurring ways in which individuals are likely to engage with digital technologies, as the mediational means for thinking, learning, and acting in the 21st century (Wertsch, 1993). Like Gee (2001), who argues the core-identities are likely to 'holds more uniformly […] across contexts. (p. 99)', user-identities refer to the relatively stable ways of thinking and acting with digital technologies across various contexts. As such, they draw on the wider frames of reference individuals hold towards digital technology as well as their use of digital technology in various domains of everyday life. These include their wider beliefs and attitudes towards digital technology, which include what they think digital technology *are* and *can do* for them (Goode, 2010).

With that in mind, I have developed the concept of user-identities in relation to two sub-concepts. I have used these concepts to capture the fundamental dualism between mental processes (learning) and socioculturally-mediated activities (Daniels, 2008). Drawing on previous research, user-identities can be explored by looking at the *digital mindsets* (meanings) (Tour, 2015) individuals hold towards digital technologies, as these in turn shape the *technological partnerships* (activities) (Salomon et al., 1991) they use digital technologies for (See Figure 1.). I explain each concept in more detail below.

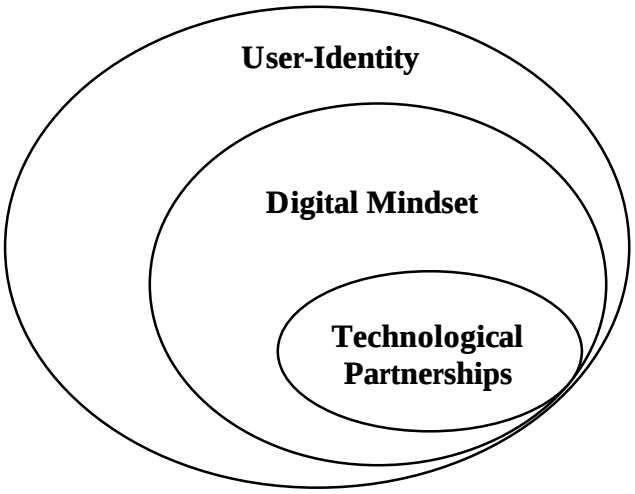

Figure 1. User-Identity Framework

Digital Mindsets

We may first conceptualize user-identities as being based on the mindsets individuals hold towards digital technologies. The concept of 'digital mindsets' is helpful in understanding the ways individuals construct meaning around digital technologies in everyday life contexts. I derive this concept from Tour (2015), who explored the ways in which teachers' adoption and use of digital technology in everyday life influenced their use of technology in the classroom. The study revealed that how teachers used and learned with digital technologies in their wider life contexts played a significant role in shaping the ways such technologies were used and applied for pedagogical purposes in the classroom. According to Tour (2015), the digital mindset 'comprised the assumptions about affordances of digital technologies which inclined the participants to use technologies in particular ways across various domains. (p.134)'.

These mindsets are shaped by the meanings individuals construct around digital technology in everyday life, in relation to the affordances they are able to perceive and realize, with regard to the various domains of everyday life where they find these relevant. Drawing on Lankshear and Knobel's (2006) original concept, Tour (2015) refer to mindsets as 'sets of assumptions, beliefs, values, and ways of doing things that orient us toward what we experience and incline us to understand and respond in some ways more than others' (p. 31). The notion of mindsets therefore provides a conceptual lens for examining the unique frames of reference held by individuals towards digital technology in everyday life. In revealing the meanings individuals construct around digital technology, mindsets offer a basis for understanding the ways individuals interact and engage with digital technologies in various everyday life contexts. These digital mindsets shape the forms of 'technological partnerships' individuals realize and exercise in their lives.

Technological Partnerships

I derive the concept of 'technological partnership' from Salomon et al. (1991), who refer to our use of tools and technologies as 'partners in cognition'. Applying the concept of technological partnerships allow us to conceptualize the ways individuals appropriate digital technology, as they use them in intentional and goal-oriented ways. Technological partnerships can be conceptualized as 'the influence of intelligent

technologies on human intellectual performance and activity' (Salomon et al., 1991, p. 2), where tools 'assume part of the intellectual burden (Salomon et al., 1991, p. 3)' of activity in everyday life. Drawing on Ellul (1964), Salomon et al. (1991) argue that there are two ways in which we may conceptualize technological partnerships, in relation to the roles machines play in our everyday lives: 'machines that work for us and machines that we work with (p. 3)'. The former include computer processors, fitness trackers, timers, and so on, as they do not require active participation on the part of the user and therefore *automate* work for us in some way. The latter include word processors, search engines, email, online banking, and so on, as they require some form of active participation on the part of the user and therefore we 'work with them' (ibid).

Given the wide variety of digital technologies now available, from the Internet to computers to laptops to tablets to smartphones to smartwatches, and the rich affordances they offer, users are given a plethora of possibilities and options learn and enact distinct forms of technological partnership in daily life. In complex societies (Hannerz, 1992), individuals are no longer expected to learn and master all the tools they are afforded. With digital technologies, individuals are given the flexibility to exercise distinct and individualized forms of technology partnerships due to their rich multifunctional affordances (Selwyn, 2011) and interpretive flexibility (Pinch and Bijker, 1987). These vary not only depending on the individuals needs and preferences but also her ability to master the digital technologies she makes use of which may now vary considerably from individual to individual (van Dijk, 2005). In order to understand one's user-identity, therefore, one must examine the qualities and forms of technological partnerships that are realized and enacted by the individual across various domains of life.

User Identities

User-identities therefore serve as a useful analytic lens for analysing the ways individuals interact and engage with digital technologies in their everyday lives. The concept of user-identity seeks to examine the ways individuals construct meaning around digital technology by exploring the *digital mindsets* individuals hold towards digital technologies. Digital mindsets help us understand what causes the individual to interact and engage with digital technologies across different contexts. As such, not

only do they shape the ways individuals are likely to learn and master digital technology, they also shape the forms of *technological partnerships* individuals are likely to exercise. Technological partnerships are not static as they are constantly learnt by the individual and as such are developed over time. They are dependent on the individuals needs and circumstances, which may change and vary across time and space, but more importantly, they are based on the individual's mastery of the tool appropriated.

This dissertation seeks to apply the concept of user-identities to explore the ways individuals interact, engage, and learn with digital technologies in unique and idiosyncratic ways. In the next section of this chapter, I set the empirical basis for conducting research on user-identities, introduce the group whose user-identities I explore, and establish the research aims and questions of this study, as these guide the overall investigation moving forward.

F. Exploring the User-Identities of Postgraduates in Technology-Related Courses

Research on the ways meaning is constructed around technology in everyday life often focus on particular devices (phones, laptops, the Internet), while often being localized to specific contexts, such as the home (Bakardjieva, 2005), school (Tour, 2015), or work (Marks and Scholarios, 2007). Research is yet to explore the ways in which individuals, as *users* of technologies in their own everyday lives, construct meaning and make use of 'digital technology', as the wide range of mediational means in everyday life that offer new possibilities for learning, acting, and thinking in the 21st century (Wertsch, 1993).

From an analytic point of view, maintaining the broadness of the concept of 'digital technology', as opposed to limiting it to a specific artefact or context, is fundamental if we are to understand the ways these individuals construct meaning around 'digital technology', as the wide repertoire of material artefacts used to facilitate the operations of daily life (Wertsch, 1993). The 'convergent' character of digital technologies also enables us to analyse one's relationship with digital technology, not in terms of specific artefacts or affordances, but as the *collective* means and set of resources for thinking and acting in everyday life.

While the concept of a user-identity may be applicable to any user of digital technology, an obvious group for exploring this concept are those whose own identities

are already likely to strongly involve the use or application of digital technologies in some way[1]. Here, I am not referring to the 'ordinary user' of digital technology (although this would be an interesting group of study on its own) but rather those whose own educational, occupational, or professional trajectories have included the study, application, or mastery of digital technology.

In this dissertation, I explore the user-identities of postgraduate students in technology-related courses. Studies show that those who work closely with technologies on a regular basis are likely to grow and attachment towards these technologies (Marks and Lockyer, 2004; Marks and Scholarios, 2007). As such, I have chosen this group as they are theoretically more likely to have a strong sense of user-identity, as they have developed some form of deeper meaning towards digital technology over time.

Similarly, these individuals are likely to hold some personal stake with digital technology beyond their own immediate needs in everyday life, such as that of a formal interest or professional requirement (Bridgstock, 2009), or that which gives them an additional incentive for learning about and mastering technology that is uncharacteristic of the ordinary user. As technological advancements are likely to play a significant role in the progression and development of their occupational careers, these individuals are therefore more likely to be continuously learning about technology or its properties across different learning contexts of their lives. As such, they may also be considered 'specialists' of digital technology in their own right.

For these individuals, learning with and about digital technology is likely to be part of a wider pre-existing trajectory or interest in mastering digital technology in some way. Deciding to undertake postgraduate study may be based on a desire to enhance or develop a pre-existing trajectory, having already pursued a similar field or craft, either professionally or academically, at some level (Candy and Crebert, 1991). For others, it is based on a newfound interest or desire to specialize in a certain area, where undertaking postgraduate study entails some element of retraining or preparation for the professions or industries they would like to pursue (ibid).

As such, in order to examine the user-identities of these individuals we must

[1] **It is important at this point to distinguish between an identity and a user-identity. While identity serves as a wider all-encompassing concept, user-identities focus on the meanings and activities of individuals, specifically in relation to their use of digital technologies in everyday life.**

also understand their wider trajectories with digital technologies and the roles digital technologies play in these learning pathways (Erstad, 2013). As Erstad (2013) argues, identities can be seen as the learning pathways individuals take, as they 'traverse and interweave different contexts' (p. 151) through their digitally-mediated positioning practices. For these individuals, digital technologies can be seen to play a significant part of the 'learning lives' (Sefton-Green & Erstad, 2017), where they serve not only as tools for thinking and acting in everyday life but also the formal object of one's learning.

As such, user-identities are not fixed or set ways of appropriating digital technology; rather, they are continuously emerging ways of interacting with digital technology, which results from one's previous exposure, experiences, and learning of digital technology. In order to understand their user-identities, therefore, we must examine the ways these individuals developed distinct forms of mastery over digital technology over time across different contexts for learning and using digital technology. How postgraduate students in technology-related courses construct meaning around their user-identities are therefore likely to be shaped by the character of their learning pathways with digital technology (Biesta & Tedder, 2007).

From a methodological standpoint, examining the user-identities of postgraduates in technology-related courses therefore entails a two-fold task. Firstly, it entails an examination of their user-identities are they are constructed by the individual at the time and place in which they are explored by the researcher. Secondly, in order to have a richer understanding of this, we must investigate the learning pathways of these individuals with digital technology, from where their user-identities are likely to have developed and emerged over time.

With this in mind, the following research aim is set as: *to explore the user-identities of postgraduate students in technology-related fields.* In exploring the user-identities of these individuals, the following research questions seek to be answered:

1) **What are the qualities of their user identities?**
2) **How are these user-identities shaped by their learning pathways with digital technology?**

In doing so, this study aims to make a theoretical contribution to the field of learning and technology, by exploring the concept of 'user-identity' as an analytic lens for understanding the ways individuals learn and interact with digital technology in everyday life. It also aims to make a substantive contribution by examining the ways postgraduate students in technology-related courses construct meaning around their own user-identities, as these are shaped by their wider learning pathways with digital technology.

Chapter 2 – Methodology

A. Research Design

This research is underpinned by a constructivist philosophy, which posits that realities are 'self-created' (Guba & Lincoln, 1985, p. 73) and that 'multiple realities exist and are dependent on the individual' (Guba & Lincoln, 2005, p. 102). This ontological philosophy lends itself naturally to the research aim of this study, which aims to explore user-identities of individuals, as they construct meaning around their everyday use and appropriation of digital technology, as shaped not only by their everyday needs but also their wider learning pathways with technology. This study uses semi-structured face to face interviews with 18 postgraduate students in technology-related fields (specifically, computer science, internet studies, and education and technology) from a mid-sized elite university in the Southeast of England. Interviews lasted for an average of 67 minutes, with the shortest interview being 40 minutes and the longest one 90 minutes. All interviews were audio-recorded and subsequently fully transcribed by the researcher. An interpretivist position (Preissle, 2006) was taken in analysing the data, where the analysis was conducted through a grounded theory approach (open coding, axial coding, and selective coding) (Corbin & Strauss, 1990), in order to examine the salient characteristics of the user-identities of participants.

B. Sample

For academic researchers seeking to explore the identities of individuals, in relation to particular occupational or professional backgrounds, postgraduate communities offer an interesting context for research, as they provide a specific point of access to diverse groups of individuals with similar occupational interests (at the bare minimum, that of pursuing the same postgraduate degree), who would otherwise have varied points of contact or dispersed geographic locations. In my case, the postgraduate communities of students in technology-related fields offered a convenient starting point for conducting my own research, which aimed to explore the user-identities of individuals specializing in various fields of technology, whose learning pathways were likely to include some aspect of learning digital technology at a formal level. These communities provided me with access to individuals with varying

disciplinary affiliations as well approaches and points of view towards digital technology, which proved to be fundamental to the exploratory nature of my research.

Purposive sampling **(Kuzel, 1992; Morse, 1989) is a technique often used by qualitative researchers, as it allows the researcher to carefully select participants based on the opportunities they afford the researcher in uncovering or exploring the social phenomenon under investigation (Miles & Huberman, 1994). This sampling strategy, Bryman (2012) notes, requires that the researcher 'establishes criteria concerning the kinds of cases needed to address the research questions, identifies appropriate cases, and then samples from those cases that have been identified.' (p. 422). Consequently, participants in this study were selected purposively on the basis that these individuals were enrolled in postgraduate courses that directly involved or engaged with digital technologies at some level. Only postgraduate programmes that were likely to give participants a formal and deeper understanding of digital technology were included. These programmes either tackled digital technology as an object of analysis and study in itself (i.e. Internet Studies) or were considered to be inherently related or relevant to digital technology in some way (i.e. Computer Science). That these individuals decided to enrol in a postgraduate program specifically related to digital technologies also ensured that digital technology was likely to play some form of deeper significance in these individuals' wider learning trajectories as well as sense of occupational identity. Sampling was therefore conducted on 'conceptual grounds' (Miles & Huberman, 1994, p. 29), with the overarching objective of exploring the user-identities of individuals specializing in technology-related fields, who were likely to pursue or already have pursued technology careers.**

While the premise for sampling was set purposively at the onset of the research, the process of recruiting participants reflected characteristics of ***snowball sampling*** **(Patton, 1990). While the researcher initially recruited participants through personal means, by locating participants whose descriptions matched the basis for sampling on the public profile pages available on the departmental websites of the university, succeeding participants were later recruited through recommendations made by previous participants whom they believed were likely to be relevant or interested in participating in the study. Based on these recommendations, the researcher then carefully selected succeeding participants as appropriate and relevant to the sampling criteria, while also considering the balance of occupational backgrounds and areas of**

interest in technology reflected in the sample. Ultimately, the final sample consisted of 18 postgraduate students, enrolled in either Master's or PhD programmes, across three fields of study: Computer Science (8), Internet Studies (5), and Education and Technology (5). Out of the 18 postgraduates who took part, 10 participants were male and 8 participants were female. All participants were in their early twenties to early thirties. Participants came from a wide variety of ethnic and cultural backgrounds, with around 10 nationalities represented in the sample (British, American, Irish, Polish, Dutch, German, Finnish, Chinese, Brazilian). No specific nationality or ethnic group was overrepresented in the sample.

While the participants may be categorized conceptually in relation to the three fields of study that each participant specialized in (Computer Science, Internet Studies, and Education and Technology), it should be noted that a great deal of variation was evident from participant to participant, in relation to their specific interest in technology, across and within these fields of study. Each participant had a distinct occupational focus on digital technology, therefore resulting in different inclinations towards their programme of study. A wide variety of backgrounds included that of law, politics, psychology, education, journalism, business, software engineering, cybersecurity, artificial intelligence, machine learning, and so on. This had implications for the nature of their formal learning and approach to digital technology, which ranged from highly conceptual and theoretical for some (such as applying political or sociological theory to digital technology) to more applied and technical for others (such as programming, software development, and hacking). Fundamentally, however, all participants regarded digital technology as an integral part of their formal learning pathways and occupational identities, with most, if not all, desiring a professional career that directly involved or focused on digital technologies, had they not already had one prior to undertaking postgraduate studies.

C. Data-Gathering

Interviews are generally regarded as effective tools in exploring the 'subjective understandings' (Schutz, 1967) of individuals. These include the perceptions, meanings, identities, and narratives constructed by individuals around their everyday lives and wider life trajectories (Kvale, 2015; Mishler, 1991; Tracy, 2013). These subjective understandings, Seidman (2006) argues, are useful in uncovering the

contexts behind the behaviours of individuals. Given the aim of this research to explore the user-identities of individuals, which entails a specific focus on the ways individuals perceive as well as conceptualize technological affordances, and the meanings they construct around technological partnership as they realize variations of these in everyday life, the interview method lent itself naturally to the core of this research.

Semi-structured **interviews, otherwise referred to as qualitative interviewing (Warren, 2002), are often used by qualitative researchers in research underpinned by constructivist philosophies (Lincoln & Guba, 2013). The strength of the semi-structured interview lies in its ability to allow the researcher to explore the specific social phenomenon under investigation (user-identities), while allowing the participant to respond in relation to her own specific frame of reference (Brinkmann, 2013; Rossman & Rallis, 2012). Consequently, data-gathering was conducted through semi-structured interviews with each participant of the study. This entailed an in-depth face to face discussion, which aimed to explore the user-identities of each participant, and lasted for an average of 67 minutes across the 18 interviews conducted. The shortest interview lasted for approximately 40 minutes, with the longest around 90 minutes. All interviews took place within the grounds of the university where all participants were enrolled as postgraduate students. Interviews took place at a time and place mutually agreed upon by both participant and researcher, as reasonably convenient to both parties. Most interviews took place at a university-café, as per the suggestion of the researcher at the initial call for participation. A few interviews took place in other communal spaces or in meeting rooms around the university, as requested by the participant. All interviews were audio-recorded and subsequently fully transcribed by the researcher.**

An interview schedule was prepared by the researcher prior to formal data-gathering, in order to specify and refine the specific areas of inquiry necessary to deliver the overarching aims of the research. Three separate pilot studies were conducted with individual participants in order to assess and evaluate the effectiveness and strength of the schedule, where specific modifications to the schedule were made after the first pilot. With no significant revisions made to the schedule after the second and third pilot studies, both participants were later included in the final study (with consent requested for by the researcher and given by the participants retrospectively), granted they had already fit the criteria for sampling set by the researcher. The final areas of

inquiry covered by the schedule included the following (see Appendix A for a copy of the interview schedule):

> **1) Learning pathways – this served to contextualize the participant backgrounds, positioning the role of technology across his or her wider learning trajectory. It also explored motivations behind pursuing the specific postgraduate programme taken.**
>
> **2) The use of digital technology in everyday life – this explored the various digital technologies used by the individual on a regular basis, as well as their primary motivations for using digital technology and the Internet, providing a backdrop for technological partnership in the everyday lives of participants.**
>
> **3) The impacts of their formal learning on the use of technology in everyday life – moving beyond descriptive questions, this forced participants to think about the ways their own formal learning and understanding of technology affected their own conception of technology in daily life (if any).**
>
> **4) User-identities – on a more abstract level, participants were asked to actively reflect on the ways they use technologies in everyday life, characterising this use, while considering the areas previously discussed. These included key questions such as: 'How would you describe yourself as a user of technology?' 'In what ways would you consider yourself different from the ordinary or average user of technology'? 'What do you see in technology that others do not?' These often captured salient characteristics of their user-identities.**

This schedule was loosely followed during the actual conduct of the interview. Following Brinkmann (2013), semi-structured interviews allow 'much more leeway for following up on whatever angles are deemed important by the interviewee. (p. 21)'. Flexibility was given to accommodate each participant's unique frame of reference, restructuring and refocusing aspects of the schedule as necessary during each interview, in relation to the areas of interest participants were likely to resonate with or find more interesting or relevant to their personal circumstances. The extent to which some areas were covered were therefore considerably less or more so for some participants than for others. The interview also entailed an element of 'making the familiar strange' (Mills, 1959), particularly as the object of analysis (technology in everyday life) made it difficult for some individuals to discuss this at a deeper level, given the pervasiveness and 'everydayness' of technologies (Barthes, 1972; Pea, 1997). While some struggled to conceptualize their user-identities, or the roles technological partnership played in their everyday lives, others showcased a relatively strong grasp of this, with some informing the researcher that they had already actively thought about such topics in the past, at least to some extent on a personal level.

The method was effective in eliciting the ways individuals perceived and valued technological partnership in everyday life, across various domains of life, such as work, education, leisure, social life, and personal life, as these were shaped by the affordances they were able to perceive in technology as well as their abilities to realize these as needed. While effective in drawing out wider user-identities, one limitation of the method included that of capturing the actual uses and behaviours of individuals with digital technology, with one participant informing the researcher after the interview that she had forgotten to mention a variety of uses of digital technology in her daily life.

While exploring behaviour is an established weakness of the interview, Seidman, (2006) notes that a basic assumption behind qualitative interviewing is that the ways individuals construct meaning around their experiences are likely to influence and shape the ways they deliver and carry out these experiences. As such, while the method was unable to capture the actual everyday uses of technology, it was effective in drawing out the wider user-identities of participants, which were often revealed through the 'digital mindsets' held by participants (Tour, 2015), as these were likely to shape the ways they engaged with digital technology in everyday life and pursue certain forms of technological partnership over others. Drawing on the strengths of the interview method, in revealing the meanings and contexts behind behaviour, therefore, served as an effective as well as apt means for investigating the one's personal user-identity, as salient aspects of these subjective constructions were elicited during the interview.

In acknowledging the subjective character behind the construction of user-identity, it also is right for me to point out my own role as the interviewer in the process of meaning-making and interpretation during interviews (Guba, 1996). Meaning in the context of an semi-structured interview entails that of a joint construction of reality (Guba and Lincoln, 2005), or as Miller and Crabtree (1999) put it, "a co-construction of the interviewers' and [participants'] experience and understanding of the topic of interest (p.93)." Despite my attempts to remain as open ended and sensitive to each participants' frame of reference, I acknowledge that my own positionality or inclinations towards the investigation was likely to influence participants' construction of meaning in certain ways as well as the "problem of meaning in the limited context of interviewees' efforts to understand and respond to specific questions (Mishler, 1991,

p. 67)". Mishler (1991) notes that researchers often come into the interview situation with a 'framework for meaning', which participants are likely to conform to in order to reach as successful interview. As such, I consider the ways in which my own 'ideological sensibilities' (Davies, 2017, p. 13) were likely to shape the responses of participants, particularly in instances where my own social science background in technology was likely to shape the overall quality of interaction between me and the participant. Having similar social science backgrounds in technology with some participants, for example, enabled me to understand them at a deeper level that would've otherwise been difficult or impossible for an outsider without the same disciplinary thinking, as these were evident in the ways they constructed meaning around their user-identities. On the other hand, there were limitations in my ability to probe further into certain areas when interviewing postgraduates with disciplinary backgrounds in technology that were completely different from my own, such as those with technical backgrounds and engagements with technology, such as programming and software engineering, which were likely to be brought up during their discussions of technological partnership.

It would be difficult for me to argue, therefore, that I maintained the same 'interviewing stance' (Tracy, 2013) or strategy across all interviews, given the variety of disciplinary affiliations and inclinations of each participant, as these directly impacted the ways they engaged with certain aspects of the interview in significant ways. For participants with similar social science backgrounds as mine, with whom I was likely to share similar disciplinary sensibilities or approaches to technology, I was likely to pursue an approach of that of 'collaborative/interactive interviewing' (Ellis & Berger, 2003), jointly crafting a shared understanding of their user-identities. Having this insider knowledge, however, also allowed me to take on a 'confrontational approach' (Kvale and Brinkmann, 2009) when I found it necessary to challenge and explore possible taken for granted meanings or behaviours of participants. This was also effective in testing for alternative interpretations. On the other hand, for participants with strong technical backgrounds, such as those in computer science, I was more likely to take the stance of 'deliberate naiveté' (Kvale, 1996), given my outsider perspective and lack of technical knowledge with computers. While these served as limitations in understanding my participants at a deeper level, it also opened possibilities for me to probe into aspects of their realities and disciplines that would be

taken for granted from an insider's point of view. Considering the unique interactions that took place during the interview, as shaped by the positionalities of both participants and my own, I therefore acknowledge the 'local and specific, constructed and co-constructed realities' (Guba & Lincoln, 2005, p. 193) that emerged from where my construction and analysis of participants' lived experiences and user-identities are based upon in this study.

D. Analysis

All interviews were audio-recorded and transcribed fully by the researcher. In-process analytic memos (Rossman & Rallis, 2012) were written assiduously during the process of data gathering and analysis. Rossman & Rallis (2012) stress the importance of writing memos, particularly on "emergent insights, potential themes, methodological questions, and links between themes and theoretical notions (Rossman & Rallis, 2012, p. 287)," as these help the researcher in formally developing ideas, moving from a descriptive take on findings to that of formal analytic engagement. These were likely to occur after each interview as well as during the process of transcribing. Memos were 'substantive, theoretical, methodological, or even personal' (Punch & Oancea, 2014, p. 229), depending on the nature of the insight at the time of writing.

A grounded theory approach (Corbin & Strauss, 1990) was followed in analysing the data, where *open coding*, *axial coding*, and *selective coding* were used respectively. Open coding was used to explore and 'open' up conceptual and theoretical possibilities in the data, both explicit and implicit (i.e. 'meaningful use', 'wasting time', 'means to an end'). Relationships between open codes were then sought out by the researcher through the process of axial coding (i.e. 'intentional usage'). Finally, central aspects of the data were selected, where emergent themes and core categories (i.e. 'Aware') were developed by the researcher, based on previous sets of codes and patterns. While the majority of codes were analytic and researcher-lead (Strauss, 1987), a number of codes were adapted *in vivo* (Glaser & Strauss, 1967) when these reflected the salient aspects of participants' lived experiences.

NVivo (CAQDAS) was used as a means for managing the data throughout the process of coding (see Appendix B). This proved to be extremely helpful in cataloguing, indexing, and coding the data, given the large corpus of textual data that

emerged from the study. While it served as an efficient and organized means for managing data, a commonly cited affordance of CAQDAS (Moseley et al., 1997), a keen awareness by the researcher of NVivo's limitations for data analysis (Chowdhury, 2014), such as its potential to decontextualize data and stifle researcher creativity (Roberts & Wilson, 2002), was essential in ensuring analysis was not constricted by the software. Resisting an over-reliance on NVivo, therefore, played a crucial part in data-analysis, where the researcher relied on analytic memoing for processing or explaining relationships across data that were not always effectively expressed or captured by the pre-defined format of NVivo (See Appendix C).

E. Ethical Clearance

The researcher followed ethical guidelines provided by the British Educational Research Association Ethical Guidelines for Educational Research. Approval to conduct the research was given by the Education Departmental Research Ethics Committee (DREC), under CUREC reference number ED-C1A-17-125 (Appendix D), with no revisions made to the original application. Each participant was given a Participant Information Sheet (Appendix E), explaining the nature and purpose of the research, as well as possible risks involved, prior to participation. Formal written consent (Appendix F) was requested for by the researcher and were given by all 18 participants who participated in this study. Finally, the names of participants, their programmes of study, their university, or any other identifiable information, have either been anonymised in this paper to protect participant anonymity.

Chapter 3 – Findings

In this chapter, I present the user-identities of my participants as these emerged thematically in the study. Acknowledging the richness of human experience, I do not claim nor aim to capture the user-identities of my participants in their entirety, rather, I merely attempt to capture the salient characteristics of these user-identities, as these were revealed during my interviews with participants. Similarly, while each participant held unique and rich constructions of their own user-identities, I present my findings below in relation to two groups whose user-identities were considerably different from one another. These identities reflect divergent learning pathways which resulted in distinct forms of 'mastery' over digital technology, as these shaped the user-identities of both groups in considerable ways. While shaped by the wider learning pathways of participants, these user-identities also reflect the 'academic tribes' and disciplinary cultures of both groups towards digital technology (Becher & Trowler, 2001), which in turn shaped the ways they engaged and interacted with digital technology in their everyday lives.

The following section of this chapter is therefore divided into two parts, with respect to these two groups. Firstly, I present salient aspects of the user-identities of participants whose learning pathways involved that of a heavily technical nature and engagement with technology, often from a relatively early start in life. To use the term of my participant, Anna, these individuals identify themselves as *technologists*, or those whose formal engagements and learning trajectories with technology have been of a highly technical nature and continue to be so. Secondly, I present the salient aspects of the user-identities of participants whose learning pathways have only until recently become heavily intertwined with technology for a number of reasons related to their pre-existing occupational trajectories. Anna refers to these individuals as *social scientists*. Here I use this term to refer to their learning and engagement with technology to be one of a broader societal nature. These individuals are likely to apply the study of technology to a pre-existing discipline or occupation (education, law, psychology, business, etc.), where digital technology may now be relevant for various reasons.

In each part, I discuss the learning pathways taken by these individuals in more detail. I then discuss the salient characteristics of their user-identities, as these were expressed by participants through the digital mindsets they held towards digital

technology as well as the forms of technological partnerships they valued or exercised, relating these to their learning pathways.

A. Learning Pathways of Technologists

'A very very early exposure to Computer Science'

For some participants, their formal engagements and learning with technology began at a very early age. These participants were likely to have a very early interest in technological devices. While the formal interests of most participants began with computers, others' interest were piqued by exposure to other technical devices such as toy robots, like Ralph, or model planes, like Anna, which then eventually led to a broader interest and desire to learn digital technology over time. These participants acknowledge that they have always had an active interest in the *technical* aspects of technology, and that these have shaped their formal learning trajectories in some way, having undertaken courses relating to technology or computers in secondary school or in undergraduate studies before undertaking postgraduate studies.

These individuals were likely to have access to various 'technological gateways' (Selfe & Hawisher, 2004) at a relatively early age, which prompted their interest in learning technology, where they eventually developed a variety of electronic and digital skills and literacies. For some individuals, mastering technology at an early age resulted from parental support and encouragement, such as Darren, whose dad bought him a C++ programming manual at the age of 11. Other participants attribute this to cultural expectations, in relation to the specific geographic communities they were brought up in, such as Gabriel, who, having grown up Asian-American in Silicon Valley, says he was expected to become either a doctor, a lawyer, or a software engineer. Gabriel chose the latter. Like Darren, Gabriel's parental background played a big role in shaping his formal interests. "So growing up [in Silicon Valley], it's like everybody's the child of someone who works at a tech company." While Gabriel's interest began as an implicit cultural expectation, others, such as Anna, developed an affinity for working with technologies at a young age, as a result of formal institutional requirements and expectations. Having been enrolled at an elite primary school in China, she 'started to learn programming from the first year of primary school'.

Because of this, Anna describes her learning trajectory as having 'a very very early exposure to computer science'. This early exposure and engagement with technology was likely to shape not only the learning trajectories of participants but also their occupational identities and aspirations as technologists, which they all strongly identified with during the interviews.

Either having just finished an undergraduate degree related to technology or having been in a technology-related job for some time, these individuals all made the decision to continue studying technology at the postgraduate level for reasons often related to professional and personal development. While these participants were spread across the different programmes being undertaken (Computer Science, Internet Studies, and Education and Technology), a majority of them were undertaking postgraduate programmes in Computer Science, studying technology at either theoretical or technical levels or both. Despite having distinct formal interests and engagements with technology, which shaped their learning pathways with technology in unique ways, these individuals actively acknowledged the fundamental role technology played in shaping their learning trajectories, as the formal object of learning, whether these were in informal learning contexts (creating a search engine, running a private server, managing an online business, and so on) or in formal educational ones (primary school, secondary school, undergraduate studies). Similar to Marks & Lockyer (2004) these individuals had an attachment to the technologies they worked with, being able to discuss their interest in technology with me at great lengths. Acknowledging the roles technology played in their formal learning pathways, the ways in which these individuals constructed meaning around technology, as these meanings developed over a wider learning trajectory with technology, were likely to influence the ways they engage with technology in everyday life, shaping their user-identities in significant ways.

B. User-Identities: Creator, Problem-Solver, Expert

For technologists, pursuing pathways that involved learning technology at a highly technical level meant that these individuals developed a strong understanding of technical affordances and what technologies could do, having developed a relatively strong knowledge of hardware and software over a number of years. For some individuals, their passion for mastering technology was often driven by the things

technology allowed them to create. They were not only learning how to use technology over time but learning how to create things with it. As William explained when he talked about the reason he got into computer science:

> **'I always wanted to be an architect. I wanted to design movies. Yeah, design structures. And I never really did a lot with computers. And then at the end of my high school, I discovered programming through a course. We were making a project for game development. Yeah I discovered programming was actually what I wanted but almost unlimited, you could design and build everything you want. So that's where I kind of switched towards computer science instead of designing buildings. Yeah so from that point onwards I just focused on computer science.'**

Whether it was creating a fitness app like Ralph, a personal grade calculator like Gabriel, or a private server of an existing online game like William or Blake, this desire and inclination to use technology for creation had implications for the ways these individuals engaged with digital technologies in their everyday lives, often enabled by their technical mastery of technology. As a result, these participants often considered their use of technology as different from the 'ordinary' user. As Darren explained, distinguishing himself from the ordinary 'consumer' of technology:

> **'I'm probably using it for different ends than most people. Yeah, for like, different kinds of creation and things like that. So I see myself a lot more as a transformer of technology than just a consumer. Um, I think that… yeah, I don't know. I think that those are probably how I'd see myself different from a lot of people.'**

These individuals were more likely to tinker and explore the affordances of their devices at their own time, which allowed them to develop a rich understanding of what these technologies could be used for. As Peter explains: 'not many people have the sensitivity or willingness to explore what their devices are capable of'. Changing available technology 'away from the default' was also a commonly expressed characteristic of their engagements with technology. As Ralph puts it: 'I guess I just kind of like to tinker with things more maybe. Maybe I'll change some setting away from the default just because it works better for my workflow or something.' Realizing the affordances of their devices beyond that of what they perceived to be the 'immediately available' and 'accessible' functions they offered was often a salient characteristic of their user-identities.

Whether it was a 'transformer' like Darren, a 'designer' and 'builder' like William, or a 'constructor' like Anna, these individuals were likely to highly value and

actively realize various forms of creation that digital technologies enabled them to do. While these individuals considered their engagements with technology as merely exploratory, playful, and informal, when viewed in relation to their wider learning trajectories their highly self-driven and self-motivated engagements with technology often entailed what Bloom et al. (1956) consider an advanced form of learning and activity: creation.

Not only would these individuals create things with technology, their rich understanding of affordances allowed them to alter the immediate functions of technologies according to their needs through various forms of technological partnership. Like Anna, who says she learned to 'manipulate a lot of machines' at a very young age, these individuals mastered the affordances of technologies, which allowed them to use technology in relatively advanced ways in everyday life. Similar to Rogoff and Lave (1984), these uses of technology were often oriented towards everyday problem-solving where the application of digital technology was useful in some way. Having a rich understanding of their technical affordances, as well as a mastery of the ways these may be realized, these technologists saw rich opportunities in their devices for everyday problem-solving, which they often expressed during interviews. As Darren explains:

> **'I think it's just a good way to do problem solving. And so, I think that I'd definitely turned to that [technology], when I've thought through a problem. I feel very confident in my ability to solve it using a technological solution. You know obviously depending on what sort of problem it is, but I think that, there's a lot of possibilities to solve a lot of problems using technology.'**

Often, the focus of these individuals on the affordances technologies offered for problem-solving in everyday life were influenced by the mindsets these individuals held towards programming. These individuals were likely to include programming as one of their main uses of technology, often either as a result of personal interest and curiosity, which they learned at a relatively early stage in life, or due to requirements in their formal studies previously or currently, or both. As Ralph describes it: 'programming is just, to me, it's kind of writing code usually to solve some problem.' The problem-solving mindset required by programming languages often influenced the views they held towards technologies in everyday life. As a result, these individuals

were likely to see technical solutions in the technologies they used and adopted, which were enabled by their specific knowledge in programming. As Gabriel pointed out:

> **'Anything I needed, I'd spend around an hour to write a program for it. And then I'll write a script. And then that way, anytime in the future I had this problem, I would just run the script, or I would run the program, and it would just solve it for me.'**

That these participants viewed technology in relation to the opportunities they provided for problem-solving shaped what they valued in technology. These often revolved around 'productivity', 'efficiency' or 'optimal' activity. As Pea (1997) would put it, these individuals were off-loading various cognitive tasks in everyday life to the technologies they used, augmenting and automating various aspects of daily life in order to deliver more complex systems of activity, as made possible by the affordances of their surroundings which they were able to realize. Being able to realize these affordances required a rich technical understanding of these technologies, which these individuals had developed over their wider learning trajectories.

Overall, the technologists believed they were likely to have a deeper understanding of how their devices 'worked'. Because of their formal learning interests in technology, these individuals were likely to develop some level of technical expertise and familiarity with technology, which then shaped their understanding and use of the technologies they appropriated in everyday life. As Ralph pointed out:

> **I think there's certainly a bias among computer science people, or maybe even people in STEM, just to use computers for more things just because through work we use them quite a lot anyways. So compared to people in other fields maybe we see or we learn how to use them better. So we're kind of more comfortable using them than maybe somebody that doesn't work with computers would be.**

Because of their technical expertise, these individuals claimed they were often able to benefit more from the technologies they used in everyday life. Lucy claims:

> **Because I know how it works, I can use her [Alexa] better. So I know some people that, like, start screaming at Alexa. They don't really understand you first have to say 'Alexa' for example and then something. And then if she doesn't understand they just keep talking to her. She doesn't listen anymore. So yeah sometimes people, because they don't understand how the technology works, it's harder for them to use it. Although they do try to make it as easy as possible [to use technology].**

The feeling of being a 'competent' user of technology was widely shared by these participants, like Peter, who referred to himself as a 'supporter' or that person who would often help others with their technical problems, or Darren, who considered himself an 'evangelist' of technology to his family and friends, often offering them with various technical solutions to various everyday problems they encountered. Oftentimes, merely being able to troubleshoot issues with technology in everyday life was enough for these individuals to consider themselves being able to benefit more from the affordances of technology than most users, like Blake or Lucy, who argue their families would simply be 'stuck' if it were not for their ability to troubleshoot their technical problems for them. This reinforced their competent and expert user-identities. As Arnold captures succinctly: 'Because if you're more competent at it, you can make the most out of it, you know more about what you can do and how you would do it with technology.'

For technologists, having developed an advanced technical understanding of technologies through the learning pathways they had taken led to them to develop a sense of technical competence and expertise over their use of technology in everyday life. The perceived malleability and manipulability of digital technologies, as reinforced by their technical know-how, enabled them to use technologies for a variety of ways which they often considered distinct from the 'ordinary user'. These shaped their user-identities in significant ways, often revolving around using technology for various forms of creation and problem-solving in everyday life.

C. Learning Pathways of Social Scientists

'If I want to understand these questions I really have to go and study technology from a societal perspective.'

In contrast to the technologists, other participants' interests in learning technology were often piqued by the emerging role digital technologies were now beginning to play in the existing occupation or discipline which they were undertaking. These individuals were likely to characterize their learning trajectory with technology as one that emerged only more formally later in their careers, as a result of the influence technologies were now playing in these occupations.

The reasons for learning and desiring a mastery over technology were often varied for these participants. For some, there was a need to develop a sense of competence over the new technologies that were now being embedded into professional practice. Meghan, a music teacher, points out: 'so I had a look at how music teachers use technology, that they were lacking a lot of knowledge and, um, things weren't really working out in the classroom [with technology].' Seeing this, she decided she would have to retrain and learn how to incorporate new technologies into her existing pedagogy. Others believed the emergence of digital technologies was transforming the overall landscape of their discipline, which they now felt they lacked adequate training in, therefore preventing further professional development. Vince, a political scientist, notes: 'in public administration there weren't any theories about how technology and public administration were connected.' Vince felt there was a gap between his understanding and the realities of political science in the 21st century, prompting him to undertake formal studies in technology. Finally, there were also those who, aspiring particular occupational paths, saw technologies as potentially causing new problems and issues in these domains which needed addressing. Cathy, who hopes to be a psychologist someday, thought: 'someone's got to be an activist about [cyberbullying] because everyone else is an activist about very important things but I feel like cyberbullying got overlooked.' Cathy knew she would have to understand digitally-mediated forms of bullying if she were to pursue a profession that tackled these issues later on. For whatever reason, these individuals were likely to experience some form of disruption or interference in their pre-existing occupational trajectories by the direct or indirect influence of new technologies. This prompted them to learn technology at a formal postgraduate level, specifically in relation to the wider role it played in their field.

As a result of the wider influences technology had on their disciplines, these individuals were more likely to learn about technology from *societal* perspectives. As Vince pointed out: 'If I want to understand these questions [in my field], I really have to go and study technology from a societal perspective.' While technologists' learning pathways with technology were of a technical nature, which were often focused on exploring the affordances of technologies, the social scientists' learning pathways with technology were often of a more social and applied nature, in relation to the specific

disciplines they pursued (education, law, business, psychology, politics), where technologies were now relevant in some way.

Either having just completed their undergraduate studies in a completely different discipline, where technology played no formal role as an object of study, or having just come from an occupation that only until recently became relevant to the study of technology, these individuals decided to undertake postgraduate studies in technology, often in either Internet Studies of Education and Technology, often with targeted motivations behind doing so relating to their pre-existing occupational aspirations and trajectories. These individuals believed technology was a trend in the 21st century that would inevitably shape and transform the nature and landscape of their disciplines. This prompted their desire to learn technology at a formal level, whereby they could apply such knowledge to their pre-existing disciplines or interests.

Finally, learning about technology, as these applied to their disciplines, was not merely a one-off decision or transient occurrence for the participants. Often, they recognized that technology would play a continued, if only increasing, role in their occupations and in their everyday lives, and would therefore continue to be an essential part of their learning pathways moving forwards. Ultimately, the roles technologies played across their wider learning lives had implications for the ways they constructed their user-identities in everyday life, as these were influenced by their wider societal understanding and expertise in technology.

D. User-Identities: Critical, Cautious, Aware

For the 'social scientists', pursuing postgraduate studies in technology resulted in them developing a strong understanding of the wider societal forces behind technology, which were now affecting their occupations and disciplines in considerable ways. In contrast to the technologists, who often framed their user-identities in relation to the distinctive character of their usage (i.e. 'creation'), which they considered different from that of the ordinary user, the social scientists often expressed their user-identities through the mindsets and views they held towards technology, as these were shaped by the nature of their learning pathways and expertise with technology. More often than not, these individuals considered their uses of technology as no different from that of the 'ordinary' user, in the sense that they rarely deviated from what they considered to be immediately available or 'mainstream' uses

of technology (the Internet, social media, communication, information-seeking, entertainment, and so on). The character of these engagements, however, were often shaped by the mindsets they held towards digital technology.

Often, these mindsets were of a critical rather than an enabling nature. As Trisha shares: 'I've got quite a critical and negative view of technology'. This was often due to the focus of their learning on the commercial and political forces behind technology, which were now penetrating not only their disciplines but also, as they perceived, their everyday lives. As Jemima explains:

> **'The course helped me connect how my own kind of personal experiences or frustrations [with technology] were connected to like wider economic incentives, or like the kind of socio-economic circumstances in which all of this technology was developed in order to maximize profit, which indirectly happens to be like maximizing the amount of attention and data I give to these websites so that they could target their advertising more effectively.'**

Like Meghan, who argued that 'technology is never neutral', these individuals conceptualized their use of technology in everyday life in relation to the wider interplay of commercial and political agendas behind technology which they now perceived their everyday technological practices to be a part of. Upon asking what issues she saw in technologies, when she explained herself to be a 'critical' user of technology, Sally argued: 'I guess it's the commercial drive behind technology. All the content is too focused on entertainment and on commercial profits.'

While some attribute their formal learning of technology as the reason for developing a critical mindset, others assert they had held these views towards technology even before undertaking their courses, and that, if anything, their formal studies had only reinforced these. Like Vince, who described himself as a 'complainer' of technology because complaining about technology was so commonplace to him that it was like 'complaining about the weather', or Jemima, who described one of her favourite pastimes as 'talking shit about the Internet and how Facebook is affecting about social life', these individuals were likely to have pre-existing trajectories or histories of viewing technology through critical or negative frames. These frames, in turn, shaped the way they were likely to engage with and learn about technology in both everyday and formal learning contexts, where they often paid a keen attention to the social issues, tensions, and problems related to digital technologies.

This tension between their everyday needs and uses of technology and their awareness of the wider commercial agendas and forces behind the mainstream technologies they adopted, often resulted in ambivalent feelings towards the adoption and use of technology in everyday life. Having learned about technology in this way, Jemima explains: 'I've definitely become a lot more paranoid when I'm online since I've taken the course.' She also argues that knowing these things about technology 'largely just makes everything more complicated.' As a result of their learning pathways with technology, these individuals interpreted digital technology beyond their functional use and benefit in everyday life, which they considered to be uncharacteristic of the 'ordinary' user. These interpretations were key to their user-identities which, in turn, shaped their engagements with technology in considerable ways. As Cathy explains:

> **'I mean yes, once you taken the red pill so to speak, not the placebo one, you kind of like, change your Google preferences and you're more aware of how ad block or cookies work. You read the transparency reports a lot more. You're way more up to date with laws being passed about the Internet. I definitely find that I'm reading more about what's going on with the Internet.'**

These individuals developed habits of learning about the potential social issues and harms of the devices they used in their everyday lives. Where the technologists were acquiring technical skills and knowledge in their everyday interactions with their devices, these individuals were continuously developing an increasing social awareness towards digital technology, where they often developed 'a heightened sensitivity' for issues related to digital technology. Tod explains how this led to his cautious usage of technologies:

> **'I think it's just because this is what I study, I have kind of a heightened sensitivity for these kinds of issues because I know what's behind all of this. When I go on Youtube, I know exactly how these kinds of things work and why they do what they do. So like knowing how these things work just makes me just slightly more cautious in interacting with any such environment. '**

Often, their cautious approach to the use of technology in everyday life came hand in hand with the ways these individuals perceived their individual sense of well-being and the roles technologies played in either enhancing or deterring these. Having developed a keen social awareness of the issues surrounding digital technologies,

Jemima was easily able to draw on her learning when she explained the ways she believed commercial and political agendas were influencing her own productivity and sense of well-being:

> **'I think I really really buy into the idea of like attention ethics. So it's the idea that like a lot of the way technology that is designed right now is to hog our attention. So like maximize the amount of eyeball time. And that we can have certain goals that that is not conducive to entirely. So that technology should be designed more in a way that helps us accomplish our goals rather than helps us accomplish the goals of tech companies who want to harvest more of our data.'**

Whether you were a 'rational' user like Peter or a 'healthy' user like Meghan, these individuals were likely to actively weigh the benefits of adopting a certain technology against the potential risks (such as privacy, security, time, cost) these posed. Beth, who argued that the adoption of any technology in everyday life entailed trade-offs, explained: 'I think that as new technologies might be created, I can evaluate the risks and the benefits of adopting it.' Because of the cautious views they held towards technology, as these individuals perceived potential harms in technology, they often expressed the need to 'shut off' from technology in everyday life. In contrast to the technologists, who often described themselves as 'extensive' or 'dependent' users of technology, and were less likely to delineate between parts of their day where they were 'online' or 'offline', these individuals were likely to stress the importance of 'being away' from technology. As Peter explained: 'Sometimes we need to stay away from technology and enjoy ourselves a bit as a human beings'.

Having a rich understanding of the wider systems in play behind technologies in everyday life, and how these penetrated or impacted the everyday lives and activities of users, these individuals often described themselves as being 'aware' users of technology. This 'awareness' was often a direct result of their learning with technology, as this often referred to the negative impacts of technology in everyday life that they considered to be unseen or unnoticed by the 'ordinary' user. Tod, who held somewhat defiant views against digital technology, argued:

> **'I mean I'm very very sceptical. I'm very critical of technology. The way we use technology, I don't think technology necessarily makes peoples' lives better. Maybe they think it does, but I don't think… I think there's a good chance it doesn't actually for many people.'**

Having developed a keen understanding of the wider commercial and political forces in play behind mainstream technologies, these individuals sought to resist the risks, harms, and agendas often embedded in technology, which they strongly felt in their everyday engagements with technology. Similar to Davies (2017), these individuals had very targeted uses of technology, often making deliberate choices with regards to the ways they would adopt them in everyday life. As Tod added: 'I think if you don't use it right, um, "right", whatever that means, can just like, waste a lot of your time.' Having developed a rich understanding of what they perceived to be the negative effects of technology reinforced their calculated and targeted use of technology in everyday life, which were often actively directed towards what considered to be life-enhancing or valuable engagements with technology. When asked what it meant to be an aware user of technology, Vince responded:

> **'Asking what's the purpose of doing it and how is it affecting my life? And analysing what are the qualities of my use? And thinking about it and being reflective about my use. And thinking about, what am I getting from this, and like is this something I want to do more or less. And that kind of thing.'**

Despite calling herself a sceptical and conservative user of technology, Cathy argued that 'you can still do meaningful actions on your screen'. Characterizing themselves as 'aware' users, therefore, often implied being able to enact and realize alternative uses of technology, which allowed them to resist wider commercial or political agendas, while still serving their individual goals and needs in everyday life. Despite arguing that adopting technology always entails a trade-off, Beth argued: 'I think I'm always looking for improvements, at how technology can improve my life'.

For the social scientists, having an awareness of the wider socio-political forces and agendas behind the mainstream technologies they were using often resulted in critical mindsets towards these technologies. This influenced their user-identities in significant ways, often resulting in calculated and targeted uses of technology. Ultimately, their user-identities were shaped by the learning pathways with technology, where they developed a keen understanding of and interest in the latent effects of technology in everyday life. Not only were these user-identities formed through the programmes they were undertaking, they were also influenced by their everyday engagements and interests in digital technology, often driven by their desire to learn about the social issues surrounding the digital technologies. As Vince explains:

I think about technology a lot. I dont think everyone thinks so much about technology.' These critical and cautious user identities were evident in the way they constructed meanings around digital technology in everyday life, which, in effect, led to certain ways of engaging (or disengaging) with digital technology.

Chapter 4 – Discussion

A. User-Identities Develop Across Wider Learning Lives

Applying Wertsch's (1998) concept of mediational means, which argues that the relationship between actors and mediational means can be characterized through 'mastery' and 'appropriation', both technologists and social scientists developed distinct forms of mastery over the mediational means (digital technologies) they appropriated in everyday life. These shaped their user-identities in significant ways. As participants displayed, their user-identities developed over the course of their learning lives across contexts (informal and formal learning), trajectories (educational and occupational), and identities (everyday users and specialists of technology) (Erstad, 2013) (See Figure 2).

Firstly, user-identities developed across *contexts* over the course of their learning lives, where digital technology played a formal role in their learning, firstly, as an everyday tool in itself, but also, secondly, as a formal object of study, having also learned digital technology at a formal educational level, where their occupational and specialist expertise were based. Secondly, these individuals developed distinct frames of reference for appropriating digital technology through the learning pathways and *trajectories* they had taken, as these were reflected in the ways they constructed meaning around digital technology in everyday life. Thirdly, these prominent frames of reference towards digital technology developed across different and shifting *identities* of their learning lives (Erstad, 2013), where, as both everyday users (informal learning) and specialists of technology (formal learning), they developed a mastery of the mediational means they appropriated in everyday life through everyday processes of learning and using digital technology. These learning lives shaped their overall user-identities in significant ways, where they each constructed unique meanings around the mediational means (Wertsch, 1993; 1998) they used in everyday life as well as their own ways of appropriating these tools as "individual(s)-operating-with-mediational means" (Wertsch, 1993).

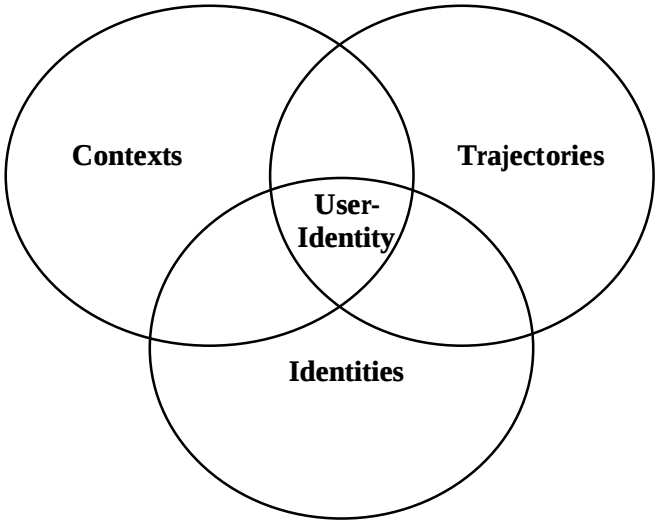

Figure 2. Learning Lives Framework Applied to User-Identities

Due to the distinct learning pathways taken by these individuals as specialists of technology, these groups displayed divergent user-identities, and these were reflected by the unique *meanings* (digital mindsets) they constructed around digital technology, which in turn, shaped the *activities* (technological partnerships) they engaged in with technology. Where the user-identities of the technologists often focused on the affordances technology offered in everyday life, as shaped by their rich technical understanding of technology, the user-identities of the social scientists were often of a more risk-averse yet intentional and targeted nature, as a result of their societal and applied approach to mastering technologies, where they developed a critical view of technology. Similarly, not only were the overall qualities of these identities different, they were also expressed in different ways, in relation to what they believed were the most distinctive aspects of their user-identities, whether these referred to the various ways in which they exercised technological partnerships (Salomon et al., 1991) in everyday life (technologists) or the unique digital mindsets (Lankshear & Knobel, 2006; Tour, 2015) they held towards technologies (social scientists).

In the next sections of this chapter, I discuss the qualities of my participants' user-identities in more detail. These user-identities were often drawn from their own learning pathways with digital technology, reflecting distinct ways of 'mastering' digital technology. On the one hand, technologists displayed a 'technical mastery' over

digital technologies and this enabled them to exercise a wide range of technological partnerships in everyday life. On the other hand, social scientists developed a keen 'social awareness' of these mediational means, resulting in intentional and targeted uses of digital technologies when applying them for various forms of technological partnership in everyday life. As these masteries over digital technology developed over time, it was clear that their user-identities were often expressed in relation to what they considered to be 'latent' qualities of digital technologies (Feenberg, 1995; 1999) or that which may not be readily realized, perceived, or experienced by the ordinary user of technology. As both groups have also shown, digital technologies can have enabling (Wertsch, 1993; Gibson 1979) as well as constraining (Feenberg, 1995; 1999) effects on the individuals who appropriate them.

B. User-Identities of Technologists: Technical Mastery Leads to the Realization of More Affordances in Everyday Life Contexts

For technologists, their user-identities were often expressed in relation to what technologies afforded them to do in their everyday lives (Gibson, 1979). Oftentimes, this reflected *enabling* frames of reference towards digital technology. These individuals valued and recognized the role of technology in delivering, shaping, and enhancing activity (Pea, 1997; Salomon et al., 1991), where their user-identities often revolved around maximizing and fully realizing Wertsch's (1993) concept of 'individual(s)-operating-with-mediational means'. This shaped not only the ways they used technology but also the ways they learned and engaged with them, where they often appropriated digital technology in everyday life with the desire to master the affordances of their devices (Gibson, 1979), oftentimes beyond that of their immediately available functionality and features. As a result, these individuals accumulated a rich technical knowledge and understanding of digital technology over the course of their learning lives. This often entailed developing knowledge and skills in computing and programming, which are fundamental to digital technologies (Ceruzzi, 2013).

Having this technical know-how these individuals were able to utilize their devices for a wide variety of problem-solving and creation in everyday life, which were key to their user-identities. The forms of technological partnerships which these individuals considered to be fundamental to their user-identities, therefore, were often

distinct from that of the 'ordinary' users or 'consumers' of technology, in that they were only available to these users insofar as they were able to develop advanced technological rationalities (Feenberg, 1991; 1995), necessary to realize these alternative and creative uses of technology (Bakardjieva, 2005; Feenberg, 1991). The partnerships they had exercised and had become key to their user-identities had to be learnt and 'developed over time' (Salomon et al., 1991, p. 3), just as these individuals gradually developed a technical mastery of technology over the course of their learning lives, in order to be realized. Beyond that of what these individuals considered to be the readily available affordances of digital technologies to ordinary users (i.e. playing games, searching for information, communicating, etc.), these individuals were confident in their ability to create, manipulate, and shape digital technology in order to cater to their individual needs in everyday life.

Their user-identities, as shaped as their wider identities as technical experts, echoed that of 'digital wisdom', noted by Prensky (2011), referring 'both to wisdom arising *from* the use of digital technology to access cognitive power beyond our innate capacity and to wisdom *in* the prudent use of technology to enhance our capabilities. (p. 18)' While there is no way to guarantee their actual uses and activities with technology, that these individuals highly valued the role of technology in enhancing, augmenting, or improving human activity in everyday life (Pea, 1997), is likely to shape the ways they engage and learn with technologies, in the contexts of both incidental or self-directed learning (Jarvis, 2007) with technology, in ways that support these wider motivations and dispositions (Goode, 2010).

Similarly, in viewing technologies in terms of what these afforded or allowed them to do in everyday life, these individuals believed they were able to benefit more from their devices, as they were able to realize the affordances of their devices for more forms of technological partnership, therefore serving a wider variety of needs and activities in everyday life. Using the terms of Anna, having this technical know-how and familiarity, they were able to use their devices both 'widely' and 'deeply' and this, in turn, had implications for the things they could do with and benefit from technology in everyday life (Robinson et al., 2015; van Deursen et al., 2017), which participants felt positively about in most cases.

Where these individuals developed a deep technical mastery of the devices they used in everyday life, they often felt they were able to realize more of the affordances

of digital technology in everyday life. Ultimately, their user-identities were the result of pre-existing learning trajectories with technology, one that placed the technical aspects of technology at the centre of their learning, often resulting in a rich understanding of their affordances, from where their user-identities, as prominently expressed through the wide range of technological partnerships they valued and were able to exercise, were likely to emerge. This prominent frame of reference towards technology held by the technologists highlighted the enabling characteristics of technology, with respect to the affordances they provided them in everyday life contexts. In contrast to the enabling frames held by technologists towards technologies in everyday life, the frames held by the social scientists were markedly different.

C. User-Identities of Social Scientists: Social Awareness of Technology Results in Intentional and Targeted Use

For social scientists, their user-identities were often expressed in relation to the constraints they perceived technologies placed in their everyday life contexts. These were heavily influenced by the ways they learnt about digital technology, which were often focused on the wider social, commercial, and political forces shaping the technologies they appropriated in everyday life (Feenberg, 1995). As a result, it was these perceived pressures and constraints that shaped their overall user-identities, which motivated them to use (or not use) technologies in particular ways.

Due to the nature of their expertise in technology, shaped not by a technical learning of technology but a broader and applied societal learning, the social scientists were more likely to express their user-identities in relation to the mindsets they held towards digital technology, as shaped by their wider knowledge and social awareness of technology. Often holding critical mindsets towards digital technology, these individuals conceptualized their mediated activities with digital technology as either reinforcing or resisting the wider socio-political hegemonies behind the production and appropriation of technology in everyday life (Feenberg, 1995; 1999).

While the cultural-historical approach (Vygotsky, 1978) and theory of mediational means (Wertsch, 1993) are often able to highlight the ways tools enable new forms of thought and action, as reflected by the technologists, they fail accommodate the wider politics of technology and material artefacts (Daniels, 2008; Feenberg, 1995; Oliver, 2016), whereby the appropriation of technology in everyday

life is likely to be shaped. While also enabling action, Wertsch (1998) notes, mediational means may also constrain action. Similarly, mediational means are 'associated with power and authority' (Wertsch, 1998, p. 25) which may influence the ways they are appropriated by individual users. Having developed a keen social awareness of the digital technologies, the societal scientists strongly perceived and experienced the socio-political qualities in the digital technologies they appropriated. This resulted in *constraining* frames of reference towards digital technology in everyday life, which in turn shaped their user-identities in significant ways.

While the critical mindsets they held towards digital technology were influenced by the social awareness they held, these were also shaped by the nature of their engagements with technology. In contrast to the technologists, who developed a technical mastery of digital technology over time, allowing them to realize the affordances of technology that were not immediately available to the ordinary user (i.e. creation), the social scientists' uses of technology in everyday life were often based on mainstream, often commercially-driven, uses and affordances of digital technology (the Internet, social media, communication, information-seeking, entertainment, and so on.) In engaging with digital technologies in this way, they were much more likely to feel the constraining aspects of digital technology, which they perceived resulted from the wider commercial and political forces and agendas behind the mainstream and everyday uses of technology of the ordinary user. In contrast to the technologists, they were unable to realize a wider range of technological agency and creativity with their devices. This resulted in ambivalent feelings or tensions between their own needs and uses of digital technology in everyday life and the immediately available affordances of these technologies, which they believe were often influenced by the commercial interests of big tech companies such as Facebook, Youtube, Amazon, Google, and so on. Similar to Rose (2003), these individuals were critical of the techno-elite cultures behind technological production.

Rather than basing their user-identities on what they considered to be the mundane and everyday uses of technology, these individuals focused on the wider social contexts in which their everyday technological practices were a part, which they had developed a strong understanding of through their learning pathways. In effect, the meanings they constructed around these wider contexts significantly outweighed the meanings behind their everyday functional uses of technologies. Beyond being the

total number of affordances they offer, Feenberg's (1999) argues that 'the essence of technology is abstracted from a larger social context within which functionality plays a specific limited role' (p. 84). Across their wider learning lives with technologies, these perceived wider social contexts influenced the engagements and activities of social scientists with digital technology in considerable ways.

Fundamental to their user identities, which shaped both the mindsets they held and the forms of technological partnerships they exercised in everyday life, was therefore the sense of 'awareness' they believed they had towards digital technologies, having developed a social awareness of these technologies over time. Holding mindsets that viewed digital technologies as being orchestrated by wider hegemonic forces (Disco, 2005) resulted in intentional, instrumental, and often cautious ways of engaging with digital technology in everyday life. This, they believed, was key to resisting the negative or detrimental effects of technology in everyday life. Realizing their positions within a wider technological order was key to realizing the 'creative appropriation' (Feenberg, 1991) of technology, necessary to realize alternative opportunities in technologies (Bakardjieva, 2005). However, due to the lack of technical expertise, it is likely that these individuals were unable to fully realize the creative possibilities or alternatives in technologies, where, despite a desire to do so, they were more likely to simply resist technology through either withdrawal or disengagement with the immediately available affordances of technology all together.

D. Developing Effective Literacies with Digital Technologies in the 21st Century

That both groups developed highly distinct meanings towards digital technology, as reflected by their divergent user-identities, speaks to the wider 'interpretive flexibility' (Pinch & Bijker, 1987) of these artefacts. Where the partnerships of technologists highlighted a rich understanding of the affordances of technology, as they were able to realize a wide variety of affordances in their devices, the mindsets held by social scientists reflected a keen awareness of technological practice as *situated* practice, where wider interplays and struggles for power and emancipation take place (Bakardjieva, 2005; Feenberg, 1995; Oliver, 2016).

While reflecting the salient meanings these individuals constructed around digital technology, they also uncover some of the inherent qualities of digital technologies themselves, as the mediational means for thinking and acting in the 21st

century. As individuals whose learning pathways involve formally mastering digital technology in some way, their constructions of what digital technologies 'are' and what digital technologies 'can do', at a time when digital technologies are penetrating the lives of most, if not all, individuals (Bell, 1973), may help us to better understand what it means to be a user of digital technology today with regard to the ways users must appropriate these tools.

As technologists have shown, digital technologies have enabled new forms of activity in everyday life, allowing for unprecedented ways of partnering and problem-solving with technology (Brynin & Kraut, 2006). The ability to realize these affordances in new and innovative ways, however, is dependent on one's technical mastery of the technology (Gibson, 1979). Individual users must therefore learn and master the technological artefacts they appropriate in order to realize their affordances for a wide variety of technological partnerships in everyday life, as these may have a variety of implications on outcomes across different life contexts over the life course (Robinson et al., 2015). However, while acknowledging the ways technologies enhance and enable activity, there is also a need for individual users to recognize and understand the wider commercial and socio-political forces behind digital technology which are now beginning to shape the appropriation of technology in everyday life in considerable ways in the 21st century (Bakardjieva, 2005).

Similar to Feenberg's (1991) *critical constructivism*, examining the meanings individuals construct around technology must move beyond what technologies enable individuals to 'do' in result in their day to day lives. Rather, they must also take into account the underlying technological codes and rationalities beneath the seemingly benign and ñeutral' surfaces of digital technologies (ibid), as these shape their everyday engagements and practices with technology. As the social scientists have shown, these factors can have a significant effect on the ways individuals engage with technologies, whether they are aware of these or not, and these may not always be beneficial to the everyday user and, at times, may even be detrimental. While digital technologies have reshaped the contours of everyday activity, enabling new ways of learning, thinking, and acting in everyday life (Brynin & Kraut, 2006; Wertsch, 1998), digital technologies 'can no longer be considered as a collection of devices, nor, more generally, as the sum of rational means [alone] (Feenberg, 1999, p. 83).'

Catherine Hobbs (1995) argued that there is a need to develop 'effective literacy' with electronic technologies, referring to 'a level of literacy that enables one to effect change in her own life and society (p. 2)'. Applying this to digital technologies, as individuals learn and master digital technologies over the course of their learning lives, they must develop effective literacy with digital technology in ways that enable them to realize these opportunities made possible by the affordances of these artefacts. As both specialist groups have revealed, on the one hand, this requires a *technical mastery* of technologies, which allows individual users to realize the affordances of technologies, as these allow for increasingly new forms of action and social participation in the 21st century. These have been repeatedly voiced by digital divide scholars, who argue the need for digital skills and literacies in order to use and engage with digital technologies in ways that can truly be life enhancing (van Dijk, 2005; van Deursen et al., 2017, Robinson et al., 2015).

On the other hand, users must also develop a *socio-political awareness* of the digital technologies they appropriate, understanding not only the functional and rational means technologies provide but also the symbolic, cultural, and political underpinnings of these artefacts (Bourdieu, 1985; Robinson, 2009; Warschauer, 2003; Winner, 1986). In doing so, they must recognize the ways powerful groups design and shape technologies, as these shape not only the appropriation of technology in everyday life by individual users but also the ways they may exercise agency in the 21st century as 'individual(s)-operating-with-mediational means' (Wertsch, 1993).

As commercial and political agendas are increasingly integrated and embedded into digital technology (Harbers, 2005; Selwyn & Facer, 2013), everyday users of technology must develop these effective literacies over the course of their learning lives if they are to fully maximize the enabling characteristics of digital technology in everyday life, while mitigating the wider structural forces and pressures that are now embedded in digital technologies, as these shape technological practices in ways that may run counter to individual well-being. In acquiring and developing a technical mastery of these mediational means as well as a social awareness *of* them, they may effectively realize alternative possibilities and interpretations of technology (Feenberg, 1995), which may become increasingly necessary to exercising agency in the 21st century, amidst potentially constraining structural forces and agendas that have now

become embedded in everyday technologically-mediated practices (Bakardjieva, 2005; Harbers, 2005).

E. User-Identities: A Way Forward in Learning and Technology Research

As the technoscape of the 21st century continues to change and adapt in new and exciting ways, and as digital technologies continue to penetrate various facets of everyday life and activity, there is a need to reconceptualise the relationship between individual users of technology and the material affordances they are offered by their surrounding environments, as they master and appropriate these through everyday processes of learning.

Koper (2007) suggests there is a lack of theoretical work on the nature of learning with digital technology. Research in learning and technology must 'make the familiar strange' (Mills, 1959) by placing digital technology, the now taken-for-granted reality and baseline for human activity in the Digital Age (Bell, 1973), at the conceptual focus if we are to understand the ways individuals think, learn, and act in everyday life contexts. As digital technologies now serve as catalysts for life-wide, life-deep, and life-long learning (Sefton-Green & Erstad, 2017), exploring the ways individuals construct meaning around digital technologies, as they appropriate and master these for various forms of technological partnership in everyday life, is fundamental for a number of substantive fields such as learning and technology, new media research, and digital sociology.

New methodological and epistemological means for understanding the ways individual's appropriate digital technologies in everyday life are fundamental in a world where the interactions between technology and human beings are increasingly interdependent (Latour, 2005). In my research, I have sought to refrain from focusing on the specific digital technologies or their technical affordances, instead analysing digital technology as these were deemed by participants to be relevant to their own everyday lives and operations. Research must be able to accommodate the ways individual users relate to and appropriate the technology around them, as the collective and wide range of mediational means in everyday life that enable new forms of activity (Wertsch, 1993). Examining the ways individual agents operate with these mediational means in the 21st century (Wertsch, 1998) merits closer analysis, as these influence a number of life outcomes across one's life.

Oliver (2016) argues that 'research in learning technology makes many claims about technology's effects, but rarely asks what technology is' (p. 35). Wertsch's (1998) theory of mediational means provides a powerful analytic tool for analysing the relationship between users of digital technology and the material affordances of their environments. Informed by Vygotsky's cultural-historical and sociocultural theory of learning (1978), the theory of mediational means provides the groundwork for analysing the ways individuals construct meaning and actively engage with existing as well as emerging technologies, as these afford them with continuously increasing affordances for learning, thinking, and acting in the 21st century.

As Corbin and Strauss (2008) argue, the purpose of qualitative social research is the development of concepts which allow us to organize our knowledge and understanding of the social world. While I have applied the concept of *user-identities* here as a means to explore the learning pathways of postgraduate students in technology-related courses influenced their user-identities, the concept of a 'user identity' is a powerful methodological and epistemological one, which may be useful to research that seeks to explore the ways individuals learn and engage with digital technology in a variety of life contexts. For researchers interested in exploring in-depth the ways individuals use digital technology in their everyday lives, the concept of user-identities may serve as a helpful conceptual starting point enabling them to 'focus on how technology uniquely shapes the way individuals live their lives (Goode, 2010, p. 501)'. As Goode (2010) argues, there is a need to examine 'beliefs about one's technology skills, beliefs about opportunities and constraints to use technology, beliefs about the importance of technology, and beliefs about one's own motivation to learn more about technology. (p. 498)' as these may shape one's engagements with technology in considerable ways. As this study demonstrates, the identities individuals construct around being users of technology must be recognized as a legitimate means for understanding and analysing the ways individuals learn and engage with technology in everyday life.

Gee (2001) argues that identities play a significant role in the ways individuals learn and act in everyday contexts and must therefore be used as analytic lenses in education research. Identity, according to Gee (2001), refers to a way of 'acting and interacting as a "certain kind of person"' (p. 100). These are shaped by the *interpretive systems* (Taylor, 1994) individuals develop over time across the life project. Applying

this to user-identities, user-identities examine the ways individuals interact with technologies in everyday life as "certain kinds of users", as these are shaped by their wider learning lives with digital technology.

While examining the meanings and dispositions held by individuals towards digital technology, the concept of the user-identity may also be helpful in exploring the 'use-genres' (Bakardjieva, 2005) of everyday users. 'Use-genres', Bakardjieva (2005) argues, refer to 'typical uses of technology, along with the recurrent situations in which they arise (p. 45)'. In revealing the specific predispositions and motivations held by individuals towards certain forms of technology partnership, user-identities may also uncover the specific contexts or domains in everyday life where learning and acting with digital technology are likely to take place (education, work, leisure, etc.). While I have conducted my research on user-identity through semi-structured interviews, applying an ethnographic approach to the study of user-identity may offer a richer exploration of certain aspects of the individual user's appropriation of digital technology in everyday life that may not lend themselves as easily to the interview data-gathering method. User-identities are performed as much as they are subjectively constructed and therefore the examination of such may benefit from ethnographic approaches which are more able to capture both the constructed (meanings) and performed (activities) aspects of user-identities. Further research may therefore explore the observable and empirical aspects of the user-identities of individuals, as these are actively realized and enacted by individuals in a number of everyday life contexts.

At a time when increasing accountability is being placed on the individual (Beck, 1992), analysing the ways individuals engage with digital technologies is significant on a number of fronts. From being passive consumers of broadcast media to active users of digital media, the ways individuals engage with digital technology now has implications for a variety of educational, occupational, social, civic and life outcomes (Robinson et al., 2015, van Dijk, 2005, van Deursen et al., 2017). The concept of a user-identity therefore may be relevant not only for analysing the ways individuals learn with digital technologies across the life course but also the ways they develop certain forms of relationships and partnerships with technology that enable them to realize these in productive and beneficial ways, which may have significant implications for a variety of life chances and outcomes. Examining the differential appropriation of digital technology through user-identities places the unit of analysis

on the individual user's relationship with technology, which may be key to understanding the uneven effects and outcomes of technological appropriation in everyday life.

Finally, the concept of user-identities may serve as an important conceptual starting point for exploring the learning lives of individuals, in relation to the roles digital technologies play across contexts, trajectories, and identities (Erstad, 2013) over the life course. As Säljö (1999) argues, learning cannot be separated from the specific tools and artefacts that facilitate and mediate these processes. Digital technologies therefore play an increasingly important role in shaping the identities of individuals as learners in everyday life contexts, as they appropriate and master these tools as users of these mediational means in everyday life. Exploring the user-identities of individuals allows the research to uncover aspects of their learner identities, which are specifically shaped by their engagements with digital technologies in everyday life. As life becomes increasingly recognized as a context for learning (Edwards, 2009), user-identities provide a useful point of reference for understanding the ways individuals learn across these broader learning contexts through the locus of one's engagements with digital technologies, where learning in everyday life is increasingly likely to take place.

Chapter 5 – Conclusion

As technological partnerships become a fundamental part of social practice in everyday life in the 21st century, everyday forms of learning become more and more intertwined with one's engagements with digital technology. How individuals learn and construct meaning around digital technologies are fundamental to the ways they engage and appropriate these artefacts, shaping not only their specific engagements with digital technology but also the *contexts, identities* and *trajectories* of their learning lives that both shape them and are shaped by them over the life course. As digital technologies now serve as valuable loci for examining everyday learning, research in learning and technology must develop new ways of conceptualizing individual engagements with digital technology, as these are appropriated by users in idiosyncratic ways for a number of goal-oriented and intentional activities in various everyday life contexts.

In this dissertation, I have attempted to do two things. Firstly, on an epistemological level, I have sought to develop a new analytic and theoretical approach to the study of learning and technology, using the concept of a 'user-identity' as a means to explore the ways individuals appropriate the mediational means afforded by their environments, as they utilize these for various forms of activity in everyday life which facilitate everyday processes of learning. Rather than focusing on particular artefacts or specific affordances of digital technologies, I have drawn on the wider frames of reference held by individual users towards, in relation to the meanings they construct around what digital technologies *are* and what digital technologies *can do* (Goode, 2010), as these shaped their user-identities in significant ways.

By drawing on the cultural-historical paradigm (Vygotsky, 1978) and Wertsch's (1993) theory of mediational means, user-identities bring into focus the taken for granted realities of our mediated experience (Barthes, 1972). While the specific character of sociotechnical change in the coming decades and centuries may be uncertain, there is no doubt that the interdependence between human activity and digital technologies will continue to grow (Latour, 2005) as the 'digital' increasingly becomes the default for everyday material artefacts (See Bunz & Meikle, 2017, for a discussion of The Internet of Things). As the 21st century 'morphs through successive and confusing new forms' (Selfe & Hawisher, 2004, p. 205)", user-identities offer a

much needed analytic lens that emphasizes the role of the individual *user* of technology, as she actively learns, realizes, and appropriates the increasing number of digital artefacts and affordances that facilitate everyday activity and participation in everyday life in the 21st century. The strength of the user-identity is derived from its *relational* approach to the study of learning and technology, allowing the researcher to examine learning through its fundamentally mediated as well as agentic nature, bringing into the fore the role digital technologies in both everyday processes of learning and the wider digitally-mediated learning lives of individuals.

Secondly, on the substantive level, I have *explored the user-identities of postgraduate students in technology-related fields,* as these developed over their wider learning lives and formal learning pathways with digital technology, as both everyday users and specialists of digital technology. As both specialist groups have shown, digital technologies have played a significant part of their learning lives albeit in very different ways, where they developed distinct forms of mastery over the mediational means they appropriated in everyday life. These shaped the overall characters of their user-identities, which in turn influenced their mindsets towards and partnerships with digital technology. While exploring the user-identities of postgraduate-students in technology-related courses enabled me to examine the ways user-identities developed and formed across wider learning lives (contexts, trajectories, and identities), it also aroused new questions with regard to the relationship between the user-identity and individual learning life such as: What role do user-identities play in shaping the learning lives of individuals? What are the implications of different user-identities on the learning life? These questions must be further explored in order to have a better understanding of the roles user-identities play in the learning lives of individuals as these are shaped and facilitated by their interactions with digital technologies.

Similarly, not only did the research reveal the qualities of their user-identities, it also shed light on the character of digital technologies themselves as material artefacts of the 21st century. As the user-identities of both specialist groups reflected, new questions must also be asked regarding what it means to be a user of digital technology in the 21st century such as: How must individuals master and appropriate these mediational means over the course of their learning lives in a time when there are both ever-increasing affordances made possibly by digital technology but also the increasing politicization of these mediational means in everyday life? As digital

technologies begin to penetrate various facets of everyday life, these questions must be raised, not only because they enable new and unprecedented possibilities in everyday life but also because they may begin to impose new constraints and pressures on everyday life which may be harmful or detrimental to the everyday user of digital technology. As individuals are handed greater agency by the digital technologies, they also become increasingly accountable (Beck, 1992) for their interactions and engagements with these devices. Individual users must learn and master these mediational means in ways that allow them to appropriate and fully realize the enabling characteristics of digital technologies, developing the effective literacies necessary to realize these possibilities in technology.

To close, as the number of affordances offered by digital technology continue to increase and everyday social practice become increasingly remediated by digital technology, new ways of examining individual interactions with digital technology must be developed. As sociotechnical milieus change, so too do learning processes and the ways in which we may examine such. In this dissertation, I have attempted to develop a new analytic means for understanding learning and activity in everyday life as it occurs through its socioculturally-mediated form. The concept of user-identities serve an innovative theoretical approach to the examination of learning in everyday life through the locus of one's engagements with digital technology. User-identities may therefore provide future researchers with a powerful analytic framework for examining the individual learner as she learns, thinks, and acts in socioculturally-mediated world.

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Appendix

Appendix A. Interview Schedule

A. Introduction

Hello. My name is X and I am a Master's student in Education and Technology at Oxford University.

Before we begin this interview, I just want you to know that all your responses will be kept confidential and that your anonymity will be protected in any written reports that emerge out of this study.

I understand you are taking a course in _____ at X university.

I have asked you to participate in this study because I want to understand how you personally make sense of technology in your everyday life. In this interview, I will be asking questions about your use of technology in your day to day life as well as your general attitudes and views towards technology.

You might find that some questions seem far-fetched, silly, or perhaps difficult to answer during the interview. This is because some questions may be more appropriate for some participants and not for others. If there is anything unclear during the interview, please feel free to interrupt me and ask for clarification at any point.

There are no right or wrong answers in this interview, as I am interested in your personal views and experiences.

Hopefully after this interview, you and I will both have a deeper understanding of how you use technology in your everyday life.

Finally, would you mind if I took an audio recording of our interview? This will help me analyse the data gathered from the interview later on as well as allow me to focus on our conversation rather than taking notes during the interview.

Thank you again for agreeing to participate in this interview.

B. 'Warm Up'

1. **Tell me about yourself.**

    Additional Prompts:

    a. **How old are you?**

    b. **Where are you from?**

    c. **What do you currently do/study?**

2. **Why did you choose this course? (if mentioned, probe into technology-related reasons)**

    a. **Is technology something that particularly interests you? Why?**

    b. **Are you enjoying your course so far? Why?**

3. **Can you tell me about your daily routine? You can start from when you get out of bed in the morning up to the point when you go to sleep at night.**

C. Interview Proper

Use and Rationales

4. **You mentioned your use of device X in your daily routine, can you tell me a little bit more about how you use this device in your daily life.**

    a. **What do you use this for?**

    b. **Where do you usually use this?**

    c. **How frequently do you usually use this?**

5. **You mentioned several ways earlier in which you use device X. I want to talk about these with you in more detail. Is it ok if we talk about these one by one?**

6. **Can you please expound on reason X (*probe into each use until exhausted; explore each use in the context of motivations and wider life circumstances*)**

    a. **How did you come about using your device for this?**

    b. **How long have you been using it in this way?**

    c. **How often do you use your device in this way?**

    d. **Do you think this is beneficial to you in your day to day life?**

        i. **If so, in what ways?**

        ii. **If not, why not?**

    e. **Do you think you would be able to fulfil X activity (as related to given reason for use) without the device?**

    f. **Do you think you will continue to be using technology in this way in the future? Why?**

7. **May I ask how you have come to own or use such a device?**

    a. **Is there any specific reason as to why you chose this particular device?**

    b. **What factors did you take into account in selecting this device? (Features, price, convenience, etc.)**

8. **Apart from device X, may I ask what kinds of technologies or devices you own?**

9. **Repeat questions 4-8 until exhausted.**

10. **We have talked a lot about various activities that you do either through or with the help of technologies. Are there any particular activities in your day to day life that do not involve the use of technologies?**

a. **What are these?**

b. **Why do you think the use of technologies are absent in these activities?**

11. **What do you think is the difference between the kinds of activities you do that require the use of technologies and the kinds of activities that do not?**

    a. **Do you think these activities touch on different aspects of your life? (Work, education, social life, leisure, etc.)**

    b. **How so?**

    c. **Explore each aspect mentioned.**

12. **What do you think you use technologies for most in your daily life?**

    a. **Why do you think this is so?**

13. **You mentioned using technologies for XYZ. Do you think these are of equal importance or value to you?**

    a. **How so?**

    b. **What do you think counts as using technologies in "valuable" ways?**

    c. **What do you think counts as using technologies in ways that are not valuable?**

14. **How would you characterize your use of technologies?**

User-Identity and Dispositions

15. **How would you describe yourself as a technology user?**

16. **What motivates your use of technology?**

17. **Are there specific goals or activities you have in in mind when you use technologies?**

18. **On a scale of 1-10, with 1 being the lowest and 10 being the highest, how much would you say technology mediates your daily activities?** ***(point for discussion)***

    a. **Why is this so?**

19. **On a scale of 1-10, with 1 being the lowest and 10 being the highest, how important do you think technology is to your daily activity?** ***(point for discussion)***

    a. **Why is this so?**

    b. **Can you please expound on this.**

20. **How would you compare yourself as a technology user to other people? (peers, family, etc.)**

21. **Do you consider yourself to be an average user of technology?**

    a. **Why would you say so?**

    b. **In what ways are you an average user of technology?**

    c. **In what ways do you think your use of technology is different from the average user of technology?**

22. **Why is technology important to you?**

23. **In what ways do you think technology influences or contributes to your life?**

    a. **What aspects of your life do you think technology plays a crucial role? (Education, career, personal life, daily tasks, etc.)**

        i. **Elaborate on each** ***(probe into offline circumstances)***

b. **Among the aspects mentioned, which do you think technology plays the most important part in?**

    i. **Why?**

24. **(If appropriate to previous responses) Do you think technology will continue to play an important role in your life?**

    a. **Why so?**

    b. **How do you feel about this?**

    c. **How do you think this impacts your attitudes toward technology?**

25. **How would you describe your general attitude towards technology today?**

D. 'Cool Off'

User-Identity and Dispositions (Cont.)

26. **Do you think your use of technology will change in the future?**

    a. **If yes, how so?**

    b. **If not, why not?**

27. **I would like to ask you a final question. I understand that talking about technology in this manner, and really scrutinizing about your use of technology, is not really something you do every day. I want to know:**

    a. **How did you feel about the interview?**

    b. **Was there anything you realized about your use of technology that you had never really considered before?**

28. **Do you have any final comments, suggestions, questions, thoughts, or feelings that you want to share before we end this interview?**

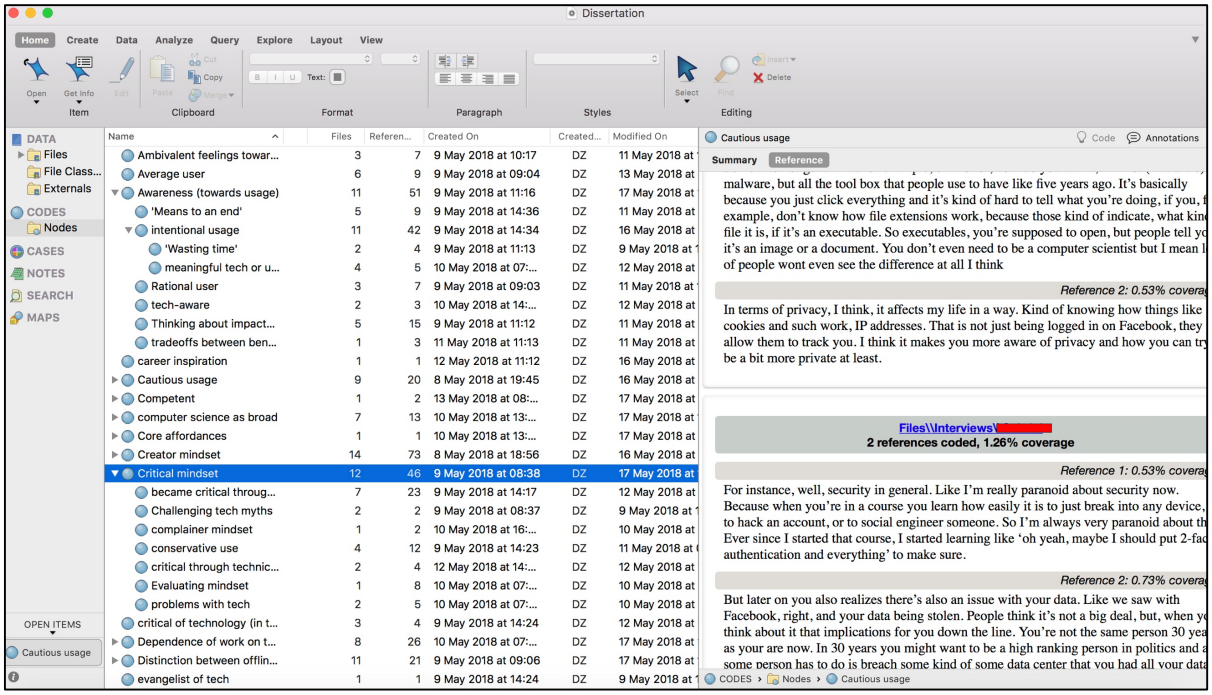
E. Closure

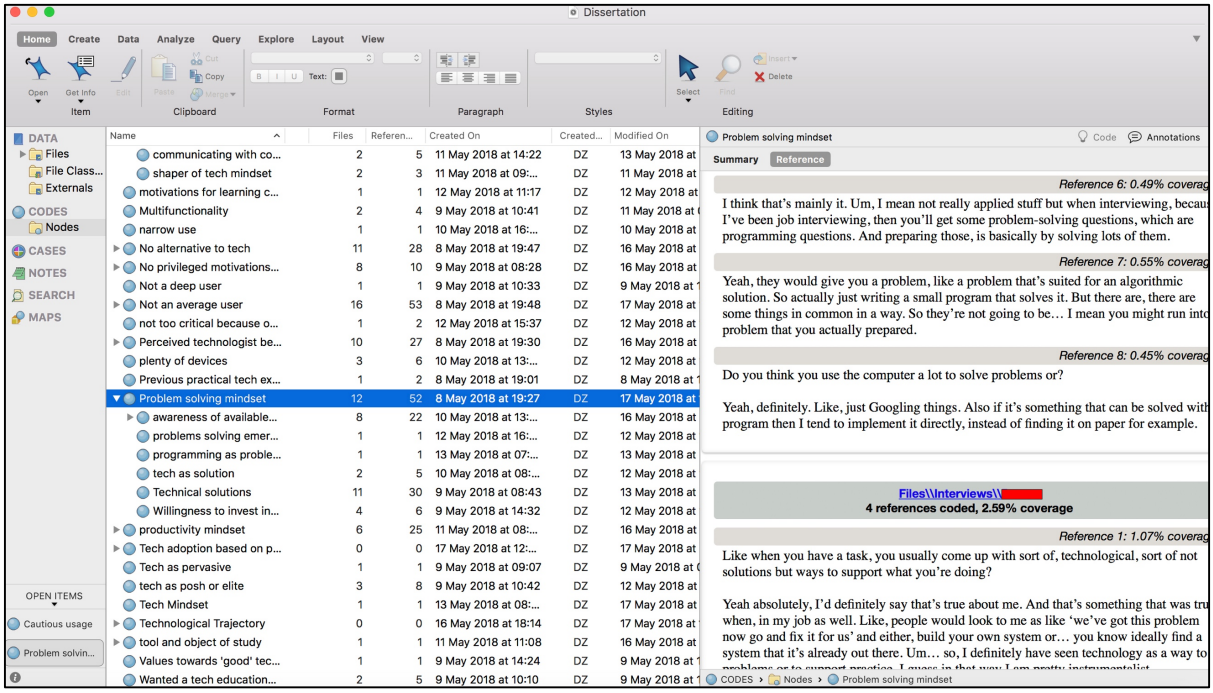
Thank you so much for participating in this interview. Your participation will help me better understand the concept of technological partnership in everyday life in the 21st century in hopefully more nuanced ways.

Would you mind if I reached out to you again in the future, in case I develop more questions for you based on this interview?

Similarly, if you ever come up with more reflections or realizations about your use of technology after this interview, feel free to reach out to me. I am open to having a further discussion about this.

Appendix B. NVivo Coding Tree





Appendix C. Analytic Memo Samples

"I probably use technology for learning more than for anything else." **Technology plays a significant role in what may be considered his 'learning life'. Technology serves as a conduit of this learning, facilitating both his informal and formal learning in significant ways. This is most evident in his regular use of technology for audiobooks and podcasts.**

"I would say I'm a healthy user of technology. Because, I can… I know when I've reached a certain line or border of having spent to much time on my laptop for example. Or, also, healthy in that sense that I'm, not binge watching any series, I would also consider as healthy in the sense that I'm not too naïve, about my personal data that I share, but still I think I'm not critical enough." **She characterizes herself as being above the average user of technology, not in terms of having an advanced knowledge of the material processes behind technologies but in the way she conceptualises and uses technology as a part of her everyday life. Perhaps, having a 'healthy' attitude towards technology is metaphorical for appropriating and using technology in ways that are relevant to one's life circumstances, in relation to their sense of personal development and wider sense of well-being. Having a healthy attitude towards technology entails not only an awareness and understanding of the ways in which technologies may harm well-being, such as the risks, dangers, and distractions posed by technologies, which she is cautious to avoid and balance, but also a desire to realize 'healthier' technological choices in daily life.**

"For me technology is less about entertainment than it is about productivity and work stuff"**. This statement reflects quite clearly the kind of user of technology that he is. He says so in opposition to what other user-identities may be like, and for whom entertainment may play a significant purpose and aim in their technology use.**

"I'm efficiency-oriented" / "I think that I try to use technology for efficiency or because it's kind of necessary". **This is clearly expressed by the participant all throughout the interview, that he has a very pragmatic and efficiency-driven use of technology. His use of technology is very calculated in that he only uses them in the ways that are most**

efficient or productive to his everyday life. It is interesting that he frames technology in this way because it does say something about what role technology plays in the activities of everyday life. To say something is efficient hints at concepts such as 'process' 'activities' 'systems' 'outcomes' 'outputs' and so on.

Appendix D. CUREC Approval

CUREC Application Approval: ED-C1A-17-125 Inbox ×

Heath Rose [redacted] 28/02/2018, 18:08

CUREC Application Approval: ED-C1A-17-125

Title: Technological Partnership in Everyday Life: Exploring User-Identities of Students in Technology-Related Courses

Researchers: [redacted]

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

Please note that CUREC approval does not guarantee access to participants, and it is your responsibility to check whether countries or contexts in which you plan to conduct your research might impose additional requirements.

If your research involves participants whose ability to give free and informed consent is in question (this includes those under 18 and vulnerable adults), then it is advisable to read the following NSPCC professional reporting requirements for cases of suspected abuse
http://www.nspcc.org.uk/globalassets/documents/information-service/factsheet-child-abuse-reporting-requirements-professionals.pdf

Should there be any subsequent changes to the project which raise ethical issues not covered in the original application you should submit details to research.office@education.ox.ac.uk for consideration.

Good luck with your research study.

Yours sincerely,
Heath Rose

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Heath Rose
Associate Professor of Applied Linguistics
Department of Education
University of Oxford

Appendix E. Information Sheet

PARTICIPANT INFORMATION SHEET

Ethics Approval Reference: ED-C1A-17-125

1. ***What is the purpose of this research?***

Digital technologies are now pervasive in almost every sphere of life, from education to work to recreation. People now employ a variety of technologically-mediated strategies (google searches, social media networks, commuter apps, online banking, etc.) to enhance, augment, or deliver various activities of everyday life. By exploring the people's general attitudes towards 'technological partnership" as well as the ways they utilize digital technologies in their everyday lives, this study aims to understand the factors that shape people's use of digital technologies, in relation to their wider motivations, goals, and circumstances. This study hopes to answer the following questions: How do people use technology in their everyday lives? What are their rationales for using technology in such ways? What factors shape their use of technology? How do they make sense of their personal "user-identities" as users of technology?

2. ***Why have I been invited to take part?***

To be included in this study, you must be a postgraduate student in a technology-related course of some kind (computer science, internet studies, artificial intelligence, digital humanities, media studies, or any other course in which technology may play an integral part).

You have been invited to participate in this study because we are interested in exploring how students in postgraduate degrees in technology-related courses such as yourself use technologies in their everyday life. We are interested in exploring what significance you give to technologies, in relation to the role you perceive it to play in your daily activities. We want to explore how you make sense of your own "user-identity", as a user of technology currently undertaking a formal degree in a technology-related field.

3. ***Do I have to take part?***

No. You can ask questions about the study before deciding whether or not to participate. If you do agree to participate, you may withdraw yourself from the study at any time, without giving a reason and without penalty, by advising the researchers of this decision.

If you decide to withdraw from the study, your data will no longer be included in any written report that emerges from the study. You may withdraw yourself from the study until the point before the publication of the final research report. In this case, kindly let the researcher know as soon as possible if you decide to withdraw.

4. ***What will happen to me if I take part in the research?***

In agreeing to participate in the study, you will be participating in at least one full interview with the interviewer, which will last for approximately 1 hour. The time and place will be agreed on by both the researcher and the interviewer as mutually convenient to both parties.

After the interviewer, you will be asked whether or not you are interested or available for a possible follow up interview. However, there is no obligation to take part in a second interview.

The interview will be audio-recorded and transcribed by the researcher.

If you are still happy to take part, you will be asked to sign a consent form. This will include the following:

- **I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.**
- **I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or academic penalty.**
- **I understand that research data collected during the study may be looked at by designated individuals from the University of Oxford where it is relevant to my taking part in this study. I give permission for these individuals to access my data.**
- **I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.**
- **I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.**
- **I understand how this research will be written up and published.**

- **I understand how to raise a concern or make a complaint.**
- **I consent to being audio recorded.**
- **I understand how audio recordings / videos / photos will be used in research outputs.**
- **I agree to take part in the study.**

5. ***Are there any potential risks in taking part?***

There are no significant risks (physically, psychological, mental) expected to arise from taking part in the study. However, if your use of technology in daily life is something you consider a sensitive or private matter, then you may choose not to take part in the study. If you opt to participate, there is no obligation to disclose these specific uses to the researcher during the interview. To avoid this issue, the researcher will ensure and remind the participant before the interview that he/she need only share what he/she is comfortable sharing with the researcher.

6. ***Are there any benefits in taking part?***

There will be no direct benefit to you from taking part in this research. However, participants may leave the interview with a deeper understanding of their own use of technology in everyday life, which some participants may personally find to be beneficial.

7. ***What happens to the data provided?***

All research data, including personal / sensitive data will be stored confidentially using a file-encryption software (Keka) and backed up on HFS, both university-recommended software for data safe-keeping.

All participants will be given random identification numbers/codes, which will only be known and accessible to the researcher. An encrypted key giving identities will be stored separately in order to control access to the data and ensure the confidentiality and anonymity of participants throughout the research project.

Both the researcher and his supervisor will have access to the research data derived from the study. All research data and records will be stored for 3 years after publication or public release of the work of the research.

8. ***Will the research be published?***

The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

The research will be written up as a thesis. On successful submission of the thesis, it will be deposited both in print and online in the University archives, to facilitate its use in future research. The thesis will be openly accessible.

9. Who is organising and funding the research?

This research project is organized by the Department of Education, 15 Norham Gardens, OX2 6PY, as a major research requirement of the researcher for the MSc Education programme. This project currently receives no external funding from a third-party.

10. Who has reviewed this study?

This study has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee (Reference Number: ED-C1A-17-125)

11. Who do I contact if I have a concern about the study or I wish to complain?

If you have a concern about any aspect of this study, please speak to the relevant researcher [Researcher Number] or their supervisor [PI Mobile] who will do their best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how they intend to deal with it. If you remain unhappy or wish to make a formal complaint, please contact the relevant chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter in a reasonably expeditious manner:

Chair, Social Sciences & Humanities Inter-Divisional Research Ethics Committee; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

12. Further Information and Contact Details

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

(Researcher Name)
Department of Education
15 Norham Gardens, Oxford, OX2 6PY
(Researcher Mobile Number)
(Researcher Email)

Appendix F.

PARTICIPANT CONSENT FORM

CUREC Approval Reference: ED-C1A-17-125

Technological Partnership in Everyday Life:
Exploring the User-Identities of Postgraduate Students in Technology-Related Courses

Purpose of Study: To explore how students in technology-related courses use technology in their everyday lives and to understand their personal user-identities and attitudes towards the notion of "technological partnership".

		Please initial each box
1	I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or academic penalty.	☐
3	I understand that research data collected during the study may be looked at by designated individuals from the University of Oxford where it is relevant to my taking part in this study. I give permission for these individuals to access my data.	☐
4	I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.	☐
5	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	☐
6	I understand how this research will be written up and published.	☐
7	I understand how to raise a concern or make a complaint.	☐
8	I consent to being audio recorded	☐
9	I understand how audio recordings / videos / photos will be used in research outputs	☐
10	I agree to take part in the study	☐

Name of Participant	**Date**	**Signature**
Name of person taking consent	**Date**	**Signature**