Chapter :5 Conclusions

The 'technological investigations' and philosophical reflections in which I have been engaging informally to start with and then in a rigorous and systematic way lead me to these conclusions:

- There appears to be a zone of optimal auto/pedagogy (ZOAP), when, in my professional journey, epistemology (in particular, my way of knowing), self and information and communications technology, interlock simultaneously and cause learning to happen.
- There are some consistently-occurring factors of this ZOAP which can be seen when one drills down into the narratives that comprise the illustrative moments for the study. Illustrative moments that were selected because they appeared to epitomise key professional learning episodes in my career. These four factors are identified by the phonic signifier 'N' (which stands for 'need', 'knowledge', 'network' and 'new').
- When these four factors are seen to interlock, they produce a theoretical framework that could be adopted by other professionals, evaluating their own learning, facing new challenges in their professional context or attempting to build curricula for structured CPD activities in the present economic climate. It might also be used by those considering "What next?" in their career or projecting forward a development pathway for it.

At the outset of the formal phase of this research, I had already believed that professional learning could be facilitated entirely by technological means and that the purpose of the research was to test that belief. I have come to realise, however, through wide-reading and the structured reflexive research process, that this initial hypothesis was the product of my own ambition *viz.* a

professional development context facilitated entirely by computers. Self-criticality now enables me to record that this was a naïve proposition. Research appears to show that learning may be mediated by technologised means but is most likely when this is one ‘agent’ among others (as was demonstrated in chapter 2).

As time has gone on it has been necessary to refine the hypothesis and to be clear about its scope since, as shown in chapter 2, this study straddles three apparently disparate fields: epistemology, self and information and communication technology. This is, however, part of its uniqueness since, for the first time, an attempt is being made to define the ‘space’ at their interlocution. I have chosen to call this the 'zone of optimal auto/pedagogy' because, in my career, as shown by appendices 1-6, each of the factors were present and both underpinned and catalysed my own professional learning. I use the adjective 'optimal' since it means 'most favourable or advantageous' (Hanks et.al., 1989) and the IMs I chose were those times when I perceived the conditions for learning to be precisely that.

I believe that such a zone will exist for other informed practitioners seeking to make sense and meaning out of their own professional contexts. Once the framework is disseminated, they may well apply it consciously in their own work.

The work therefore has its origins in the philosophical domain of epistemology, the educational domain of teachers’ professional development and the growing domain of information and communications technology (ICT). Represented graphically, as a Venn diagram (see figure 33), the space to be defined is the *nexus* described here as the ‘zone of interlocution’.

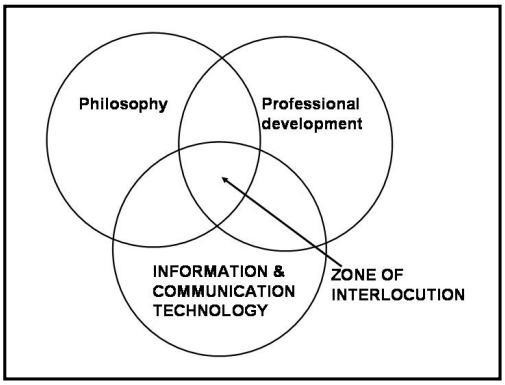

Figure 33: Zone of Interlocution

Were the above model to be generalised for the professional development context it might look like that presented in figure 34:

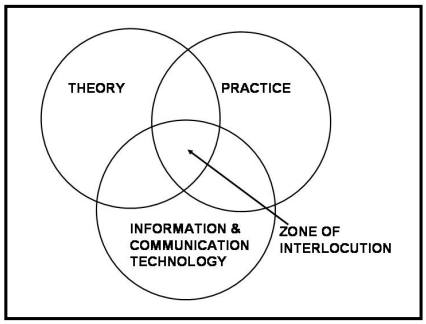

Figure 34: Generalist interpretation

This is a model with which current education professionals might be familiar, since they are expected to take account of theory, integrate it with their daily work (practice) and access and deliver it through ICT (see www.ttrb.ac.uk or www.think.com).

I have chosen to use the term 'theory', here, since it was this that we were exhorted to use on the TTRB by Leask and White (2004) and Leask (2010) when what they actually meant was 'evidence-based practice'. Atkinson and Claxton (2000), Dadds and Hart (2001), Hayes et. al. (2004) and Whitehead and McNiff (2006), albeit from widely differing perspectives, might argue that this is a limited understanding of 'theory' in educational settings. My intention in using the term here is to signal my belief that professional educators need to have a theoretical basis for their actions. This is in keeping with the insights of Leask et. al. (2004, 2010) but also takes account of the contested notions of the nature of theory articulated by the other scholars

above. The problematic term here is "evidence", since there is no consensus within the domain of education about what this is in reality. In this thesis, I am arguing strongly that there is evidence of a theoretical framework in the structured narration of illustrative moments in my career - a phenomenological and relativist perspective. Leask (2004, 2010), at the other end of the epistemological continuum insisted that those of us working on the TTRB only include projects, objects or articles which disseminated the outcomes of quantitative, positivist research and development programmes. Only this, would she tolerate as 'evidence' and referred to it as 'theory'. Indeed, for Leask, theory and fact were interchangeable. I am less convinced, because. I learned from Polanyi (1962) that facts are those things that a self warrants to be true, with the exception perhaps of 'pure' mathematical phenomena. Evidence is assembled by the believer to 'verify' the facts they wish to promote such that the earth was once believed to be flat by a human race yet to view it from a distance. Facts can be, therefore socially-constructed just as easily as they can be the outcome of 'scientific research'. Theory, it seems to me, exists at an epistemological stage before fact.

By way of illustration here, I would point to the use of statistical performance data derived from organisations like the Fischer Family Trust. This is accessible online and requires teachers to deploy a number of Information Technology (IT) skills such as the manipulation of data in MS Excel. Teachers are encouraged to make judgements about their pupils' progress from this data, to plan future learning episodes arising from it and thus to 'improve' their own practice. Those adopting a *modus operandi* in keeping with Leask's epistemological perspective will argue that these data represent facts about children's performance since they are statistically proven and thus quantifiably reliable. I would argue that whilst they are presented as 'fact', they can only ever be the outcome of arguably unreliable testing methods, such as the computation of a range of contestable data, like the mean IDACI[70] outcomes for a school, with potentially subjective

'attainment on entry' data, arriving, as it does, from a diverse range of pre-school settings. When one takes into account that many of the predictions are also based, not on objective tests, but on subjective teacher assessments[71], the data that are used to predict likely future performance are no more reliable than those I have cited here as evidence, in my life history, of auto/pedagogic activity. The point here is that what matters is the interpretation and use of such data by the professional.

If a teacher creates an hypothesis about what s/he needs to do to enable a child to cross their individual zone of proximal development in, say, maths, they are using theory appropriately. If they then apply the outcomes of their theorising in practice, then they are potentially more likely to catalyse or support learning gains in the child. They may use ICT to help them but other pedagogical agents may be more directly helpful or relevant.

The point being that it is, in my judgement, at the interlocution of these three phenomena - theory, practice and ICT - that learning gains are most readily made in knowledge, understanding and skill acquisition. A shorthand way of describing this is the term, ‘progress’.

My definition of 'progress' is subtle, tentative, synthetic and multi-dimensional. Quite different from that used to measure, say, a child's progress against UK National Curriculum mandates. From the research, 'progress' seems to be a combination of the catalysing of learning activity, the development of new skills or attenuation of existing ones, the influence of abstract theoretical perspectives on practical contexts or situations, moments of cognitive 'fog'-busting insight - I would call this revelation, even moments of 'awe and wonder' - and the development of confidence to try things out in analogous situations. This thesis provides no evidence that progress can be predicted; rather it provides *a posteriori* evidence that a self can demonstrate

that progress in personal, professional learning has occurred.

How does this relate to my hypothesis? The answer to this question lies in the underlying assumption evinced in figure 34 which is that progress can be made at the interlocution of these three contrasting phenomena, if and when, education professionals make a personal commitment to the process of learning. It is my lived experienced that professional progress has been most assured when I worked in this zone of interlocution. The research shows that activity, over time, catalysed a radical overhaul of my understanding of pedagogy and taught me to hand learning over to the learners, rather than continue to operate didactically. It also shows that I took learning gained from working in one technologised setting and applied it in others successfully - in career terms. Moreover, I have now come to understand that in this zone my professional learning has been dependent on the agency of the 'words and works of others' or the machines they have programmed to operate pedagogically. Progress has also occurred when I have been instrumental in the development of technologies or their application; in short, where I have acted as a node on the 'network' and have caused information to 'flow'.

Looking back, it does appear as though I was motivated to learn about, with and through technology. Part of my 'focal theory' (Phillips and Pugh, 1994) was that significant professional learning gains could be made by other education professionals if they also choose to undertake structured work in this zone. To be clear, I do not think that the nexus is a theoretical place where professional learning has occurred, rather I think it is a theoretical place where learning may occur if the professional's personal motivation is 'switched on', where they have a professional need to learn, have sufficient prior knowledge to access learning resources, where they can access supplementary expertise through human, real or virtual networks and where they can play and experiment with confidence.

What lies at the heart of my revised hypothesis is that 21st Century technologies have a crucial role to play in the capacity-building that is required among the education workforce since it can make accessible, and deliver learning gains to education professionals in personal or workplace settings, which would otherwise preclude them. This, I believe, is possible since technology enables supplementary pedagogical/andragogical, social co-constructionist approaches to learning – as were described in chapter 2 - and which derive from a conflation of the work of Vygotsky (1954 or 1978) and Grimmitt (2000). Bringing forward Adair's graphical methodology for a second time, it is possible to contend that this idea might be represented as in figure 35:

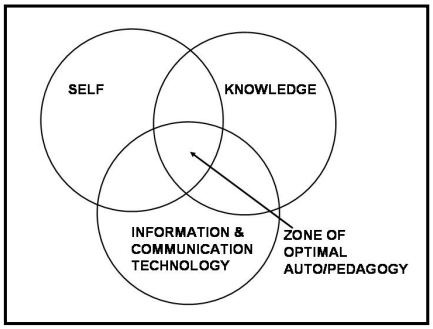

Figure 35: Zone of optimal auto/pedagogy

Here we see that the zone of interlocution comprises the overlapping of a self's interaction with a knowledge (evidence) base made possible through ICT. Note also the changed descriptor which is rendered now as auto/pedagogy. I have applied this term here since the research appears to warrant my claim that, over time, I moved from unconscious acts of auto/pedagogy to self-conscious activity of this sort. The IMs show the practical operation of the underlying theoretical framework and the 'progress' I made in professional learning.

The use of this new term signifies the "active participation in the knower in the act of understanding" (Polanyi, 1962 p. viii). It could thus be described as the 'zone of optimal epistemology' (ZOE) (which would be an intriguing coincidence of language since *Zoe* is the Greek word for 'life'). Further reflection has caused me to move on from this description, since

it would be linguistically tautological, as epistemology is the study of knowledge whereas this is a study of how knowledge is acquired, gathered, developed, mediated by, reflected on and applied in technologised settings by a self, and is thus more appropriately described as auto/pedagogy. Again, in the interests of clarity, theoretically, this is a self-directed phenomenon. The impetus for learning must come from the individual's own motivation but it can be augmented or even articulated by the factors identified in the thesis. Some professional learners may use my ideas as a starting point for the determination, identification or analysis of their own ZOAP.

A further refinement of the hypothesis is thus proffered by the following statement: significant professional learning gains can be made by other education professionals if they choose to undertake structured, reflexive work in this theoretical zone of optimal auto/pedagogy. The use of the word 'other' is made on the basis that the central starting point for the study is the analysis of my own autobiography which, as was shown in chapter 4, has been characterised by activities conducted in this theoretical zone. In short, I would contest that I have made considerable personal and professional gains by active participation in and reflection on learning episodes where technologies, or reflexive activities around them, have been at the centre of the professional enquiry.

The origins of 'auto/pedagogy'

In addition to the insights of Adair (2002) and the clear references to the 'zone of proximal development' identified by Vygotsky (1954 or 1978), I am also indebted to the notion of auto/biography as articulated by, among others, Linden West (2004). Referred to in section 3.1.4, West used a case study approach to test his hypothesis that education could have a profound and therapeutic effect on those entering it later in lives that had hitherto been

fragmented (West 2004 *ibid*). He noted the impact of personal life circumstances on the educational chances of those entering higher education and was clear about the value to the 'self' of engagement with formal learning episodes. This work he called "auto/biography" to signify the active participation of the self in life history work so that narratives do not remain two-dimensional and descriptive.

This epistemic method described in chapter 3 has been adopted and adapted for the present study but is taken a stage further by strengthening the emphasis on the self and how it comes to know from active participation in the deconstruction of its life history. To signify this re-iterated epistemology, a different term is used which imports the theoretical underpinning of auto/biography but which narrows the perspective to focus on the *learning* of a self, not just its story. Its etymology is thus: the word biography is substituted by the term pedagogy with the intention of signifying the role of the self in discerning what it can learn from active participation in self-critical analysis of autobiographic data.

Thus auto/pedagogy is, on the one hand, a deliberate, retrospective attempt to classify acts of professional learning caused by the participation of the 'self' in a systematic analysis of its own narrative. The epistemological scaffold for this assertion can be seen to comprise: personal knowledge acquired through active participation in thought experiments, which attempt to make sense of phenomena occurring in one's autobiography. On the other, it is a term that I wish to ascribe to prospective, contemporary, self-conscious, self-directed acts of professional learning, whose intention is to enable the 'putative knower', to move from one state of being to another. I will continue to need to learn new technologies, and where and how to apply them, in both personal and professional settings, and I will use auto/pedagogic insights derived from these studies to make such experiences profound. I shall continue to use the theoretical framework, I

have created, to scaffold my own self-directed learning episodes.

It is a foundational tenet of this thesis that technology has made it possible for gains in knowledge to occur where it interlocks with a professional learning self, and the body(bodies) of knowledge that the self is seeking to acquire, to understand or to be able to evaluate critically.

Auto/pedagogy, in this case, is therefore the shorthand term for the process whereby a self is motivated or inspired to seek gains in knowledge for personal or professional reasons, where there is review of episodes from self-selected life history which are thought to be significant by the individual and where these incidents/moments are subjected to rigorous analysis using a schema that can be transferred to other aspects of the self's meaning making. For the purposes of this study, the task was to look for evidence of this epistemological approach in my own life history in order to discover whether there is validity in the assertion that professional learning may occur at the interlocution of knowledge, self and technology.

Auto/pedagogy is also, therefore, a reflexive methodology for an individual who wishes to understand how s/he comes to know what s/he knows and can do. It involves the critical analysis of learning experiences, the comparison of such self-referenced events to other phenomena and the participation of the self in engagement with resources selected for the contribution that they seem to offer. Arguably, auto/pedagogy is the four-factor phenomenon, explored in section 2.2x, further refined in 2.6, tabulated in 3.0 and reflected on in 3.3 which amounts to a theoretical framework where:

Table 5: A four-factor schema for auto/pedagogy

Factor	Description	Code
1.	A self notes that it has a self-referential reason for study,	N_1 - Need
2.	The self utilises its prior knowledge, skills or understanding to access appropriate learning resources	N_2 - kNowledge
3.	The self actively participates in the social co-construction of meaning through focused and relevant communities of practical	N_3 for Network

	or professional enquiry (after Wenger, 1998; 2001 – see Smith, 2003)	
4.	The self critically evaluates these episodes and is able to apply new synthetic understandings in relevant practical or professional contexts.	N_4 - for New

I could have chosen to undertake a descriptive piece of work which narrated a range of learning experiences mediated by technology and undertaken by myself or a number of others in a collection of case studies in order to find empirical evidence of this theoretical phenomenon. Indeed, there are aspects of the work that resemble auto-ethnography, as described by, for example, Travers (2002), but I believe that adopting such a methodology would have been inappropriate because narrative accounts of what happened would not, on their own, enable me to tease out the key epistemic advances (another interpretation of 'progress') that are more likely to be achieved by an auto/biographic approach.

The self that is therefore at the heart of this study is not one that learns only from technologised learning episodes. Reading (from old technologies like books and journal articles), reflections on non-technologised life experiences and person-to-person interactions also shape the way my self is. To reflect this, a refined diagrammatic representation is offered as figure 37:

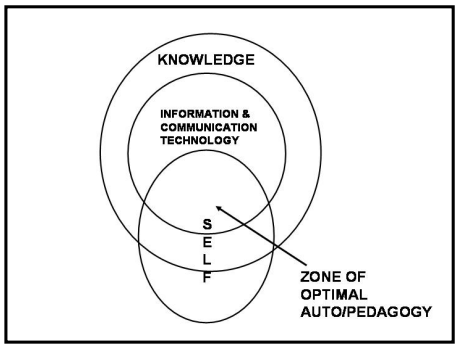

Figure 36: Zone of optimal auto/pedagogy#2

This diagram shows the reality that part of my self exists outside the professional domain, that there are parts of knowledge that I can and never will know and that there are vast amounts of ICT that I will never encounter.

It also points to an important insight for the study which is that all technology is knowledge but that not all knowledge is technology. There is knowledge which exists outside of technology.

My point is that technology cannot, however, exist without knowledge. For this insight I am indebted to Polsani (2002, see IM3 and section 4.1.3). It seems appropriate, therefore to drop the word ‘optimal’ rendering the shorthand term for it simply ZAP. The nature of the ZAP and what occurs in it are the subject and has become the focus of this thesis and the object of the claim to originality to which this chapter is leading.

What figure 36 points to also, is the reality that part of my personal and professional life manifests the interlocution of self, knowledge and ICT. I cannot separate out my personal and professional lives. As evidenced in the study, learning undertaken, for example, to meet the needs of video capture for the family has been transferred into the professional domain. SimiIarly, learning undertaken, for example, to understand how 'wi-fi' technologies might be best deployed in classroom settings have been transferred back into the context of the family.

I would contend, therefore, that the illustrative moments that comprise the 'empirical' data (see chapter 4), provide evidence that my professional effectiveness has been most apparent when I, personally, have been working in this, albeit theoretical, zone of auto/pedagogy. Not all learners will benefit from such a zone; indeed some may not recognise it as meaningful in their life at all. Polsani (2002) again,

> "Experiences in general are personal: they occur within an individual in an emotional, physical and spiritual level. Consequently, no two experiences are identical." (Polsani, 2002, 2 p. 5)

What goes on in the ZAP is a constantly spiralling, dialogic, reflexive process, similar to, but not the same as action research, where new technological challenges are tackled by a willing professional learner. The learner is aware that this new technology has created a need for learning in that it has exposed a gap which needs to be closed in personal knowledge, skills and understanding. To do this the learner may draw on existing knowledge, and seek guidance and

wisdom from the words and works of others, plugging in, however peripherally, to existing or emerging human or technological networks. Since the process of learning with technology is an inevitably ceaseless process as each new iteration of it requires new learning, so the learner has to apply constantly newly-acquired knowledge, skills and understanding in a whole range of new contexts or learning opportunities. All of this will be entirely related to a self-selected career pathway. Learning in the ZAP is personal, autonomous and technologised but it is also utterly dependent on the pedagogical agency of other humans and, in the 21st Century, personal computers.

> "Computers, long a symbol of depersonalization, were recast as tools for 'conviviality' and 'dream machines'. Computers, long a symbol of the power of the 'big' – big corporations, big institutions, big money – began to acquire an image as instruments for decentralization, community and personal autonomy." (Turkle, 1990 p.268)

I cannot find any reference to Turkle's ideas in the Jobs' biography (Isaacson, 2011) but the contribution of her one-time husband, Seymour Papert, is alluded to in Waldrop's history of complexity theory (Waldrop, 1992). As senior academics at the Massachusetts Institute of Technology (MIT) during the explosion of the information era, their ideas were prevalent and I wonder if it is in this quotation that we have the theoretical origins of the *i*Pod.

As I indicated in IM5 and alluded to in the introduction, the existence of this hypothesis would have been impossible without the impetus to personalisation and autonomy wrought by that device. The etymological connections between autonomy and auto/pedagogy are clear when the words themselves are arrayed in the same sentence. The invention of the *i*Pod has catalysed for me a change in my thinking about how teachers' professional learning could be facilitated and enabled. What I believe, as was the case for me back in 1989, is that this will be true when teachers recognise the autonomy they have to actively participate in learning programmes that

fill the gaps in their knowledge, skills and understanding – the needs they have for professional learning.

This, then, is my living theory. I believe that the auto/biographic research process, written up in chapter 4, has generated some fresh theoretical perspectives on professional learning. They have emerged from the case study of myself, in keeping with the methodology of 'living theories', but on dissemination, I think these perspectives may be assimilated by others, re-worked to illuminate other professional contexts, provide meaning to others in analogous contexts or may be applied in programme development activities.

Were any of these to be the case, my living theory would acquire the status of 'conceptual underpinning' or 'theoretical perspective'. It could even become a methodological approach for others researching their own professional contexts. In my view, the theoretical framework is most applicable in the context of teacher initial or in-service education, but e-learning programmes in other professional disciplines might well benefit from the adoption or adaptation of this model.

The Claim to an Original Contribution

There are three claims to an original contribution to the domain of professional learning I wish to make as outcomes of the research process undertaken in pursuit of these doctoral studies:

1) A new theoretical framework for reflexively evaluating professional learning activities

This project has been through three different phases: First, but only on reflection, a randomised, constructivist approach akin to that described by Conner et.al. (1996) aimed at creating a 'domain' encompassing all that is to do with computer-assisted learning. Second, the refinement of that constructivist adventure into a series of outputs, one of which was the four-factor framework of N-ness. Third, how the framework was applied to the illustrative moments. I was always sure that the IMs were significant in the story of my evolution as a professional. Having now applied rules and rigour to their analysis, I have assured myself that they were the correct objects to select, that they do provide coherent logic and as such support the theoretical framework through, and about which, they were written. I contend that the framework is, therefore, potentially useful, useable and ubiquitously applicable in professional learning contexts.

2) A piece of 'living theory'

I assert that this is warranted true belief. In my case it was evinced through my own auto/biographic processes. As such, it stands as a living theory. I believe that others may find the method useful and the framework interesting were they apply it to their own life-histories or narratives and that its use might produce for them their own living theories about their own professional practice and context.

3) A new term, 'auto/pedagogy', which could be deployed in professional learning contexts

Nervous that someone else might have got there first, I have regularly 'Googled' the term auto/pedagogy. There does not appear to be anyone using this term currently, especially not as an outcome of a structured inquiry into an aspect of professional practice. I claim therefore that the term, "auto/pedagogy", can be applied to the structured, theoretically-imbued, reflexive processes outlined above and that it is a legitimately new term to describe them. Moreover, I claim that in my auto/biography, there is a theoretical zone of auto/pedagogy (ZAP) wherein I am most effective as a self-directed and autonomous professional learner.