Chapter 2: Underpinning literature

The purpose of this chapter is to set out the underpinning literature that supports the thesis. It is arranged in three parts:

- A discussion about why I began to review literature around three domains: epistemology, self and technology
- Essays on each of those topics which summarise the literary foundations of the project
- An addendum to the original literature review which focuses on the existing body of knowledge about professional learning.

The inclusion of the addendum is the direct result of the reflexive processes for the study which in early 2010 caused me to recognise that it was necessary to focus on professional learning as opposed to learning in general and children's learning in particular. It will also help to justify the positioning of this thesis in that particular domain.

This piece of writing has enabled me to:

1) explore the place of literature in the development of my ontology (Whitehead and McNiff, 2006), a critical task if the outcomes of the research are to be considered objective and reliable;
2) explore the place of literature in my autobiography and the influence this has had on my epistemological standpoint. As will be seen, that tends to be more philosophical than practice-oriented. This has been a challenge given the choice of positioning the work as a doctoral thesis in education as opposed to a Doctorate in the Philosophy of Education;

3) chart the direction of travel - It demonstrates the development of my approach to professional learning over time, which moved from a structured, and probably 'strictured', theological method to a more open, dynamic, dialogic method in keeping with the spiralling and iterative nature of learning mediated by technology. One might say, 'journeying into theory';
4) provide the literary foundations for the theoretical conceptual framework on which the work is predicated and to tee it up.

Rationale for selecting Epistemology, Self and Technology

The three 'foundational' domains were chosen because I was aware that (information) technology was having an impact on my career. This was, I realised, affecting me as a self and I was keen to know in what ways that might be the case. It became important, therefore, to re-visit the theoretical explanations as to why I know what I have come to know and even some of the processes by which this has happened.

There is some 'fuzziness' (Reid, 2008) with regard to interchanging the words 'epistemology' and 'knowledge'. Epistemology, according to Hanks (1989) is a noun, "the theory of knowledge." (Hanks, 1989 p. 514). I want to argue that my review of the literature shows that there are multiple theories of knowledge so I prefer to see epistemology as the study of knowledge in much the same way as theology is the study of *theos* - God. Quinton describes epistemology as, "the philosophical theory of knowledge, which seeks to define it, distinguish its principal varieties, identify its sources, and establish its limits" (Quinton, 2000 p.279). In this thesis, therefore, I am keen to show the principal varieties of my knowledge, show their sources and establish their limits. The first section is designed to set out how I believe I know things. The second sets out how I act as a self, though in this case I intend to limit this discussion to my professional self as an educator. In the third part of the chapter I want to explore very specifically how emerging and evolving technology has been influential on the development of my professional knowledge, skills, identity and, ultimately, career.

Section 2.1: Relevant Literature About Knowledge (Epistemology)

> "True knowledge is existential knowledge. The act of autobiography, above all, reveals to the student the truth of this proposition, and in so doing, prepares him to become a responsible and responsive teacher." (Abbs, 1972 p.6)

The purpose of this section is to set out as clearly as possible the sources and influences on my use in this thesis of the term 'knowledge'. As will be shown later in the thesis (section 2.2x), kNowledge (N_2), as I understand it, is a significant factor in the theoretical framework which the study is exploring.

What lies at the heart of my inquiry is the question "How do I know what I know?" and the subsidiary question, "If there is something that I don't know, how do I set about trying to find it out?" Throughout the thesis, I take time to point out the moments when what I was learning *in transit* changed the way the study was developing and the epistemological processes through which it was travelling. Though challenging to traditional research methodology, it is this specific organic, dynamic, living theoretical process that makes this thesis unique and, arguably, original.

Within the context of the study, what I am talking about here contributes directly to that aspect of the framework that I characterise later as N_2 - kNowledge. It is a mixture of prior knowledge that is, that which I have acquired in formal or informal learning contexts in the past and knowledge that has been set down by others as an outcome of their own research and learning: in the words of Glynn Kirkham (2003), "The words and works of others."

It is not the purpose of this study to exegise the words of Donald Rumsfeld (US Secretary of State during the second Gulf War) though they are worth repeating here by way of illustration:

"As we know,
There are known knowns.
There are things we know we know.
We also know
There are known unknowns.
That is to say
We know there are some things
We do not know.
But there are also unknown unknowns,
The ones we don't know
We don't know."
(Rumsfeld, 2002)

While the statement might be risible given the enormity of the context about which it was uttered, it is a neat summary of the important challenges facing any enquirer at the start of their learning journey.

In the formative stage of this process I read widely in the field of epistemology to find a solution to the question, "...how do we know what we know" and, indeed, how do we start to find out what we don't know? (see Rumsfeld, 2002 above) That work indicated that some philosophers in the Western tradition (e.g. Plato, 2004, Ayer, 1972) see knowledge as existing in an abstract sense and ascribe to phenomena the definition *a priori*. Take for example this extract from the dialogue reported between Socrates and another of his disciples, Glaucon:

> "And is there anything more akin to wisdom than truth?
> How can there be?
> Can the same nature be a lover of wisdom and a lover of falsehood?
> Never.
> The true lover of learning then must from his earliest youth, as far as in him lies, desire all truth?" (Plato, 2004, Book VI)

Here the term, ‘wisdom’, is used interchangeably with the term, 'knowledge', and was, for Socrates, 'owned' by philosophers. The older the philosopher, the wiser he was since he had had more time to accumulate wisdom. This conceptualisation of knowledge as *a priori* data, can be described as the precursor to deontological approaches to knowledge, i.e. those ‘facts’ that exist because they exist and are known empirically.

This tends also to be the case in Eastern traditions where thinkers or 'arguers' such as the Buddha or Kung-Fu Tzu taught about the ideal forms of things and that the mission of the human was to aspire to know or understand these physically and metaphysically occurring phenomena.

> "O *Kāśyapa*, there are four [means] to attain the great treasure of the bodhisattvas. Which four? He rejoices at the presence of the Buddha; he hears the six perfections (*pāramitā*)..." (from the *Kāśyapaparivarta Sūtra* c. 5th Century C.E. cited in Holm & Bowker, 1994)

Here the key to enlightenment is meditation and the control of passions (bodily cravings) as a means of liberating the soul.

Other philosophers in the Western traditions (e.g. Aristotle, 2000; Polanyi, 1962; Ryle, 2009) tend to see knowledge as the outcome of a human’s participative engagement with real world phenomena. In essence, what is known is that which has been learned from reflections on experience – that is, knowledge or understanding accumulated after the event or *a posteriori*.

> "Recognition of a truth may in some cases contain as factors both previous knowledge and also knowledge acquired simultaneously with that recognition-knowledge, this latter, of the particulars actually falling under the universal and therein already virtually known." (Aristotle, 2000 p. 1)

The challenge for me as a learner was to establish my own approach to knowledge given the fine distinctions that are necessary when examining some phenomena. For example, the existence of mathematical patterns or forms in the world indicates an order and logic that some have called ‘pure fact’ (e.g. Plato, 2004 and Ayer, 1972). However, those who believe that knowledge is

acquired inductively will argue that even Plato and Ayer required sensory phenomena to act as triggers for their 'rational' approach to knowledge and understanding.

I am inclined now to argue that, on balance, the inductive approach seems to me to be more tenable and realistic in a constantly-evolving and changing world, so that I therefore approach the acquisition of knowledge in a tradition that has come to view it as the outcome of reflections on experience. To do other would be to perpetuate some of the ancient dualisms (see Ryle, 2009) that separated body from soul, mind from spirit and heaven from earth back before scientific enquiry enabled humankind to understand the holism of creation (that is, the world as experienced by human beings) and the integral part played by 'us' in the evolution of the biosphere. I am indebted to writers like Matthew Fox (see e.g. Fox, 1982) and James Lovelock (see e.g. Lovelock, 2009) for insights on this carried forward from previous parts of my career:

> "Science itself has broken down in our century [Fox wrote this in the 20th Century] and is going through a profound breakthrough, a fashioning of a new paradigm by which to model the universe. This new paradigm is sure to affect all elements of society - from education to medicine, from religion to economics, from politics to psychology - just as the previous Newtonian model has done for three centuries." (Fox, 1982 p. 15)

In the introduction I noted the impact that technology has had on relatively recent history. Authors such as Friedman (2006), Kuhn (1962) and Waldrop (1992), who have been influential on this study as a whole, have shown this impact by rehearsing hypotheses about new paradigms of knowledge and the science that underpins them.

> "Very, very slowly, there's been a gradual shift from an exploitative view of nature - man versus nature - to an approach that stresses the mutual accommodation of man and nature. What has happened is that we're beginning to lose our innocence, or naiveté, about how the world works. As we begin to understand complex systems, we begin to understand that we're part of an ever-changing, interlocking, nonlinear, kaleidoscopic world." (Waldrop, 1992 p. 333)

I grew up being taught that science was the means by which we knew about and understood the world. During my time as a student of theology, I learned, that the origins of the word 'science'

are in the Latin word *scientia*, which translated simply means knowledge[9]. Thus, I hold that this is a scientific enquiry even though it has no test tubes, thermometers or triangles. It is a study, however, that is trying to establish what knowledge is and how it is acquired.

Most notable for the purposes of the project is the seminal work of Michael Polanyi (1962) who shifted publicly from his role as an academic scientist to work as an epistemologist precisely because he saw the tensions between reified knowledge as he saw it in the physical sciences and his own experience, the outcomes of which he saw as rather less fixed and open to change and difference. Polanyi writes,

> "... scientific theory is denied all persuasive power that is intrinsic to itself, as theory. It must not go beyond experience by affirming anything that cannot be tested by experience, and above all, scientists must be prepared immediately to drop a theory the moment an observation turns up which conflicts with it. In so far as a theory cannot be tested by experience - or appears not capable of being tested - it ought to be revised so that its predictions are restricted to observable magnitudes." (Polanyi, 1962 p. 9)

Polanyi offers here a critique of the Newtonian paradigm alluded to above in the words of Matthew Fox. He goes on to note alternatively that,

> "We shall find Personal Knowledge manifested in the appreciation of probability and of order in the exact sciences, and see it at work even more extensively in the way descriptive sciences rely on skills and connoisseurship. At all these points the act of knowing includes an appraisal; and this personal co-efficient, which shapes all factual knowledge, bridges in doing so the disjunction between subjectivity and objectivity. It implies the claim that man can transcend his own subjectivity by striving passionately to fulfil his personal obligations to universal standards." (Polanyi, 1962 p. 17)

Accordingly, I would argue that kNowledge (N_2) for me is the outcome of an appraisal of a range of experiences. It is not, in Polanyi's theory, enough to have participated in an experience event; there has to be a process by which the putative knower appraises what has been seen, heard, touched, tasted or smelt. As such all matter are therefore phenomena to be experienced first and then 'come to be known' later. I may experience, for example, video-conferencing in a

[9] See Hanks 1989

lecture hall with an expert operator manipulating the technology to desirable effect. It will only be after I have attempted to engage with such technology that I can say that I know fully what it is, or how it works. I have seen many people using technology and concluding on first engagement that 'it doesn't work' - they have not transcended their own subjectivity. It seems to me that those who can see past the 'technical hitches' are those who can both deduce from universal standards and create their own.

The key difference, therefore, between personal knowledge and 'personal knowledge' as proposed by Polanyi (1962, *ibid*) is that the knower has appraised phenomena objectively. Were I to substitute the word 'appraised' with 'reflected upon', it begins to draw this argument closer to the discourse of teachers' professional development (see e.g. Schön, 1985; Jasper, 2003). A significant part of the research methodology for this study is a systematic series of reflections on some phenomena from my own autobiography (see chapter 3 for a discussion of the methodology and chapter 4 for the reflections themselves).

Autobiographically, a text that has been influential on my thinking since the 1980s is *A Theology of Liberation* (Gutierrez, 1971). The epistemic method therein is known as the 'hermeneutic circle'. Gutierrez writes,

> "In the last analysis, the true interpretation of the meaning revealed by theology is achieved only in historical praxis" (Gutierrez, 1971 p.13)

I want to adopt this hermeneutic circle and apply it to my epistemic method because I believe that I come to know things best when I act on the theories I have accumulated as I journey through the world and time.

One of the causes of paradigm shifts in science (and therefore *scientia)*, has been the rapid expansion of technology (Friedman, 2006, Waldrop, 1992, Naughton, 2000). Again, in my

childhood and adolescence science and technology were 'disciplines' studied by those wishing to be doctors, engineers, mechanics or 'artisans'. I was 'encouraged' rather to pursue the arts, humanities and languages and, as a result, learned little in physics and chemistry that is memorable, or useful. Today, such a binary approach would not be helpful as it is in the coming together of the disciplines that real advances in knowledge and understanding seem to be made. The Santa Fe Institute, as described by Waldrop, exemplifies this point admirably:

> "Basically, what I'm saying is not at all new to Eastern philosophy. It's never seen the world as anything else but a complex system. But it's a world view that, decade by decade, is becoming more important in the West - both in science and in culture at large." (Waldrop, 1992 p. 333)

Even before I had encountered, what might on the face of it be described as a hard-nosed, (computer) scientific theory like 'Complexity', I had also read the seminal insights of Pierre Teilhard de Chardin (1960), the creation-centred insights of Fox (1982) and a significant amount of popular science (e.g. Lovelock, 2009). Each of these, in their own ways was leading me to an understanding of the world that was not able to isolate scientific world-views from spiritual ones.

> "The arrangement of the parts of the universe has always been a source of amazement to men. But this disposition proves itself more and more astonishing as, every day, our science is able to make a more precise and penetrating study of the facts. The farther and more deeply we penetrate into matter, by means of increasingly powerful methods, the more we are confounded by the interdependence of its parts." (Teilhard, 1960 p. 44)

Elsewhere in this study, I have embraced Naughton's (2000) description of autobiographic moments as 'magic' or 'miracle', metaphorical language which locates the discourse right on the edges of hard-nosed scientism and philosophy and theology. There is, of course, nothing metaphysical about the insights afforded to the human condition in the 21st Century by computer-aided technology, though sometimes the outputs provoke a reaction similar to that described as 'awe and wonder' in the DFES Circular 1/94 (DFES, 1994). What is actually

occurring in these moments is a shift in what the observer perceives to be possible now, with the assistance of technology. Without formally having studied computer science, I can see that its power is awe-inspiring when applied carefully in the pursuit of human understanding. In education, as I have experienced it over twenty years, the outcomes and outputs of research and development in computer-based technologies have been instrumental in shaping the future of possibilities for learning.

Technology, in professional learning, is likewise causing constant changes in our understanding as a human community. In the domain of formal learning such is the pace of change that, "content can't be pre-specified." (Conner et.al., 1996 p. 30). In that sense, it becomes important to induct patterns, theories or propositions that might be the case in the present or future, confident that the only thing likely to remain unchanged is the need to change – again and again. A short autobiographical illustration is given in the vignette below to illustrate the point that the more we worked with technology and our knowledge base increased, so did our capacity for recognising better tools when we saw them and our ability to amend, adjust or develop them or others to our purposes. It is also referred to in appendix 3.

Vignette 1: The *Dataease* Debacle

A frequent challenge for teachers is the annual need to report on the progress of their pupils. At some point in the early 90s, St Simon Stock School attempted to develop its own database driven system to simplify the process and to reduce the number of repetitive tasks teachers were required to perform. Working with Simon Stanford (see IM1 - appendix 2), I set about writing a definitive set of reports using a state of the art program *Dataease*[10]. Engaging with this new technology was another chance to play in the metaphorical 'sweetshop' of technology[11]. The system was used once! It was abandoned in favour of another system that came 'plugged in' to the ever-emerging SIMS product that was gaining ubiquitous adoption across the education market-place at the time.

[10] This product is still owned and developed in the UK having been bought by Sapphire International.
[11] Further analysis of this metaphorical term is undertaken in section 4.4

As can be seen in IM3 (see appendices 1 and 4), help towards understanding of this phenomenon came from engagement with the work of Polsani (See 2002 1 and 2). His work as a philosopher attracted me to his session at ICCE 2002 at which he read from the paper that contains these words:

> "More adequate categorization would be to call software a collection of symbolic arguments. Unlike traditional tools, the symbolic assemblages (software) are applied to production of other symbolic groupings. Therefore, the knowledge production in the Information Sphere is the application of knowledge for further knowledge." (Polsani, 2002, 1 p.2)

Elsewhere, Polsani (2002, 2) articulates in greater detail the correlation between this and what he calls 'performative knowledge' - a term he adopts from Jean-Francois Lyotard (1984),

> "With preparedness for change as a fundamental principle, performative knowledge can be grouped into two categories, functional knowledge and optimal knowledge. Functional knowledge is the ability to access correct information in the right way at the right moment to perform tasks. Optimal knowledge on the other hand is the capacity to arrange previously independent data into a new series of arrangements to generate new projects or optimize the existing projects." (Polsani 2002, 2 p 3)

If I synthesise the insights derived from Polanyi (1962), Gutierrez (1971) Lyotard (1984) and Polsani (2002, 2), I arrive at a point where knowledge seems to be acquired by an individual who wishes to know and understand more about their engagement and interaction with the world and does so by total immersion and participation. On this basis, I would argue that there are three dominant strands in my thinking about epistemology, all of which are supported in the words and works of those cited after each bullet point:

1. Knowledge formed as a result of participation in conscious acts of learning (post Aristotle (2000), Polanyi (1962), Glaser (2002), Conner et. al. (1996), Lave and Wenger (2008))

2. Knowledge accumulated by professionals as an outcome of their reflective practice and participative inquiry, including the critical feedback of pedagogical agents (Schön (1983; 1987), Dadds and Hart (2001), Whitehead and McNiff (2006))
3. Knowledge acquired about self through reflexive processes, especially, again, where this is accompanied by feedback from professional agents (West (2004), Reid (2008), Husserl (2001), Natanson (1971), Sokolowski (2000))

The first is extrapolated further in section 2.3 where the notion of pedagogical/andragogical agency is explored since most 'conscious acts of learning' will occur in a formal education setting and will be more or less conducted by a learned expert or guide. Significantly, this tees up the question of whether or not a 'self' can act as her or his own pedagogical agent.

The second might be said to be a statement of the present state of epistemological practice within the teaching profession.

The third serves to act as a lead in to a summary account of literature reviewed about the 'self'.

Section 2.2 Relevant Literature About Self

Reading in philosophy pointed the way to further exploration of the concept of 'self', since it is identified as one of the four core concepts in post-modernism (see Taylor, 1984) and is evoked by writers such as Lyotard (1984). I dwelt on reading around this topic, since the self, and specifically myself, forms a significant 'object' for the research that underpins the thesis. Of note have been the works of Natanson (1970), The Buddha (1985), Freud (see Blum, 2003; Thornton, 2006; Chiriac, 2006), Jung (1978) Taylor (1989), and West (2004). These disparate 'sources of the self' (Taylor 1989) were brought together in my reading of Sokolowski (2000) who gave me an insight into how 'self' can be both subject and object within phenomenology and is thus a legitimate focus for structured enquiry.

Further work has been undertaken in the exploration of 'selves' as presented in social-networking sites such as www.bebo.com, www.facebook.com, www.myspace.com, and www.secondlife.com. This material is difficult to reference but I have included in section 2.3 a short review of the emerging literature around 'virtual' and online identities in education and how they are being used to co-construct new knowledge and meaning. This is an important example of where technology and self overlap and interlock. Much research has been carried out into the identities teachers develop in their professional lives (Day et. al., 2006; Day et. al., 2007) which is an important background consideration for this study. Of greater interest is the selfhood and perceptions of self as a journeying learner that sits behind the public identity that is fore-grounded in a career.

I will also aim to deal with the fact that I now see the inclusion of the word 'virtual' in the pre-study documentation as inappropriate since the identity teachers create are real to them

(Goodson and Mangan, 1991) whether they are disclosed in online, technologised, digital, blended or face-to-face professional learning settings (see Day et.al., 2006 and Day et. al., 2007).

Natanson proposes that in order to make sense of complex ideas which transcend a variety of academic disciplines, it is necessary to move from 'mundanity' to a 'philosophical attitude' (Natanson, 1970 pp. 15-17). He argues, "The individual who does philosophize in serious terms is the one who breaks through mundanity to the paradoxical recognition that radical reflection is one of the possibilities of the mundane world" (Natanson, 1970 p.16). This approach is echoed by Sokolowski (2000), who argues, "when we move into the phenomenological attitude we become something like detached observers of the passing issue or like spectators at a game." (Sokolowski, 2000 p. 48). This, however, both affirms Natanson's approach but also begins a divergence from it. Natanson noted that the philosopher's "…materials are inseparable from his own existence, he is his own subject matter" (Natanson, 1970 p. 16).

> "Let us call the historicized ego, the self. It is the ego[12] which has a concrete biography, a continuous experience and a specific orientation toward the future in terms of projects and dispositions" (Natanson 1970 p. 16)

Whereas Sokolowski clearly sees operating within the 'phenomenological attitude' as more akin to the analysis of observable phenomena,

> "The world is more like a context, a setting, a background, or a horizon for all the things there are, all the things that can be intended and given to us; the world is not another thing competing with them, it is the whole for them all, not the sum of them all…" (Sokolowski 2000 p.43).

There is, thus, even within the apparently unified phenomenological approach, a bifurcation between those who see the self as the main *object* of philosophical enquiry and those who see it as the principal *subject*. In order to make sense of this, my aim is to rehearse some ancient

[12] It is important to note that Natanson is operating in the post-Freudian era and that attention is paid to Freud's work later in this section.

wisdom on the ‘self’ in a quite mundane manner, to move from there into the ‘philosophical attitude’ – Natanson’s concept attenuated by Sokolowski into the ‘phenomenological attitude’ - so that a more detailed analysis can be undertaken and then to present some conclusions which will inform and enrich further sections of this study.

It is my intention to see myself as both the subject and object of the research, adopting a phenomenological attitude whereby I 'bracket out' those things that can be construed as 'noise' in order to get greater clarity on those moments that have been illustrative. But I also want to acknowledge that it would be impossible to bracket myself out of the moments as a 'nod' to objectivity, since, as will be seen in section 3.1.2, Moustakas (1994), a leading practitioner of phenomenological research methods, affirms the contribution of the researcher's self to the process. In undertaking this review of literature about the self, I am therefore intending to understand more about the self, myself, that will conduct the research.

2.2.1 Historico-philosophical approaches to the 'Self'

The self is an entity. It is also a concept and probably a psychological reality. The notion of the self is one that emerged in the writing of the ancient Greeks including Plato and Aristotle. In Plato's work there appears to be inter-changeability between the terms spirit, soul and self (see Thomas, 1998). For Aristotle, the focus is much more on how an individual 'self' responds to its duties within a nation state and to the moral imperatives of citizenry (Ross, 1997). There is certainly plenty of evidence, therefore, that in the ancient Greek world the relationship of the self to the political world was an important matter of philosophical debate.

The 'self' is both the subject and object of some significant figures in Western thought. Augustine, in his *Confessions* (see Outler, 1995), wrote of the impact of the self on morality and the dynamic interplay between the moral self and the public self. Fundamentally, however, he abrogates responsibility for his actions to a greater power – God:

> "And what is there in me that could be hidden from thee, Lord, to whose eyes the abysses of man's conscience are naked, even if I were unwilling to confess it to thee? In doing so I would only hide thee from myself, not myself from thee. But now that my groaning is witness to the fact that I am dissatisfied with myself, thou shinest forth and satisfiest. Thou art beloved and desired; so that I blush for myself, and renounce myself and choose thee, for I can neither please thee nor myself except in thee." (Augustine *Confessions* Bk 10 Ch. 2)

St. John of the Cross acknowledged the struggle of the self in its quest for truth in *The Dark Night of the Soul* (Whiston, 2000) and picks up Augustine's theme of temptation, pointing to those things which can de-rail a self from that quest:

> "Herein it extols the great happiness which it found in journeying to God through this night with such signal success that none of the three enemies, which are world, devil and flesh (who are they that ever impede this road), could hinder it; inasmuch as the aforementioned night of purgative [20] contemplation lulled to sleep and mortified, in the house of its sensuality, all the passions and desires with respect to their mischievous desires and motions." (St. John of Cross, *Dark Night of the Soul Book 1*)

Ignatius Loyola commended Spiritual Exercises as a way to joining the soul to the divine (http://www.ccel.org/ccel/ignatius/exercises.html). Aquinas located the self within a broad cosmology, which enabled personkind to see its place in relation to the vegetative, animative and spiritual domains

(see. http://www.ccel.org/ccel/aquinas/summa.i.html?highlight=thomas,aquinas#highlight).

Undergirding each of these Christian philosophies is an unreconstructed rehearsal of platonic notions of the self as a pre-existent formless entity which comes to earth at birth, 'mingles with the flesh', becomes human for its lifetime and then departs the body at death, returning to the spiritual realm. MacQuarrie, attempting to explicate this for an existentialist audience, says,

> "How then is this structure of the self constituted? We may begin by recalling that in Greek philosophy there were various theories about the self or soul, and that Plato and Aristotle present us with an interesting contrast. Plato may be taken as an exponent of the "substantial" soul. On this view, the soul is regarded as capable of existing apart from the body. […] Aristotle, on the other hand, thinks of the soul as the "form" of the body, and as continuing to exist after the dissolution of the body." (MacQuarrie, 1977 p. 74)

Subduing the body, by the will of the soul/spirit/self is, for many of the aforementioned 'doctors of the Church', the moral purpose of a lifetime. It is, however a counter-intuitive pastime and, paradoxically, incompatible with the Christian doctrine that to separate mind from body is dualistic and thus heretical.

More recently, theologians have seen the importance of an understanding of the self as the starting point for liberative actions in the quest for freedom (e.g., Moltmann, 1967; Gutierrez, 1970; Boff, 1981; Metz, 1981). Each self, as referenced in the works of these authors, is a being situated in a real context at a real time, suffering politically or physically, disenfranchised, marginalised and in need of liberation. However, each self, in collaboration with others has the

potentiality to change the circumstances of their life by a structured process of reflection that involves education and always leads to action. Hence Gutierrez advanced the primacy of *orthopraxy* over orthodoxy in Christian living (Gutierrez, 1971). This concept will be at the heart of later reflections in this study. Such people were the architects of pastoral theology(ies) and owe much to the, then, contemporary hermeneutics (e.g. Gramsci, 1971; Lyotard, 1984), post-structuralist approaches to knowledge and post-marxist critical analyses. The bridge between their work and educational discourse is Paolo Freire (1972). Hermeneutic approaches always require the individual to establish a dialogue between themselves and their context where they can be both influenced and influencer simultaneously.

Taylor (1984) would argue that the self, from a post-modern perspective, is a constantly shifting entity which impacts on and is reciprocally impacted by the experiences through which it passes. Thus experiences of childbirth, schooling, partnership, business, parenting and death contribute to making the self what it is.

In the professions, Donald Schön commends all practitioners to examine the impact on themselves of work-related learning and professional development (e.g. Schön, 1987), and I am constantly reminded of tutorials with new members of staff or students learning to teach that invited them to consider the impact of teaching events on their self… "What did you learn from this experience…?" As I see it, there is no such thing as a fully-autonomous human being – Indeed John Dunne's (1572-1631) notion of no man being an island is probably right (Dunne, 2007). We are who we are because of the behaviours and genes of our parents (Freud, 1923; Dawkins, 2006,) the influences of teachers (Woodhead, 2001; Dadds and Hart, 2001), the pressure of our peers (Biddulph, 1995), the outcomes of our learning (TDA, 2007), the context in which we find ourselves (West and Carlsson, 2007) and the values system we develop and

grow (Natanson, 1970). The self is subject to both nature and nurture therefore (Atkinson and Claxton, 2000). It is not my view that we are hard-wired psychologically and through evolutionary means into one particular way of being. Newman encapsulates the challenge in the following synthesis: "To live is to change, and to be perfect is to have changed often." (Newman, 2007)

2.2.2 Buddhist approaches to the 'Self

The decision to separate an analysis of Buddhist 'writing' on the self from other spiritual approaches (see below) is a conscious decision. It is based on the understanding that Buddhism is a philosophy, not a spirituality and also that its philosophical underpinnings are all derived from Siddhata Gautama's insight that *his* self, was his own vehicle to enlightenment. "One truly is the protector of oneself, who else could the protector be? With oneself fully controlled, one gains a mastery that is hard to gain." (Buddharakkita 1985). This is quite different, say, to Augustine's approach which was theological and dependent as seen above.

By way of illustration, the following piece of reflexivity is offered.

Vignette 2: Buddhism and Change

> I was taken aback at the end of one PGCE year when posing the evaluation question to the students, "What have you learned this year which has changed you…?" One boldly replied, "…nothing, I haven't changed at all." It was not my intention to let the silence speak for itself, I was just surprised. The silence was broken by one of the others, a practising Buddhist, who replied that everything in life causes us to change[13]. No-one, he argued, could have been through the experience of PGCE without having changed.

Selves then are changed and affected by the circumstances in which they find themselves. This is remarkably similar to the phenomenological approach which accounts for the 'intentionality' of events and their impact on selves and *vice versa*. As Sokolowski says, "phenomenology is the study of human experience and the way things present themselves to us in and through such experience." (Sokolowski 2000 p.2)

[13] See, for example, Carrithers (1996)

For Buddhists, the search for enlightenment begins with a rigorous analysis of the self which includes the adoption of ascetic modes of being, subjection of the mind to deep immersion in reading and the adoption of contemplative practices aimed at knowing the self better. A standard critique of Buddhism is that its practices can become self-indulgent, disengaged from reality and thus, potentially solipsistic or even narcissistic. This critique will become a frame for assessing my own assertions about the self and how it develops in professional learning settings.

2.2.3 Scientific approaches to the 'Self'

Returning briefly to Plato and Aristotle, it is possible to say that however ineffable, intangible or immeasurable the self is, there is indubitable evidence that zoologically selves exist. Dawkins, pre-eminent among popular natural scientists, advances empirical and quantitative evidence of the physical presence of selves (Dawkins, 1978 or Dawkins, 2006). For him there is no virtual reality, there is only organic matter. The self is thus a collection of tissues, formed from genetically-controlled reactions, and 'bonded' together in a chemically-organised manner which seems to have something to do with the functions it needs for the survival and perpetuation of its own genetic identity (Dawkins, 1978 p. 7). In the post-Darwinian discourse in which Dawkins' work is situated this is unproblematic. Outside that paradigm, there remain debates about the verifiability of his theses and the reliability of the science on which they are predicated (McGrath, 2007).

More helpfully, from within the neuro-scientific community, Damasio writes eloquently about the neurobiology of feelings (Damasio, 2004 p. 101). In so doing, he points to the anatomy of those things, 'hard' science has often found it difficult to explain, things like beauty, altruism and love. Based on a number of 'scientific experiments' conducted within laboratory settings he reports the physiological modifications that occur when a self is experiencing feelings, which he argues are the precursor to emotions. Of particular interest to this study is Damasio's conclusion that, "an entity capable of feeling must be an organism that not only has a body but also means to represent that body inside itself" (Damasio, 2004 p.109). Contributing to the modifications described above are hormones, chemicals, electrical impulses and secretions all of which are connected to the personal interior landscape of the self being affected by external stimuli. This research would appear to validate *in absentia*, therefore, the belief systems of many, apparently 'quack', alternative therapies like acupuncture, the manipulation of *chakras* and *reiki* that

'operate' on parts of the anatomy, and which ancient wisdom(s) suggests 'affect' healing in other parts of the body. It is important to park the notion of *absence* for the moment because its significance for this study renders treatment crucial, but more appropriate, later on.

So far consideration has been given to the anatomy (Quine in Warburton, 1999) and genetic make-up of selves (Dawkins, 1978) as well as the physiology and neurobiology of emotions and feelings (Damasio, 2004; see also the recent insights of Prof Mukandun, 2008) . Further insights are available from the field of psychological enquiry. Psychologically, the self is an individual who possesses emotional, social, relational and cultural needs. This self exhibits behaviours which reflect the satisfaction or otherwise of those needs. Maslow arranged these into a hierarchy of the prepotency of needs which, when realised, would lead to what he called self-actualisation (Maslow 1970). Goleman reports the workings of the amygdala, the small part of the brain which controls the 'fight or flight' instinct that generates a reflex response to danger and thus protects organisms from imminent harm (Goleman 1996 p.5). Damasio presents a range of data, including the results of MRI scans, to show activity of the amygdala when in response to stimuli (Damasio, 2004).

These research-informed insights resonate with Freud's (1856-1939) attribution of certain behavioural phenomena to the *id*, that part of the self which, in evolutionary terms, goes back to our reptilian ancestry and which, up to a point, explains certain primeval, instinctual reactions. His own psychoanalytic work led him to deduce that there was/is a part of the self that operates psychologically on a plane above this. The *ego*, as he called it, controls normative human and behavioural interactions and might more easily be identified with the emotions as opposed to instincts. It is the *ego* that controls the *id*. Only when a self is acting in control of their

reactions, or paying homage to shared external values would Freud have attributed such behaviour to the third of his categories – *the super ego* (Freud, 1923).

As a neurologist, Freud's training would have been medical and thus positivist in paradigm. What caused him to re-think his work were the many disintegrated selves he met in his clinic, selves seeking healing for their dis-eased (my hyphen) minds and his own self-analysis (See Chiriac, 2007). The cases he treated and studied presented patterns of behaviour and concern that constituted a sufficient critical mass for him to extrapolate from their individual illness to broader patterns of human psychological behaviour.

Online syntheses of his work (e.g. Thornton, 2006; Blum, 2003; Chiriac, 2007) indicate that Freud contributed the following insights to the human 'thought experiment':

- Human beings experience desire at the deepest core of their being;
- Such desire can be inappropriately directed, according to social convention, at maternal (Oedipus complex) or paternal (Electra complex) figures and is thus repressed;
- Early experiences of rejection or 'wound' inflicted by our parents cause psychological injury that may surface in adulthood and are manifested as disease.

In the context of learning mediated by technology, it may well be that it is desire, for status or authority, privilege or position that impels a self to learn. Reflections on the illustrative moments that form the research objects of the study do contain whispers of ambition and aggrandisement. Cross-references therein to Maslow's hierarchy of needs are evident and so it is important to acknowledge the rectitude and relevance of some of Freud's insights in the context of my own story.

Dawkins accounts for desire as a necessary biological impulse required for reproduction and thus the *self*ish preservation of a self's own genetic make up, "The evolutionary importance of the fact that genes control embryonic development is this: it means that genes are at least partly responsible for their own survival in the future, because their survival depends on the efficiency of the bodies in which they live and which they help to build" (Dawkins 1978 p. 25). He skates over the issue of incestuous relationships, save where, the mingling of genes to strengthen chances of survival is deemed to be a good thing and less likely if mating occurs with a self that possesses the same genetic makeup (i.e. a self's parents). Damasio's research prompted him to conclude that the physiological modifications through which a self passes during a stimulus-response operation are embedded in memory and are re-enacted when causal stimuli are applied to the self. "As far as I can fathom, few if any perceptions of any object or event, actually present or recalled from memory, are ever neutral in emotional terms. Through either innate design or by learning, we react to most, perhaps all, objects with emotions, however weak, and subsequent feelings, however feeble" (Damasio 2004 p. 93)

This accounts for the repugnance experienced by a victim of abuse who relives their experience every time the abuser is present to them whether or not there is physical contact. A comparison can be made at this point with the work of Timothy Gallwey, and the suite of books that emerged from his seminal text, *The Inner Game of Golf*. Here Barry Green rehearses an experience familiar to many musicians:

> "I was a nervous wreck. I felt sick to my stomach and was certain I would forget the music I had taken such pains to learn. Playing in front of the acknowledged masters in one's field is hardly the sort of thing that's conducive to self-confidence and ease. My hands were sweaty, my knees wobbled (which is a problem when you're holding a double bass), my heart was pounding, and I had trouble just breathing comfortably." (Green & Gallwey, 1986 p.24).

Green goes on to state that the remembering of such moments can, in later life, be so overpowering, that subsequent performances can be blighted and affected too. Conquering these feelings, is he says, playing the inner game and also one step on the road to greater musical accomplishment (Green and Gallwey 1986 p.26). The similarities between these insights and those of Damasio are obvious. Indeed, the neurological data that might have been gleaned by the latter, had Green been wired up at the time of his adjudication, would have been fascinating. Though not relevant here *per se*, it seems likely that teachers' early experiences of failing technology may inhibit their engagement with it. If such data disasters have occurred in front of pupils, the psychological baggage will be even greater. Mental re-enactment, "even the thought of it", may reproduce such feelings of panic and/or anxiety that they may well be prevented from even thinking about trying again. Further scientific support for this theory may be emerging in the work of Mukundan,

> "Brain Electrical Oscillations Signature profiling – or BEOS - works by analysing a subject's brain activity in response to a series of statements – or probes - detailing their suspected involvement in the crime. When they hear a true statement which tallies with their experience their brain has a kind of flash of remembrance which is registered by a computer." (BBC, *All in the Mind* 2008)[14]

Freud (1923) noted that where the ego had repressed such experiences the reaction could be just as strong despite the impact of the sub-conscious on the self. Victims of abuse may have repressed the memory so powerfully that it only surfaces in therapy when a skilled psychiatrist is able to nurture it back to cognisance and then treat it.

It is important to note that which is of significance from this short survey of scientific approaches to the self. In physiological terms the self is a complex organism comprising a myriad of genetic, chemical, molecular tissue and substances (Polanyi, 1962; Dawkins, 1978,

[14] Further non-technical reference to this potentially important work can be found at this blog... http://ankurbetageri.blogspot.com/2006_11_01_archive.html

2006). It also houses a brain which in turn contains that which is known as the mind or *psyche* (Freud, 1923; Bly 1992; Biddulph, 1995*)*. The potentialities and corresponding limitations of that organ are yet to be discovered but what is known (Damasio, 2004; Mukundan, 2008) is that external stimuli are processed by it neurologically and cause modifications to the body which are manifest in behaviours and physical symptoms.

2.2.4 Spiritual approaches to the 'Self'

Spiritually, the self is an intangible being, formless and timeless, which is on a journey to *moksha (*See RE-Net 2006[15]*)*, salvation (Lk 9:25), *nibbana* (See RE-Net 2006), *Valhalla* (Lindemans 2002), depending on the spiritual tradition in which it finds itself. In each tradition here represented the self is accompanied on its journey by a body. Separation of the two is impossible even though, historically, divergent sects within each tradition have attempted to do so[16]. Certainly anything which separates mind from body and spirit is, in Christian theological terms, heretical. It is perhaps, therefore, more appropriate to argue that to describe a self or selfhood is to promote a deeper understanding of an integrated and whole self where body, soul and spirit are as one.

One of the characteristics of the human condition is its inquisitiveness and sense of curiosity. It is this that has taken personkind out into space and to the depths of the ocean. Journeying or questing like this is commonplace in the lives of many. Spiritual journeys or pilgrimages can be found in the narratives of the founding figures of the principal religious traditions of the UK. In the Semitic traditions, Abraham, the common ancestor of Jews, Christians and Muslims left Ur of the Chaldeans in search of truth and selfhood and crossed out of ancient Mesopotamia to a land flowing with milk and honey (Gen 11-12). In Jewish foundational texts, later canonised by the founding fathers of Christendom (e.g. Ireneaus of Lyons who is credited with the assembling of the Bible at the beginning of the 2nd Century of the Christian Era), Moses crossed the Sea of Reeds to escape persecution and slavery (Ex 12-14). Jesus of Nazareth, the itinerant preacher of Christianity, toured the towns and villages of Israel on an inexorable journey towards Jerusalem,

[15] It is to be noted that this term is used in both the Hindu and Buddhist traditions that emerged from the Indian sub-continent.
[16] By way of illustration here, it is necessary only to talk of the Gnostic sects of early Christianity that reinforced dualistic approaches to the self, like those whose thought inspired the apocryphal Gospel of St. Thomas (See. http://www.friktech.com/rel/canon/thomas.htm)

the centre of his own faith tradition in order to complete his mission on earth (Mt 4:23). The prophet Muhammad (*pbuh*) journeyed to *Al-Madinah*, in order to find the freedom to practise his true belief and out of respect for his own selfhood (Al-Kadhi, 2007 p. 5). Prince Siddhata Gautama journeyed outside his palace walls in order to begin his own quest for self-enlightenment and ultimate liberation, "It occurred to me that life in the home is cramped and dirty, while the life gone forth into homelessness is wide open; it is difficult to live a spiritual life completely perfect and pure in all its parts while cabined inside" (M I 241 of the Pali canon).

It is not an accident that Maurice Natanson called his book, *The Journeying Self: A Study in Philosophy and Social Role* (Natanson 1970). That is what selves do when they want to discover truth, enlightenment and liberation of the spirit – they journey. The whole of their self participates in the process, their bodies, minds, souls and spirits for it is in this holistic engagement with the world that true insight and wisdom is accumulated and selfhood enhanced.

Selves, Hume argued, remembered the sensory experiences that had led them to behaviours or responses, but these were grounded in empirical realities and not just perceptions:

> "Every one will readily allow, that there is a considerable difference between the perceptions of the mind, when a man feels the pain of excessive heat, or the pleasure of moderate warmth, and when he afterwards recalls to his memory this sensation, or anticipates it by his imagination"
>
> (Hume in Warburton 1999 p.2660)

It is no surprise that the English analytical tradition in philosophy has as its wellspring this empiricist approach and it may well be appropriate to blame Hume for the consequent difficulty many have in seeing the self as an integrated human being. It is, after all, a short step from here back to the platonic dualism that was eschewed by Jesus (See Mt 10:28 "Do not be afraid of those who kill the body but cannot kill the soul. Rather, be afraid of the One who can destroy

both soul and body in hell") or to the 'Cartesian error' that asserted the primacy of reason over more visceral ways of knowing (after Damasio, 2004). For philosophers such as Camus (1913-1960), Sartre (1905-1980) and, most significantly for this study, Heidegger (1889-1976) and Husserl (1859-1938)[17], the body-mind problem was less acute and this may well explain the greater ease with which, certainly the French, were able to grapple in the last century with questions of metaphysics, existence, phenomenology and non-empirical routes to truth. Christian theology has been careful to assimilate these findings into its own thought experiment so that authentic accounts reflect important insights. MacQuarrie, wishing to present a synthesis of continental existentialist philosophers' 'take' on the self, asserts,

> "An authentic self is a unitary, stable, and relatively abiding structure in which the polarities of existence are held in balance and its potentialities are brought to fulfilment." (MacQuarrie 1977 p.74)

It is perhaps here, at the confluence of philosophy and spirituality, that epistemology takes over as language becomes the tool for describing (representing, perhaps) and interpreting knowledge acquired from intellectual, physiological, visceral and spiritual/religious experiences. What is clear is that 'truth' will be dependent, contingent and subjective according to the context in which it is experienced. This is not to adopt wholesale a relativist approach (e.g. Derrida, 1992; Foucault, 1972; Erricker, 2007; Jackson, 1997, 2006), rather it is to propose that what is known about selves, and about myself in particular, will only be meaningful for an observer able to empathise with the setting. To make the point it is worth observing that Jesus clearly journeyed to death on the cross which is a 'fact' substantiated by evidence in the literary history of the time[18]. That this act of martyrdom 'ransomed' mankind forever remains, however, a 'mystery of faith' accepted by millions, who experience their own resurrected Christ, but is derided by others

[17] Reference and attention is paid to the works of these philosophers and their contribution to the study in chapters 3 and 4.

[18] Both Josephus, the Jewish antiquarian and Tacitus the Roman historian, who would have had a vested interest in the death of Jesus report it as though he were just another 'dreamer' in need of punishment. Their testimony is proof, however, of his existence as a real person in history. Only empathy will cause a person to make the leap of faith required to assert that this man was also God. (See Bettenson 1979 pp 1-3)

(e.g. Dawkins, 2006). So a Christian 'self' might base their religious practice on a profound religious experience as in the cases of Augustine, John of the Cross or Ignatius Loyola mentioned above.

2.2.5 Post-modern approaches to the 'Self'

By the middle of the last century when Foucault was at work, modernist tendencies within philosophy had opened up the possibility for thinkers to explore the concept of the self outside the limits of linguistic analysis. The 'self' as an entity was no longer to be seen as either object or subject, in Scruton's phrase the 'grammar of self-reference' (Scruton, 1994 p. 484), as a direct challenge to the earlier work of both Hume (1711-1776) and Kant (1724-1804) but also of Descartes (1596-1650) and his *cogito ergo sum* principle:

> "We think of ourselves as self-conscious observers of our world, occupying a unique perspective upon it – the perspective summarised in those mysterious words 'I, here, now'. But we also suppose ourselves to be part of the world, changing and changed by it, observable to others, and bound not only by a common moral law, but by the natural order of the universe." (Scruton, 1994 p. 482)

In essence, these 'two irresistible but incompatible thoughts' (Scruton, 1994, p.482) are, it seems to me, complementary parts of the hermeneutic circle that emerged as a tool for personal, political and professional analysis as the second half of the 20th Century wore on (Gutierrez, 1971; Friere, 1972). In my view, progress is made in each of these three domains of human endeavour when a self seeks enlightenment and understanding by:

- evaluating prior experiences,
- assessing present realities
- interpreting events in the light of contemporary theories
- synthesising new wisdom from each of the above.

For me, this is learning in the 21st Century.

As will be seen in section 2.2, there are the first inklings here of an emerging framework. Each of these can be mapped to the four 'N' factors that seem to combine to form such a framework. It would be tempting to jump straight to that point but there are other insights in the next few pages which contribute to its theoretical underpinning, which might get lost if not approached in logical sequence.

The problem of post-modernism is, however, the very individualism that it encourages since one potential outcome is anarchy and the decay of any societal structures.

> "Ours is the era of unadulterated individualism and the search for the good life." (Bauman, 1998 p.2-3)

These words of Bauman, taken out of context, might have been uttered by Margaret Thatcher, Prime Minister of Great Britain when I was an undergraduate who could also be said to have applied the logic of Darwinism (as evinced by Dawkins, 2006) when she opined,

> "And, you know, there is no such thing as society" (Thatcher, 1987)

Re-experiencing the visceral reactions to this statement, suggests that at the time I was disinclined to agree with her. It is interesting to play with the concept again, now that I understand the *zeitgeist* in which it was made and to approach it from a different perspective as encouraged by phenomenologists. True empathic approaches would require me to attempt to 'stand in' Mrs. Thatcher's shoes in order to understand her perspective and the selfhood from which she made the statement. Of greater importance and more pressing concern is the necessary examination of Bauman's statement which represents a post-modern[19] approach to ethics. If he is right, the logic is that each self should by definition engage only in those

[19] Bauman chooses to join post and modern together as one word. In keeping with the philosophical tradition there is no consensus as to whether a hyphen between the two is grammatically accurate. My preference is to signal the progress from 'modernism' by the use of a hyphen.

behaviours that bring personal fulfilment, pleasure, gratification and the selfish replication of 'my genes'. Paradoxically, here, there is a convergence of Darwinism and relativism.

Taylor (1984), working within a post-modern approach to the study of theology adopts the concept of 'erring' as a way of playing with ideas. He says, "'Erring extends to the reader an invitation to participate in a "thought experiment"' (Taylor, 1984 p. 17). As long ago as 1984 he described the role of the self in making sense of experience and literature – he uses the word "scripture", consistent with the discourse within which he was writing – and makes this important observation:

> "This infinite interrelationship of interpretations cannot be captured in a closed book; it must be written in an open text. Texts point beyond themselves to other texts. In view of this intertextuality, it becomes apparent that writing is a ceaseless process in which writer is already reader and reader necessarily becomes writer." (Taylor, 1984 p. 16)

This is a remarkable pre-figurement of the 'intertextuality' of the internet incidentally – today it would be described as non-linear hypertextuality. Fundamentally, moreover, it points to the dynamic relationship between a self and that which it is reading/learning. The reflective cycle[20], and, in my view its older sister, action research, depend on the learner interpreting the messages of their learning and applying them in the context in which they are working. Thus, the self takes control of the truth of a situated reality. Charles Taylor charted the evolution of the concept of the self through the history of western philosophy arriving in his final section at an analysis of the then contemporary scene. He argues that, 'Modernism succeeds…in the search for sources which can restore depth, richness and meaning to life' (Taylor, 1989, p. 495). Presumably then Taylor would celebrate any modern technology which restores depth, richness and meaning to the learning process. He would certainly acknowledge the need for tools which can liberate the self from ignorance, intellectual impoverishment or alienation. Law describes

[20] A popular iteration of the hermeneutic circle of Gutierrez's methodology (Gutierrez 1993)

this as liberation technology (Law, 2001 p.160ff). This is an important insight for the next section of the study but before moving to a discussion of what is meant by technology within this thesis, it is important to complete this analysis of the self by exploring insights from within phenomenology, the starting point for the section. To do so requires also the analysis of the self in 'mundanity'.

2.2.6 'Mundane' approaches to the 'Self'

At this point it is worth pausing to reflect on how the concept of the self is used in 'mundanity'. Space determines that remarks are confined to the context of education, which is the dominant arena for this study. It is reasonable to state that there has been considerable effort recently to analyse teachers' selves as a thought experiment among educationists (Beijaard et.al., 2000; Roberts, 2000; Day et al., 2006). None of this work constitutes, however, work in the 'philosophical attitude' as proposed by phenomenologists (Natanson, 1970; Sokolowski, 2000); rather it arises from qualitative research projects more likely to rehearse the outcomes of emotional, rather than cognitive processes (MacLure, 1993; Boyatzis, 2001; Day et al., 2006; Day et al., 2007). What emerges in the outputs of these research enquiries are statements which illustrate forces that impact on teachers' selves and their professional identities:

> "Because of their emotional investments, teachers inevitably experience a range of negative emotions when control of long-held principles and practices is challenged, or when trust and respect from parents and their students is eroded." (Day et.al. 2006 p.612)

What appears to be absent from these enquiries is the teachers' own analysis of her/his own self. Where a teachers' perception of her/his own self is reported, it is usually confined to a description of the situated reality, a narrative or a biography and how these relate to her/his own sense of identity (MacLure, 1999; Roberts, 2000). Inevitably, a deficit model emerges,

> "..teachers' lives become a topic of concern for what they are not; where identity is always incomplete, alienated or inaccessible; and where the aim is to remedy these shortcomings

of the self. The notion of development comes to be applied, not only to professional practice or public conduct, but to identity itself, which is held to be in a state of suspension." (MacLure 1999 p. 321)

Since research outcomes such as this dominate the field it is not surprising that therapeutic responses are currently being deployed to help teachers "get better". Weare writes that,

"Having a clear, positive and realistic self-concept includes:

- Liking myself (although not always liking my behaviour)
- Valuing and respecting myself as a unique individual
- Being able to identify and feel positive about my own strengths
- Being able to identify my own limitations and vulnerabilities, and accepting them without undue self-blame or guilt
- Seeing myself as separate from others, with the right to be treated with respect and kindness by others
- Not being harder on myself than I am on others
- Understanding aspects of myself, such as my personality, preferences and needs
- Having an accurate and realistic assessment of how I compare with others at the moment"

(Weare, 2004 p. 23)

I find this a thought-provoking statement about the current ontologies of teachers, both because it can be interpreted as a positive agenda for self-evaluation but also because it could become a tick list against which school managers might begin to assess the personal identities of their staff. For me, it provides the kind of construct whereby I can begin to analyse more deeply, the motivations and impetuses that caused myself to adopt the professional learning dispositions and behaviours I did. Certainly this research process is causing me to have to understand, "aspects of myself, such as my personality, preferences and needs." (Weare, *ibid*)

Models of coaching, however, currently being embedded in leadership and management programmes within the National College for School Leadership, for example, are predicated on the assumption that participants need to be shown where their deficiencies are so that they can move forward in the professional lives and thus – it is thinly veiled – improve the quality of schooling for pupils (NCSL, 2007). Noteworthy in this field of professional learning is the

uncritical acceptance of the work of Boyatzis (e.g. 2001), Goleman (1996), and Goleman, Boytzis & McKee (2002) whose ideas are presented as though they were fact. As indicated earlier, critiques of such policies are now beginning to emerge (Burton, 2008; Ecclestone and Hayes, 2008)

> "Of course, people differ in their abilities in each of these domains [Salovey's extrapolation of Gardner's theories]; some of us may be quite adept at handling, say, our own anxiety, but relatively inept at soothing someone else's upsets. The underlying basis for our level of ability is, no doubt, neural, but as we will see, the brain is remarkably plastic, constantly learning. Lapses in emotional skills can be remedied: to a great extent each of these domains represents a body of habit and response that, with the right effort, can be improved on." (Goleman, 2001 p.44)

In the emotional intelligence project, exemplified here, there is a clear presentation of the self as a professional in need of activity in the four domains of emotional intelligence:

> "self-awareness, self-management, social awareness, and relationship management." (Goleman, Boyatzis, & Mckee, 2002 p. 30)

Emotionally intelligent schools may be nice places to work and learn but they can only be called schools if they impact as much on matters of the head as on matters of the gut. Remaining operational within the affective components of a self alone is likely to cause ineffectiveness in its other constituent parts. Indeed, as was referred to in the introduction, phenomenologists would argue that it is in the acceptance of the complexity of a self that we can begin to understand the 'moments' that combine to make a 'whole'.

A response to this might well be that teachers simply do not have the time or the energy to adopt the philosophical attitude so as to excavate themselves in order to understand the fullness of their being or their potential. This, in turn, may explain why schools can often seem intellectually bankrupt and why 'stretch and challenge' have to be made mandatory rather than being naturally organic. The point is, however, that as a professionally-detached observer of the phenomena of

teacher selves in the phenomena of schools, there is a dominant 'mundanity' about the ways in which they are and continue to operate. As Natanson notes,

> "The self, then, lives in a social reality defined through a complex of types, constructions of typical elements and aspects of possible actions. The stockpiling of such types starts in childhood and continues throughout the life of the individual." (Natanson 1970 p. 20)

To end this survey of the 'self' in literature, it is appropriate, now, to turn to what phenomenologists say.

2.2.7 Phenomenological approaches to the 'Self'

This section commenced with a brief statement of how the phenomenological attitude accounted for a range of beliefs around the same issue. More will be said about it as a methodological framework in chapter 3. Here the focus is specifically on what phenomenology has to say about the self. Why it is useful here is because it enables the drawing together of the range of philosophical approaches to knowledge and the self that have been investigated hitherto. If the last sub-section ended around the 1980s, it could be argued that this sub-section appears in chronological sequence and brings this historical survey up-to-date. This is possible only if it is accepted that post-modernism precedes phenomenology. In reality, they overlap and insights emerging in one discourse may inform and enrich the other and *vice versa*.

Bob Jackson argues that his own 'interpretive approach' (Jackson, 1997) emerged from his engagement with the so-called phenomenological method in Religious Studies pioneered by Ninian Smart (Smart, 1976). In conversation with Jackson (See RE-Net, 2007), it became apparent that the interpretive approach evolved out of phenomenology because empathy alone was not, in Jackson's mind, sufficient to gain an understanding of the 'other'. This is an important critique of phenomenology since one of its central tenets is the way of knowing that proceeds from the 'I-other' relationship (Natanson, 1970 p.33).

"I am inter-subjective by taking and working with another's roles" (Natanson, 1970 p.34) and "… the other is typified by the self through the role played by the defining self" (Natanson, 1970 *ibid*). This is fascinating in the context of the creation and presentation of virtual identities made possible by web-based social networking utilities such as www.facebook.com, www.secondlife.com, www.bebo.com as seen above and discussed further in section 2.3. Its relevance here is to point to another helpful insight of phenomenology and that is of the

existence of an 'alter ego' for each self. "…what is There for the ego is Here for its alter" (Natanson, 1970 p. 32) and the reverse is also true. Sokolowski dwells on the importance of presence and absence: "we live constantly in the future and in the past, in the distant and the transcendent, in the unknown and the suspected, we do not live only in the world around us as it is given to the five senses" (Sokolowski, 2000 p.37). Of note here, though, is the centrality of the self as the meaning-making instrument living in reality. Sokolowski goes on: "another important singularity in our spontaneous experience is the SELF, the ego, the I. If the world is the widest whole and the most encompassing context, the I is the center [*sic*] around which this widest whole with all the things in it is arranged" (Sokolowski, 2000 p.44). For Sokolowski, "…the I is the dative of manifestation" (Sokolowski, *ibid*).

Jackson's critique was, in part, based on his own realisation that the process of research in which he was engaging was influencing him just as much as he was influencing others and the project (See RE-Net, 2007). His decision was to underpin future developments of the Warwick research project with three concepts: 'Representation, Interpretation and Reflexivity'. The latter of these will be explored more fully in chapter 4 since it is an essential component of the methodology I wish to deploy in the analytical part of the enquiry. Representation, as he envisages it, becomes a foundational concept within sub-section 2.3 (information) Technology as I seek to show how technology enables computer users to represent themselves. As a 'moment' in the 'whole' of his adaptation of the phenomenological approach, I wish to pause here and explore how 'Interpretation' is useful for individual's understanding of themselves, and I, of myself.

In phenomenology the concept of 'intentionality' is central (Sokolowski, 2000 p.8). This describes the relationship a subject has to its object(s). A relationship can exist in presence or absence so that I may teach my students online even if they are not actually present through the

use of an asynchronous conferencing tool. That I intend learning upon them is sufficient for the relationship to exist. If I wish to analyse myself, then, adopting the phenomenological attitude, I can intend towards myself as a 'detached observer' providing I do so consciously (Sokolowski, 2000, p.8). If I choose, then, to interpret the outcomes of that activity I may grow and develop in consciousness and action. There is an ontological link from interpretation to reflexivity as expressed by Jackson (RE-Net, 2007), which coincides elegantly with notions of the hermeneutic circle advanced by Gutierrez (1971) referred to earlier and which emerges as pivotal in the auto/biographical method that is the main methodological tool for this study.

> "The core doctrine in phenomenology is the teaching that every act of consciousness we perform, every experience that we have, is intentional. It is essentially "consciousness of" or an experience of something or other" (Sokolowski, 2000 p.8)

So if I intend towards myself as an act of "self-consciousness-raising" – Gutierrez (1971) and Boff (1971) would call this process, 'conscientization', I become a legitimate phenomenon worthy of investigation.

A further component of phenomenology is the 'issue of appearances' (Sokolowski, 2000 p. 3). This is explained in much of the literature by the metaphor of the 'cube'. Gurwitsch (2010) extends the metaphor of a 'cube' to that of a 'house' to illustrate the point more fully. One of the problems with straightforward observation is that it can render findings in two dimensions only. In effect, it is only like a non-critical reading of a text where no attempt is made to analyse what is 'written between the lines' or operates as a sub-text to a plot. Instead of examining an object from a flat perspective as characterised by figure 2 below, it can be more helpful to look at it from a range of angles, a variety of perspectives, from 'round the back', at the side, from above and from below as signified by figure 3 which shows the same object viewed from a corner-on perspective.

This model and theoretical perspective is employed deliberately in chapter 4.

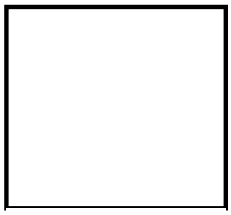


Figure 2: A cube in 2-dimensional aspect

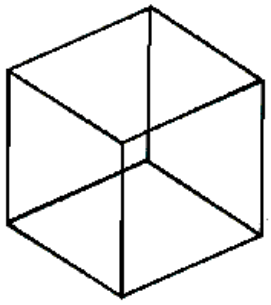


Figure 3: A cube from a different perspective

Changing the perspective from which an object is viewed can very much change the perception of what is seen and what it represents. The object can look very different. Indeed, looked at in certain ways the 'Neckar Cube' (figure 3.) can look like a stylised eight-legged creature. Changing the perspective from which a self is viewed might render similarly startling results.

Without paying due homage to its intellectual foundations, Damasio applies this phenomenological method to his own analysis of the phenomena of feelings,

> "Feelings are perceptions and, in some ways, they are comparable to other perceptions. For example, actual visual perceptions correspond to external objects whose physical characteristics impinge on our retinas and temporarily modify the patterns of sensory maps in the visual system. (Damasio, 2004 p. 91)

Of significance here is Damasio's clear acknowledgement that observable phenomena are interpreted by the individual personally.

> "Feelings also have an object at the origin of the process and the physical characteristics of the object also prompt a chain of signals that transit through maps of the object inside the brain. Just as in the case of visual perception, there is part of the phenomenon that is due to the object, and a part that is due to the internal construction the brain makes of it." (Damasio, 2004 p.91)

This is similar to both Natanson's (e.g. 1970) and Sokolowski's (e.g. 2000) approaches, though he diverges from them in that his explanation of the self's reaction to a phenomenon is neurobiological as opposed to their explanations which tend to accentuate social, demographic or historical factors. What his work shows however is that, albeit, sub-consciously the critical use of a phenomenological approach can be instructive in a range of learning settings.

One last observation is crucial. In the philosophical/phenomenological attitude – please note the decision to make these two terms explicitly separate but implicitly connected and thus represented conjoined – both 'I' and 'Me' are important:

> "The Me is the source, then, of what is typical and habitual in experience. The I, of what is innovative and audacious." (Natanson, 1970 p.18)

A contextualised approach to the phenomenon of the self for this study

> "Like Kant, he" (Wittgenstein) "believed that philosophers often unwittingly stray beyond the limits into the kind of specious nonsense that seems to express genuine thoughts but in fact does not do so." (Pears, 1997, 2nd edition p.12)

Mindful of Pears' caution when writing of Wittgenstein, it has been my intention – in the mundane attitude – to present a range of literature that has been consulted to show how the self is regarded within the philosophical/phenomenological attitude. The intention has been to express genuine thoughts. In the process, and as an outcome of a post-writing reflexive process, it seems as though three themes have emerged:

- The importance of linguistic accuracy and specificity when tackling a potentially amorphous topic like the self;
- The centrality of 'I' and 'Me' (both subject and object) within the thought experiment that this study represents;
- The impossibility of shedding theological training from the processes of reflection and writing, nor the deployment of metaphors and models derived from religions, the discourse of religious education and my own religious experiences.

This latter point would be troubling were it not for the cautions already applied in relation to the potential solipsism of Buddhist reflection, on the one hand, and action research on the other. Moreover, what also emerges from a critical investigation of phenomenology is the opportunity to undertake a structured, contextualised approach to my own self in the expectation that such a journey will yield potential learning gains that will be of use to Me, as well as I, and to other selves within the professional domains in which I operate. I can no more detach myself from my own situated reality than I can empathise fully with one of Bob Jackson's research subjects

given that I am not Hindu, do not live in Coventry or Warwick and am not still at school. But, I do have a life history and a whole host of experiences both positive and negative that, when shared, might be interesting to others and my own interpretations of those experiences may enable me to become a more effective practitioner and ultimately a reflexive professional.

Intuitively, perhaps even viscerally, I do not think that this 'philosophical investigation' will result in the outpouring of specious nonsense. This will be warranted as a statement if learning gains are derived from the process. I will acknowledge however, the challenge of producing an objective piece of work in the context of a thesis predicated on auto/biographic methods (see chapter 4).

2.2x: Relevant Insights derived from the first stage of the literature review

In order to set the scene for my review of the literature surrounding technology, it is appropriate to set out some of the insights derived from the literature review so far. The reasons for doing this are to articulate the sources of literary support for my hypothesis and to show how my reading contributed to the development of the theoretical framework which underpins the study. Section 2.3 has been written to show where each factor of that framework is found in the relevant literature. It was necessary to start to arrange things in this way so as to limit the volume of material that might have been included. It is intended that the four factors of the framework are seen in section 2.3 and so the shorthand descriptor (N_x) is inserted where relevant to point this up.

The principal finding of the literature survey so far is this: In the 21st Century, it is widely held that new knowledge is the outcome of the inter-relationship between pre-existing knowledge that a self holds as a result of learning experiences in formal and informal contexts and its encounter with sensory phenomena. Selves recognise phenomena in a wide variety of forms and categorise experience accordingly. Thus I identify the phenomenon of 'dub step' as a form of music despite its difference from a Bach Chorale, that which might be by some identified as the perfection of musical experience. I categorise Irish Wolfhound and Chihuahua in the same genus as 'dog' despite the very obvious differences and I categorise as 'food' both the experimental *haute cuisine* of Heston Blumenthal and Tesco *Value* beans. The point is that all phenomena are assessed by the 'knower' in the way s/he has grown accustomed to so doing. Support for this notion comes from Whitehead and McNiff's reportage of the insights of Malcolm Gladwell:

> "... in Blink (2005), Galdwell sets out the idea that seemingly snap decisions are grounded in complex developmental processes of knowing from experience." (Whitehead and McNiff, 2006 p.34)

Perhaps it is this 'knowing from experience' that enables my learning with technology. Autobiographically, it does seem as though I have assessed the multifarious phenomena categorised as 'technology' as potential aids to learning - the principal project of my career. Some moments in that autobiography have been profound and, in them, learning has been mediated by technology. It is to be noted that I did not undertake this review of the literature in isolation from reflecting on experiences or from engaging in the reflexive auto/biographical process that is set out in chapter 3. Inevitably then, insights were emerging about the nature of my professional learning co-terminously and dialogically with the growth in my knowledge acquired through reading.

A secondary finding of the research so far is this: When a self sets about learning something new: a skill, a piece of knowledge, a piece of software, a new piece of display equipment and so on, a number of factors seem to combine to catalyse and then embed the change. This, I would warrant as 'true' in my case.

These factors would seem to be the need to learn whatever it is in the first place, like, for example, when we all had to learn our (Personal Identification Number) PIN codes off by heart in order to operate our bank accounts. Moreover this is a self-referenced need in that 'I know I need to learn this'. If I don't perceive a need to learn it, then I don't. In some ways, therefore, learning now implies a personal commitment.

Secondly, some prior knowledge is required, either of existing frameworks, or keywords to enact searches, or foundational knowledge on which applied knowledge is dependent. For example, in order to operate Google's epoch-making search technology one has to know how to launch a browser and locate the URL http://www.google.co.uk. Using my prior knowledge of a topic,

may enable me to limit the number of hits I get from the search engine when otherwise, I would quite literally be drowned in data.

Thirdly, in my experience (as also evidenced in appendices 1-6), particularly in the 21st Century and especially in technology-related learning contexts, the self participates in appropriate networks or as I might say now, 'communities of professionalism' - a self wishing to learn how to teach undertakes a programme of study leading to an award which is staffed by those possessing theoretical and practical knowledge (incorporating the principle of 'recent and relevant'). When it comes to learning a new technology now, I rarely visit the textbook; rather I will open up a browser, type in some keyword operators, follow the links to the online *fora* and search within them for those people who have solved the technological issue for themselves. Noteworthy here in support of this assertion are the following words of Seymour Papert, a seminal 'knower' in the context of this study:

> "... the computer presence might, I think, plant seeds that could grow into a less dissociated cultural epistemology." (Papert, 1993 p. 38)

Finally, the literature seems to suggest that learning is completed when the 'knower' applies the newly-acquired knowledge, skills or understanding in a new context (Bloom, 1953; Kolb, 1984; 2005). In the most basic of illustrations, the discovery of the <undo> button in Microsoft Word can be like a personal epiphany for a user who then sees it on the toolbars in Excel, Access, Powerpoint and so on,

> "I wish you'd shown us this a year ago...it would have saved me hours!" (Andy Lee, PGCE RE student 1999)[21]

[21] Thirteen years ago, when this was uttered, I was not tuned into the 'knowledge transfer' agenda. Today I would be celebrating this as evidence of my proficiency as a facilitator of professional learning.

The four factors or phenomena of learning in the 21st Century identified through my survey of the literature, reinforced by reflections on relevant experiences, can all be summed up in one word each as in the illustration here:

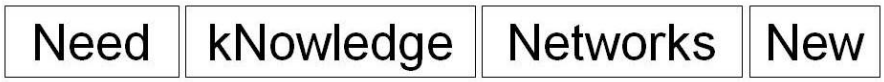


Figure 4: N^4

It is a coincidence that each one begins with a phonic sounding 'n'. One might say, therefore, that learning in the 21st Century, expressed as an equation, might look like this N^4. In mathematical contexts a number *n* to the power of an index - expressed in superscript as in my equation usually means the base number multiplied by itself a given number of times - thus n^4, where $n = 4$ is the sum of $4 \times 4 = 16 \times 4 = 64 \times 4 = 256$. In normal case, the index would mean the base number multiplied by the index, $n \times n$ which, in my equation would simply be $n \times 4$. This would mean that learning was simply the product of need, knowledge, and networks tested in new instances. N^4, as I prefer to express it, implies the constant multiplication of need, with knowledge, participation in networks and the ongoing and relentless testing of the idea, concept, skill or piece of understanding in new and ever-changing situations. The more a self adds to the process, the better the knowledge gained, or understanding developed.

If this is the case then the illustration above might be more powerfully rendered as in the next figure:

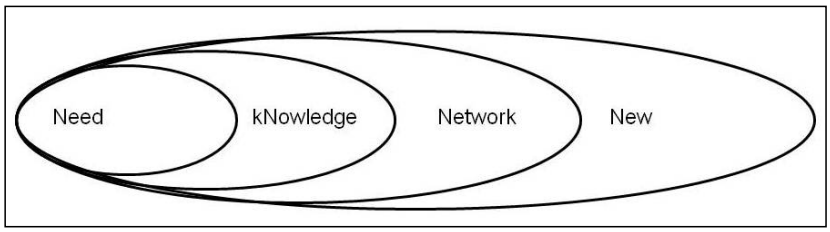


Figure 5: N^4#2

It is important to read this diagram in the dialogic context of the reflections on a prior learning experience recorded in section 4.1.5 (IM5), for example, and figure 23 (Fullan's model, 1990). It is intended to show the interdependence of each of the different factors, especially when what is to be learned is a new technology, a new ICT skill or a new piece of software but it might include anything that a self wished or needed to learn.

So I want to argue now that the hypothesis to be explored in this study is, in shorthand terms, professional learning episodes where learning is signified by *l*, and amounts to a simple equation $l = N^{4.}$

The Four Factors/Phenomena of the Emerging Theoretical Framework

It is my contention that for a learning episode to be profound, a learner is likely to experience all of these phenomena, if not necessarily in sequence. Graphically so far, the framework has been set out in linear fashion, but a learner could be anywhere in the process at any time. It is unlikely, however, that they could apply their learning in new settings before it has been learned. Thus it is more likely that a spiralling-dialogic approach will occur as a learner grows in knowledge and understanding by experiencing the factors at different times, depending on where they are in the process. Hence the proposal here that N to the power of 4 (N^4) equates to a profound professional learning experience. In other words, the sum of engaging with all four phenomena in a learning episode will be greater than individual encounters with each i.e. n *x* n *x* n *x* n.

The literature surveyed so far helps with the classification of the Ns, which seems important if they are to be reliable components of or factors in the theoretical framework towards which the

thesis is working. Though an apparent interruption to the flow of this chapter, it seems important to take time to explore the characteristics of each N more fully.

Need

'Necessity who is the mother of invention' (Plato, 2004)

The platonic axiom, rehearsed above, is directly relevant, in my experience to the context of technology-learning. I have observed that human beings only learn technologies when they need to. To reinforce this point historically, the Turing Machine, one of the precursors to modern PCs was the direct output and outcome of the British need to find a way to crack the codes generated by the German military during the second world war (Hodges, 1992); its invention was the product of extensive research and application of mathematical and logical principles. In section 2.2, sources quoted suggest that the kind of profound learning that underpins such an invention is the case when ‘a self notes that it has a self-referential reason for study’.

As indicated above, the origins of this can also be found in the theories of Freud (1923) and Maslow (1943). I have witnessed many education professionals become childlike when confronted with a new technology, especially if they perceive no need to learn to use it. The 'data disasters' I referred to above can become psychological blockers for selves, as in that moment described in the context of music by Green and Gallwey (1986). The narrative of this thesis (appendix 2) begins with my urgent need to learn to use a computer properly because I had said that I could. I had no way out and was at risk of committing professional suicide if I did not meet the challenge I had set for myself.

Another approach to justifying the inclusion of need in the emerging framework comes from the liberationist foundations of much of my pre-existing knowledge base. Gutierrez (1971) and

Freire (1972) would argue for the moral imperative for education to be one of the vehicles for lifting the most needy out of their situations of marginalisation and oppression. Without misappropriating their theory, I believe that even now in the UK there is a need for education professionals to use whatever means they can, including ICT, to lift themselves and their pupils out of the oppression of ignorance.

Knowledge

The inclusion of the phenomenon, characterised for my emerging framework as, ‘knowledge’, derives from my observation and reading that human beings can only make use of learning technologies if they already possess that which contemporary epistemologists describe as 'performative' knowledge. In section 2.1, a more full description of this is summarised as ‘the self utilises its prior knowledge, skills or understanding to access appropriate digital learning resources’. Performativity as defined by Lyotard (1984) and enunciated by Polsani (2002, 1 and 2), once I discovered it in New Zealand, literally, helped me to understand how we use what we know already to master the things we do not as yet know. In order to use a satellite navigation system (satnav), you have to know the address or, even better, the postcode. The act of punching the locus into the device is, for me, a daily act of performative knowledge. 'Knowing', here is not just a noetic phenomenon (Natanson, 1970; Sokolowski, 2000), it can be utterly embodied or unconscious as in the phenomenon of 'touch typing' or 'intuitive', in the sense that Gladwell explains in *Blink* (Gladwell, 2006). The point here is that humans control machines; machines do not control them. This is warranted to be 'true', through the literature in section 2.3, even in a world where human beings have created 'artificial intelligence'. There is no 'ghost in the machine' (Ryle, 1990); there is no body-mind dualism as in the Cartesian error, against which Ryle was writing. Here, in technology-related learning, phenomenologically, body and mind are as one.

The next sub-section challenges this holistic approach since it begins to argue that one of the pedagogical agents from whom professional learning can be derived is the disembodied machine that connects to other disembodied machines through the utterly material architecture of computerised networks.

Network

Postulation of the phenomenon 'network', for the emerging theoretical framework, derives from my observation that human beings learn technologies best when they can share their learning with others, have access to good models or can 'play' with equipment or software in 'safe' and 'comfortable' settings. Crucially, learning appears to occur when there is an 'agent'. In each of the appendices 1-6, I recall how a person, a teacher, a tutor, even a piece of carefully written technologised training material contributed to profound learning experiences in my case. Humans may learn well from peers, as I observed in the very earliest days of my unconscious participation in this process (appendices 2 and 3) or perhaps, for the first time in the history of humanity, directly from machines. Described more fully in section 2.3.3, 'network' is described as how, 'the self actively participates technologically in the social co-construction of meaning through focused and relevant communities of practical or professional enquiry' (after Wenger, 1998; 2001 – see Smith, 2003). It is to be acknowledged here that 'network', in keeping with modern technological discourse is both noun and verb. The notion of a rhizomic network is more fully discussed in reflections on my time in New Zealand (appendices 1 and 4 and in section 4.3.3). Learning about it was mediated by the words and works of Polsani (2002, 1 and 2); he was my pedagogical agent.

Polsani's accidental intervention in my lived experience triggered a variety of activities and self-directed learning opportunities, many of which are written up in chapters 3, 4 and 5 and especially in appendices 1 and 4. As appendix 1 shows, I began to experiment with his ideas whilst still at the conference in order that I would be ready to apply them in new professional contexts on arrival back at work.

New

Postulation of the phenomenon 'new' derives from my observation that human beings become confident and competent technologically when they are able to apply new knowledge and understanding in a different context or setting. In essence this is how the competing core applications software Microsoft Office and Macintosh *i*Life programs work. 'I' know that <File> and <Save> stores my work in Microsoft Word so that when I meet the same commands in Microsoft Excel, I have instant understanding of what I am supposed to do to protect my content. 'I' may learn to use one virtual learning environment which is providing technological support in one educational setting, but if I have confidence and competence with it, even if I move to another software client used in a different educational setting, I may have only momentary loss of operational effectiveness. The concept of 'transferable skills' is predicated on this notion of the utility of knowledge in ubiquitous settings. So, for a professional learner, the success of an informal learning episode with technology is likely to be the ability to do the same thing in another context. The literary origins of this phenomenon are attributable to Bloom (1954) and Kolb (2005), both of whom have had an enduring impact on teachers' professional learning programmes. Their schemas are frequently referenced by those seeking to make the point that learning that remains in the head and is not rolled out in practice will wither and atrophy. This is explored further in sections 2.5 and 2.6.

The emerging framework

In my judgement, derived from reading and dialogic reflections on experience, profound professional seems to occur for me when I have a need to learn something, I have some prior knowledge or skills to draw on, or that can enable me to perform some functions, there are expert agents to consult who can supplement my emerging understanding and I can apply newly-acquired knowledge in other contexts.

If I seek to generalise these emerging findings from my own context of technology-mediated learning to the wider context of teachers' professional learning mediated by technology a theoretical framework begins to appear. It looks like this:

1. A self has a self-referential reason for study (N_1);
2. The self utilises its prior knowledge, skills or understanding to access appropriate learning resources (N_2);
3. The self actively participates in the social co-construction of meaning through focused and relevant communities of practice (N_3);
4. The self critically evaluates these episodes and is able to apply new synthetic understandings in relevant practical or professional contexts (N_4).

There is an underlying assumption in this model which is that this is very much an adult approach to learning and thus the term andragogy may be more useful in the sense in which it is used in the present discourse of lifelong learning (Knowles, 1978). To distinguish this from a strictly pedagogical approach, it would be fair to note, that the curriculum for most pupils (i.e. children engaged in formal schooling) is determined by their teachers and the extra-curriculum

by other adults including their parents. Autonomy in learning is not a normative experience in the experience of school-aged children in the UK. The essence of this approach is that it is the learner themselves who drives the process of knowledge and skill acquisition, development and deployment. In this next section I attempt to explain this in more detail.

A Further Exploration of the Emerging Framework for Technology-Mediated learning

The table below is presented to further aid the process of exploration. Each proposition has been converted into a row in the table indicating a phase in the process and, for each factor, characteristic behaviours have been identified as well as technologies which may contribute to the development of knowledge within each aspect. Each of these could be evidenced from my own personal, or professional experience.

Factors	Description	Characteristic behaviours exhibited	Exemplar technology
Factor 1 (N_1)	Identification of need for knowledge or skills	Driving forces 'poke' need for change	E-mail Gap analysis tool e.g. P.G.C.E. subject knowledge audit (*stimulus technologies*)
Factor 2 (N_2)	Utilisation of 'performative knowledge' to open learning gateways	Metacognitive searching, (Research), heuristics	Google TTRB (*search technologies*)
Factor 3 (N_3)	Social co-construction of meaning through andragogic networking in rhizomic communities of practice	Joining, forming or participating in focused/relevant groups	Google groups Facebook VLEs (*collaboration technologies*)
Factor 4 (N_4)	Dissemination of newly synthesised understandings in practice, publication or professional development activities	Reviewing, writing, reporting, deploying or publishing new knowledge	Blog Website PDF Youtube DVD (*distribution technologies*)

A reasonable critique of this model might well be that learning does not occur in such a strictly delineated fashion. This is affirmed since the framework is speculative and provisional at this stage of the doctoral process. It is expected that this model will evolve as the research develops. At this point, then it is presented as an hypothetical framework only. It does, however, shape what follows. Logically, then, it seems to make sense to apply this insight to the review of literature about technology which comes next. In so doing, the aim will be to see if these factors and the hypothetical framework are also to be found there.

2.3.0 Reframing the literature review

In section 2.1 the concept of epistemology was explored in order to establish a context whereby it would be clear what exactly I meant when I used the term 'knowledge' both in relation to the general principles of research as befitting a doctoral study and also within the specific context of this study. It was a wide-ranging review and was conducted, I now realize, in the manner of a theological study which begins by surveying the history of ideas, 'drops-in' on those that are relevant to the topic and 'tees up' the specific points to be made by the author. In that discourse it is therefore relatively straightforward to assert the provenance of an idea, theory or hypothesis. The method is what enables the claim to be made that, '... we are standing on the shoulders of giants.' Metaphorically our new ideas are the product, at a given moment in time, of blending new experiences with 'ancient' wisdom. Having developed this insight I now intend to apply the approach to the next section so that reflections on key texts around Information and Communications Technology will also become part of the theoretical background to the latter parts of the study.

In section 2.2, I attempted an historical and multilateral review of literature to draw strands of thought together from across the disciplines of theology, psychology and philosophy both Western and Eastern traditions - this also befitting of a 21st Century piece of work which would inappropriately discount insights deriving from Eastern philosophical traditions despite the work being undertaken in a European context.

This means that my understanding of the self, generically, and myself specifically derives from insights garnered from a survey of global literature. This is appropriate since much of the work undertaken in and around this project is the outcome of thought processes from across the world,

delivered by 'knowers', scholars, thinkers and arguers working out of a wide range of academic, spiritual and cultural traditions.

Serendipitously, as a tool for escapist reading on my summer holiday 2011, I selected the 'best-seller', *The Lost Symbol* (Brown, 2009). The novel is fanciful and controversial but it does contains some interesting observations about the state of the human condition at this moment in time. It also provides verifiable accounts of the influence that technology is having on the human condition and explores some of the issues tangentially relevant to the present study: things like artificial intelligence, augmented reality, cybernetics and so on. Most intriguingly, it explores the inter-relationship between ancient wisdom and cutting edge thinking, making the following series of points:

> "A change is coming. Human beings are poised on the threshold of a new age when they will begin turning their eyes back to nature and to the old ways... back to the ideas in books like the *Zohar* and other ancient texts from around the world. Powerful truth has its own gravity and eventually pulls people back to it. There will come a day when modern science begins in earnest to study the wisdom of the ancients... that will be the day that mankind begins to find answers to the big questions that still elude him." (Brown, 2009 p. 92)

Prior to going on holiday, I was privileged to be at the 'Proms' premiere of the *Concerto for Turntables and Orchestra*, written by Gabriel Prokoviev (Grandson of Sergie) and performed by DJ Switch[22] with the National Youth Orchestra (NYO), (Symphony Hall, Birmingham, 3rd August 2011). This a radical fusion of traditional Western orchestral music and so-called popular culture. A year previously the NYO had performed works by the 20th Century composer, Edgar Varese, who had experimented then with electronically-derived sounds influencing, in the process, more populist musicians like Frank Zappa. At one after-show party,

[22] A whole essay could be written about the way in which DJSwitch was using a computer interactively with his turntables to re-create the sounds of the orchestra while the acoustic instruments were playing 'call and response' with him. This was pre-figured by the artist Moby on his seminal album 'Play' in 2002 where he too used modern technology to re-create the sounds of traditional instruments. I wrote about this phenomenon at the time and presented the idea at a staff conference in Canterbury in 2003. As reinforcement of that point and others made here, DJSwitch, read his score for the piece from a *Macbook Pro* eschewing the traditional music stand.

the sounds of Varese were 'mashed up' in popular parlance by a DJ working the crowd in the foyer of the Sage Theatre in Gateshead. What this points to is the 21st Century phenomenon of 'fusion'.

Restaurateurs also experiment with so-called 'fusion' cooking where culinary insights from around the world are 'played' with experimentally in kitchens to produce ever more interesting and challenging tastes and menus. Each food 'artist' produces their own 'signature' dish and style creating individual eating experiences. Of course old techniques, ways of doing things, ancient culinary knowledge and recipes are added 'to the mix' but new technologies, new flavours, new tastes render them forever adjusted and enhanced. There are, for instance, things one can do with a microwave that could never have been achieved over an open fire.

The insertion of this additional section in the study is to explain that the next piece of writing about technology is very much a 'fusion' or 'mash up' of some old ideas with new technology. As such, the methodology is different from that used to review the underpinning literature found in sections 2.1. and 2.2. In section 2.3, therefore, I look at how technology has shaped learning and where some old ideas like constructivism have been re-invigorated within this context. Rather than a theological canter through the history of technology, the piece is designed to be read as an interweaving of reflections around specific historical moments in the evolution of computer-assisted learning. Chapters 4 and 5 contain writing which I would argue now interweaves reflections on historical moments in my career as it developed alongside the evolution of computer-assisted learning.

Section 2.3 acts therefore as a bridge between writing 'old style' and a literary mode more in keeping with the theme of the thesis. Symbolically, it marks the end of old ways of knowing -

even my old way of being 'self' - and opens up the rest of the study to a more dynamic and dialogic way of interweaving self with technology and epistemology. From this point on it reads more readily as a piece that takes account of the insights from the literature survey which were highlighted at the end of section 2.2.

I attempt to do this by paying attention to the four 'N's of what appears to be an emerging framework. This section therefore operates at two levels: a generic review of literature in the domain and, where relevant, signposts to material that amplify, in the arena of learning, need (N_1), knowledge (N_2), networks (N_3) and the application of learning in new (N_4) contexts or situations.

2.3 Relevant Literature about (Information) Technology

2.3.1: Historical accounts of the emergence of technology

In order to provide some coherence to the section I have tried to organise my writing around a gradually-narrowing focus. I start with the big picture which amounts to a chronology of the history of information technology. I focus in on the impact this has had on pedagogy/andragogy and then focus in on how learning technologies have influenced freedom or liberating movements, since as was seen in section 2.2, liberation is one of the goals of education.

There are a number of texts that have been heavily influential on the development of my knowledge base, written in such a way as to make the subject interesting and intriguing, surprising given the potential dryness of the content. Of particular note in this category are the biographic *Alan Turing: The Enigma* (Hodges, 1992), the docu-novel *iPod, Therefore I am* (Jones, 2006), the journalistic, *The World is Flat* (Friedman, 2006) and the historical, *The Facebook Effect* (Kirkpatrick, 2010). In addition the works of Standage (2000), *The Victorian Internet*, Naughton (2004) *A Brief History of the Future* and Galambos and Abrahamson's (2002) *Anytime, Anywhere: Entrepreneurship and the Creation of a Wireless World* have also contributed to the nulti-disciplinary nature of the study, bringing to my understanding contributions from history, economics, politics or business environments. In order to keep this section focused, I have concentrated remarks specifically on learning technologies and their evolution.

Most influential on the development of my thinking - and indeed an underpinning text for some of my own published work (e.g., Hughes, 2003) - was the fascinating book, *Complexity: The Emerging Science at the Edge of Order and Chaos* (Waldrop, 1993). This book might also be described as a docu-novel since it charts in narrative form the rationale for, development,

foundation and outputs of the Santa Fe Institute in California. This academic hub, bearing all the characteristics of a learning network (N_3), drew in a range of 'arguers' and researchers all working on different aspects of 'chaos' theory but in different professional domains and using different professional discourses. So, computer scientists worked alongside economists, mathematicians, particle physicists, molecular biologists and systems analysts. What emerged in this exemplary interdisciplinary experiment - itself evidence of prior knowledge (N_2) being used in thought experiments - was the theory that rather than there being chaos evinced by empirical analysis of the world there is 'complexity'. Complexity being, in summary, the observed behaviours of a 'system that is complex, in the sense that a great many independent agents are interacting with each other in a great many ways' (Waldrop, 1993 p. 11). Waldrop goes on to say, 'Think of the quadrillions of chemically reacting proteins, lipids, and nucleic acids that make up a living cell, or the billions of interconnected neurons that make up the brain, or the millions of mutually interdependent individuals who make up a human society' (Waldrop, *ibid*).

Complexity theory is based on the assumption that underlying these phenomena are mathematical patterns that determine their behaviour and that that behaviour is dynamic and adaptive and evolving though not necessarily in a linear manner. Technologically, webs have formed in much the same way throughout history[23] and, ahead of the invention of the internet, complexity theorists posited the notion of the interconnectedness of computer-based systems that would also be adaptive and dynamic. This one quotation has been an ever-present in my thinking and presentations and has been a benchmark to which I have often returned when challenged in some professional training contexts:

> "Moreover, these technological webs can undergo bursts of evolutionary creativity and massive extinction events, just like biological ecosystems. Say a new technology like the automobile comes in and replaces an older technology, the horse. Along with the horse go the smithy, the pony express, the watering troughs, the

[23] This is the key point that Standage makes about the Victorian internet being a precursor to the present day phenomenon (see Standage , 2003)

> stables, the people who curried horses, and so on. The whole subnetwork of technologies that depended upon the horse suddenly collapses in what the economist Joseph Schumpeter once called a 'gale of destruction'. But along with the car come paved roads, gas stations, fast-food restaurants, motels, traffic courts and traffic cops, and traffic lights. A whole new network of goods and services begins to grow, each one filling a niche opened up by the goods and services that came before it." (Waldrop, 1993 p. 119)

This one quotation exemplifies clearly that human creativity is often caused when a genuine need (N_1) is identified. Waldrop ascribes this thinking to Brian Arthur, one of the founding members of the Santa Fe Institute who describes this phenomenon as 'lock in', "...once a new technology starts opening up new niches for other goods and services, the people who fill those niches have every incentive to help that technology grow and prosper." (Waldrop, 1993 p.119)

The history of my engagement with educational technology reflects this phenomenon (see appendices 1-6). Reflecting on the narrative of my career indicates the extent to which I have become 'locked in' to new (N_4) technological ways of facilitating learning and have demanded ever increasing functionality and facility of technologies so that increasing returns might be driven from each learning episode[24].

A similarly chronological review of texts that deal with technology-enabled learning amplifies the above point. In this category, the following are examples of influential and relevant material. Referred to in Waldrop (1993, p. 115) for his contribution to complexity theory but in any case a stand-alone contributor to the emerging body of literature is Seymour Papert whose *Mindstorms: Children, Computers and Powerful Ideas* (1993) has seminal significance in the context of this thesis. For example, he writes,

[24] Just today (7th July 2011), I have shared a 'google doc' for the first time with my supervisory team, partly as a means of enabling access to those working in disparate locations (Nottingham, Wolverhampton and Prague) but also because I can. It is the application of a new skill acquired working alongside employees of a start up technology company Anspear Ltd., in a different domain (N_4).

> "In my vision the computer acts as a transitional object to mediate relationships that are ultimately between person and person. There are mathophobes with a fine sense of moving their bodies, and there are mathophiles who have forgotten the sensory motor roots of their mathematical knowledge. The Turtle establishes a bridge. It serves as a common medium in which can be recast the shared elements of body geometry and formal geometry. Recasting juggling as structured programming can build a bridge between those who have a fine mathetic sense of physical skills and those who know how to go about organizing the task of writing an essay on history." (Papert, 1993 p.184)

Similarly influential have been Salmon's (2000*) E-Moderating: The Key to Teaching and Learning Online* and *E-tivites: The Key to Active Learning Online* (Salmon, 2002), as well as Kearsley's (2000) *Online Education: Learning and Teaching in Cyberspace*, Thorne's (2004) *Blended Learning: How to Integrate Online and Traditional Learning,* Lynch's *(2002) The Online Educator* and Wenger, White and Smith's (2009) *Digital Habitats: Stewarding Technology for Communities*. What can be seen, even in the titles of the text themselves, is the evolution of the discourse which continues to move from talking about computers (see Papert, 1993) to communities (see Wenger, White and Smith, 2009). Thus, it is fair to say, that in parallel to the development of my career - as narrated via appendices 1-6 - there has been a commensurate development in thinking about the influence of technology on learning. We are no longer concerned with what computers can do, we are concerned with what they, more generically categorised as 'technology', can do for us as communities of professionals – put simply networks (N_3),

> "Technology extends and reframes how communities organize and express boundaries and relationships, which changes the dynamics of participation, peripherality and legitimacy. It enables very large groups to share information and ideas at the same time as it helps smaller groups with narrower, more specialized and differentiated domains to form and function effectively. It allows communities to emerge in public, opening their boundaries limitlessly, but it also makes it easy to set up private spaces that are open only to members. It affords many ways to limit access, expressing intimacy or privilege, or it can greatly enlarge a group's periphery. A person who comes across a community site as a result of a search engine, combs it for ideas and information, and never comes back is part of the largest periphery." (Wenger, White and Smith, 2009 p.11)

Examining texts written around the middle section of the time frame for this study, from around 1996 to 2006, it is clear that the concern of authors was how technology could be used to enable collaboration, co-operation and constructivist approaches to learning. Collis (1996) notes,

> "Educationally there is a growing movement toward acknowledging the value of cooperative work and computer-supported cooperative work is a multidisciplinary growth area." (Collis, 1996 p. 406)

She goes on to say,

> "Interconnectivity and integration also refer to the movement toward regarding computer use as an integrated part of the educational environment integrated in terms of computer application in traditional subject areas, but also in terms of computers as a catalyst to stimulate more integration of subject areas." (Collis, *ibid*)

Kearsley was the first author I came across who systematically tried to map the emerging landscape of the potential uses of technology in education (see Kearsley, 2000). Writing around the turn of the century he introduced me to terms like MultiUserDomains (MUDs) and Multi User Interfaces (MUIs) (Kearsley, 2000). It is more than coincidence that one of the most widely adopted so-called virtual learning environments is MOODLE (Modular Object-Oriented Dynamic Learning Environment). MOODLE is a multi user domain in that many people can be inside a virtual learning environment (VLE) all at the same time and it is supported by a user interface that allows for many people to operate it synchronously[25]. It could be argued that a fully-functioning VLE is the current technological zenith of a learning network (N_3)

Historically, it was a small matter of months before practitioners in the field had started to condense such apparently complex phenomena into short hand terms like e-learning (see

[25] Gillespie, Boulton, Hramiak and Williamson (2007), base a whole book for teachers in training on the assumption that MOODLE will be the virtual learning environment they will have to use when they arrive in schools. In the period from about 2004 to the present day, schools have invested significantly in VLEs. In that time I have experienced professionally, *Fronter*, *Frog* and RM's *Kaleidos,* none of which are significantly better in terms of affordances (see Collis above or Wenger, White and Smith, above) than Moodle (Now that MOODLE has been turned into a global phenomenon, its accronym has been adopted as a brand name and thus it is appropriate to use from here on the normal case spelling.

Salmon, 2000). The next few years saw the development of a range of proprietary software products delivering virtual learning environments. As can be seen in appendix 4, in November 2002, I had the privilege of witnessing Dr. Mary Smith teaching students in Fiji from her office in Palmerston North in New Zealand using *WebCT*, one such virtual learning environment. Canterbury Christ Church University where I working at the time, took a different path and adopted first O'Reilly Associates' *Webboard* (see figure 6 below) before settling on the *Blackboard* Virtual Learning Environment.

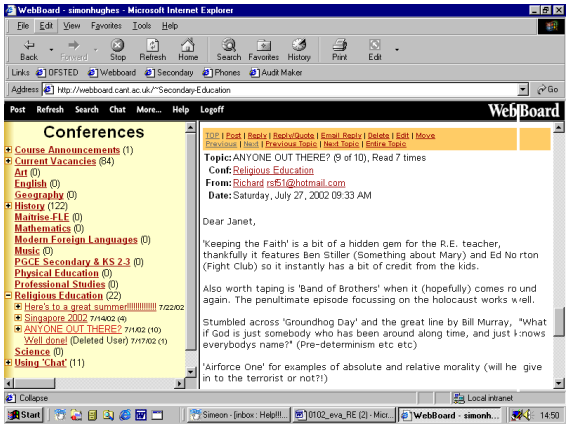


Figure 6: Screen dump of Webboard

I have included figure 6 for two reasons. First, it timestamps this piece of evidence as the date shown is 27th July 2002 and, as such, helps to provide chronological evidence for this work. Second, it provides evidence that I was an early adopter of technologies where I could see value and utility in my facilitation of professional learning (in essence, a working example of what I mean by N_4). For each of the subject areas recorded in the left hand pane, with the exception of history (122), there were at that time no other subjects using this multi user domain to facilitate co-operative learning.

Simultaneously, there were some attempts to categorise the type of people who used computers or perhaps more accurately to categorise where, on a continuum a person's behaviour with

technologies, placed them. Most would agree[26] that this continuum starts with 'innovators' or pioneers, continues with 'early adopters' (Salmon, 2000 p. 71) and 'later adopters' and then takes on the majority of people who are likely to take more time to 'buy in' to the new idea or technology. At the end of the line are those who are categorized as 'laggards', 'luddites', 'resistors', even 'sloths', whose behaviour is characterised by resistance to change - this group of people is over-represented in the teaching profession and were a notable challenge when eventually I ended up working on the Building Schools for the Future project around 2008. This behavioural phenomenon has been noticed by others working in the field:

> "Change - inevitable as it is - continues to be perceived by most educators as a threat. The question for educators is whether to be a part of the change or a victim of change. Too often, as educators, we have allowed others to make system-wide decisions for us. Too often, we have behaved like bystanders, reacting to change rather than being proactive planners or active participants and contributors." (Lynch, 2002 p. 2)

The identification of resistant behaviours appears in all the writing that was emerging as I embarked on this literature survey, indicating and indeed reporting the belief on the part of many that they did not need (N_1) to change:

> "Simon, we're an outstanding school [according to Ofsted]! Why do we need to change?" (Anon[27], 2009)

Some notable examples of readings that were informative at that time include Prensky's influential *Digital Natives; Digital Immigrants* (Prensky, 2001), a controversial paper and thus one that triggered some important bits of thinking. Of the divide between digital natives and digital immigrants, he notes,

> "It's very serious, because the single biggest problem facing education today is that our Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language." (Prensky, 2001 p. 2)

[26] See QuickMBA.com (http://www.quickmba.com/marketing/product/diffusion/) for a single reference to a coherent expression of these types of behaviours. Whilst the reference here is to consumers, the behaviours described are directly comparable to those displayed by all sectors of society approaching new technology.
[27] This is a direct quotation from the Vice Principal of one of the schools on the BSF project I was working on who, even by 2009, was still exhibiting the behaviours identified by Lynch.

In more temperate language Sherry Turkle[28] makes a similar point in a landmark paper entitled *Computers and the Human Spirit*,

> "Children in a computer culture are touched by the technology in ways that set them apart from the generations that have come before.
> Adults are more settled. In the worst of cases, they are locked[29] into roles, afraid of the new, and protective of the familiar. Even when they are open to change, established ways of thinking act as a braking force on the continual questioning so characteristic of children." (Turkle, 1990 p.266)

Whilst a recent critique of Prensky's work (Helsper and Eynon, 2010) sets out a wider range of factors causing a person's engagement or not with technology, the reality is that there was at the time generational 'lapping' going on if not a generational gap (Helsper and Eynon, 2010 p. 505). It seems as though, there has been a narrowing of the gap in the last decade and adults are able now to keep up with younger people who are themselves entering adult life bringing with them their, sometimes, technologised learning styles:

> '... if being tech savvy is determined by exposure and experience, then collaboration and learning is possible in environments where younger and older generations interact.' (Helsper and Eynon, 2010 *ibid*)

Perhaps this generational gap was never as great as Prensky assumed or perhaps he was super-imposing on virtual/online/web-based contexts his assumptions about the 'disconnect' between traditional classrooms and their 'tech savvy' clients. Shortly after the publication of his work, Lynch was writing research-informed materials that were designed to give leadership and advice on setting up virtual classrooms (Lynch, 2002). She notes, 'Moving away from a focus on ourselves as teachers and focusing instead on the learner, we begin making the transition from the traditional knowledge transmission model to a facilitation model that enables us to involve students in their learning processes.' (Lynch, 2002 p. 32)

[28] Papert's attribution of his own learning to Turkle is important in the development of the discourse. That they were married is a fact known to the community by his announcement of it in *Mindstorms* (Papert, 1993)
[29] It is worth noting that this is not the same type of 'locking in' as that enunciated by Brian Arthur (see above and Waldrop, 1992)

Lynch makes these observations in a section on adult learners where she draws on insights derived from Knowles (1978; 1984) and to whom she ascribes the theory of 'andragogy' (Lynch, 2002 *ibid*). 'Adults', she says, 'have a great deal of experience and knowledge upon which to build' - that which I categorise as (N_1) - and 'usually have specific learning goals in mind when they decide to continue their education' (Lynch, 2002 *ibid*). In the context of this study where it is my adult learning that is the subject of the research, Lynch's opinion that andragogy is at the constructivist end of the learning continuum is a helpful insight when considering more recent thinking about technologised learning.

Elsewhere (appendix 3) I refer to the importance of Polsani's paper (2002) that radically affected my thinking on the nature of knowledge in the information sphere after I heard him speak in New Zealand. This was at the same conference where I was taken by the thoughts of Lewis (2002) on knowledge-building environments and his re-working of Vygotsky's zone of proximal development for the new era (Lewis 2002 p. 4).

Much of the literature associated with the contribution of technology to learning refers back to Vygotsky's ideas. Grabe and Grabe (1998) make the point that 'Vygotsky is a classic example of a scholar whose ideas were much more influential after his death than in his lifetime' (Grabe and Grabe 1998 p. 68). His three core ideas summarised here as: 'speech/talk', 'scaffolding' and the 'zone of proximal development' are all components of 21st Century computer-supported learning. Combined they are characteristic of 'constructivist' learning episodes. It can be argued that there has been a happy confluence of constructivist pedagogies and the emergence of computer-assisted learning. Sprague and Dede (1999) write,

> 'In a constructivist classroom, students are more actively involved than in a traditional classroom. They are sharing ideas, asking questions, discussing concepts,

> and revising their ideas and misconceptions. Such activity involves collaboration, with occasional competition, among students. Collaborative environments can encourage the knowledge construction model for lasting learning.' (Sprague and Dede 1999 p.8)

Sprague and Dede (1999 *ibid*) acknowledge the contribution of Jonassen's (1996) important work in this area and his influence on the development of their pedagogic approach. Writing from a different perspective Wenger, White and Smith (2009) write, 'The close, voluntary collaboration in communities enables their members to invent and share new uses for the technologies at their disposal. Communities often play a key role in the dissemination and appropriation of new technologies.' (Wenger, White and Smith, 2009 p. 12) In all cases what seems to be the case is that computers provide collaboration and communication tools which lend themselves well to knowledge-construction. Somekh (see e.g. 2007[30]) is pre-eminent in describing these phenomena as 'affordances'.

A brief examination of the *'Facebook Effect'* (see Kirkpatrick, 2010) illustrates this point well as users of this global technological aid to interactivity affords its users communication, collaboration and the construction of knowledge. My first encounter with a 'facebook' was on the second cohort of Teach First in 2004. In that iteration, digital photos were taken of all staff and participants and turned into an electronic document with brief résumés[31] of each person added, so that we all would know who each other was. It was little surprise to me that within two years of this phenomenon, I became aware of an online solution emanating from Palo Alto, California that was becoming widely available across campuses. This is itself a microcosm of the fourth ' N_4' of the emerging framework, an existing idea applied in a new technologised setting.

[30] Somekh (2007) is a compendium of the most recent expression of her thoughts, re-publishing aspects of her work from the late 1990s.
[31] The use of the US English term has been adopted to account for the North American origins of this programme.

Kirkpatrick (2010) verifies this historical reflection by simply applying the title *2006* to a chapter which starts to chronicle the development of knowledge-construction tools within the 'Facebook'. This extract points to this event:

> 'The new tool they arrived at would help users find the information that most mattered to them at any given moment. That might include everything from which party a friend planned to go to on Friday to updates about the political situation in Tajikistan someone might have posted as a Web link. The point was to make sure you saw what you cared about, whatever it might be. The order in which information would be presented would depend on what you had shown - by your behaviour - you like to look at. Zuckerberg explained it to colleagues "A squirrel dying in front of your house may be more relevant to your interests right now than people dying in Africa"' (Kirkpatrick, 2010 p. 181)

The point here is that the 'Facebook' affords its users a range of technologies to conduct their social activities. Some early adopters have grabbed these affordances and used them in learning contexts too, primarily because the client group (i.e. the learners) are already familiar with the technology, use it seamlessly with the rest of their lives and because the user-interface is more attuned to Human-Computer Interface (HCI) values than many of the proprietary 'virtual learning environments'. A brief meta-analysis of this in academic contexts suggests that it is the additional affordance of a global platform such as Facebook or Google groups that enables users to bypass the silos created by Computer Services departments in schools, universities and local authorities who are tasked with locking systems down so that they are not subject to virus attack, the corruption of data, the compromise of information security or the potential risk to child or personal safety. The net effect of this is that the boundlessness of technology (Kearsley, 2000) and its ability to afford communication and collaboration (Somekh, 2007) is frustrated, causing early adopters to step outside the firewalls of their institutions and use social networking utilities to construct knowledge and meaning.

> "New communication tools shake things up because it's hard for a threatened regime to control them. With a variety of circumvention tools, the internet is even more difficult to control. Why else did the Egyptian government shut down the internet as the revolution unfolded?" (Nash, 2011 p.1)

The transfer of the underlying principles in the above quotation to the context of education metaphorically makes the point. Two illustrations attempt to support the claims being made here; the first is about communication; the second about collaboration and construction.

In figure 7, it is possible to see how 'Facebook' is being used by Catherine Meehan of Canterbury Christ Church University to recruit new students, broadcast the successes of existing students and provide a platform for them working in dispersed and remote settings:

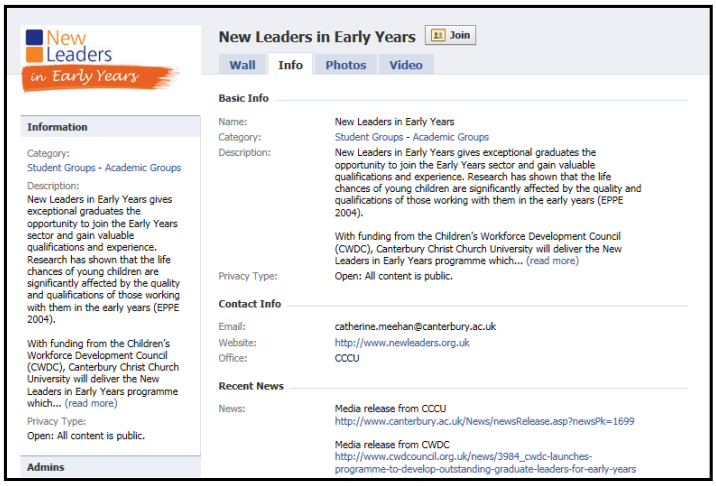


Figure 7: Facebook image 1

In figure 8, an inter-university group 'Academics for Academic Freedom' can be seen using 'Facebook' to share ideas and generate knowledge:

Figure 8: Facebook image 2

Noteworthy here is that the pedagogical agent, Dennis Hayes, provokes debate by making a proposition online. This is in keeping with the classical philosophical tradition of the protagonist. As a post-marxist scholar, Hayes frequently adopts this philosophical method to catalyse a dialogic episode. Unlike Socrates, however, Hayes is able to deploy the multi-user domain of 'Facebook' to catalyse something more akin to a 'multi-logic' episode. He 'posts' an article in which his argument is rehearsed and members of the group then respond using the technology. Anyone associated with the group can make a comment thus democratising the process of knowledge construction. In other examples, respondents submit other articles generated from their prior learning (N_2) which help to increase the knowledge capital of the whole group (N_4) - this appears to be a model of social-constructivism in action. Some of the postings may challenge the conventional wisdoms of the group, not unlike in a conventional classroom. The difference is that the emotion is taken away from the encounter, because everyone is at arm's length. This next example shows this clearly:

Figure 9: Facebook image 3

More is written in section 2.3.3 about the influence of technology on freedom. Here, the concern is the historical development of technology as an agent of learning, or perhaps it would be more appropriate to say, the emergence of a range of learning technologies which afford users opportunities for communication, collaboration and knowledge-construction. Somekh (2007) again,

> "The development of new social practices will therefore be transformative to varying degrees, depending on the affordances of the tool, the skill with which human agents learn to use them and their ability to imagine new possible uses." (Somekh, 2007 p. 13)

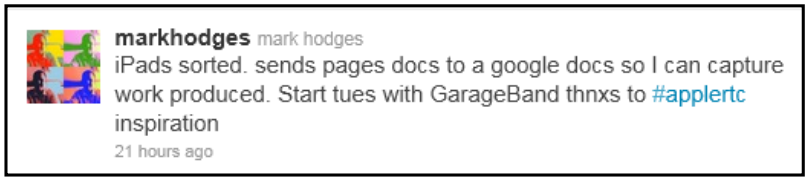
In the examples cited it has been the academic staff who have explored the potential affordances of 'Facebook'. This, as Somekh noted. The power of 'Facebook' and other social networking utilities has been precisely their creators' ability to attenuate the software behind them and re-iterate according to the needs and demands of the user. This is exactly the phenomenon that Polsani described (see below, section 2.3.2) around a decade ago. In the 21st Century performative knowledge 'flow' is both the subject and object of the global human network.

> "Social networking (Linkedin, Facebook), blogs, webinars and microsharing (eg Twitter) are all examples of different types of social media technologies that are increasingly in everyday use both in and out of work, indicating that the appetite to collaborate and share across networks is huge." (Robinson, 2011 p. 13)

Robinson's statement above is a neat summary of where society is now with learning technology. Her writing arises from the experience of professional learning for business - her message is, however, transferable to the Education sector. For example, recent contract work has brought me into contact with two types of education users tweeting:

1. School managers[32] using twitter to get messages about their schools out beyond the confines of their own local authority firewalled IT systems e.g.

2. Educational technology pioneers[33], trying to build a community of professionals who can share information, ideas and guidance for each other e.g.



Perhaps it is the affordance of tweeting from a handheld device that may be driving the adoption of this potential learning technology since there is no need to get hands on a terminal, no need to remember a password and no need to log on to a system that will take 90 seconds to load, require you to launch a further application and then find third party client software to contribute to the construction of knowledge. In the same of edition of *E.Learning Age*, Naish (2011) comments,

> "Several practical issues compete for attention in e-learning: content, the learner's technological device and the delivery system/software. Ideally one achieves excellence in all three. But often coming late to the party, like the fourth musketeer, is the issue of adoption by the target audience; is the e-learning really used? Without successful adoption, the other issues (arguably) become irrelevant." (Naish, 2011 p. 6)

[32] Permission granted for this citation, see foreword
[33] Permission granted for this citation, see foreword

In effect what Naish is arguing is that we have now arrived at a point where the range of technology and the access it provides to learning resources is unsurpassed in history. What remains to be solved is the challenge of enabling the intended audience to engage with the intended learning episodes. Recent literature in the domain is tending to focus on how to achieve widespread adoption of the affordances of learning technologies. Naish cites one case study as evidence to support his hypothesis:

> "...lawyers are raised on a diet of lectures/tutorials/textbook, at university and post-graduate law college, so naturally assume further learning will come from further doses of the same, plus on-the-job training." (Naish, 2011 *ibid*)

CPD for teachers likewise remains a mainly face to face affair. Perhaps the tipping point will be caused by the most recent addition to the range of potential learning devices - 'handhelds'. Literature is already beginning to emerge about the potential affordances of new generation software tools known colloquially as 'apps'.

> "... apps tend to do one job really well with the minimum of fuss. They are formatted perfectly for the devices on which they are based. They tend not to tempt you away from the job in hand with links, pop-ups and extraneous clutter. They can usually be accessed with a single touch. By comparison, I find that I hardly ever use the browser on my *i*Phone, mainly because most sites are unreadable or unusable." (Shepherd, 2011 p. 6)

Shepherd contributes an important point to my hypothesis. He is effectively saying that the clamour (a refinement of 'need' N_1) for lightweight, handheld devices bundling together telecommunications software, access to the internet as well as software applications such as an organiser, led to the creation of PDAs[34] and, at the time of writing, *i*Phones, Android Phones and Windows Mobile 7. He reports however that browsing is best undertaken on a bigger screen device. To respond to this real HCI challenge, software developers - led again by the team at Apple - have produced a multitude of apps designed to facilitate 21st Century living - once again the application of new learning in a new context (N_4). 21st Century learning is catching up and

[34] Personal Digital Assistants.

there are an increasing number of learning-centred apps emerging on the market. Figure 10 is a simple screen dump of a selection of the results of the submission of the search term 'learning' into the *i*Tunes Apps Store search engine[35]:

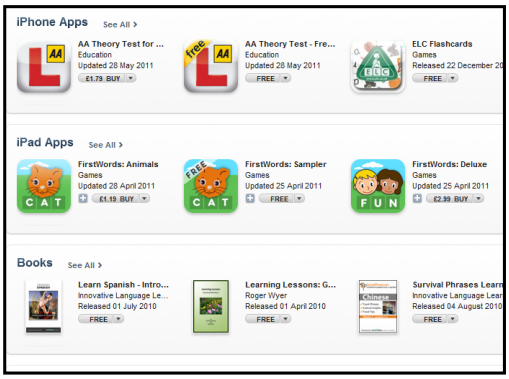


Figure 10: *i*Tunes Apps for learning

The potential affordances of handheld learning were not lost on me as long ago as 2003-4 when I bid for and was awarded funding by the UK Training and Development Agency for Schools (TDA) to explore them in initial teacher education[36]. The device in question was the XDA II supported by O_2 which we used to capture digital video text of teachers in training in the classroom without the paraphernalia of a Teacher's TV film crew or a full-on documentary. I had already discovered the much-enhanced facility afforded by digital video in creating 'movies' of my own children. It was the application of this prior knowledge (N_2) in the professional context (N_4) that enabled us to secure the project's funding.

We also reduced to 640 *x* 320 pixel size, mobile word templates which created documents for lesson observations and which also, for example, gave users a handy app[37] of all the TDA standards on the handheld device. More recently, I have been involved in the marketing of a

[35] Taken on 18th June 2011
[36] Though not one of the selected IMs for this study, the XDA II project is a potent example of me applying an existing technology (e.g. the Word document) in a new context (N_4)
[37] I have used this term here though it was not in common parlance at the time. Again, one of the benefits of hindsight.

handheld learning platform developed by Anspear Ltd. which makes English Language and Numeracy learning interactive, discrete, multimodal, portable and cheap. As an example of 'liberation technology' (Law, 2001 p. 165), I will return to the Anspear tool in section 2.3.3. Here, though, its development illustrates also how advances in technology are shaping the way we learn today and as Standish (2000) shows, this is because of the 'confluence of certain socio-cultural factors with elements of the hardware' (Standish, 2000 p. 152).

To summarise this section I have chosen to cite *verbatim* the following quotation written in 2000. It could be Standish's description of a museum exhibit:

> "What is understood by 'computer' here is probably the desktop; typically this will incorporate the box housing the processor and drives, the keyboard and a screen...
> ...The fact that we habitually think of the computer in terms of this particular configuration of box, keyboard and screen reflects, quite naturally, the way in which the technology has developed and the part that it plays in our lives. It is not difficult to imagine a different machine without screen or keyboard, one that relied primarily on a combination of number keypads, microphones and loudspeakers, and yet that used more or less the same microchips. The home computer that we in fact have has developed in the context of particular social activities and cultural meanings. It cannot be understood merely in terms of an inevitable technological evolution, a kind of inhuman force that increasingly determines our lives." (Standish, 2000 p. 151)

Is it possible that Standish had seen a prototype of the *i*Pod? Might he have had a premonition of the ubiquitous spread of handheld devices? Could he have been predicting the emergence of virtual/touch screen keyboards? The reality is that technology is changing people as fast as people are changing technology - again the confluence of socio-economic factors and the hardware. In the context of this study, it is important to note that simultaneously the affordances of potential 'learning technologies' are changing with every release of new hard or software. In such circumstances the need (N_1) for human beings to learn in agile and flexible ways seems to increase and thus it is appropriate to consider next the potential impact of technology on pedagogy/andragogy.

2.3.2: Accounts of the impact on pedagogy/andragogy of technology

"And these children that you spit on
As they try to change their worlds
Are immune to your consultations
They're quite aware of what they're going through"
Changes, David Bowie 1972, RCA Records

In this next section I want to explore some of the literature that reports the impact that technology has had on pedagogy/andragogy. It is outside the scope of this thesis to debate the nature of these two concepts. What follows are my own definitions of what I mean when I use both terms as shorthand descriptors for complex ideas and theories.

Pedagogy - A dictionary definition of this term has it as a noun meaning the "principles, practice or profession of teaching" (Hanks, 1989 p. 1131). I would extend this definition to be the science of teaching that encompasses: the role of the teacher who leads her/his pupil(s) on a journey to greater knowledge, skills and understanding; the role of the learner who follows the leader by participating in the activities and exercises designed to increase knowledge, skills and understanding and; the role of the academic who studies the interactions between the two. The basis of these ideas is in the Greek origins of the word which can be assumed to lend the English language both the word *Paediatrics* - the science of 'child' medicine, or, from similar origins, *Podiatry*, the science of feet. Conflating these two definitions, renders the useful descriptor of pedagogy as the walking of a child out of ignorance and into new knowledge.

Andragogy - The same dictionary (Hanks, 1989) has no entry for this term interestingly. Knowles, the scholar most frequently acknowledged to be the architect of this term, promulgated it first in 1978 (Knowles, 1978). Dictionary.com has this for its entry, "the methods or techniques used to teach adults"[38]. Again, to extrapolate from this simple definition I would add

[38] See http://dictionary.reference.com/browse/andragogy?s=t

the following: On the assumption that embedded within the definition of Pedagogy is the notion of a child, it is clear that in Andragogy it is *man* who is being studied or doing the studying, again from the Greek. Users of this term generally apply it in contexts where it is *adult* learning that is in focus. In the 21st Century 'andragogy', though derived from the Greek word for man or 'other person', also includes women.

Differentiated use of the terms comes about because of the recognition that adult learning may require particular or specific approaches and needs to be cognisant of the additional concerns around 'power-in-relation' (Foucault, 1982), gender, ethnicity, inclusion and the psychological constructs under which the learning may be taking place. It is important to dwell on this for a while since all of the learning I have undergone in relation to this project has occurred when I was, at least in British legal terms, an adult. Here is what Lynch has to say about adult learning - I have annotated her quotation using the 'N' signifiers to point out the serendipitous nature of her work:

- "Adults tend to be self-directing [N_1]
- Adults have a rich reservoir of experience that can serve as a resource for learning [N_2]
- Since adults' readiness to learn is frequently affected by their need [N_1] to know or do something, they tend to have a life-, task-, or problem-centred orientation to learning as opposed to a subject-matter orientation
- Adults are generally motivated to learn by internal or intrinsic factors (such as helping their child with homework) as opposed to external or extrinsic forces (such as a raise in salary) [N_1]" (Lynch 2002 p. 2)

Facilitating adult learning is challenging when the motivation is extrinsic as in a formal learning context. Writing from an international perspective, Marrett and Harvey (2001) note,

> "They did not seem to grasp the need for taking personal responsibility for their own learning, using the materials provided and whatever other resources might be available to them in their own countries. They still expected to be "taught" and were upset when the local tutors did not lecture or deliver the entire course to them." (Marrett and Harvey, 2001 p. 44)

This resonates with my experience of working in Malaysia with HE tutors preparing to deliver a UK model of teacher education and where I had been asked to 'train' them on the use of Blackboard. One anecdote, makes the point:

Vignette 3: Constructivism in Malaysia

"'Ah Mr. Simon! I am looking forward very much to your CPD lecture this afternoon.'
[Me] 'Well it's not really a lecture, more like a workshop where you will be learning in a hands-on context'
'Yes, yes! Very good, we like the way you lecture on constructivism!'"

And as if to prove the point, here is a photo of me literally and ironically delivering a lecture on constructivism with the participants arranged in traditional classroom style.

Figure 11: A Lecture on Constructivism...

Marrett and Harvey (2001) attempt to account for this phenomenon. They write,

> "These reactions may have been a holdover from the school system based on a pedagogical model (teaching children) through which they had passed. The transition to an andragogical model (helping adults learn, Knowles et. al. 1998) is not always easy." (Marrett and Harvey, 2001 *ibid*)

Perhaps the advent of more and more online opportunities for adult learning have given rise to the expansion of writing about adult learning facilitation. In short, there are more people doing it because they can.

The literature cited in the domain of educational technology so far, and below, is uncompromising on the assumption that computers are a powerful tool for facilitating just this sort of learning.

> "Course evaluation studies... typically find that students do at least as well in online courses as in traditional classes. Students consistently show higher levels of involvement in online courses, likely due to the increased interaction with their instructors and fellow students via email and conferencing. Some students do prefer traditional classes, and this preference may result in poorer performance if they are required to take an online course. It seems, however, that most students like online courses." (Kearsley, 2000 p. 50)

> "The communication capabilities of the Internet provide us with the opportunity to help create the kind of educational environment we want for tomorrow's students" (Lynch, 2002 p.2)

> "Human use of computing is vast and growing. Networked technologies such as the Internet and the World Wide Web have been called 'transformational' because of their wide-ranging impact. Electronic networking creates communications across terrestrial boundaries, across cultures and on a global scale. Concepts of space and time are changing, and of how and with whom people can collaborate, discover communities, explore resources and ideas and learn." (Salmon, 2000 p. viii)

Dr. Pithamber Polsani (2002) of the University of Arizona would argue that to limit 'it[39]' to this alone - i.e. a tool - would be the equivalent of using a wheel barrow to protect your head from rain whilst working in the fields. A wheelbarrow makes a good *parapluie* or *parasol* and enables the user to work sheltered for longer periods of time. Take it off your head however, use its power to shift produce and increase productivity and the investment in it begins to show far greater returns. Similarly, technology is not, he argues, just a tool of education, it is the educator of the future itself. This notion is extended and enriched in the work of many educational

[39] IT in the sense of Information Technology. The inclusion of the C was very important to add value to that which was already known about.

technologists who argue that the purpose of educational technology is to participate in the process of knowledge-construction.

> "Online learning may get students excited about learning who otherwise would drop out of school" (Kearsley, 2000 p. 141)

Sadly, however, the literature is beginning to show that education as a project is not keeping pace with technological developments in ways that are liberating and enabling. Naughton (2011) notes,

> "The current curriculum undermines the authority of the education system by revealing to tech-savvy children how antediluvian it is.
>
> But more importantly, the curriculum is disabling rather than enabling for most kids, because it is preparing them for a technological world that is vanishing before their eyes. Training children to use Microsoft Office is the contemporary equivalent of the touch-typing courses that secretarial colleges used to run for girls in the 1940s and 1950s - useful for a limited role in the workplace, perhaps, but not much good for life in the modern world." (Naughton, 2011 p. 2)

There are now adults who have grown up with technology and who wish to use it extensively and effectively in their facilitation of learning. Curricula for teacher training in ICT must also become now, fit for purpose, and modelled on the best principles of andragogic practice.

2.3.3: Technology as a liberator

I want to argue here that technology has become a force for educational liberation. My starting point is Gutierrez's (1971) notion of 'organic intellectuals' (see 3.1.4 for a more detailed explanation of this term) which derives from his reading of Gramsci (1971). For me, there was a happy conflation of marxist ideology (where I was politically as a student) with Christian activism (where I was theologically and spiritually) wrought by the *Theology of Liberation* (Gutierrez, 1971). Much of my early professional identity as a teacher was constructed around 'freeing young people from the captivity of ignorance', 'inculcating values of justice and freedom in the hearts and minds of young people', 'extending the invitation to participate in charity and activism'. I wanted the pupils I taught to think for themselves, make their own judgements, develop values and, break through the glass ceilings of privilege, power and prestige in ethical, informed and intelligent ways. It was an identity forged in idealism. There remains for me a symbiotic relationship between education and liberation.

There is an increasing body of literature that documents the involvement in and influence of technologies on contemporary social and political movements, all of which themselves spring from sets of ideals.

> "... many new social media tools have inbuilt features which make them easy to appropriate for political ends. The group and personal profile pages of social network sites such as Facebook offer a new space where people can share dissenting views and exchange information when planning demonstrations; a modern reworking of the traditional 'public sphere'. Blogs, such as tortureinegypt.net, have proved effective in documenting injustice and brutalisation over long periods of time, and have provided a lens through which to focus and direct public anger. Other tools, such as Twitter, enable the very fast dissemination of news." (Nash, 2011 p. 2)

Though not an illustrative moment as such and therefore outside the remit of this thesis but tangentially convenient, the following anecdote rehearses another moment where liberation and freedom were wrought at the intersection of self and technology - not, in this case, myself.

It was at a conference in Oxford that I heard the head of a Rape Crisis Centre talking powerfully about how the mobile phone given to her had saved her life. As her violent partner attacked and beat her senseless she was able to speed dial the panic line at her local police station. As a result he was apprehended at the scene, charged, tried and convicted. Simultaneously, the emergency services got aid to her and she survived to tell the tale. For me this was a profound learning moment and prompted me to reflect further on the potential contribution of technology to moments of liberation and education.

Less stark but more directly relevant to the present project is the story told by Usman (2001) of the nomadic women of Nigeria using radios to access broadcast education programmes which enabled them to learn and develop out of the circumstances of relatively dire poverty:

> "Most radio education programs emphasize certain aspects of nomadic work roles such as prevention of certain animal diseases. To educate the nomads, the broadcasts were designed not only to be heard, but also to stimulate reflection and reaction in the Fulbe [the particular group in question]. Thus their general awareness of events around them would be wakened, and they would be able to participate fully in their education because the broadcasts would bring knowledge of areas that affected their daily life" (Usman, 2001 p. 95)

Legend has it that the modem was invented by the African National Congress as a means of encoding Mandela's speeches that he wrote in Robben Island, the prison that he famously re-cast as a university. It was also used as his means of staying in touch with the outside world.

> "Using a laptop computer and modem, Maharaj was able to open new and direct lines of communication between South Africa and the ANC in exile. Maharaj obtained the full Mandela memorandum and showed it to UDF leaders in Johannesburg and to Mbeki in Port Elizabeth. 'When they saw the full text of the letter they realised they had misread Mandela's intentions. Within days we were able to sort the matter out. I sent a message to Mandela explaining how the trouble had arisen. He promptly sent invitations to Govan Mbeki and the others involved to come and see him'" (Seekings, 2000 p. 243).

As suggested in section 2.3.1, I want to adopt the phrase I first encountered in the work of Andy Law, when he chooses to describe phones and computers as 'liberation technology' (Law 2001 p.165). The obvious connection to liberation theology whose hermeneutic principles are important for this study, hardly needs spelling out. Law goes on to say,

> "Through the gift of microprocessors, computers (and many other domestic and business goods) get better and cheaper, thereby defeating our preconceived notions that better things are more expensive. They serve us well and add value to what we do, but in themselves are too readily obsolete." (Law, 2001 p.166)

In this next quotation, some pointers are offered to the potential impact of computers on the human condition.

> "At St. Luke's[40] technology is a great leveller. Beyond the skill of programming, the use of computers is a fair and democratic process. That's good, because it means that work's greatest enabler is available to any and every human, regardless of who they might be." (Law, 2001 p.168)

Friedman makes an important contribution to this debate, celebrating the work of the 'Open Source' movement. He writes, "The primary goal of the free software movement is to get as many people as possible writing, improving and distributing software for free, out of a conviction that this will empower everyone and free individuals from the grip of global corporations" (Friedman, 2006 p. 106). He writes powerfully about the impact of Google Earth on the small nation state of Bahrain, and its capacity to metaphorically breakdown the walls imposed on the population by the ruling elite (Friedman, 2006 pp. 506-507).

As a prologue to his historical report on Facebook, Kirkpatrick rehearses the story of Immanuel which again illustrates the power of technology to liberate and educate (see Kirkpatrick, 2010 pp. 1-7).

[40] Andy Law's own advertising agency.

From the abstract to the directly relevant, it is necessary to cite the work of Naughton (2000, 2004 and 2011) again. In this quotation it is important to note the interlocution of technology with liberation/freedom and education:

> "What the tech resistance movement shows is that there is an alternative to the national curriculum in ICT. Instead of laying the dead hand of key stages 1-4 on our children, we could be opening their minds to the disruptive and creative possibilities of computing and networking, reversing the decline in entrants to computer science departments and - who knows? - even seeding the development of the ARMs of the future." (Naughton, 2011 p. 3)

For clarity, the 'tech resistance' movement is the grassroots 'lack' of organisation that seeks to use technology to liberate young minds to 'tinker'. The kind of tinkering that led to the founding of ARM, a global intellectual property licensing company, based in Cambridge, England that invented, developed and licensed the base technology that powers all the world's mobile phones[41]. The parallels with Law's writing could not be more clear. Moreover, in Salmon's work, based almost exclusively on research undertaken in andragogical online contexts, it is clearly stated that,

> "At stage five [Development], participants become responsible for their own learning through computer-mediated opportunities and need little support beyond that already available. Rather different skills come into play at this stage. There are those of critical thinking and the ability to challenge the 'givens'." (Salmon, 2000 p.35)

In my experience, this is precisely because they have been trained to think for themselves in a constructivist environment, which whilst still providing a scaffold, also creates the conditions where thinking is possible and happens organically.

Strategically there are those that argue that ICT has a formal role to play in the development and liberation of peoples as yet struggling to access resources for living as well as higher levels of need like participation in democratic processes:

[41] ARM was featured on a BBC programme, *Made in Britain* and hosted by Evan Davis of the BBC. Further information about the influence of ARM can be found here: http://www.v3.co.uk/v3-uk/the-frontline-blog/2082317/arm-showcased-british-innovation Accessed 29th June 2011

> "Many of the promises of ICT, like those of lifelong learning, come couched in the language of access and equity, appealing both to social justice and to efficiency. On its own, this gives us no reason for rejecting the promises as false or misleading. Information technology clearly does have the capacity under appropriate circumstances to reach large numbers of learners through a few well-qualified teachers using materials developed by specialists. In places where both books and qualified teachers are scarce, ICT may indeed have the capacity to provide learning resources where there are none." (Lelliott, Pendlebury and Enslin, 2000 p. 48)

Lelliott et. al. (2000) were writing out of the context of facilitating learning on the continent of Africa but their insight is transferable to the UK context. There are some important words in this passage: 'access', 'equity', 'justice' as words related to liberation or freedom; 'capacity', 'well-qualified', 'specialist' as words related to education and learning.

Resonances with Polsani's notion of technology as the teacher of the future (see above), Law's notion of liberation technology and the general understanding of education as a means of achieving freedom, if only from ignorance, make this an important quotation in the context of this study. Goodson and Mangan note however, “that people have different levels of access to information, and different levels of awareness regarding its formulation and distribution” (Goodson and Mangan, 1991 p.13). This means that control can be exerted over subordinates because they simply ‘do not know’. Liberating the means of ‘knowing’ and freeing access to the sources of knowledge is actually an act, therefore, of moral heroism and revolution. As has been shown, technology can do this. Halpin converts this aspirational understanding of the power of ICT in educational terms into a more urgent imperative to change. Since ICT has been a catalyst of social revolution, he argues, curricula need to evolve to keep pace:

> "...the nature of modern society, in particular the most significant social revolutions presently underway within it which are radically reconfiguring how life is currently experienced and lived, and which I now want to insist demand a fresh curricular response from schools. (Halpin 2003 p. 106)

In essence it appears as if Halpin is arguing that technology is both the problem and the solution. I would concur with this entirely. Technology has, as shown above, both facilitated and contributed to a range of social revolutions or revolutionary and liberating phenomena.

This thesis is the story of the impacts of such phenomena in career terms, something akin to the 'evolutionary burst of activity' accounted for in complexity theory. I saw it happening with pupils I was teaching and see it now in the liberating processes going on round the world[42]. If Halpin is right about the need for '... a fresh curricular response from schools,' (Halpin 2003 *ibid*) it may also be true in the context of professional learning.

The work of Anspear Ltd., was referred to earlier and is a powerful example of how learning, technology and liberation have come together. Research and development projects for the literacy, numeracy and British Citizenship 'test' support materials have been undertaken with the following hitherto marginalised groups: Young offenders working on a summer school on the Anglo-Welsh border; Bangladeshi women accessed via a community hub in Tower Hamlets; Former Gurkhas in Ashford, Kent identified by the Ethnic Minority Achievement team from the County Council and a large community of Gypsy, Roma and Travellers temporarily resident in Swaleside, Kent. In each case, the tool was adapted to meet a defined 'need' in the community: Access to better quality health care; access to the English curriculum; access to knowledge; participation in learning in general and so on.

[42] There has been a fascinating series of debates about the uses or abuses of Blackberry Messenger by the so-called 'rioters' during the outbreak of disturbances in English cities in the summer of 2011 (see e.g. http://crave.cnet.co.uk/mobiles/blackberry-messenger-shutdown-rumour-spreads-in-london-riots-50004663/). The hash tag @riotscleanup became a locus for the alternative response to the trouble. Again, both sides in evidence of the technology coin.

The feedback from these commercially-oriented research and development projects has demonstrated that liberation from ignorance, exclusion, isolation and incarceration is achievable, in part, with learning mediated by technology.

My 'self' has, I would argue, been liberated periodically by learning mediated by technology. This has been most frequently the case in professional contexts, hence the reason for limiting the illustrative moments to those in my career. Literature, therefore, that can be said to focus on the impact of technology on professional learning is the next section, thereby amounting to a summation of this whole review.

2.4: Liberation technology and professional learning - the Addendum

Originally the literature review was going to focus on the three domains, epistemology, self and technology, but the inclusion of this additional section was agreed to be necessary in a dialogic process with the supervisory team. Its intention is to locate the work in the domain of professional learning in education since it is my professional learning that is the subject and object of the study.

At the outset, I wish to state clearly two important parameters for this section. First, this is about one professional community only – the education profession - , so health and social care, medical, legal, law and order, military, musical, guidance and careers professionals, and their situated contexts, are not discussed even though there may be resonance between and across the domains. Second, this is about professionals and not practitioners. At some point a paper needs to be written, which builds on the important work of Atkinson and Claxton et.al. (Atkinson and Claxton 2000 p. 4) that charts the progression from a mindset that constrains teachers to be reflective practitioners, to one that encourages them to be reflexive professionals. These two metaphorical descriptions require further explication.

Reflective practice, if operated without the appropriate theoretical wrapper, carries with it the danger of a backward-looking self-referential, concentrically circular workplace demise since a reflective practitioner may hold a mirror up to themselves but may do no more than take note of the two-dimensional image that comes back. I have witnessed this phenomenon in both initial teacher education and continuing professional development programmes. The real danger is solipsism, (Kirkham, 2003) reflection without action or even action without reflection. Either way round, learning does not occur.

Reflexive professionals, at the other end of a continuum and not just in binary opposition to reflective practitioners, alternatively act on the outcomes of a structured enquiry into themselves, their professional lives and their working practices. In so doing they bring forward positively a dialogic, hermeneutic process which prompts them to undergo structured, scaffolded, analytical processes, carried out in isolation but more effectively with the supplementation of a learned expert, a guru or, in educational terms, say, a 'coach' (See NCSL, leadership pathways methodology), or, in technology-mediated contexts a 'pedagogical agent'. In this *modus operandi*, account is taken of the many dimensions of a professional educator's life. It may be viewed by a 360° process, or it may be examined from different aspects, sides or perspectives (Natanson, 1970; Sokolowski, 2000; Grimmitt, 2000; Jackson, 2006). Where reflexive professionals differ significantly from reflective practitioners is in the mandatory development of action plans that arise from the reflexive process. These may be personal development plans as advocated by Covey (1989), they may be strategic action plans as advocated by national self-evaluation methodology (OFSTED, 2004) or they may be practical action plans that focus on an identified 'area for development' in a practical context.

> "To begin with the 'end in mind' means to start with a clear understanding of your destination. It means to know where you're going so that you better understand where you are now and so that the steps you take are always in the right direction." (Covey 1989 p. 98)

2.5 Approaches to Professional Learning

The history of education points to the adoption for education of the concept of reflective practice in the work of Donald Schön (1987). The impact of his theory on the profession has been significant and has contributed to the elevation of it, away from models of instrumentalism that pertained in the 19th and early 20th Centuries (See Atkinson and Claxton 2000 pp 4-6). Schön argues that his work was set in a tradition that had evolved out of a positivist research construct which might have created lots of new knowledge but which paid little attention to the practical situations for which it was 'intended' – this term is used here in its phenomenological sense as well as in its standard meaning. Schön states,

> "And so the separation of research and practice. And the consequence of this is, I believe, that if you find yourself in university, you find yourself in an institution built around an epistemology--technical rationality--which construes professional knowledge to consist in the application of science to the adjustment of means to ends, which leaves no room for artistry and no room for the kind of competence […] that a reflective teacher displays when she responds to the puzzling things that kids say and do in the classroom. No room for these indeterminate zones of practice-uncertainty, situations of confusion and messiness where you don't know what the problem is. No room for problem-setting which cannot be a technical problem because it's required in order to solve a technical problem. No room for the unique case which doesn't fit the books. No room for the conflicted case where the ends and values in what you're doing are conflicted with one another. And so you can't see the problem as one of adjusting means to ends because the ends conflict." (Schön, 1987 p. 6)

At the time he was operating and developing his ideas, teachers were 'trained' to work in classrooms in university departments of education but even more attended lectures at teacher training colleges. The nomenclature of these institutions discloses the approach to be adopted in them. Looking back on the learning activities undertaken by my friends and peers in the teacher training college where I 'took' my first degree, and they 'studied' education, it is clear that they were being prepared for the technical operation of a 'job'. The highlight for them was educational technology lectures where they got to learn how to use overhead projectors and the

'banda' duplicating machine. These two, at the time exciting technologies themselves, reveal, however, the underpinning pedagogic approach to be adopted: deontological, didactic and teacher-centred.

In the UK many of these teacher training institutions were established by religious foundations whose expressed intentions were to 'form' young men and women for their roles as inculcators of the pre-dominant social *mores* if not explicit Christian values:

> "St Mary's University College has a long and distinguished history as a Catholic college for the education of teachers. It was founded in 1850 by the Catholic Poor Schools Committee to meet the need for teachers to provide an education for the growing numbers of poor Catholic children. It started in Brook Green in Hammersmith in the charge of the Brothers of Christian Instruction with an intake of twelve young men." (St. Mary's University College, 2007)

> "Canterbury Christ Church College was the first teacher training college established by the Church of England in the twentieth century. It was founded in 1962 particularly to meet the needs of Church schools at a time of an acute teacher shortage. (CCCU, 2007)

Noteworthy in the first quotation is the use of the term 'instruction' which signifies also the pedagogic method employed by these 'educators'. If this was the case for beginning teachers, student teachers or trainees, how much more true was it of in-service training? I qualified in 1985 and was occasionally sent on a course – to learn how to do something - in the first three years of my career.

Professional development and training did, however, undergo something of a radical shift during the period of time when the Secretary of State for Education in the UK was Sir Kenneth Baker. It was decreed, as an axiom of the 1988 Education Reform Act, that all teachers would be required to undertake five days of training per year, taken out of the holiday allowance. The

correlation between the promulgation of Schön's theory and the establishment of 'Baker Days', is not attested to in the literature, rather the Conservative government's perception of the need for the 'upskilling' of the education workforce is seen as the principal driver behind this innovation. This approach was symptomatic of the technicist-rationalist mindset of that particular government (Grimmitt, 2000 p. 7; Atkinson and Claxton, 2000 p.17). It insisted that teachers required greater 'know-how' (Furlong, 2000 p.17), irrespective of questions of 'know-what' or 'know-why'. John Fletcher reports that during this period:

> "Teachers were publicly relegated to technician status in a number of ways, reduced to mere agents delivering policies that had been originated elsewhere. They were undermined indirectly by the discrediting of the initial preparation that they had received (Joseph, 1983[43]). Teacher 'training' replaced teacher 'education': it became customary to refer to a teaching 'force' not a teaching 'profession'". (Fletcher, 1995 p. 141)

Fletcher goes on to illustrate the 'instrumentalist' underpinnings of the raft of INSET measures that emerged from this reform of education, all of which were aimed, not about personal development for teachers but, improvements in performance by pupils (Fletcher, 1995 p.143).

The consequent de-professionalisation of teachers is reminiscent of that noted by Schön in the 1950s in the US when, the need to counter 'communism' and 'sputnik' were the policy drivers (Schön, 1987) or in the 1980s, when the perceived threat was from Japan and the rest of the pacific-rim economies (Schön, 1987 ibid). It was these kind of drivers that led Woodhead, as Her Majesty's, then, Chief Inspector of Schools to endorse the findings of Reynolds' research into whole class teaching of literacy which he had elicited from studies of literacy learning in Taiwan (Reynolds, 1998). This became an orthodoxy which spawned an industry known better as, The National Strategies (for numeracy and literacy teaching). Such pedagogic strategies - even instructional methods, to use the American terminology - moved away from the post-

[43] A reference to Sir Keith Joseph the, then, Secretary of State for Education.

Plowden, child-centred, post-Vygotskyan, constructivist learning management techniques that had become pervasive in the vast majority of England's primary schools. Teachers were 'trained' to deliver the strategies in an unashamedly didactic manner.

History will show that this approach was unpopular with teachers. It was ideologically-driven, it was theoretically-thin (one sponsored, research paper from Reynolds (1998), see above) and was out-of-step with the research-informed insights of the CPD community in England.

Refreshingly and reassuringly the TDA had listened carefully to these CPD experts and produced a policy document which enshrines pervasive ideas in teacher education which are more in keeping with contemporary research-informed evidence and theory (TDA, 2007). A standout bullet point in the present context is this:

> "It [CPD] enables the participants to develop skills, knowledge and understanding which will be practical, relevant and applicable to their current role or career aspiration – for example, in curriculum or subject content, teaching and learning strategies and the uses of technology.
>
> CPD is only effective when it is directly relevant to each participant. Where CPD is provided for large groups, or for the whole staff, it may be useful to separate the participants into smaller groups so the CPD can be customised to suit each type of participant." (TDA, 2007 p.2)

What is presented here, largely on the basis of synthetic insights arising from EPPI reviews (http://eppi.ioe.ac.uk/cms/), is a model of CPD that is personalised, focused, ambition-oriented and with the professional learner at the centre of their own journey. It notes also the lack of value added to teachers' professional learning by whole staff INSET that is often described as 'airport anthropology', 'seagull strategy' or 'hit and run training'. Accounted for implicitly in these quotations is the notion of self-directed learning.

The key point to be made here is that in my reflections on the learning gains I have made as a professional, technology has been an integral component, usually as both the cause and agent of change. Professional learning has been mediated by technology. Two simple illustrations help make the point. They are chosen because they don't necessarily fit the pattern of the five IMs that are the main research objects for the study but they are nonetheless indicative of the relationship between technology and learning in my autobiography. In these cases, however, the obverse effect is to be noted. In other words these were bits of technology I learnt outside the professional domain but which I have subsequently applied in that domain with, as indicated, career enhancement outcomes.

Vignette 4. **NCO and PHP**

> In December 2008 I began a period of volunteering for the National Children's Orchestra . Among other roles, I took on responsibility for managing their website www.nco.org.uk. All I was given was a phone number of the original parent volunteer who had the access codes to the back end database and the log in details for the mail server. It quickly became apparent that the site was coded in four different scripting languages, was based on an open source solution that I had never seen before and operated an 'htdocs' methodology which meant I could find no actual text to edit. By re-visiting a number of logical processes I had developed over time (see below for reference to Gladwell's notion in *Blink* (Gladwell, 2006)) and with the accumulated experience of working with technologies as well as making use of the phone number, I managed to learn fast enough and fully enough to keep the site fresh. At the end of the process I had acquired skills in open source content management, php5 and MySql. When I came to set up my own *moodle* (vle) in the summer of 2011 for commercial uses, I was able to deploy many of the skills acquired at that time. Moreover, I became free from the need to use Microsoft products as standard.

Vignette 5. From Home Movies to Teacher's TV

> In the summer of 2007, it became necessary to extend the range of handheld video cameras we had available as a family. Staying loyal to the Sony brand, I bought a camera which captured video direct to DVD. There was familiarity with the controls and the leads that came with it but there was no obvious way of getting the movies to play on a standard DVD player. This caused me to enter a new process of self-directed learning, from which I acquired new skills (creating DVD menus and playlists, burning DVDs etc.), new language (rendering, compressing, finalising etc.) and new needs (for example, it soon became apparent that the processing power of

my home PC was not sufficient to cope with the resource requirements of video-editing). It is a fact of history that that new knowledge was applied on the RE-Net project when we produced a range of talking heads of the great and good in RE as a resources for tutors new to RE to use in their sessions in initial teacher education work[44]. This, of course, meant that we were free from the need to pay for professional film companies to make usable quality movies available online. It was also invaluable experience when I came to apply the editing principles and processes to Teacher's TV programmes.

The above illustrations provide uncorroborated evidence that technology had a liberating effect on aspects of my career. I certainly felt enhancements to my cognitive self as I was able to do things I could not do before. I knew things, I hadn't known previously but I was also motivated to acquire such knowledge, skills and understanding which made the process that bit more satisfying.

It is my contention that professional learning should be a liberating process. I think there is support for this assertion in this extract from Whitehead and McNiff':

> "...the video showed him actively denying the values underpinning his ontological commitments to creative independent investigation, because he saw himself imposing his own ideas on his students and telling them what to do and think, rather than encouraging them to find out things for themselves and explore their own ideas.[...] over the last thirty years, Jack has systematically worked at improving his practice of enquiry learning by responding to people in a way that will encourage them to have faith in their own capacities to create their own knowledge." (Whitehead and McNiff, 2006 p. 26)

In my epistemological tradition (i.e. theology and philosophy as shown in chapter 2.1), the acquisition of new knowledge, skills, understanding, wisdom, expertise or experience is the equivalent of 'emancipation from mental slavery' (after Bob Marley *Redemption Song*, Island Records, 1980). The next line of Marley's song is, "...None but ourselves can free our minds" (Marley, 1980 *ibid*). In modern parlance, Marley is arguing that we should 'back ourselves'; Whitehead and McNiff would articulate this as 'having faith in our own capacities to create our

[44] Some of those resources are now being made available through Facebook, though they are hosted on my own webspace (http://www.fernbankassociates.co.uk/renet_legacy.htm).

own knowledge'. Frequently now I would opt to back myself and create my own knowledge using the knowledge acquisition methods that have evolved over time. This is certainly the case when it comes to learning a new technology. Did I enrol in a class to learn how to tweet? No, I downloaded the software and got on with it. Did I purchase a textbook to learn how to use an interactive whiteboard? No, I found an empty classroom, plugged in a notebook with the Smart tools pre-installed and got on with it. Did I go to a tutor and ask to be trained in scripting PHP? No, I called the helpdesk at claranet (www.claranet.co.uk) and happened upon an enthusiastic engineer, bored with his day job who clearly enjoyed the rare opportunity to act as an andragogical agent.

In the context of my own career, what seems to be occurring therefore is a kind of *'autopedagogy'* where professional challenges and subsequent reflections on these phenomena have led me to undertake self-directed study. It may even be that 'autopedagogy' is a phenomenon in its own right. On lighting on this term, I experienced a moment of euphoria. I, then, discovered that it is used in America in the context of driving schools. It occurred to me that in the same way that I am not writing an autobiography, but am engaging in auto/biographic activity, it would be more appropriate to adopt the term auto/pedagogy as the shorthand descriptor for the phenomenon. This is because I am starting to see that over twenty years, I have been engaging in self-directed, professional learning episodes where it has been necessary to engage in reflexive processes relating to them. To be clear I do not intend to use an auto/pedagogic research methodology to create theory about auto/pedagogy; rather I am using an auto/biographic method to build a theory of auto/pedagogy.

In section 2.6, I set out further what auto/pedagogy seems to be. If the hypothesis is accepted, it is intended to explore this by a research methodology which is set out in chapter 3 and written up in chapter 4.

2.6: Auto/pedagogy

An Emerging Framework

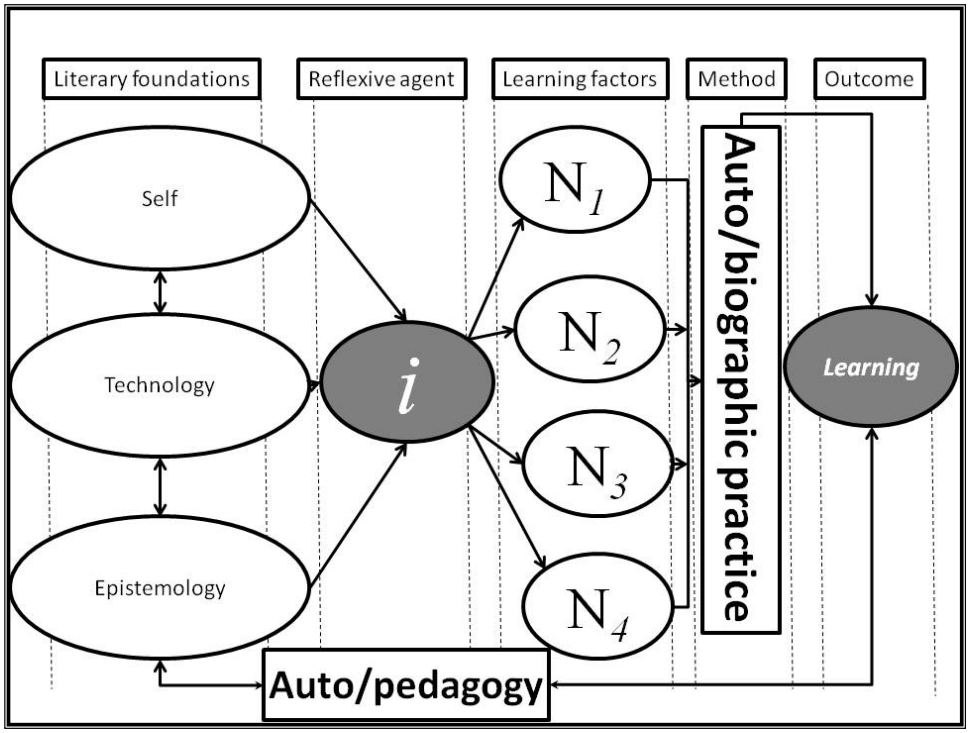


Figure 12: Auto/pedagogy

The diagram above seeks to set out in diagrammatic form, the process of auto/pedagogy as I intend others to understand it. In effect, what I have created is a snapshot of the doctoral process that underpins the thesis.

In keeping with Western approaches to reading, most people will start on the left and work in a rightwards direction. That is how the process started for me with an immersion in three discreet bodies of literature: writing about the self; writing about technology and prior readings and understanding of the literature in the domain of philosophy that deals with epistemology. Clearly it is myself that has elected to read in these domains and to review them reflexively. In fairness, I have adopted the term 'reflexive' as the study progressed since it is the conversion of

reading into action that has been instrumental in moving the thesis forward. In keeping with the underlying theme of the thesis and in homage to the '*i*' in *i*tunes which is an underlying metaphor for the study, I have chosen to use the italicised '*i*' to represent I in the diagram. I as in myself.

This is supposed to denote that I am the main agent in the framework, though that is not to say that others would be the '*i*' in their own auto/pedagogic activity. It is the '*i*' that is pivotal in the diagram. As can be seen, the outcome of reflection on the literature was the emergence of the theoretical framework, and now I am unable to read anything from either of these domains without classifying it against one or more of the learning factors. As explored towards the end of chapter 2, these 'N's are code for the four factors of the framework that seem to underpin auto/pedagogic activity: N_1 for need; N_2 for knowledge; N_3 for network and N_4 for new. As can be seen it is in the combination of these that the framework starts to emerge.

In order to demonstrate the provenance of the phenomenon, it seems helpful to present the history of its evolution and etymology. Ultimately, the concept is traceable back to later interpreters of the phenomenological tradition (see Russell, 2007; Silverman, 2002) and thus has its origins in approaches to research and truth deriving from that philosophical school.

In section 2.5, I described auto/pedagogy as a phenomenon in its own right. At an earlier stage of this process I wondered if the original contribution to knowledge might be the 'discovery' and definition of this new approach to learning. That might have led to the setting of an overarching frame for the study. This is because my hypothesis is that my own auto/pedagogic activity (mapped against that framework) is potentially illuminative for others attempting to make sense of the 'space' between their own personal or professional contexts and the epistemological tools they might employ for self-improvement. I see now that it is perhaps more important to use a

more established method to explore this phenomenon itself, hence the retreat from the creation of a new methodology, auto/pedagogic research, to an auto/biographical analysis of some phenomena that might support the proposition of what, for the moment, remains a hypothetical way of learning.

Auto/pedagogy, as an epistemological tool, is thus a deliberate attempt to validate claims to professional learning caused by the participation of the 'self' in a systematic analysis of its own narrative, in order to discern potential and possibly patterns and processes therein. The epistemological scaffold for this study can be seen to comprise, therefore: personal knowledge (Polanyi, 1962) acquired through active participation in thought experiments (Taylor, 1984; Swann & Pratt, 2003 p. 21), which attempt to make sense of phenomena (Natanson, 1970) occurring in one's autobiography (Abbs, 1974).

What follows is an account of the research I undertook to establish whether or not this hypothetical framework has meaning in the context of professional learning.