TEACHING PRACTICES, INFLUENCES AND OUTCOMES IN THE ADULT ICT USER CLASSROOM: MORE THAN AN INPUT/OUTPUT APPROACH?

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A thesis submitted in partial fulfilment of the requirements of the University of Sunderland for the degree of Doctor of Philosophy

March 2010

Abstract

ICT user skill is a relatively new subject area and has a limited pedagogical history. To date, most of the discussion has been about ICT within schools, particularly integration of ICT into other curriculum areas, with less emphasis on how to teach user skills, especially to adults. This research explores differing teaching practices within the adult ICT user skills environment from a teacher professional knowledge perspective. By examining the ways that teachers develop, maintain and enact pedagogical knowledge and by determining influencing factors, this investigation contributes to the subject and pedagogical understandings vital to an emergent subject area. A naturalistic, qualitative, multi-methodology approach was used, involving interviews, classroom observations, document examination, and learner questionnaires. This enabled flexible examination and triangulation of the varying influences on practice and the development of emergent models.

The research identified seven different teaching approaches but concludes that ‘transmissive’ teaching styles focusing on procedural skills dominate. Activity is almost universally perceived by stakeholders as practical, hands-on and individual. The diversity and nature of the teachers’ professional backgrounds, ambiguous subject goals, perceptions of adults as learners, and strong institutional and examination influences all contribute to this narrow perspective. This thesis questions whether such one-dimensional subject and pedagogical outlooks could impact adversely on outcome, leading to skills deficiencies which may limit economic and/or personal ICT potential. Drawing on problem solving examples from the research the thesis proposes a more holistic approach to create a robust theoretical base for both subject and pedagogy.

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Acknowledgements

First and foremost I would like to thank the people without whom this research would not have been possible - the various teachers and learners who readily allowed me to share their classroom experiences and freely gave of their time to answer my questions. And to the centre managers who forwarded my requests for help and willingly talked to me about their hopes and concerns for the courses offered. To all these people my grateful thanks.

I am indebted to my supervisors for their expertise and advice. Firstly, Dr. John Grey for his responses to evolving ideas and thesis extracts, and for many helpful discussions over cups of coffee. Secondly, Prof Caroline Walker-Gleaves for her constructive suggestions for improvement to completed chapters.

Thanks also to the staff and students of the University of Sunderland who have encouraged and helped me during the course of the research process. From those who listened to the arguments and offered suggests, to those who simply offered a smile, all have contributed to a successful PhD experience.

I would also like to thank my friends and family who have put up with me being distracted and occupied without complaint. Especially to my husband who listened patiently when the ideas flowed and encouraged when they didn't. It was his unstinting support and optimism that kept me going to completion.

Introduction

The government states that Information and Communication Technology (ICT) skills are essential for economic and personal development (Cabinet Office, 2005). It also supports arguments that non-computer users will become economically or socially marginalised by lack of involvement with ICT (PAT_15, 2000). Computer literacy and digital inclusion are, therefore, key parts of the government's skills agenda (e-skills UK, 2004; Cabinet office, 2005; QCA, 2005[a]). Yet despite government initiatives to widen access to ICT and to increase training there is no consensual definition of what skills or knowledge are required by computer users. Training provision in ICT, especially in the adult sector, has grown fragmentarily (CEC, 2007) often responding to rapidly changing software innovations or qualification criteria.

This study is predominantly concerned with skill and knowledge needs and questions whether this lack of clarity about content and laissez-faire approach could lead to deficiencies in skills acquisition (Dillon, 2004) which ultimately could limit economic and/or personal ICT potential. These concerns stem from the researcher's own observations as a primary and adult ICT teacher from which she perceived the subject to be approached differently according to learners' age. The researcher had observed (Topp, 2002) that in both cases the teachers demonstrated the basic skills and routines required to achieve an action, but that the way that these procedural elements were rehearsed and the nature of tasks were distinctly different. For example, for children activity was seen to take place in small groups around one computer working on a problem solving task often related to an ongoing project. The children were asked to share ideas and jointly apply actions. The computer was used as a tool to help complete a contextualised task with the teacher acting as guide. In adult classes learners were observed to work individually with the aid of step-by-step manuals and practice worksheets with numbered tasks building to a problem solution. The computer procedures were paramount making the computer the main focus and the task the means to practice skills, with the teacher acting as instructor or troubleshooter. The researcher felt these perceptions of practice warranted research to explore their authenticity and to identify influencing factors, especially as teaching approach was perceived as having potential to impact on skill outcomes.

A range of factors, such as concepts of ICT as a discrete subject, differing notions of the purpose of education, classroom logistic and management issues, autobiographical factors, or perceptions of adult versus children's learning needs or expectations could account for variations in approach. For example, adults might be perceived as able to conceptualise when and how to apply actions for themselves while children as life novices need support. Further, to teach adults in the same way as children might be seen as condescending or disrespectful. But it can also be argued that as subject novices adult learners might require just as much support in interpreting application as children. Yet the kind of adult activity outlined above appears not to encourage reflection on the purpose of ICT use. The problem solution was provided through the step-by-step instruction. This seems akin to teaching art using 'paint by numbers' which could result in an 'artist' with a degree of technical skill and a reasonable looking picture but without experience of the essences of art, namely flair, imagination or creativity. Such a process would provide little understanding of artistic methods or of being an artist. This raises the question of whether such narrow adult ICT activity might similarly provide learners with a limited feel for ICT problem solving or what it is to be an ICT user. In real life situations the starting point is the problem or task, the solution to which requires an outcome that is fit for purpose. The computer operating skills are simply enablers to completing the task. This would suggest that 'soft skills' such as display or creative problem solving are important features of developing effective ICT solutions. Thus, regardless of age, a dual focus on procedural skills to perform actions and conceptual understanding of how and when to apply those skills could help develop more effective computer users.

From these examples of practice, concerns for outcome were associated with the perceptions of adult activity. It was therefore decided to concentrate research on the adult classroom. The intention was to examine differing teaching practices within an adult ICT user skills environment through a teacher professional knowledge perspective. The research had three aims arising from previous research (Topp, 2001, 2002). The first aim was to explore how genuine the above perceptions might be by defining what models of teaching and learning underpin classroom practice. The first research question was: What teaching practices are evident in the adult ICT user classroom and under circumstances? The second aim was to investigate teaching decisions and identify factors which might influence practice. This generated two research questions: How do teachers of ICT to adults construe ICT teaching and what factors inform their vision? How is an adults' ICT teacher's professional knowledge developed and maintained? The third research aim was to stimulate discussion about the ways practice might influence learning outcomes. This generated two further research questions: What are the implications of practice for outcomes? How might computer expertise be defined or achieved within this context? The research focus was thus on interpretation of adults' ICT teachers' relationship with subject, context and pedagogy.

A focus on the adult classroom was also indicated by the literature. 'Adult' here is taken to be post 19 and 'classroom' to refer to taught lessons set in a specific time and place. This includes provision from a variety of contexts such as Higher Education (HE), Further Education (FE), Community education or work-based learning, but excludes drop-in centres or distance learning environments. ICT is a relatively new subject area and has a limited pedagogical history. There is now a growing literature about ICT within schools, particularly related to integration into other curriculum areas (see Maor and Taylor, 1995; Peacock and Beard, 1997; Selinger, 1999). Following the emergence of ICT as a discrete subject in 1995 (Department of Education, 1995) research into the teaching of ICT in schools is also now emerging (see Hammond, 2004; Hammond and Mumtaz, 2001). For adults, the literature to date has focused on e-learning (see Alexander, 2004; Gorard and Selwyn, 1999, 2005) or how-to organize teaching (see Clarke, 2006; Clothier, 1996; Keys and Zeff, 2000), but there has been little research linking practice to theory. By investigating this gap this research can contribute to the understanding of classroom practices necessary to develop models of pedagogy in this comparatively new and underdeveloped area. Such knowledge has an important part to play in the evolving discussions and understandings that naturally attend the emergence of a new subject area.

A professional knowledge approach was chosen because it has been argued that ultimately it is the ways that teachers perceive and negotiate policy (Sachs, 2003) curriculum (Wood, 2004) and research initiatives (Shulman and Shulman, 2004) that impact on how they are implemented in the classroom. Professional knowledge is defined here as Pedagogic Content Knowledge (PCK), the knowledge that teachers develop from contact with the varying communities and sub-cultures in which they work (Hashweh, 2005; McCaughtry, 2005), and the reality of practice (Atkinson, 2004), *id est* enacted Pedagogic Content Knowledge. The strength of this approach is that it emphasizes the knowledge and beliefs of teachers themselves and takes into account real teaching and contextual influences (de Vries & Beijaard, 1999). It approaches classroom practice from the inside rather than from the researcher's outside view. It is therefore a powerful and insightful way to analyse and discuss how teachers think and make decisions about teaching (McCaughtry, 2005). It is not the intention to define what is 'good teaching', but rather to describe what is happening in the classroom and to try to interpret why teachers select particular teaching styles or activities and how those choices might affect learning. In this way, the research will contribute to the understanding of how teachers' professional knowledge is developed and enacted in the context of a rapidly developing ICT milieu. This in turn can inform debate on what skills are needed for computer literacy and how they might be achieved.

A naturalistic, qualitative, multi-methodology approach will be used, including: semi-structured interviews with individual teachers, learners and college managers; loosely structured classroom observations recorded in research field notes; examination of documents such as lesson plans, task worksheets and manuals, work samples, college prospectus and curriculum material; and learner questionnaires. This qualitative approach will enable flexible examination and triangulation of the varying influences on practice and development of emergent models based on rich data.

Before commencing, some terms and definitions need clarification. ‘ICT User skills’ are taken to be those skills or knowledge required to use computer hardware and software in everyday work or leisure environments. The terms ICT and IT (Information Technology) tend to be used interchangeably. ICT will be used throughout as this is the term adopted by the schools’ National Curriculum in England (DfES, 1999) and conveys modern multimedia computer use. Periodically quotations may include the term IT but should not be considered as distinctly different from ICT. Throughout the discussion teachers will be referred to as ‘she’ and learners as ‘he’, unless indicating a specific research participant. This in no way implies a dominance by one gender or the other but is merely for convenience and to avoid constant ‘he/she' repetition. Likewise researchers will be referred to as ‘she’ simply because in this instance the researcher is female.

Hashweh (2005) defined PCK as Teacher Pedagogical Constructs developed through the teacher’s personal experience of subject, context and pedagogy. This mirrors the foci of the research questions so the literature concerning these elements of experience will be explored in the first two chapters. Chapter 1 concentrates on the subject and context exploring how computer literacy might be defined, the aims for literacy, skills and knowledge, and finally provision. Chapter 2 focuses on the teacher and pedagogy and examines how teachers’ professional knowledge might be defined, developed and maintained, and possible influences on practice. The research methodology and design are outlined in Chapters 3 and 4 respectively. Chapters 5 to 8 report the research findings, followed by discussion on the possible outcomes of findings, Chapter 9, and ways that potential limitations might be alleviated, Chapter 10.

The dramatic growth in computer use has been claimed to affect all our personal and professional lives (Cabinet Office, 2005; e-Skills UK, 2008). The number of households with personal computers has risen from 13% in 1985 to about 80% by 2006, while access to the Internet had similarly increased from 33% of households in 2000 to 57% in 2006 (NS, 2002; NS, 2006; NS, 2007a). One effect of this increase can be seen in the rise of Internet services, for instance online shopping netted £14.7bn in 2007 (Verdict, 2008, Williams, 2008). Computer growth in industry has been similarly meteoritic. Leitch (2005) reported that ICT skills, once seen as specialist and technical, are now core to many jobs. It is estimated that 88% of establishments in the UK employ computer users (e-skills UK, 2004). This rises to almost all establishments in the public sector or those employing more than ten staff. That translates to 20 million employees in the UK who require ICT skills as part of their daily job (e-skill UK/Gartner, 2004).

This investigation is concerned with the teaching of ICT to adults within the Lifelong Learning agenda, highlighting economic growth, personal development, and social integration (CEDEFOP, 2004). Concerns over low levels of productivity, linked to inadequate skills in the workforce, led the UK government to develop a strategy focused on raising standards and raising inclusion (Cuddy & Leney, 2005; DfES, 2006). Within ICT the concern for government is three fold and links to three underlying ideologies (Bagnall, 2000) the individual, the adaptive and the democratic.

The first aims to provide individuals with basic skills required for industry. The government argues ICT skills, for both ICT professionals and users, are essential to remaining competitive in global markets (Cabinet Office, 2005, DfES, 2006, e-skills UK/Gartner, 2004). Concluding that without workers able to exploit ICT's potential (Cabinet Office, 2005; Cheuk, 2002; e-skills UK/Gartner, 2004) investment has limited value. The second concerns responding to change, to both keep pace with technological developments (Clarke, 2006) and adapting to potential changing working practices (DfES, 2003a; Macefield, 2004). Employers predict that the levels of user skills required, especially in professional occupations (e-skills UK/Gartner, 2004), will rise over the next few years (e-skills UK/Experian, 2004; e-Skills UK, 2008) with a corresponding fall in the demand for intermediate and basic skills. Such forecasts are, however, disputed as many jobs, especially those related to the service industries, have been argued (Bromley, 1998) to require low ICT skills. The third aims to empower individuals to engage with democracy and to address social imbalances. ICT ownership has been seen as linked to household income (NS, 2006), with 52% of the lower socio-economic groups describing their computing knowledge as 'non-existent' (Becta, 2001; DfES, 2000), creating suggestions of a 'digital divide'. This argues that individuals without ICT skills will become excluded both professionally and socially (Cabinet Office, 2005; e-skills UK/Gartner, 2004; PAT_15 2000) and that ICT skills are as fundamental as literacy or numeracy skills (e-skills UK, 2008). The government is committed to increasing ICT skill levels (Becta, 2001; CEC, 2007) arguing that it is only by eliminating the digital divide that individuals can become fully active economically and socially, and the nation can compete effectively in increasingly technological and global economies.

This vision of ICT skills as being at the 'heart of our success as individuals and as a nation' (Hirst, 2004) has, perhaps, ensured that ICT literacy is a key part of government agenda. The government (DfES, 2003a) has declared ICT to be a third key skill along with literacy and numeracy. Yet, despite this emphasis on the need for ICT skills and concerns for skills shortages, ICT literacy has lacked clear definitions (McMullen, 2006; Sellin and Gramlinger, 2005) and there has been little discussion on how best to teach it (Dillon, 2004; Hammond, 2004; Kennewell, 2003). Training provision and skills focus seemed to develop fragmentarily (CEC, 2007; Reid, 1992) as rapidly changing software and qualifications emerged, and Dillon (2004:138) suggested that this had left little time for a 'robust intellectual tradition to be established'. The European e-Skills Forum (ESF) was set up in part 'to prepare, validate and agree a European ICT-skills Meta-Framework' (Sellin and Gramlinger, 2005:1). It identified three e-skills areas: Practitioner skills, namely skills required for workers within the ICT industry; e-Business skills focused on the means to use ICT to exploit business opportunities such as developing commercial websites; and e-User skills required by non-specialists. To date the ESF have focused on practitioner skills and have yet to report on user skills. National standards have only recently emerged for adult user skills following the introduction of the National Qualification Framework (NQF) and the ICT Skills for Life standard (QCA, 2005a). Hammond (2004) concluded that this absence of research base led to misconceptions concerning the nature of ICT as a subject and thus difficulty in defining its character and scope. Such ambiguity is evident in the differing interpretations for ICT education as either a basic skill, a resource to support other activity, a subject in its own right (Tanner, 2003) or an agent for change (McFarlane, 2001). This discussion will begin by exploring the nature of user ICT and definitions of ICT literacy.

1.1 Defining ICT Literacy

Education provision of ICT skills and concepts of ICT literacy have evolved and developed as technology has changed. Examining user skill needs in Higher Education (HE) Martin (2003) concluded that the concept of ICT literacy has gradually changed in emphasis through three phases; ‘Mastery’, ‘Application’ and ‘Reflective’. This trifold-terminology provides a useful framework for discussion. The ‘Mastery’ phase, up to the mid-1980s, emphasized gaining knowledge and skill to master computer use through knowing how the computer worked and how to program it. At this time Bostock & Seifert (1986) suggested that literacy could be seen as a continuum from awareness of computer functions and vocabulary and use of application programmes at one end, to mastery of programming language at the other.

As technology developed computer power increased and graphical user interfaces (GUI) enabled ‘easy-to-use’ mass market applications to be introduced. This contributed to the massive increase in computer use in 1990’s accompanied by an increase in ICT user courses. It also changed the emphasis to the ‘Application’ phase, concerned with practical skills to use applications, focusing literacy on lists of practical competences rather than specialist computer knowledge (Martin, 2003). Despite arguments, (see Harvey, 1980; 1994), that the only way to fully appreciate and utilise the computer’s potential was through programming ability, programming gradually became seen as complex technical knowledge (Harvey, 1994) no longer pertinent to users and was dropped from user syllabuses. Mastery developed a dualism which seemed to polarise user and practitioner skills (Topp, 2002). User skills involved ‘functional mastery’ of software and were concerned with awareness of computer functions, vocabulary and use in every day life. Practitioner skills involve ‘technical mastery’ of the computer environment and were concerned with the network maintenance and programming skills required to work in the ICT industry. These foci appear to occupy opposing ends of Bostock and Seifert’s continuum. Levels of ICT literacy might thus be seen on a continuum from non-user, user and professional user [Figure 1.1].

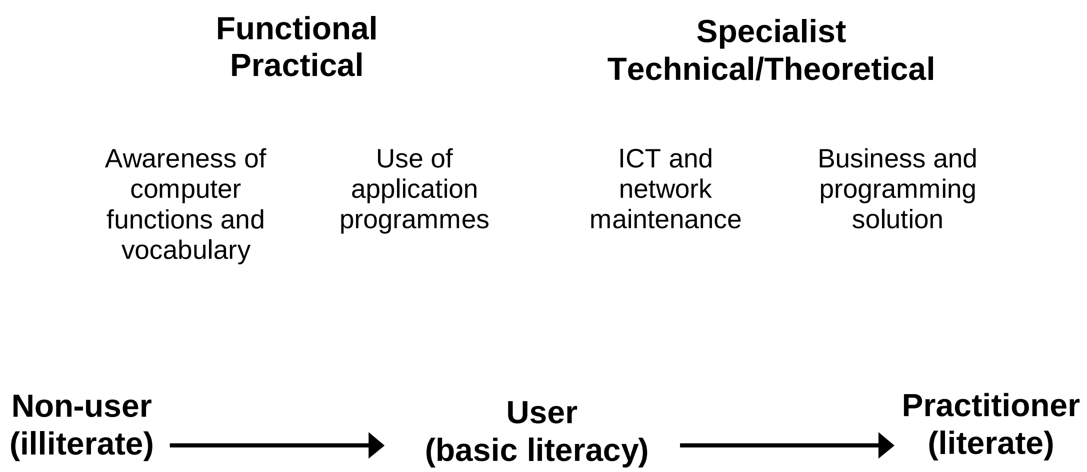


Figure 1.1: User/Practitioner literacy continuum

Martin (2003) argued that from the late 1990s the focus for user skills within HE was no longer seen as purely functional. He reasoned that by this time practical skills were assumed and emphasis changed to the reflective and evaluative aspects of usage, which he termed the ‘Reflective’ phase. ICT skills alone were no longer enough. Broader notions such as ‘information literacy’, that is how to extract, use and interpret information, became integral to computer use. Such reflective activity could be argued to be a characteristic of HE rather than ICT users but this wider interpretation has also been voiced in general user contexts. For instance the ICT Literacy Panel (ILP), comprising experts from education, government and private sector organizations drawn from Australia, Brazil, Canada, France and the United States defined ICT literacy as:

> *‘using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society.’ (iSkills, 2007:2)*

This identifies ICT literacy as far more than software skills. It extends the concept of ICT literacy to include wider notions of critical thinking and creative participation. This Gilster (1997) termed ‘digital literacy’ defined as

> *‘the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computer.’ (Gilster, 1997:1)*

In the UK the Qualification and Curriculum Authority (QCA) appeared to adopt this interpretation of literacy declaring that by level 2

> *‘…people are confident in selecting and applying ICT skills independently to develop solutions requiring overall structure. They evaluate the quality of information from different sources and use ICT efficiently to meet needs, exchange information and solve problems requiring a range of information types.’* (QCA, 2005b)

The emphasis on purposeful, independent activity in a range of contexts involving finding and exchanging information seems to indicate a reflective element but, as Clarke (2006) pointed out, this was mainly in terms of websites and not the boarder range of media and contexts explicit in the ILP's or Gilster's definitions. Similar limitations were identified by Webber and Johnston (2003) who concluded that skills were currently too focused on specific ICT skills, such as Internet searching, rather than the higher-order problem solving skills required for reflective interpretation and use of information.

Webber and Johnston (2003) argued for a separation of the 'technological dimensions of ICT' from information literacy and development of the latter as a substantive domain. Conversely Clarke (2006) and ILP (iSkills, 2007) argued for an integration of domains. For the ILP this was an integration of the technological dimension and cognitive skills, such as traditional literacy, numeracy, critical thinking and problem solving. While for Clarke it consisted of three overlapping forms of literacy, ICT, media and information. ICT literacy equates to the ILP's technological skills. Media literacy involves skills to access and employ new forms of media such as online services. This involves more using devices and/or software but extends to locating and analysing content. For his definition of information literacy Clarke drew on that of the Chartered Institute of Library and Information Professionals including identifying information needs, accessing, managing, evaluating, using, presenting and communicating information. Both Clarke and the ILP, like Martin and Rader (2003), concluded the sort of skills necessary to handle information could not be separated from those necessary to use it.

Other commentators, (see Gilster, 1997; Macefield, 2004; Papert, 1993; Reid, 1992) compare ICT literacy to 'reading' literacy, but definitions vary. Reid defined literacy as being sufficiently familiar with the advantages of reading to be able to make sensible decisions about whether to read or not. So for him an ICT literate person was

'… one who knows when to use which IT for what purpose, and knows where and how to find out more about areas where their competence is inadequate.' (Reid, 1992)

This focuses literacy on the individual, basic software skills to enable decisions about use, and ICT confidence. It has limitations; it is one dimensional and has limited connection to application or reflection. Reid warned that, unlike reading literacy, ICT literacy was not a 'once and for all' approach but needed to be constantly updated as technology developed and changed. Macefield (2004) also emphasized the adaptive, arguing new technologies had a dynamic and complex impact on information access and structures which makes skills and working practices difficult to predict. Users, therefore, needed flexible, transferable skills. Macefield argued for a learning framework, similar to that used in teaching modern languages, based on Lexicon (vocabulary), Syntax (rules) and Semantics (meaning). Macefield focused learning on GUI structures which emphasized application knowledge while his adaptive approach positions ICT as a resource to support changing work activity.

Papert (1993), and Bostock (1994/5) took a more holistic view of literacy. Here a literate person was defined as a person with the practical skills needed to read and write, but also knowledge of how text was used, ease in the print milieu, and ways of understanding and interpreting the world derived from an acquaintance with literary culture. General literacy was thus more than just being able to read but involved reading with meaning (Bugliarello, 2000; Gilster, 1997) and feeling (Drenoyianni et al, 2008), that is being involved with literature (Papert, 1993). Similarly an ICT literate person might be defined by how they engage with technology (Angus et al, 2004). An ICT literate person might thus be viewed as someone who has the practical skills necessary to operate a computer, but also knowledge of how hardware and software could be used, ease in the ICT milieu in varied situations, and appreciation of and ability to interpret and evaluate the material, issues, knowledge and concepts that derive from a computer culture. This image of ICT literacy reflects Pernia's (2008) three-dimensions of skills, knowledge and attitude, and adds a self-reflective and ethical dimension (Gapski, 2005) to ICT literacy. It offers a more comprehensive image of ICT as a subject and associates ICT literacy with digital citizenship (Bugliarello, 2000; Stergioulas, 2007). Literacy here, as UNESCO (2006) argued, goes beyond individual transformation to democratic, societal and contextual changes. Martin (2005) encapsulates this in his definition of digital literacy as

> *'the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process' (Martin, 2005:135-6)*

ICT literacy thus is envisaged as a network of related 'literacies' (Clarke, 2006; Gapski, 2005; Martin, 2005), including ICT literacy, media literary, information literacy, visual literacy and network literacy, requiring a reflective approach.

Accepting this definition, an ICT literate person need not be confined to those with higher technical skills. One could be regarded as ICT literate by engaging with and reflecting on ICT as either a user or a specialist. Such a stance can be linked to the Dreyfus and Dreyfus (1986; 2005) model of expert. From research with a variety of learner groups, from airline pilots to adults learning a second language, they identified five stages of skill-acquisition: 'novice', 'advanced beginner', 'competence', 'proficiency' and 'expertise' The 'novice' learns basic facts and features of skill and rules determining actions which are improved with practice as an 'advanced beginner'. These levels are concerned with 'mastery' of practical skills and operation of equipment, but Dreyfus and Dreyfus (2005) cautioned merely following the rules could produce poor performance in the real world. The 'competence' stage involves adoption of the rules and maxims to problem solving activity. This increasing responsibility for decision making, Dreyfus and Dreyfus (2005) concluded, could lead to uncertainty, fear and confusion and sometimes failure but they also perceived the challenge to be essential for further development. Only by negotiating challenge can learners develop situational discriminations required for the 'proficiency' stage. This stage is characterised by reflective organization, understanding of task and careful analysis about what to do. Finally, 'expertise' is defined as being intuitive, adaptive and totally engaged in skilful performance. The expert is able to apply skills and knowledge in a variety of familiar or unfamiliar contexts. In these terms one could become a practitioner expert or a user expert. Expertise is not connected with level of technical difficulty but with engagement with and intuitive, adaptive use of knowledge and skills.

How expertise is achieved is more problematic. Dreyfus and Dreyfus did not describe an input/output model where learners automatically emerged as experts. Some individuals might never achieve expertise; for example, failure to take risks at the 'competence' stage could lead to rigidity and limit the flexibility required by experts (Dreyfus and Dreyfus, 2005). The model is not linear but rather holistic and multi-dimensional involving all aspects of expertise at the same time [Figure 1.2]. Experts are envisaged as continually drawing on knowledge and skills acquired at previous levels making the various stages integral. This reflective process means that expertise is dynamic as experts identify limitations to practice and seek further development. Thus an expert may be a novice at some elements of practice or less able in some circumstances. This inclusive and dynamic vision of expertise would thus require all three of Martin's (2003) characteristics; that is, mastery of functional skills, understanding of applications, and reflective use. User expertise and technical expertise can, therefore, be seen in partnership, rather than opposing ends of the same continuum, each with its own literacy framework. For users, that framework involves layered levels relating to skills, knowledge and attitude (Pernia, 2008) and ICT literacy to the blending of these elements.

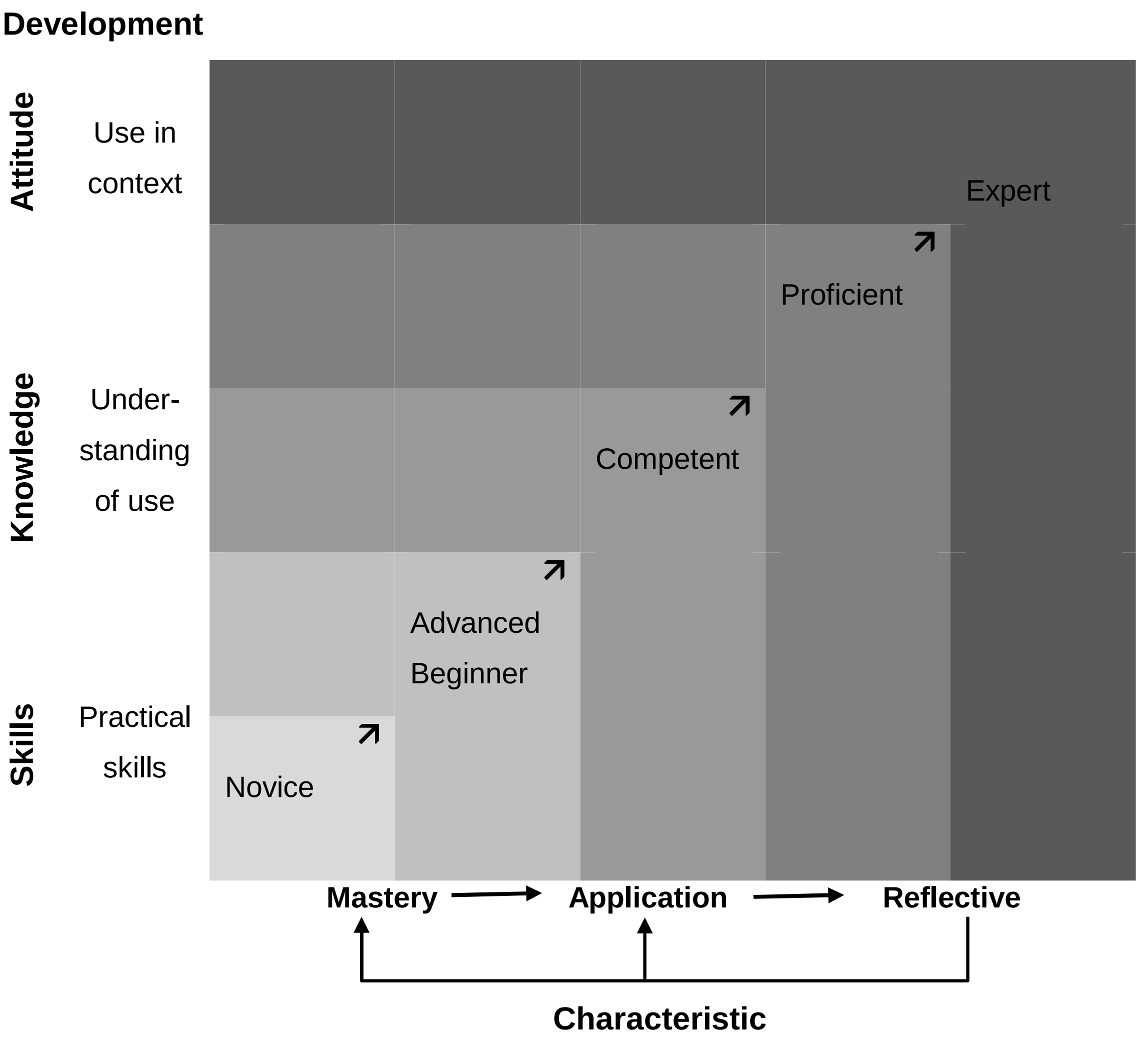


Figure 1.2: Model for ICT user expertise

1.2 Subject Aims

A key question for ICT, or any subject, is what is the learning aim or intended outcome? Exploring work-based learning Nixon et al (2006b) defined a tri-investment relationship between individual learners, learning providers and employers and suggested that the training focus depended on the prominence of the needs and interests of those various parties. Within adult education generally, employer's needs and interests are represented in government policy and initiatives and are implemented by learning providers. This reflects the three development levels Tight (2002) described as inherent in adult education.

The micro-level concerned with the individual learner and personal relationships, the meso-level related to institutions and community, and the macro-level concerned with national and wider community expectations and needs. From the government's view point investment in user ICT is essential for economic growth and social inclusion (e-skills UK, 2004; Cabinet Office, 2005). In the former case they seek to develop employees able to exploit rather than simply use ICT to improve their organization's performance and competitiveness (e-skills UK, 2004; 2008), and in the latter individuals able to take advantage of the social, economic and political opportunities attributed to ICT use (Cabinet Office, 2005).

Individual learner's needs and interests are influenced (Nixon et al, 2006a) by their 'life plan'. The reasons quoted for individuals wanting to learn ICT include employment, career plan, supporting education (individuals' own or their children's), gaining qualifications, accessing government or commercial online services, communicating with family and friends, hobbies, interest, or personal development (Clarke, 2006; e-skills, 2005b). As with governmental aims these might be seen as connected to economic or social capitals, and translate into skills for employment and/or leisure. The dynamic nature of ICT, combined with employers' needs for staff with more advanced computer skills, contribute to users continually developing their skills and understanding. Clarke (2006) suggested that even users who are largely motivated by personal reasons to learn to use ICT will often identify new areas that they want to exploit. Each learner may thus have a range of aims for user skills.

Given these two perspectives, aims for ICT tuition can be identified in four key types, Figure 1.3. The focus for aims A and B are largely related to social capital; the value derived from being a member of a society or community (Huysman and Wulf, 2004). By that membership, individuals have access to resources that are not available to non-members. The learning focus may typically be informal and could be more likely to focus on skills for hobbies,

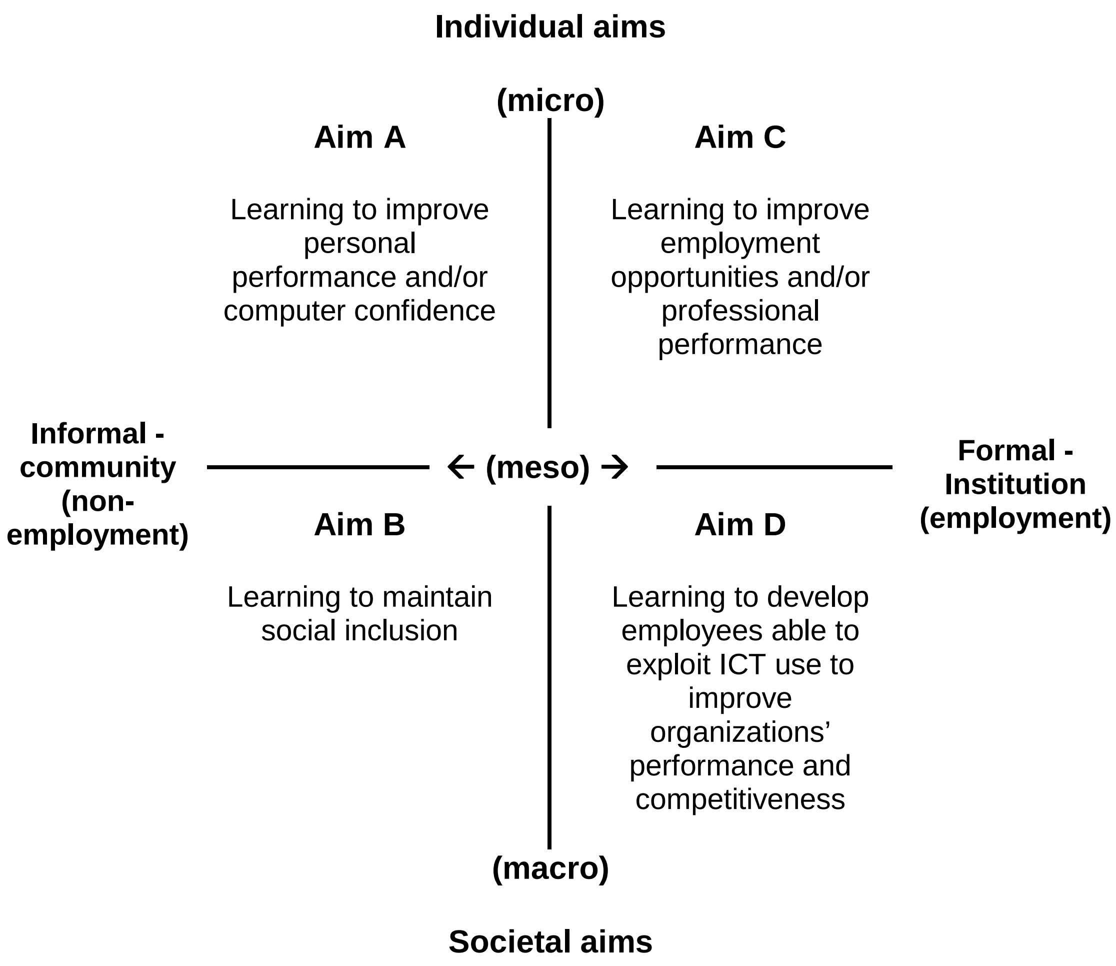


Figure 1.3: ICT user learning aims typology (Adapted from Nixon et al, 2006b:36)

communication and e-services. The focus for aims C and D is for economic development of both individuals, in terms of improved employment opportunities, and organizations in terms of improved performance. This may have a more formal focus and be concerned with specific work skills and/or examination. Such aims are reflected in the government's declared dual educational focus on economic and personal development (Cabinet Office, 2005).

1.2.1 Economic Development

Much of the government argument in economic terms concerns improving individual or organizational performance in ICT to remain competitive in global markets (Cabinet Office, 2005, DfES, 2006). This involves not only being able to use technology but also being able to adapt to changes that ICT may create. ICT has been attributed with the capacity to fundamentally effect the way tasks are completed and information accessed (Cheuk, 2002). Rowley (1999) suggested that typing was not merely replaced by keyboarding but had transmuted into document creation and formatting. Thus to write a letter requires not only typing skills but editing and presentation skills. Further, Clarke (1996) argued that the move from single function to multi-function office automation systems has changed working structures and has led to more integrated approaches. Workers therefore need multi function skills; they need ICT skills and accompanying concepts of use but also ‘soft’ skills such as communication and problem solving to be able to work effectively within changing environments. Some, (see Robins and Webster, 1985; Bromley, 1998) contest such arguments concluding that technology deskills working situations and that the demand for self-motivated, multi-skilled workers are over emphasized. Both sides of the argument present technology as impacting on work practices but the nature of that impact is disputed.

These conflicting conclusions seem confusing until they are examined more closely. Clarke was discussing administrative and managerial skill needs, Robins and Webster front line service sector jobs. It could be argued that this was merely the new skilled and unskilled labour divide (Angus, et al, 2004) and that the old discourses of ‘blue’ and ‘white’ collar still applied. Supporting evidence comes in Cooke and Greenwood’s (2008) research with workers in FE intuitions which concluded that job function impacted on access to and motivation to use ICT. Skills levels are also attributed to occupation, with 77% of managerial workers achieving high levels compared to 12% in ‘routine’ occupations (NS, 2007b). Within a business environment this could indicate that ICT training needed to match job function (Huang, 2002, Sein et al, 1999), but within adult education generally such a solution would be politically unacceptable (Coupal, 2004; Griffin, 1999a). Two further problems emerge from this discussion of workers’ needs. Firstly, deskilling arguments appear to view skills purely in terms of application competency rather than in terms of wider digital literacy. Secondly, individuals' needs beyond the work environment are not considered. It is now estimated (Kay, 2008) that 94% of Internet use takes place within the home. This has been claimed to be changing the way that society shops, banks, gains employment, holidays, learns, and communicates and/or assimilates information (Buckley, 2000; Gilster, 1997; Gunter, 2006; Huang, 2002; Quan-Haase and Wellman, 2004). These changes may not be as dramatic as some predict (Quan-Haase and Wellman, 2004) but nevertheless could be significant and evolutionary. Individuals can thus require digital literacy regardless of their occupational status, to enable them to adapt to the social changes ICT might create.

Yet, Bell (1996) concluded, industry's needs dominate at the expense of the workers' personal development and that financial priority is given to occupational training. Thus despite the rhetoric of social inclusion, public funding in adult learning in the UK is argued to concentrate on skills for work (NIACE, 2005) and the government's unremitting emphasis (Wolf, 2002) on what education can do for the economy. This emphasizes the individual's place within the work environment, vocational training and employers' needs making learning focused on aims C and D [Figure 1.3]. The economic imperative predominates perhaps at the expense of social.

The economic imperative has also been argued to dominate within the construction of provision. The 1992 Further and Higher Education Act took colleges out of local authority control and funding and moved adult education towards a market-orientated provision (Bagnall, 2000; Coupal, 2004; Cope & I'Anson, 2003; Griffin, 1999b). The rhetoric of lifelong learning is for autonomy for learners aided by flexible courses and transparent structures (Griffin, 1999b) provided by a range of commercially based educational providers. This focus on education as an economic commodity has been argued to make lifelong learning a product of and embedded in economic determination (Bagnall, 2000) which in turn reinforces the economic voice and weakens the focus on leisure or social needs (Worpole, 1996). As a marketable commodity, the onus is not only on the individual to achieve, but also on the provider to produce a package that attracts and satisfies the voluntary learner. Courses must attract learners and government funding to be profitable. Griffin (1999b) argued that this has led to a ‘quasi market’ were consumer choice may be restricted to what consumers, namely the learner or employer, can afford or what the state will and will not subsidise. Courses and qualifications can become ‘supply led’; by what is profitable to the provider, rather than ‘demand led’ in response to local community concerns or interests, leading to conformity rather than diversity (Adnettt and Davies, 2000). In these circumstances the more powerful economic discourses of industry and individual overpower those of the democratic or adaptive.

1.2.2 Personal Development

The focus for social change has been argued in terms of preparing people for the new age of ‘consumption leisure’ (Worpole, 1996) and empowering them to take part in society in ways unavailable to non-users (Huysman and Wulf, 2004). This involves being able to benefit from e-commerce (Foley et al, 2002), e-government (CEC, 2007; Foley et al, 2002) and e-learning (Gorard and Selwyn 1999, 2005). It goes to the heart of the government’s inclusion and widening participation policies (Gorard and Selwyn, 1999) by enabling users to access cheaper goods and services, democratic processes, health services, education, and communication and information networks (Foley et al, 2002) regardless of their location, time, mobility, age or working status. A correlation between Internet use and active participation has not yet been proven (Foley et al, 2002; Quan-Haase and Wellman, 2004). The use of e-government (Gunter, 2006; Foley et al, 2002) or e-learning (Gorard, 2003) services have been less comprehensive than predicted leading to arguments (Angus et al, 2004; Selwyn et al, 2005) that the use, or non-use, of the Internet is shaped by a variety of pre-existing social factors and divisions. At the societal level this involves access to and use of the Internet, while at the individual level involves issues such as trust (Gilster, 1997; Syrjänen and Kuutti, 2004), education levels (iSkills, 2007), motivation (Foley et al, 2002) and understanding about the benefits of use.

ICT skills are a prerequisite to accessing Internet resources but ‘understanding of benefits’ implies deeper understanding of use, confidence to transfer skills to varied contexts, analysis of whom and what to trust, and the ability to reflect on the implications (Gilster, 1997; Bugliarello, 2000). Bagnall (2000) argued that to manage cultural change requires an emphasis on the adaptive discourse. For some (see Haughton, 1993; McMullen, 2006; Sein et al, 1999) the key to dealing with rapid technological change is sustainable skills, in other words learning how to learn rather than learning specific competency skills that quickly become outdated. Bugliarello (2000) went further; he suggested that the ability to reflect on and understand the broader dimensions of technology was crucial for maintaining democracy. Technology here is not seen as neutral but argued to have an interactive nature (Quan-Hasse and Wellman, 2004; Valentine and Holloway,1999) making it different to other kinds of technologies (Gilster, 1997). It does not just impinge on society from outside but can itself be changed by social interaction which, Gilster (1997) argued, places greater demands on users. Bugliarello (2000) reasoned that only with clear understandings of ICT’s role could individuals contribute to debates about value and use, and thus help shape it. From this perspective social change requires an even more demanding view of literacy than adaption; it requires a reflective approach.

1.2.3 Bridging the Digital Divide

The government’s focus is often argued in terms of a ‘digital divide’, which can be defined as

> *‘the gap between those individuals and communities who own, access, and effectively use information and communication technologies (ICT) and those who do not’ (Becta, 2001:3)*

or the ‘haves’ and the ‘have-nots’. From the macro perspective this relates to developed and developing countries (Cattan, 2003), from the meso competing businesses, and from the micro ‘technology-rich’ and technology-poor’ citizens (Becta, 2001). UK government initiatives have aimed at widening participation by providing access to technology and skill training targeted at ‘deprived’ urban areas and communities. Bromley (1998) argued that the reasoning behind the government’s aims is based on ‘dubious assumptions’ about the nature of technology. The first underlying assumption is determinist (Valentine and Holloway, 1999), specifically that technology benefits all individuals equally and that access guarantees upward social or economic mobility while, conversely, lack of access or skills leads to economic or social disadvantage. The second assumption is that these initiatives would inevitably lead to ICT use (Selwyn, 2004a; Valentine et al, 2002). However, despite these measures it is estimated (DIP, 2004) that about half the adult UK population remain digitally disengaged, in other words although people may have increasing access to and some skill to use computers they do not, for a variety of reasons, use computers in their daily lives or that their engagement is restricted. The benefits of ICT skills and access may therefore not be equal (Bromley, 1998; Foley, 2004). Complex power relationships (Bromley, 1998), socio-personal factors (Foley et al, 2002), or educational issues (iSkills, 2007) could all impact on use or non-use of ICT.

In early definitions of the digital divide socio-economic factors such as the ability to afford ICT equipment or differing employment skill needs (Sein et al, 1999) were seen as key to individuals ICT use or non-use. This focused attention on existing socio-economic power (Bromley, 1998) divisions associated with employment, class, gender, race and ethnicity. As accessibility to ICT has increased, the focus has expanded to include ‘digital (dis)engagement’. This broadening concept meant use was also seen as influenced by social-personal factors (Foley and Alfonso, 2002) such as levels of interest, awareness, understanding and acceptance of ICT, and educational level (iSkills, 2007). A large scale project in Belgium, (Roe and Broos, 2005) reported that 40% of respondents were either non-users or had negative attitudes towards digital developments. The strongest correlation with computer ‘disquietude’ was level of education, followed by age and then gender. These findings have been replicated in other research, for example ‘The Skills of Life Survey’ in the UK (DfES, 2003b). There are several possible implications for such findings. Firstly, that non-use and negative attitudes, far from being confined to marginalised groups in society, could be widespread. Secondly, that access and training may not automatically lead to use. Thirdly, that the assumptions of the digital divide as temporary and ‘generational’, that is as younger ICT literate workers replace older illiterate workers (Roe and Broos, 2005) the problems will disappear, could be erroneous. Finally, that education, both basic (iSkills, 2007) and ICT could be a key factor rather than access.

Negative attitudes: Lack of relevance, confidence (Clarke, 2006; Cooke and Greenwood, 2008) or interest (Foley, 2004) are cited as reasons for non-use of ICT. These barriers may be less significant for ICT learners as enrolment requires motivation, even if that is externally driven for example employers require it. Lack of awareness of potential, fear, or lack of confidence could, however, remain key influences to level of use. Self-efficacy, defined as an individual’s belief regarding their ability to use a computer (Compeau & Higgins, 1995) was felt to play a significant role in a individual’s decision to use computers and how comfortable users were in learning skills related to effective use (Hasan, 2003; Marakas et al, 1998; Ong et al, 2004; Poynton, 2004; Torkzadeh et al, 2006; Wilfong, 2006). From a survey of managers and professionals, Compeau and Higgins (1995) concluded that computer self-efficacy exerted a significant influence on individual’s expectations of outcomes, their emotional reactions to computers, and their actual computer use. Individuals with high self-efficacy were said to use computers more, derive more enjoyment from their use and experience less computer anxiety. Wilfong (2006) predicted that increased levels of computer anxiety correlate with decreased levels of computer use. He further argued that anxiety and frustration were not just related to pre or beginner users but could affect users generally. Low self-efficacy could thus be wide spread and impact on computer usage at varying levels of experience.

Access and use: Angus et al (2004) in Australia looked at four families who were all connected to the Internet. In digital divide parlance they were all 'haves' by having access to the Internet but the researchers concluded that their engagement with the Internet was in some case limited, such as for chat room access only, and that the economic or socially disadvantaged families remained disadvantaged. A limitation of this research was lack of exploration of whether differing levels of experience, confidence, competence or attitude might have contributed to results. Valentine et al (2002) looking at children's use of ICT in UK schools, similarly concluded that access to ICT alone did not equate to either use or development of skills but rather that different groups of children understood, valued and took up or rejected ICT in different ways. These children had equal access and training opportunities but socio-personal or socio-cultural attitudes impacted on engagement. Torkzadeh and Van Dyke (2002) concluded that training could improve Internet self-efficacy but not necessarily change attitudes to computers usage. Later research (Torkzadeh et al, 2006) indicted that learners with 'favourable' attitudes to computers improved their computer and Internet self-efficacy significantly more than individuals with 'unfavourable' attitudes. These findings suggest that attitudinal influences play a strong part in computer use and that skills alone are not enough to ensure use.

Temporary problem: Older people are often perceived as lacking ICT skills (NS, 2007c; Robertson, 1998), fearful of learning (Cooke and Greenwood, 2008), and uninterested in using ICT (Roe and Broos, 2005; Selwyn et al, 2005). In terms of the workplace this was perceived to be a temporary problem that would be overcome as young ICT literate workers replaced older illiterate workers. But the discourse of computer disengagement suggests that younger workers may also lack the skills or motivation to use ICT, making such assumptions problematic. In addition it is now predicted that over the next decade only a third of jobs will be filled by younger workers as the UK's expanding older population (Gilbert, 2002), due to increasing life-expectancy and falling birth rate (NIACE, 2005; Dowling, 2006), means older workers could have to stay in work longer (NIACE, 2005). Increasing lifespan also means that people have longer retirements. Access to e-services connected with leisure, health, education, commerce and government could benefit retirees. This leisure focus may require exposure to differing software than that for work for example digital photography or family history applications, but arguments for literacy for democratic inclusion means skills to communicate, interpret and disseminate information within e-services are also required. Quan-Haase and Wellman (2004) warned that although the Internet could be viewed as reinforcing a sense of community by connecting people to each other and services, it could lead to isolation by drawing people away from physical social contact to a world of virtual relationships. But for older people who may become increasingly immobile (Gilbert, 2002) a virtual connection to community could enable them to stay connected economically and socially when otherwise they could not. From this perspective the Government's vision of an e-society requires effective ICT use for all, not just the young.

Education: Such findings have led to calls for a more sophisticated construct of the digital divide (Foley, 2004; iSkills, 2007; Selwyn, 2004a), than the 'have and have-not' model. Use or non-use of ICT is more than simply being trained to use equipment. Selwyn's (2004a) model proposed a focus on access, use and engagement through four stages: access, to effective access and basic use, to 'meaningful' use denoted by engagement with ICT, to productive outcomes. The ILP (iSkills, 2007) focused on access, and skills and training; emphasizing the need for functional and cognitive skills. For Foley and Alfonso (2002) motivation or attitude was the main barrier to use; they called for policy and educational frameworks that involved awareness of benefits of skills, access, and training, leading to use and enhanced participation which in turn would link back to increased awareness. These frameworks were seen as a continuum [Figure 1.4] but, in terms of engagement or disengagement, the models appear too simplistic. Each element on the continuum has is own continuum such as low to high awareness (Foley, 2004), slow to fast access (Norris, 2001), functional to reflective skills (Martin and Rader, 2003), non-use to productive use (Selwyn,

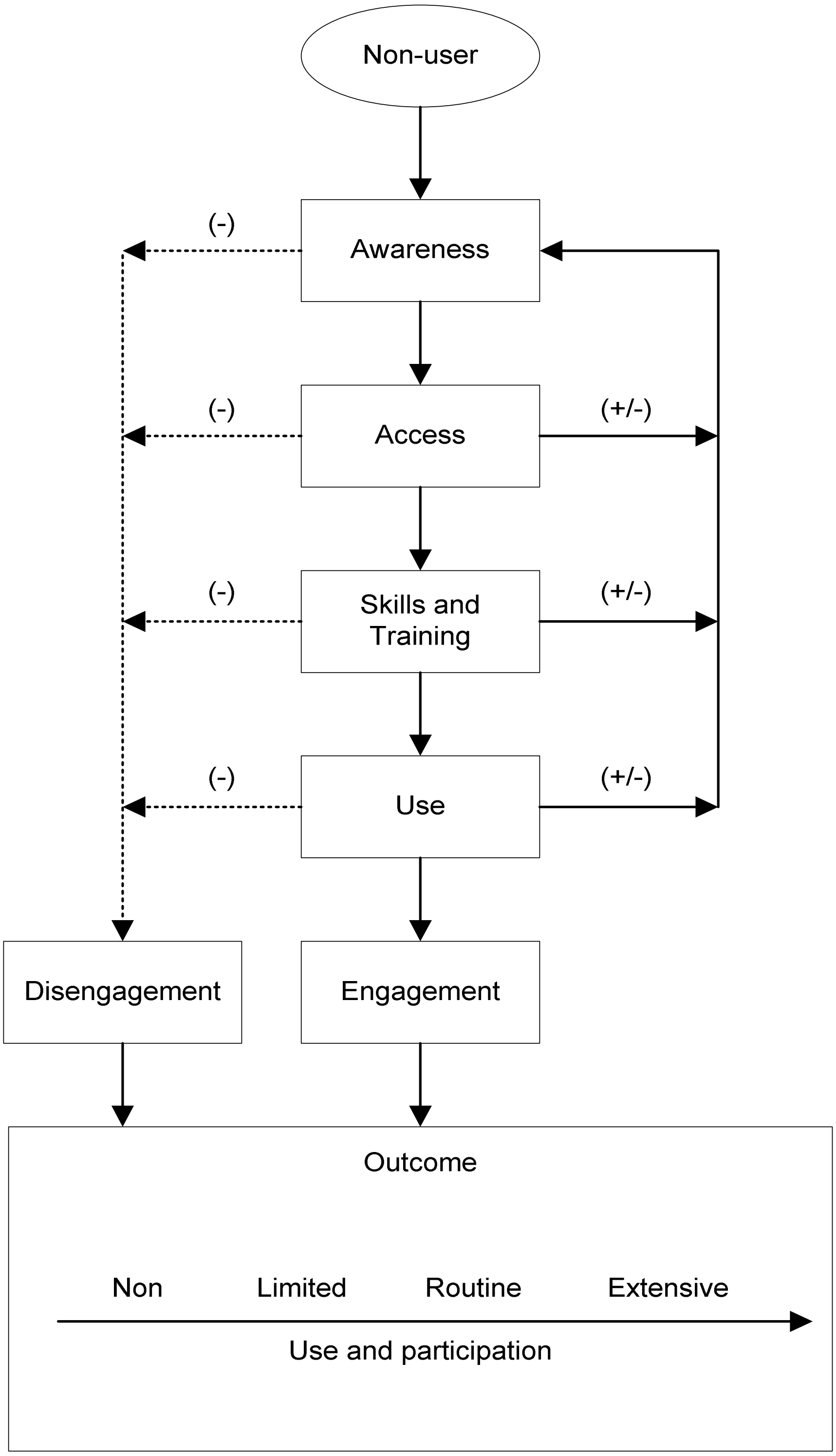


Figure 1.4: A user participation framework

2004a), each of which could generate positive or negative impacts and attitudinal responses. Thus each element has an awareness/motivational feedback loop which could generate increased or more sophisticated participation with ICT. But negative responses to any of the elements, or at any stage, could lead to disengagement, for example Wilfong (2006) suggested frustration with slow Internet access could led to reduced use. Outcome can also be seen in terms of a continuum depending on the individual's ability to engage meaningfully with ICT and the extent to which they are able to use ICT to enhance their role in the productive, political and social activities of society. The digital divide can thus be said to have multiple elements making a focus on access to hardware and functional skills alone inadequate but rather it should be defined by effectiveness of use and degree of democratic participation.

It has been argued (Bromley, 1998; Selwyn, 2003) that the digital divide is too focused on use as good and non-use as bad. Selwyn (2004b) suggested that focus should be on the individual's right to chose involvement or non-involvement. Individuals were merely exercising agency and asserting control over their lives by choosing not to use ICT. For them, using a computer or the Internet was not necessary in their daily lives, just as they may choose not to own or watch television. He also concluded that the degree of use may differ at differing points in life, for example someone may use ICT extensively in their work life but in limited ways once retired. The problem with his argument is that it assumes that non-users make informed, intellectual decisions when they choose not to use ICT. The concern is that for the majority of non-users the decision not to use ICT could be emotional, uninformed or determined by a complex range of social, economic, cultural and psychological perceptions. For example the retired person above could simply be responding to perceptions of what it is to be retired, see ICT as connected with work environments, or be unaware of how ICT might benefit a retiree. Informed choice requires a reflective ICT literacy based on high levels of awareness, access and ability to apply skills if required. Returning to Bugliarello's (2000) democratic arguments, only when individuals fully understand what it is they are opting out of can they be said to be exercising agency.

Education could be a key factor in providing that understanding. Training is argued to improve self-efficacy (Compeau and Higgins, 1995) and increased self-efficacy to helping improve computer competence (Shih, 2006). Courses that encourage reflection on skills and uses beyond the classroom might help learners appreciate the significance for ICT in their own lives. Skill transfer, or lack of it, could perhaps explain, in part, why ‘some people go on to become increasingly confident and adventurous in their pattern of use, [while] others become frustrated and drop out’ (Murdock, 2002:27). For the ILP (iSkills, 2007) skill development and deployment was dependent on cognitive skills such as basic literacy and numeracy, critical thinking and problem solving. The dualism of confidence and problem solving ability was also taken up by Stephenson (1992) in his exploration of education for capability. He saw capability as the confidence to effectively use and develop skills to deal with unfamiliar problems in unfamiliar situations. He argued that individuals mostly operated within familiar contexts dealing with familiar problems but to be really effective required them to be able to find solutions beyond the familiar. This required, he concluded, knowledge and skills but also intuition, judgement, courage, reflection and creativity. Such conclusions raise questions about skills needs and indicate that the way that ICT users learn could be as important as what they learn. Ultimately if individuals acquire knowledge about ICT but are not equipped to use that knowledge in ways which are relevant in the outside world the imbalance (Stephenson and Weil, 1992) might be detrimental to individuals, industry or society.

1.3 Subject Skills and Knowledge

Hammond (2004) concluded that ICT teachers in schools saw ICT teaching as a practical subject because it was hands-on, vocational, could be used in immediate cross-curricular contexts and could be used for leisure. For McCormick (1999) the core issue was the extent to which the subject was of practical use outside the classroom. Using either criterion, adult user skills can be seen as practical as they are hands-on (Clarke, 2006), and intended for immediate and long-term use in a wide range of vocational and leisure contexts. But this perception of user skills as practical can impact on its status as a subject and on perceptions of skill needs and provision.

Status: Young (1999) argued subjects defined by characteristics of functional, practical, non-specialist skills are interpreted as low status while those of a theoretical or specialist nature are seen as high status. Using this criterion user skill would be seen as low status and practitioner or e-business skills as high status. Further both Practitioner and e-Business skills qualification are developed within HE and can be studied to degree level or beyond. User skills conversely are generally conducted within adult education, mostly as part-time or short courses at levels 1-3 on the NQF, reinforcing the perception of low status (O'Rourke, 2001). This could define activity in terms of basic skills (Tanner, 2003), impact on depth and type of knowledge, and make skills appear routine, low-level and non-problematic. This could limit interpretations of literacy and user skills as a subject in its own right. A perception of low status could also make user skills the weaker partner in the e-skills group, for instance delaying developing user skills frameworks until the Practitioner skills have been addressed (ESF, 2004; 2005; CEC, 2007). Yet the ESF concluded (CEC, 2007) that all e-categories were of value and were interdependent in creating a computer society. User skills thus, despite their practical connotations, are an important factor in e-skills debates.

Skills: The perception of ICT skills as practical could have two impacts on skills needs: a) that skills are easily acquired and b) concerned with functional activity. Robins and Webster (1985) argued that teaching functional ICT skills was unnecessary because the main technological thrust was towards ease of use, thus skills were easy to acquire and could be taught as 'on the job training' according to individual needs. But, technology journalist, Bill Thompson (2007) warned that underlying moves by the ICT industry to make technology easier to use disguises the fact that it is complex. This, he argued, encouraged people to just accept the functional knowledge that they had and not contextualise it. Owen (1988) also pointed out that ease-of-use may not be easy. He argued that everyday skills, for example using scissors or reading a graph, were not innate but learnt. So similarly individuals need to be taught how to use new equipment and how to interpret data (Gilster, 1997). ICT skills are therefore not simplistic or easy and require a more sophisticated approach.

The focus of ICT training has tended to centre on acquisition of skills (Clarke, 2006; Reffell, 2003; Sein et al, 1999) rather than the more discursive area of information literacy. This focus on functional, procedural activity could perhaps stem from the use of the keyboard to input data linking ICT skills with keyboarding skills. Typing has been described (Atkinson, 2000) as ostensibly a low-knowledge and high practice skill. Skills are perceived as practical, hands-on and acquired by repetition. This matches Selinger's (2001) description of ICT courses consisting of repeated practice of procedural routines out of context. Such activity may prepare learners for the functional and application elements of ICT but may not offer the flexibility and range of skills (Reffell, 2003) required for effective management, interpretation, evaluation and processing of information (Bromley, 1998, iSkills, 2007) associated with reflective use.

The ILP (iSkills, 2007) envisaged the integration of technological and cognitive skills as key to effective ICT literacy. Through this process, activity is conceptualised in context. This contextualisation process is clearly visible in some other practical subjects such as learning to drive a car. Here the learner acquires the practical skills such as changing gear and practices them on the road in real life conditions, learning how to apply the skills appropriately and become a driver. From this perspective ICT users require the functional skills to operate the computer, the 'how to' do it knowledge, but also reflection on skills to conceptualise how they might be used in real life situations, the 'know-how' of intuitive problem solving activity of an expert user [Figure 1.5].

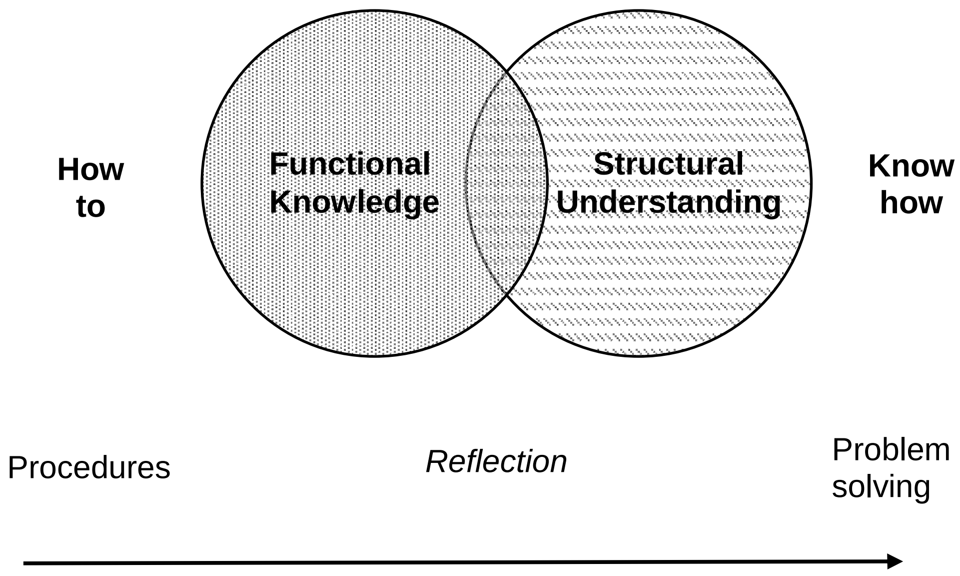


Figure 1.5: Model for skills for an adaptive ICT user

Clarke and Englebright (2003) went further offering three elements to ICT use; functional knowledge, structural understanding and generic skills, akin to Macefield's (2004) lexicon, syntax and semantics elements. 'Functional knowledge' involves the practical skills required to carry out a task, that is the procedures and routines to use input and output devices and applications. 'Structural understanding' relates to the understanding of systems and structures that allow learners to predict how to do things, for example understanding file management systems. 'Generic skills' are those that go beyond the immediate computer skills and knowledge, for example design skills, problem solving and information analysis. These elements are implicit in the ILP definition, but with one distinct difference. The ILP listed skills in sequence, suggesting an increasing cognitive complexity. They described ICT literacy as a continuum of skills and abilities ranging from those needed for simple everyday tasks to those required for complex tasks. Clarke and Englebright perceived elements as a tripartite system. The three constituents were interconnected and necessary even at basic levels of ICT. The skills could not be separated from the context requiring a reflexive approach, *id est* reflection in context. For them 'know-how' involved knowing 'what' to do, knowing 'why' to do it, and knowing 'when' and how to apply it [Figure 1.6]. Reflexive practice and higher-order thinking skills were thus essential for all effective practice.

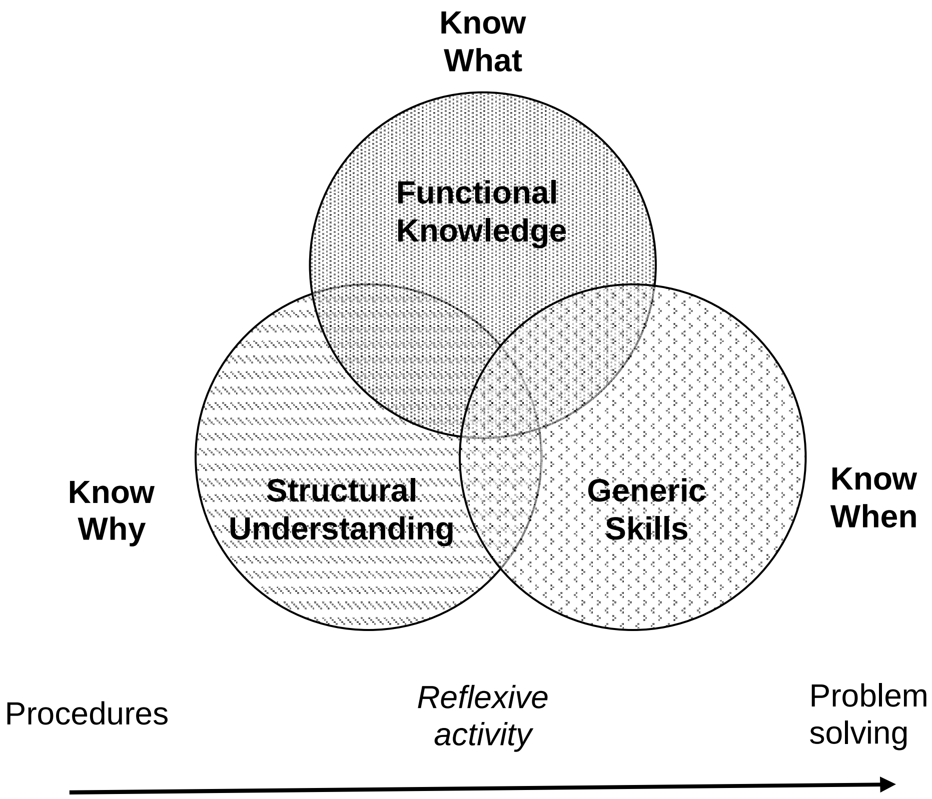


Figure 1.6: Tri-element model for ICT user 'know-how'

Revising Bloom's (1956) work on thinking skills, Anderson and Krathwohl (2001) developed a taxonomy in which they outlining six cognitive levels used to process different types of information and situations: remember, understand, apply, analyse, evaluate and create. This progressionary outline is comparable to the ILP's continuum from lower-to-higher order thinking and can clearly be traced against the NQF [Appendix A1]. As user courses and qualifications are delivered at levels 1 to 3 on the NQF such a progressionary model could mean that activity was confined to the low-order thinking skills of remembering, understanding and applying rather than the higher-order skills of analyse, evaluation and create necessary for reflective practice.

Anderson and Krathwohl further concluded that advances in educational and psychological understandings meant that a single dimensional, linear framework was outdated. In the 1950's behaviourist learning theories extensively influenced curriculum and instruction but modern theories, such as Constructivism, define learners as knowledgeable and responsible for discovering, constructing and transforming their own knowledge (Amer, 2006). The revised taxonomy therefore proposed a two-dimensional framework consisting of cognitive process and four knowledge dimensions; Factual, Conceptual, Procedural and Metacognitive. These categories were assumed to lie along a continuum from concrete (Factual) to abstract (Metacognitive), with the 'Conceptual' and 'Procedural' seen as overlapping in terms of abstractness. This reflects Dreyfus and Dreyfus's (2005) stages of expert from novice use of factual knowledge, through the challenge of different problem solving activity, to expert abstract internalised, intuitive implementation. The expert ICT user might thus be expected to engage with all four knowledge dimensions.

In terms of ICT, the revised taxonomy's knowledge dimension has some limitations. Anderson and Krathwhol interpreted user skills practical element ('how to') and the thinking element ('know-how') [Figure 1.5] as 'Procedural' and 'Conceptual' knowledge. For the latter, they argued for a distinction between 'Factual' knowledge, seen as discrete and isolated bits of information, and 'Conceptual' knowledge viewed as a more complex and organized forms of knowledge. ICT's practical focus means that a similar argument could be made for 'Procedural knowledge', indicating a distinction between the 'sensory-motor' knowledge, the physical skills required for operating hardware, and the more complex and structured forms of 'Procedural' knowledge required for operating software. Moreover the practical elements require 'Tactical' knowledge, that is the drawing together of appropriate physical skills and procedural knowledge. This requires a lower level of cognitive awareness than the strategic knowledge associated with meta-cognition. Thus user ICT draws on both knowledge of task performance (procedural knowledge) and application (conceptual knowledge) to complete tasks. This revised knowledge dimension can be traced against Andersons and Krathwhol's cognitive process [Figure 1.7] and summarised in Appendix A2.

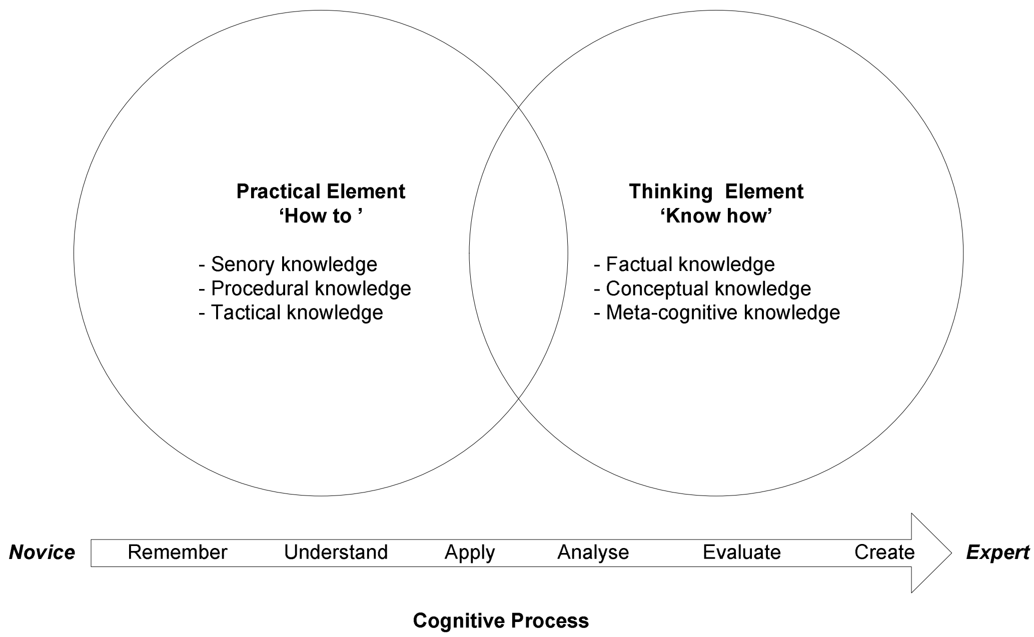


Figure 1.7: ICT user skill and knowledge elements

The interconnected nature of procedural and cognitive skills means, however, that the two elements are not separate identities but are merged. There is little point in knowing the procedures for setting page properties unless one is aware of different page formats and under which circumstances they may be used.

Likewise, knowledge of page formats is limited if the learner does not have the practical skills to implement them. As McFarlane (2001) concluded, to be effective, technique and application need to work in tandem. Rather than the semi-linear knowledge dimension of the revised taxonomy, in ICT user skills the knowledge dimension is an interwoven network of procedural and conceptual activity, as in the ICT expertise model [Figure 1.2]. It could be argued that, rather than Anderson and Krathwhols' two-dimensional framework, in user skills a three-dimensional framework is required [Figure 1.8]. See Appendix A3

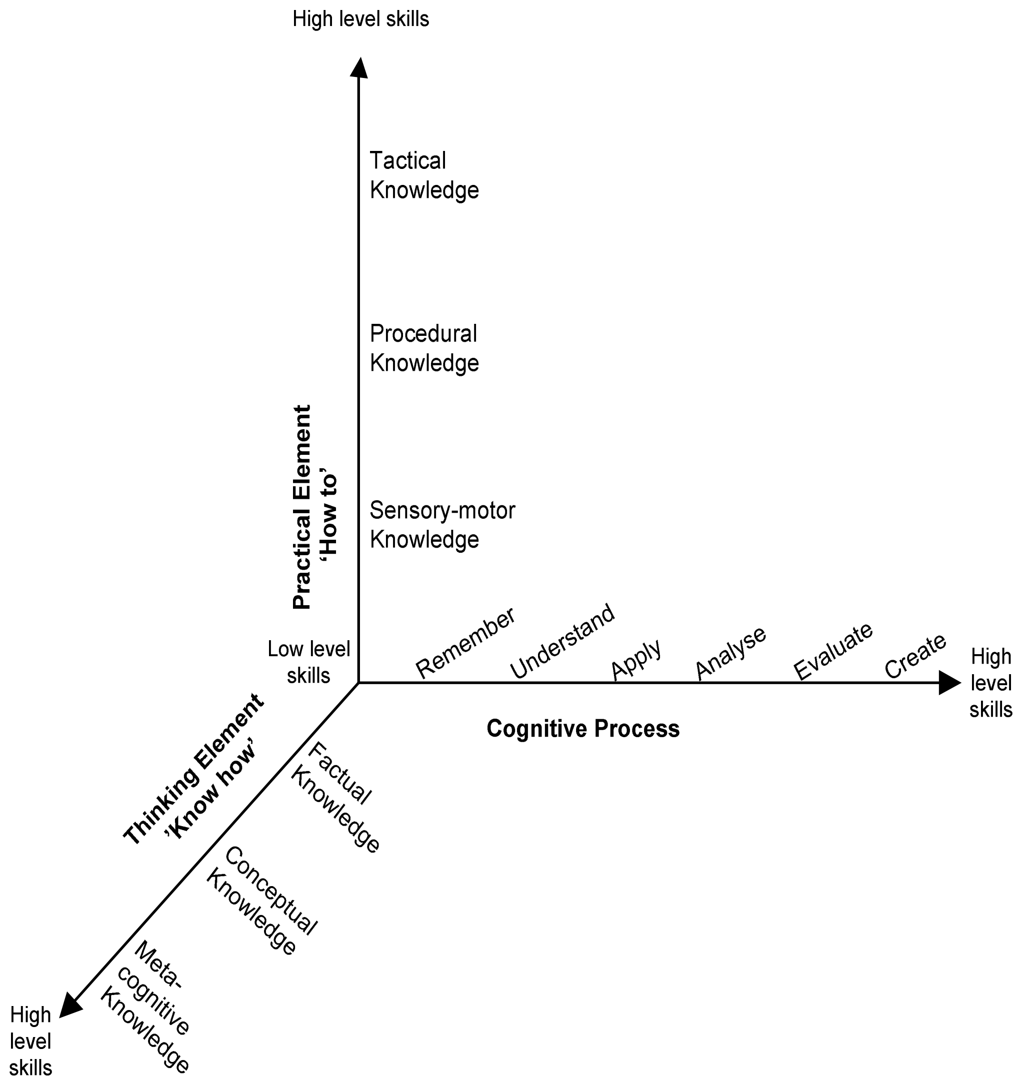


Figure 1.8: Three-dimensional model illustrating the interrelationship between skill, knowledge and cognition construction within user ICT

for a summary of how this three dimensional model can be interpreted in terms of cognitive process. A three-dimensional framework provides a more comprehensive outline for ICT users skills and knowledge but its also raises issues concerning the relationship between development of ICT skills, digital literacy, and ICT curriculum. Kay (2008) felt this relationship to be uniquely complex in user skills due to the speed and uncertainty of technological change and adoption. Such questions about how and what to teach link to questions about why teach ICT user skills and brings the discussion to Hashweh's (2005) second area of experience; context.

1.4 Subject Contexts

Within workplace learning, Nixon et al (2006a) proposed a stakeholder triangle involving learner, employer and provider. Within schools Stergioulas (2007) described four key-stakeholders: academics, policy makers, teachers associations and parent/pupils. This is insufficient to describe adult education where stakeholders include learners, employers, providers, government, awarding bodies and teachers (Topp, 2001) and academics. This generates a more complex network model involving several interconnected relationships [Figure 1.9]. The learners, employers and providers remain linked but it is the teachers, learners and awarding bodies (in the form of syllabus content) that form the immediate classroom experience. Awarding bodies and teachers act as intermediaries for employers and providers. Their stances may, however, be influenced in terms of pedagogy by teacher educators or subject content by ICT academics. The government mediates between academics, employers and providers and through policies and financial investment impact on all stakeholders (Griffin, 1999b, Wolf, 2002). At a wider level perceived needs can be influenced by changing technology and culture, or by economic and environmental conditions. Thus the demands of external players, for example software producers who introduce a constant flow of changing products, could impact on and alter the relationship. Each of the stakeholders

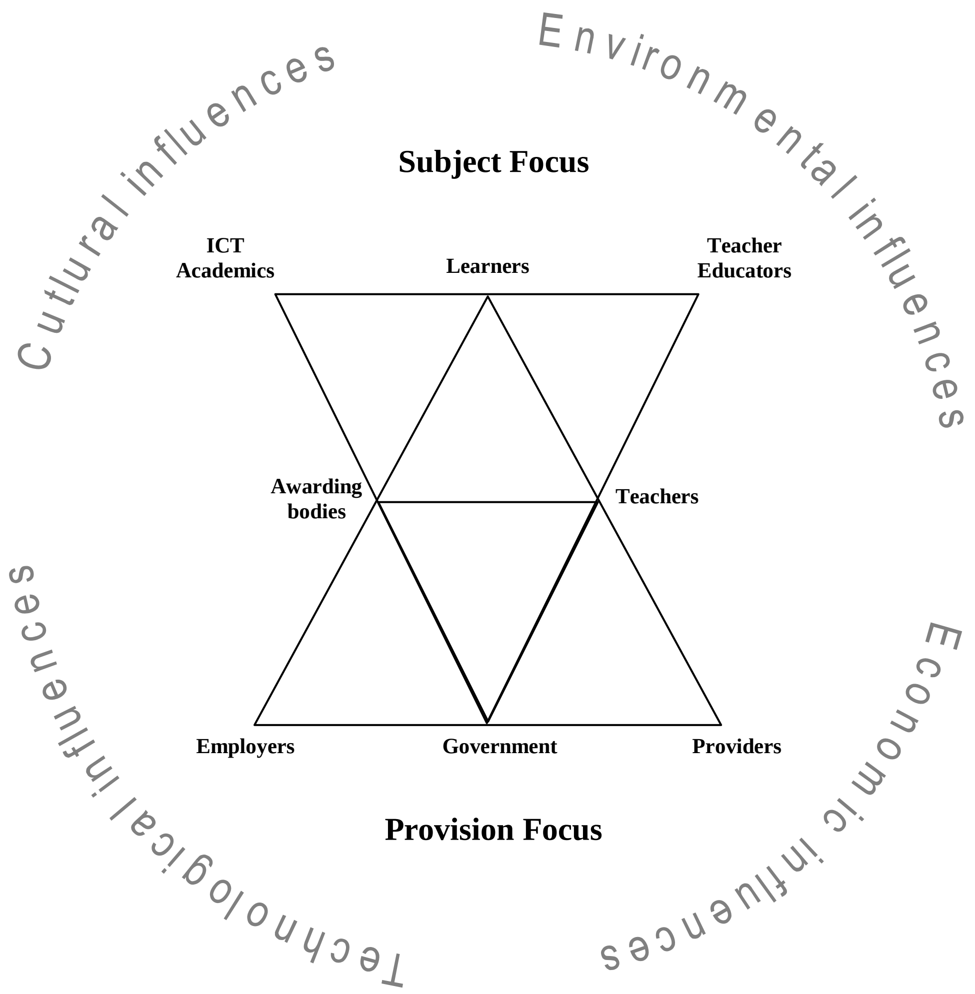


Figure 1.9: Theoretical network for stakeholder relationships and influences within adult ICT user education

has a financial and value investment in the process but the relationships may not be equal and may vary with changing conditions. Thus within the wider learning context whose voice is dominant (Ball, 2003) and in what conditions may be an influencing factor on perceptions of ICT curricula, or teaching and learning.

1.4.1 ICT Curricula

Banks (1986) recorded that early computer courses lacked structure and were often taught by tutors from other disciplines such as mathematics or engineering. Content was concerned with mastery of the computer (Martin, 2003) and typically consisted of how the computer worked, how to program it, and the social and economic effects of computers. With the development of GUI and easy-to-use mass market applications the focus changed to specific applications, for example courses were offered in WordPerfect or later Microsoft Word. But it has been argued (Huang, 2002, Sein et al, 1999) that without training structures it can be difficult for trainers and providers to support individuals' or businesses' objectives because courses become based on teachers' personal experiences. The rhetoric of accountability and employers requirement for formalisation of the skills covered during courses called for standardization, with agreed curriculum, which led to a certification element. This gave rise to courses such as CLAIT (Computer Literacy and Information Technology). Many of these early syllabuses and qualification were reconfigurations of previous office-skills qualifications and so had a strong administrative or clerical work bias (Reffell, 2003). The ECDL (European Computer Driving Licence) emerged in 1997 offering a broader range of modules which have since been adopted by other qualifications [see Appendix A5]. The premise for ECDL was that just as car drivers did not require engineering skills to be able to drive a car; likewise computer users did not require technical skills to use a computer. This further removed user skills from earlier conceptions of 'mastery' emphasizing the techniques required to work applications (Reffell, 2003) rather than developmental and problem solving tasks. These curricula and qualifications developments stressing application skills mapped ICT competences (Martin, 2003), and became the benchmark for user skills.

Heise (1998) argued that the 'right' qualification was becoming crucial for individuals to enter and stay in the labour market. He identified recognition and portability as key features, and many of these ICT qualifications have been hugely successful in this respect. The ECDL qualification for example is flexible and modular, has been accepted as the benchmark qualification by many government departments such as the MOD, NHS and police, and is also internationally recognised and accepted (ECDL, 2006b). Society, it has been argued, values homogeneous education and qualification (Gardner, 1999) as a means by which learners, employers and government can measure learning outcomes and success of teaching. Within a market driven context this is seen as vital to provide quality assurance and enable purchasers to make certain assumptions about outcomes, specifically that completion of the module test means the learner will be able to use the computer or application to a specified level. Qualifications are thus attributed with providing coherence in the system, especially since the introduction of the NQF as a standardizing tool, and the government has therefore attached funding to completion of accredited qualifications. This views qualifications as marketable commodities by which providers can attract customers and funding and learners and employers can ensure skills and knowledge.

This coherence could come at a price. Griffin (1999b) argued that educational strategy has become controlled by standards which for user skills could have several implications. The progressionary nature of the NQF indicates that ICT, perceived as a practical subject with qualifications at lower levels, could become allied with lower-order cognitive skills. The desire for quality assurance and economy means that test makers, providers and buyers look for effective, brief, uniform and easily administer test systems (Gardner, 1999) which typically emphasis factual knowledge (Burke, 2005) rather than performance or application. The links between funding and examination success could put pressure on teachers to focus on test results (Sheerman, 2008) and ‘teach for the test’. Activity thus becomes related to ‘skill and drill’ (Popham, 2001) and recalling facts or procedures (Burke, 2005) rather than problem solving activity. Heise (1998) argued that these test characteristics impacted on the interaction of individual and task, leading to ‘classroom’ versions of knowledge (Banks et al, 1999) being implemented in working contexts rather than ‘real life’ knowledge. Thus in the case of ICT user, if qualifications focus on application competencies this narrow perception of user skills could become what learners associate with ICT use rather than the wider perceptive of reflective use. An over emphasis on ‘teaching to the test’ (Heise, 1998; Sheerman, 2008) could lead to restricted versions of knowledge which could not only disadvantage individuals but also industry or society.

1.4.2 ICT Teaching and Learning

The Lifelong Learning agenda of flexibility means that ICT learning opportunities are now available in a range of learning environments, including FE and HE colleges, community centres, employment centres, and company training rooms. The emphasis and nature of teaching and skills content may be affected by these contextual environments (O’Rourke, 2001). For example community learning might traditionally be associated with personal or social inclusion motivations and informal teaching, while FE colleges and work based environments might be concerned with economic motivations and formal approaches. These differing characteristics might be argued to be related to whether they aim for education or training. Arguments surrounding education versus training are contentious and well deliberated. They can be represented by conceptual dichotomies (Stevenson, 2000; Tight, 2002) such as higher-order versus lower-order skills and in recent years have been deliberated within academic versus vocational discourses. As user skills are often referred to as ‘ICT training’, perceived as practically based, and qualifications have clear vocational links (Reffell, 2003) they are worth revisiting briefly through an education versus training lens.

Training has typically been associated with specific, job orientated objectives (Buckley and Caple, 2004; Glaser, 1962), for example machine operation, while education is described as person-oriented with broader objectives. Buckley and Caple (2004) explored definitions in terms of process and effect [Figure 1.10]. They described training as mechanistic, emphasizing uniform and predictable responses to standard guidance and instruction reinforced by practice and repetition. Education they perceived as an organic process with less predicable effects concerned with releasing the potential of the individual (Glaser, 1962). In

	Training	**Education**	**Indoctrination**
Goal	***Narrow*** *the 'right' way to do it; no choice*	***Wide*** *many ways of thinking and doing; choice*	***Narrow*** *only one way of thinking; no choice*
Process	More mechanistic	More organic	More mechanistic
	Work orientated	Person orientated	Power orientated
	Low-level knowledge	High-level knowledge	Right knowledge
	Measurable potential	Releasing potential	Controlled potential
	↓	↓	↓
Effect	Specific	General	Specific
	Uniform	Variable	Uniform
	Predictable	Less predictable	Predictable
	Immediate	Long term	Either
Outcome	**Skills**	**Understanding**	**Attitude**

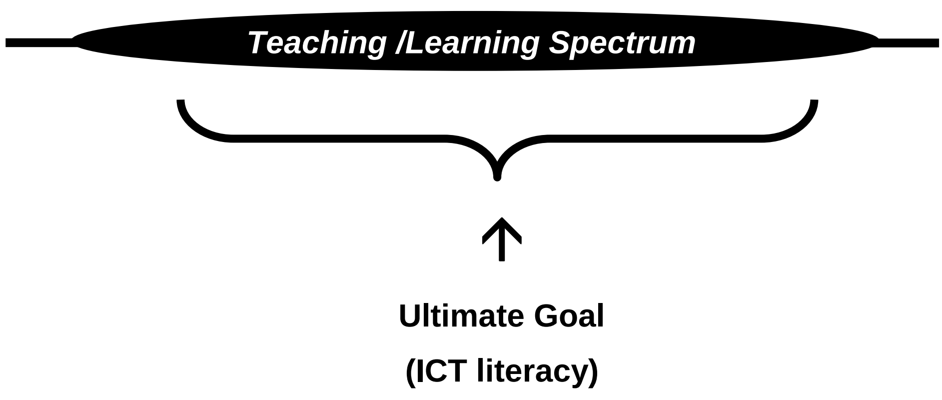


Figure 1.10: Teaching/learning Spectrum

(Adapted from Buckley and Caple, 2004:7; Rogers, 2002:53)

terms of content they felt training aimed to provide knowledge and skills and to inculcate attitudes which were needed to perform specific tasks. Whereas education provided a more theoretical and conceptual frameworks designed to stimulate an individual's analytical and critical abilities. Such definitions reflect the dualisms of economic/social developmental aims, procedural/conceptual skills and lower/higher order thinking already discussed. Buckley and Caple (2004) argued that effects of training and education could be considered by time scale. Training's effect they saw as immediate, observable and short lived. Education was more likely to show influence in the long term, possibly in a more profound way.

Rogers (2002) perceived training and education approaches in terms of 'wide' or 'narrow' goals. For him all structured learning opportunities lay along a continuum. At one end were narrow goals aimed at demonstrating 'right' ways of working which he defined as 'training' at the other narrow goals concerned with 'right' ways of thinking, feeling or behaving which he called 'indoctrination'. Between the two extremes was a large area of 'education' where the goals were wider, concerned with demonstrating that there are a number of ways of thinking and doing, and encouraging development of choice and self-determination. Rogers suggested that elements of all three came into teaching at different times depending on the situation, learners and subject matter. This idea of a teaching spectrum was also voiced by O'Rouke (2001) who argued that distinctions between training and education derived from misunderstandings about the teaching role within institutions and that both teachers and trainers delivered across a range of knowledge, skills and understandings. This more holistic model would support the skills/knowledge/attitudinal approach for user skills argued throughout this review.

At the core of the debate is how ICT might be perceived as a basic skill, a resource to support other activity, or as a subject in its own right (Tanner, 2003). How teachers and course providers define user ICT could impact on whether they aim to provide skills, application knowledge or wider subject understandings. For O'Rourke (2001) such notions are redundant. She argued two dimensions to the learning paradigm, content and process, and that the learning process should be aimed at the widest point on the development spectrum. She urged teachers to explore the potential of higher-order learning and holistic pedagogical approaches regardless of subject matter. The ultimate aim for her was always for Roger's wider goals. This brings discussion to the third area of teachers' experience; pedagogy. The next chapter will explore how teachers' professional role may be defined, how they may develop and maintain their professional knowledge and how adult ICT might be taught.

Pedagogy might broadly be defined as 'any conscious activity by one person designed to enhance learning in another' (Watkins and Mortimore, 1999:3). As this investigation is concerned with teachers' professional knowledge the exploration of pedagogy will be framed by teachers' possible interpretations and perspectives of this teaching and learning process. Teachers' professional knowledge can be seen to include Pedagogical Content Knowledge (PCK), that knowledge pertaining to content and pedagogy (Shulman, 1986) and context (McCaughtry, 2005) that are unique to teachers, and the reality of the teaching situation. How teachers' professional expertise is defined and acknowledged may impact on teaching style, development and expectations. This chapter will thus explore concepts of teacher professionalism, before exploring PCK in more depth, what practices may be evident in ICT user skills classrooms, and finally how PCK might be enacted in the adult ICT classroom.

2.1 Teachers' Professionalism

Whether teaching can be regarded as a profession is disputed (Winch, 2004). Compared to professions such as medicine and law, teaching has been described as a 'Minor' profession (Glazer, 1974), as its knowledge base was felt to be 'hopelessly non-rigorous' and conducted in shifting, ambiguous and unstable instructional contexts. Winch (2004) argued that professional knowledge alone is an insufficient claim to professionalism. Crain (2004) further proposed that professionals were characterised by autonomy, self-regulation, and a self-employed status. Using this criteria teaching, typically conducted in large organizations and with bureaucratic control over practice and standards (Day, 1999), would again fall short of profession status. Yet teaching is frequently referred to in professional terms. It has been suggested that this is due to its vocational nature (Winch, 2004), its occupational training and expertise, and its degree of teacher autonomy in implementing judgement in classroom decision-making (Day, 1999). Thus regardless of status in wider debates teachers are referred to as professionals and their evolving knowledge and practice as professional development.

The concern here is for teachers' professionalism rather than whether teaching is a profession. That is how professionalism may be defined in the adult education context and how the professional role of the teacher might be perceived and enacted. Adults' teachers may encounter differing conditions of recruitment, training, and working than their school colleagues. This could impact on the characteristics, outlined above, by which teaching may derive its professional image, namely vocation, training and expertise, and autonomy.

2.1.1 Vocation

Adults' teachers may be argued not to have the vocational impetus attributed to school teachers. Gleeson et al (2005) concluded adults' teachers come from a range of backgrounds, qualifications and experiences and frequently did not deliberately set out to become teachers. Recruitment was in response to opportunities at particular moments, often coinciding with lifestyle changes such as career breaks, redundancy, divorce and relocation. Adults' teachers may thus view teaching simply as a career change. Yet adults' teachers have an ethical dimension (Winch, 2004), for example Avis and Bathmaker (2004) concluded trainee teachers of adults had a locus of care directed at the individual. Teachers wished to create pedagogical contexts in which learners would feel valued, respected and cared for. However, Avis and Bathmaker (2004) (also Bathmaker and Avis, 2005a; Nias, 1997) concluded focusing on the individual could led to a lack of recognition of the broader contexts of teaching and critical pedagogy. Vocation, in this context, appears to assume a more emotional or personalised element concerned with interpersonal relationships and learner wellbeing (Nias,1997) rather than wider professional ideals.

2.1.2 Training and Expertise

Prior to 2001 there was no compulsory initial teacher training (ITT) for adults' teachers. This, Clow (2001) argued, meant teachers' professionalism was bound by their subject training and expertise. Their teaching expertise consisted of occupational know-how developed through classroom experience. Winch

(2004) suggested that teachers who lacked a theory base were craft workers, making their occupational knowledge practical, context-dependent and non-discursive. The government's drive towards basic teacher training for all teachers of adults may go some way to raising adults' teachers' professional profile (Sachs, 2001). But Gleeson et al (2005) argued that adults' teachers remain occupationally handicapped as they frequently work on a part-time or contract basis which limits their ability to develop and maintain 'professional communities of practice' or to engage in collaborative professional activities. Given such limitations, adults' teachers' professional identity might continue to be defined by their subject and practical classroom experiences.

2.1.3 Autonomy

The third element by which teachers may claim professionalism is autonomy. The rise of the service economy and rhetoric of accountability has been argued to have changed 'professional accountability' to 'corporate accountability' (Ranson, 2003), leading to 'de-professionalisation' (Bottery and Wright, 2000; Crain, 2004). It is argued that in the past teachers had professional control over course content, delivery and assessment but now frequently deliver imposed syllabuses that are managed from outside and are accountable to corporately defined goals and procedures (Sobiechowska et al, 1999). This shifting accountability is argued to 'leave no space for an autonomous or collective ethical self' (Ball, 2003:226) and positions teachers as technicians implementing others' views of knowledge. From this perspective the commodity of caring is reduced to performance of targets (Bathmaker and Avis, 2005b) determined by managerial and state interests. A low professional status for teachers has been argued (Bottery and Wright, 2000; Sachs, 2001) to be in the government's interest by implementing government policy. But teachers have a plurality of roles (Day et al, 2006; Sachs, 2003) which makes their professionalism dynamic. McCulloch et al (2000) argued that, rather than de-professionalism, new accountability could be regarded as 're-professionalism'. The changing context requires new sets of skills to ensure good relationships with clients and stakeholders and access to a more extensive knowledge base. For some, for example Coldron and Smith (1999) and Sachs (2003), this vision of new professionalism is defined on the one hand by structure directed by government action and on the other by agency, that is teachers have freedom of choice about how to respond and how to depict themselves.

New professionalism is thus argued (Gleeson et al, 2005; Sachs 2001, 2003) to be a dualism of two competing discourses. The first, ‘Managerialist professionalism’ reinforced by the employing authorities through policies of teacher professional development and an emphasis on accountability and effectiveness. Sachs (2003) conceded this may be the more dominant. The second ‘Democratic professionalism’, Sachs suggested, arose from the profession itself. It emphasizes learning as the core to rethinking professionalism, active participation, collaborative with internal and external agents, cooperation with colleagues and being an active agent for change. These democratic discourses Sachs felt provide the conditions for development of communities of practice (Wenger, 1998) which in turn create a strong professional identity. For adults’ teachers their professional training and working conditions could mean power to exercise democratic professionalism could be limited thus weakening their professional identity. ‘Managerial professionalism’ may, thus, become the more dominant discourse impacting on adults’ teachers’ ability to act independently and positioning their professional culture as a technical-rational.

As part of his discussion on new professionalism, Hoyle (1975) developed the concept of ‘professionality’, referring to teachers’ perceptions of the knowledge, skills and procedures involved in the process of teaching. Given its age and the current discourse of democratic professionalism Day (1999) argued that Hoyle’s notions no longer applied. But for adults’ teachers the discourse of democratic professionalism may not be so dominant. In schools the ideas of new professionalism, set against the raising standard criteria, ensure that teachers are now less isolated, their planning more collaborative, and their relationship with learners more contractual. Whereas in the adult sector the managerial emphasis mean that rising standards appear more bound with accessibility, accountability and transparency set against learner choice rather than with raising levels of teaching and learning and collaborative discourse. Teaching practices remain largely part-time, individual and isolated. In addition change from a subject expertise to a pedagogical knowledge base is relatively new (Harkin, 2005). Thus it could be argued adult education is only now experiencing its own pedagogy debate and that despite its age Hoyle's model could have continued resonance as a heuristic device in this sector.

2.1.4 Professionality

Hoyle (1975) concluded that notions of new professionalism required 'extended' images of professionality embracing a wider range of knowledge and skills than the 'restricted' professionality of the immediate classroom. But, he argued, teachers tended to be atheoretical in their day-to-day teaching, with 'relatively little interest in educational theory or research' (Hoyle, 1975:319), and perceived themselves first and foremost as practitioners. Further Simon (1999) concluded that pedagogy in the UK was confused, anecdotal and eclectic rather than coherent, systematic and purposeful. While Alexander (2000) argued pedagogy was fundamental and respected in other countries but was limited in the UK and predominantly concerned with performance and management. Such conclusions appeared to be reiterated in more recent research (Harkin, 2005) surveying 244 teachers of adults about their perceptions on the usefulness of ITT. Harkin concluded that teachers perceived the practical orientated elements, such as planning programmes or developing teaching techniques, to be the most helpful. He felt teachers tended to view theory solely as propositional knowledge or published academic work and that many teachers were quite disparaging about theory.

One of the key questions for Hoyle was whether 'restricted' and 'extended' professionality were divergent orientations or whether the latter was an extension of the former. His model lacked clarity in this respect. The government's implementation of ITT in the adult sector and their current emphasis on practice from theory (Harkin, 2005) would imply a commitment to the latter. This emphasizes teaching as a science to be learnt, with improved practice emerging from reflective practice and engagement with theory. The teachers' perceived atheoretical approach implies that they may view teaching as a craft defined by practical skills and intuitive activity. Harkin's teachers placed great value on reflective practice but they saw this purely in practical terms concentrating on their own or their learners' performance within the classroom situation. These teachers may thus see the model in either/or terms. Either you are a practitioner concerned with the artistry of actual classroom practice or you are a theorist concerned with the science of how it might be done. These conflicting viewpoints indicate possible tensions between teachers' practice and training, and definitions of expert teacher.

Viewing Hoyle's model in terms of Dreyfus and Dreyfus (1986, 2005) expert model an anomaly appears. 'Restricted' professionality may be seen as intuitive activity, characteristic of the 'expertise' stage. 'Extended' professionality sees teaching as a rational activity bound by theory, characteristic of the 'proficiency' stage. If the models are seen as divergent, in Dreyfus and Dreyfus' terms, the 'restricted' practitioner would be the more expert. Yet for Hoyle the 'extended' developed from the 'restricted' and for Dreyfus and Dreyfus the intuitive expert required assimilation of theory. The solution to this conundrum lies in remembering the inclusive nature of Dreyfus and Dreyfus' expert model. It is not the act of extending knowledge that is important but what the teacher does with that knowledge that counts (Evans, 2002). Humphreys and Hyland (2002) likened teaching to a jazz performance. Teachers, they said, required the skills and understanding of the discipline but also the intuition, the ability to perform. This would suggest that the expert teacher was a convergence of the two models.

A convergence of models does more than imply that one model extends from the other; the 'restricted' is an integral part of 'extended' (Atkinson and Claxton, 2000). This envisages teacher's role as cognitive and affective (Day and

Pennington, 1993) but also highlights a missing element in Hoyle's model. 'Understanding of discipline' places teachers in wider subject and social contexts and moves teaching beyond the individual into considering societal needs. Professionality, in this context, requires a reflexive approach; that is reflection on practice, theory, and subject. Teaching here moves backwards and forwards between Tight's (2002) three developmental levels. The micro-level concerned with the individual learner and personal relationships which are the focus of 'restricted' professionality. The meso-level related to institutions and community seen in the reflective approach of 'extended' professionality. Finally the macro-level concerned with national and wider community expectations and needs. This tri-level approach could offer a more 'holistic' interpretation of professionality to further develop Hoyle's model [Appendix A4]. Teaching in this context is an active interrelationship between the art, science and context of teaching with the teacher as designer. The teacher designs the teaching to fit the learners and context. Thus teaching expertise can be seen as intuitive application of rational theory through reflexive processes.

One problem for professionality is teachers' practice may be mediated by the educational environment in which they work (Adey, 2004). The institutional perception of professionality may impact on the nature of Continued Professional Development (CPD) opportunities, motivation and ability for reflexive behaviour, and implementation of change. This might be viewed simplistically in a 2x2 matrix [Figure 2.1]. Bottery and Wrights' (2000) research found that schools did very little in terms of in-service training to develop wider concepts of the teaching role but rather had a pre-occupation with training to develop classroom skills or management of school resource implementation. For Little (1992) this was because CPD was often viewed as a means of implementing reform or policy changes. Kennedy (2005) also felt there to be an emphasis on transmissionist models of CPD. This 'restricted' institution approach if coupled with a 'restricted' teacher approach might limit motivation to review or change practice, to engage with educational theory, or to respond to challenging ideas. A 'restricted' institutional approach could also constrain

		Institution	
		Restricted	***Extended***
Teacher	***Restricted***	Limited motivation to review or change practice	Change restricted by teacher's vision/motivation
	Extended	Change restricted by institution's vision/motivation	Motivation for meaningful and productive change

Figure 2.1: Matrix indicating teacher/institutional perceptions of professionality and implications for change (After Adey, 2004:97)

teachers with an 'extended' approach. The teachers may have little opportunity to access transformative courses designed to encourage reflective practice (Kennedy, 2005) or could encounter resistance to the introduction of new ideas or practices. This can perhaps be illustrated by an example from the researcher's own experience. A fellow student asked her headmistress for permission to conduct research with her class and was told, "I'm happy for you to conduct research, just don't start introducing any of those new ideas into your teaching." Change in these circumstances could be limited and/or controlled by managerial goals or expectations.

An 'extended' institutional approach need not guarantee effective change, however. Fraser (2005) argued that teachers' level of engagement with training impacted on how change was implemented. Thus teachers with a 'restricted' view of professionality may attend courses with a theoretical content but their own practical classroom emphasis may make them unwilling or unable to reflect on or react to theory content. Evans (2002) concluded that effective change required both functional and attitudinal development. Change without enhancing professionalism or professionality was just change. Shulman and Shulman (2004), exploring why some teachers taking part in a project to implement a new learning programme were able to adapt and change their practice and others were not, similarly concluded there to be two elements influencing change; the individual and community. They argued that these two dimensions continually interacted and were mutually determining. They decided that teachers needed five conditions for change. 1) Vision, they had to be ready to change. Fraser (2005) termed this ‘pre-engagement’, defined as a professional dissatisfaction with current practice. 2) Motivation, the willingness to change. 3) Understanding of what must be taught and how to teach it. 4) Practice, being able to engage in appropriate practice and adaptive action. 5) Reflection, learning from experience. The latter two, Fraser (2005) termed the ‘engagement’ and ‘enactment’ phases. Thus teachers need a personal readiness to effectively enact change. But their institution needs to share their vision, knowledge base and commitment and support changes though a community of practice. This would indicate that it is where the institution and teacher share an ‘extended’ view of professionality that change may be more meaningful and reflexive practice encouraged and supported. But even here, to be effective external policies and resources also need to be available.

These images of CPD can be summarised by picturing expertise in terms of Dreyfus and Dreyfus’ dynamic expert [Figure 2.2]. Continuing development of expertise from Evan’s (2002) viewpoint would require both functional and attitudinal development. While moving from novice to expert within a new practice area would require movement through pre-engagement, engagement and enactment stages (Fraser, 2005; Shulman and Shulman, 2004). All of which might be enacted against a backdrop of personal, institutional or wider community influences or expectations which could support or hinder change. Enactment accompanied by reflection could lead to satisfaction/dissatisfaction and motivate further training to change or develop practice. But enactment

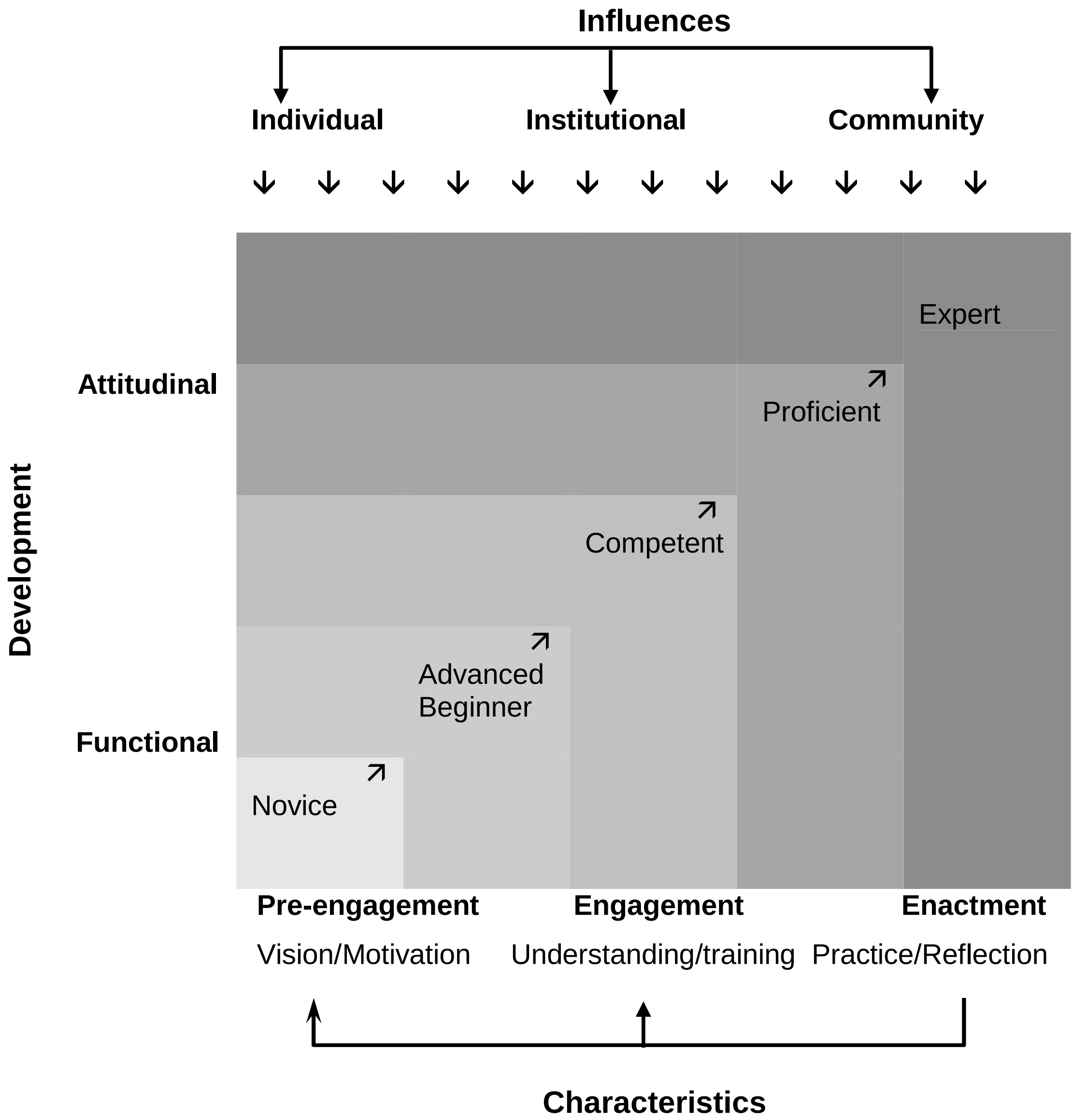


Figure 2.2: Model for teacher CPD

without engagement or reflection could result in functional change without attitudinal change. The relationship between teacher professionality, classroom practice and professional development can therefore be seen as complex and many layered. At its core, again, are issues concerning the aims of education in relation to micro, meso or macro development. But those differing levels of influence can also impact on teachers' perceptions of professionality. One crucial element to teachers' view of professionality, and vice versa, is their professional knowledge development and understandings.

2.2 Teachers' Professional Knowledge

Teachers' professional knowledge can be seen as Pedagogic Content Knowledge (PCK); that knowledge teachers develop from contact with the varying communities and cultures in which they work, and the reality of practice, enacted Pedagogic Content Knowledge.

In early articles Shulman (1986; 1987) defined the concept of PCK as:

> *'…that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding' (Shulman, 1987:8)*

Thus PCK referred to knowledge derived from interaction between a teacher's specialist subject experience and pedagogical beliefs in order to decide how a particular topic might be presented for optimal 'learnability' (Bucat, 2005). The teacher's job was seen as 're-packaging and re-presenting' (Bucat, 2005) her knowledge to 'transform' the subject-matter knowledge into forms 'accessible' to learners (Shulman, 1986). Banks et al (1999) argued this concept did not go far enough and differentiated between subject, pedagogical and 'school' knowledge. The latter, involving curricular knowledge, was defined as an understanding of the ways that subject knowledge was transformed within the school environment and established a relationship between teachers, learners and content. Thus teachers drew on personal subject constructions but also public subject interpretations contained in and shared through curriculum guidelines, schemes of work and textbooks (Loveless, 2007). McCaughtry (2004; 2005) went further arguing that teachers employ an emotional and social knowledge about their learners when making decisions about content, pedagogy or curriculum. Teachers he argued responded to the physical, emotional and social aspects of the immediate classroom experience. McCaughtry's research (2004, 2005) had limitations, as it was small scale and specific, but it accords with arguments for the inter-personal nature of humans

(Bruner, 1998; Gorman, 2004) and the ethical dimension of teaching (Avis and Bathmaker, 2004; Winch, 2004). PCK in this context is dynamic. It requires teachers to actively shape, tailor, and transform knowledge to match perceptions of learners' needs (Loveless, 2007). It is this transformation of knowledge, involving analysis of Tight's (2002) individual (micro), community (meso) and national (macro) layers of the classroom experience, which characterises teachers.

This concept of 'representational repertoire' (Loveless, 2007) was reflected in Hashweh's (2005) revisiting of PCK. He suggested that the term Teacher Pedagogical Constructs (TPCs) better conveyed the meaning and development of PCK. These constructs he envisaged as personal and private knowledge resulting mainly from planning, but also from the interactive and post-active phases of teaching. Such constructions were topic specific, interactive and drew on a range of knowledge bases for which Hashweh returned to Shulman's (1987) seven interconnected categories of teacher knowledge: content knowledge, knowledge and beliefs about learners, pedagogical knowledge, knowledge of context, knowledge of resources, curricular knowledge, and beliefs about aims of education. This image of knowledge as classroom experience dependant suggests that experienced teachers have a richer PCK, than novice teachers (Cochran, 1997; Cochran et al., 1993; Veal & MaKinster, 1999). Shulman and Shulmans' (2004) research suggested, however, that attitude as well as experience was important. They defined an accomplished teacher as

> *'…a member of a professional community who is ready, willing, and able to teach and to learn from his or her teaching experience.' (Shulman and Shulman 2004:259)*

This element of 'readiness' and self mind-set appears to be missing from Hashweh's description of PCK. Yet understanding of self and society can be seen as central to new professionalism (Sachs, 2003) and reflexive practitioner.

Every aspect of a teacher's work involves a personal dimension (Coldron and Smith, 1999). At the micro level improving practice involves assessment of own strengths, weaknesses and beliefs (Bottery and Barnett, 1996). While at the macro level teachers require understanding of their place in the wider landscape (Beijaard et al, 2004, Bottery and Barnett, 1996) and the effects of legislation or managerial influences to be able to make choices about how to respond to the socially 'given' (Coldron and Smith, 1999). It has been argued that without a sense of self in context teachers could become disinterested in the wider picture (Bottery and Wright, 2000), or undervalue their personal understanding of learners and context (Dadds, 1997) and look to outside experts, like awarding bodies or OFSTED, to provide answers. This acquiescence Nias (1997) suggested made them authority-dependent and unquestioning of practice rational. To counter this Dadds (1997) called for more opportunities for teachers to reflect on practice and develop their 'inner wisdom'. But the nature of that reflection can differ (Antonek et al, 1997; Mansvelder-Longauroux et al, 2007) and Turner-Bisset (1997) concluded that knowledge of self was an important requisite for higher level thinking and thus reflective ability. Antonek et al (1997) went further by defining reflection as a key component of the concept of self. For them there was no self without reflection. Self knowledge was, thus, the fabric of identity (Nias, 1989) and the self as teacher evolved through reflection of personal and social histories and making sense of the self in context (Coldron and Smith, 1999). Self knowledge thus can be seen as essential to developing, interpreting and utilising PCK and as such is required within a PCK model.

Shulman's (1987) and thus Hashweh's (2005), knowledge bases have further limitations in that the category labels did not clearly differentiate practical, theoretical and reflexive forms of knowledge. There were areas of overlap (Turner-Bisset, 1999). For example content knowledge encapsulated three different types of subject knowledge: a) 'substantive' knowledge, which Turner-Bisset (1999) described as the facts, concepts and organizational frameworks of a discipline, b) 'syntactical' knowledge concerned with processes for application and generation of knowledge or ideas, and c) beliefs about the subject developed from literature, engagement and concepts of what is important to know. For Turner-Bisset (1999) these knowledge bases should be seen separately. Similarly Hashweh did not distinguish between the beliefs and understandings about pedagogy and practical classroom management. The former might be defined as theoretical understandings of learners' drawn from formal training and the latter as 'Professional Craft Knowledge' (Brown and McIntyre, 1993) or 'General pedagogical knowledge' (Turner-Bisset, 1999). That is

> *'…. that part of their professional knowledge which teachers acquire primarily through their practical experience in the classroom rather than their formal training, which guides their day-to-day actions in classrooms, which is for the most part not articulated in words and which is brought to bear spontaneously, routinely and sometimes unconsciously on their teaching.' (Brown & McIntyre, 1993:17)*

For teachers of adults, perhaps with limited educational training, this type of practical knowledge could be particularly significant. Reliance on performance expertise, however, could create problems in terms of reflexive practice. Firstly, its spontaneous, intuitive nature can make it difficult for teachers to articulate (Dreyfus and Dreyfus, 1986, 2005). Practical knowledge can become so much a part of practice that teachers may no longer be able to rationalise how they know what they know. They simply react to situations, responding and adapting to context, or individual learners, without conscious thought. Secondly, novice teachers' early classroom experiences may involve misunderstanding of classroom needs (Atkinson, 2004) due to the need to control situations, the diversity of teacher/learner interactions, or the degree of influence of contributing contextual factors. These misinterpretations could become part of their personal constructs and shape their future practice. Atkinson concluded that images of 'good teaching' could be superseded by the reality of teaching leading to what he termed 'imaginary identity'. Teaching practices could thus fall short of the individual's theorised image of a teacher or perceptions of own practice. This means that what teachers say or believe about teaching may not always be reflected in what they do.

Twelve categories of personal teacher knowledge bases can be identified: including the 3 elements of content knowledge, curricular and resources knowledge, beliefs and models of teaching, social and cognitive knowledge about learners, general pedagogical knowledge, knowledge of self and context, and aims purposes and philosophy of education [Figure 2.3]. For this research concerned with teachers' professional knowledge, defined as PCK and enacted PCK, these personal interpretations of knowledge are insufficient. They form only one layer of the classroom experience. Community or social influences may also impact on teachers' knowledge.

Gudmundsdottir (1991) emphasized the value-laden nature of PCK. This suggests that as future teachers learn their subject matter they also acquire its value structure; the subject sub-culture. But teachers work within multiple-community environments (Wenger, 1998) and competing frameworks, each with its own sub-culture, beliefs and values which may, implicitly or explicitly, shape PCK. Professional knowledge is a product of all facets of the teacher's life (Heimlich and Norland, 1994) leading to the notion of multiple selves (Roberts, 2000). For example teachers simultaneously draw on knowledge of a) the classroom community, formed by the members in the classroom and their beliefs and expectations of learning (McCaughtry, 2005); b) the community of the college or institution where learning is taking place and the learning ethos it promotes, or the curriculum (Ecclestone and Pryor, 2003) and management systems (Hammond and Mumtaz, 2001) it adopts; c) the community of ICT users defined by subject-culture, what it is to be an ICT user (Hamilton, 1993; Hammond & Mumtaz, 2001; John & Baggott La Velle, 2004); d) the community of ICT users skills teachers, what it is to be an ICT user skills teacher (Olson, 1988; Shulman, 1987); e) the local geographical and/or cultural community of the learners, which may not be the teacher's own, meaning that there may be

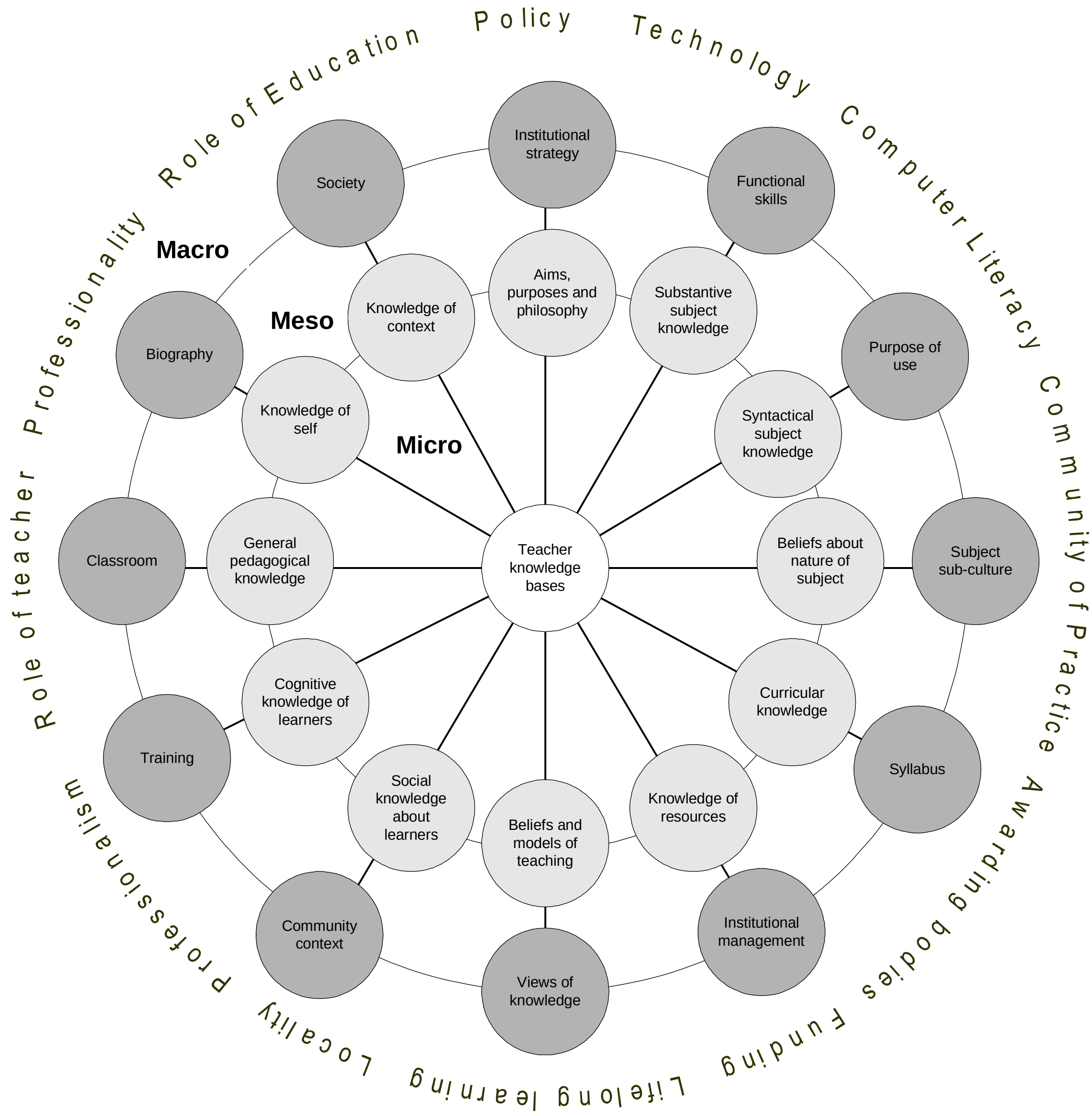


Figure 2.3: Theoretical model of ICT Teacher Professional Knowledge

duality to community values; and finally f) the wider community of the society in which the learning takes place (Broadfoot et al, 1988). This latter knowledge moves beyond the immediate experiences of teachers and learners to wider, sometimes nebulous, notions of the role of education, teacher professionalism, technological needs and governmental policy. Thus teachers' professional knowledge is not just about their personal pedagogical constructs, derived from their own beliefs and experiences but will also be influenced by the institutions in which they work and by the society in which they live. What Zembylas (2007) termed the 'knowledge ecology'. A model for teachers' professional knowledge can therefore be envisaged as triad layers of contextualised, interrelated knowledge bases.

The danger of presenting a model with labelled categories is that it might be presumed to be static (Turner-Bisset, 1999). Zembylas (2007) envisaged the 'knowledge ecology' as a symbiotic relationship between the various knowledge elements and agents, videlicet teachers, learners, classrooms, resources, employers, community. Hashweh (2005) similarly defined TPCs as interconnected and Shulman and Shulman (2004) envisaged teachers as changing with experience. The knowledge elements in this model should similarly be viewed as interdependent and interactive. A change to any of the elements has the potential to change any other elements. Thus a change in government's policy on adults' teachers' professional training has the potential to change the teacher's knowledge about her learners' cognitive development, leading to a review of epistemological understandings, thus impacting on beliefs and models about teaching and so on. This changing and dynamic nature does not just apply to changing elements. Assuming an emotional and contextual nature to knowledge means that the same teacher could respond to and interpret knowledge differently in differing circumstances for example whether she was working in a community or work based environment, with examination or non-examination curriculums, or younger or older learners. Thus how the teacher interprets the wants or needs of the differing agents in a given context could impact on their decisions for teaching practice.

Thus a range of personal, organizational and community interactions, perceptions and beliefs may impact on teachers and define teaching practices. Teachers' professional knowledge is, or should be, ongoing and active (Zembylas, 2007) constantly changing with the ebb and flow of the teacher's growing personal experiences and changing contexts. By actively reflecting on the many influences on practice teachers can design teaching that best fits their learners' needs. Teachers' professional identities are manifested in their classroom practice (Coldron and Smith, 1999) making style the match between teaching beliefs and behaviours (Heimlich and Norland, 1994; 2002). The next two sections explore how PCK might be enacted; beginning with possible interpretations of the teaching and learning process, then examining how perceptions of adult learners might influence teaching decisions in relation to user ICT as a subject. These sections are concerned with how the kind of activities and beliefs that may underpin ICT teachers' view of teaching and learning with adults might impact on outcomes.

2.3 Enacting PCK

Teaching and learning have been said to go together like Romeo and Juliet (Tight, 2002). This thesis acknowledges that teaching is dependent on learners (Tight, 2002) and, therefore, there is an important debate to be had about how ICT learners may best learn. Its own emphasis on teachers' professional knowledge, however, means that discussion will focus on teachers' possible interpretations of learners and learning against subject needs rather than on the learning process itself.

Hammond (2004) identified tensions between curriculum and subject knowledge for newly qualified ICT school teachers. They perceived the nature and scope of ICT to be changeable and unpredictable but curricula changes to be slow and learning outcomes to be prescriptive and predictable, thus constraining learners' personal exploration. In McCormick's (1999) terms such observations could limit the potential of ICT as practical knowledge. This focus on purpose of use was also the focal point for Hammond and Mumtaz (2001) research with trainee ICT teachers. They outlined two poles of activity for teaching ICT skills. The first had a weak focus on purpose of use and was characterised by de-contextualised activity, lower-order cognitive skills, emphasis on procedural skills, narrow skill set, non-authentic data, data transformed in mechanistic ways, and identical learner product. The second had a strong focus on purpose of use and was characterised by contextualised tasks, higher-order cognitive skills, focus on problem solving, opportunity to develop others skills when needed, authentic data use, learner involvement in transforming data, and diverse learner products. Unfortunately Hammond and Mumtaz did not clearly define or contextualise these characteristics, but they appear to be linked to the teaching/learning spectrum and lower/higher cognitive skills debates discussed earlier. They argued that ICT teachers would teach at some point along the continuum from low to high purpose of use but that for trainee teachers' their theoretical and practical positioning on the continuum varied, due to perceived pressure from contextual factors such as curriculum. It is unclear if experienced teachers are similarly affected, although the Teachers' Professional Knowledge model [Figure 2.3] would strongly suggest that their practice may similarly be influenced by such external elements.

Maor and Taylor (1995) concluded that how science teachers used ICT varied according to their epistemological orientation. They identified three orientations: transmissionist orientation, individual constructivism and social constructivism. Transmissionist orientation viewed knowledge as a body of facts and procedures, passed on by the teacher, to be absorbed and reproduced by the learner. In contrast constructivist orientation viewed knowledge as being actively constructed by the learner either individually or socially with the teacher as facilitator. Conversely Selinger (1999) suggested that teachers changed orientation when using computers. She argued that computer rooms changed classroom dynamics, resulting in teachers being more didactic and using transmission models of teaching regardless of their orientations in non-ICT environments. Either conclusion might be replicated in ICT user classrooms so clear working definitions and differentiations are required.

As epistemological orientation is expressed in teaching practices, it may help to examine issues in relation to teaching characteristics. Ramsden's (2003) three theories of teaching might be traced against epistemological orientations, although Ramsden does not directly relate the two himself. Theory 1 sees teaching as telling or transmission. Theory 2 sees teaching as organizing student activity to support their own learning. Finally, Theory 3 sees teaching as 'making learning possible' and helping learners to change. The latter is concerned with more than just classroom learning it aims for transfer of knowledge and bringing the learner into the subject community. This distinction can be illustrated using Sfard (1998) two metaphors of learning; the acquisition metaphor (AM) and participation metaphor (PM). AM sees knowledge as acquired by the learner. For transmissionist orientation this is from the knowledgably teacher and for the constructivist through social interaction. PM associates knowledge with 'knowing' and learning as a legitimate peripheral participation (Lave and Wenger, 1991) or as an apprenticeship of thinking (Rogoff, 1991). This introduces a fourth orientation not discussed by Maor and Taylor, that of Transformation theory (Mezirow, 1997). Here teachers, learners and subject are seen as linked together and grounded in context. This fourth epistemological orientation will therefore be included within the following discussion on epistemological orientations and teaching style.

2.3.1 Transmissionist Orientation

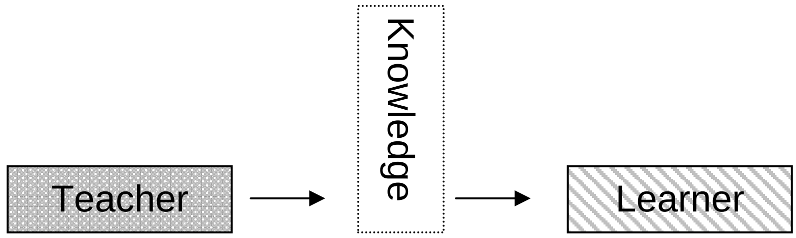
In Theory 1, transmissionist orientation, knowledge is seen as a body of information that can be passed on, it is constant, objective and transmitted by the teacher (Gobbo & Girardi, 2001). The learner is seen as a passive recipient. Data is transformed in mechanistic ways and largely dependant on memory. Pedagogy is teacher-centred using traditional methods strictly controlled by the teacher. There is generally a low expectation of learners' ability to work independently as demonstrated in a quote from a teacher in Maor and Taylor's

(1995:845) study '….You have to tell these students, otherwise they will not do it'. Classroom discourse is didactic, initiated by the teacher and generates narrow questions and simplistic problem solving. It relies on teacher content knowledge and fluent presentation. In terms of ICT users it might involve step-by-step instructions to learn new material and gain concrete experience. Activity may focus on narrow skills sets such as functional knowledge and rely on drill and routine practice exercises; an input/output approach to learning [Figure 2.4(a)].

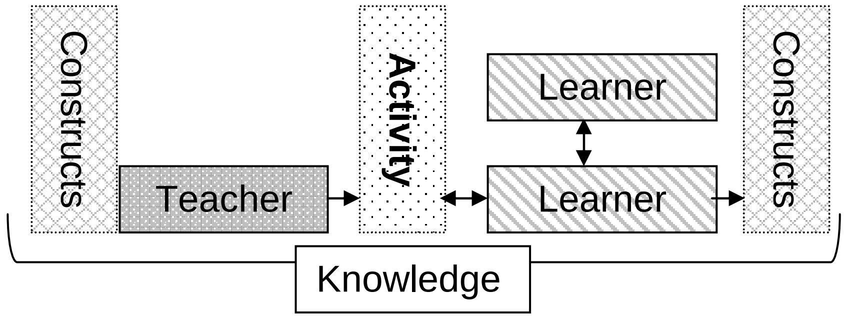
2.3.2 Constructivist Orientation

Ramsden (2003) described Theory 2 as transitional in that teaching focused away from the teacher and concentrated more on learner activity, but to varying degrees. Here the individual learner's role in constructing knowledge becomes increasing importance and can be either individually or socially orientated. In Individual constructivism, knowledge is seen as being constructed by the learner, building on previous experiences and understanding (Roth, 1999). Knowledge is described as individual and developed through a process of 'assimilation' and 'accommodation'. Assimilation involves relating new information to existing schemas, that is representations of past experiences, and accommodation modification of schema to fit circumstances. Teaching becomes a supervision process with teachers looking for ways to stimulate, motivate and organize learners. Teachers provide explanations and initiate activity, which allows learners to pose creative questions and construct their knowledge by critically reflecting on their own perspectives (Gobbo & Girardi, 2001) and reflective observation [Figure 2.4(b)]. For ICT users this might involve activity based on everyday experiences and problem solving exercises. The learner is involved in the transforming of data but the teacher is still responsible for initiating and organizing activity.

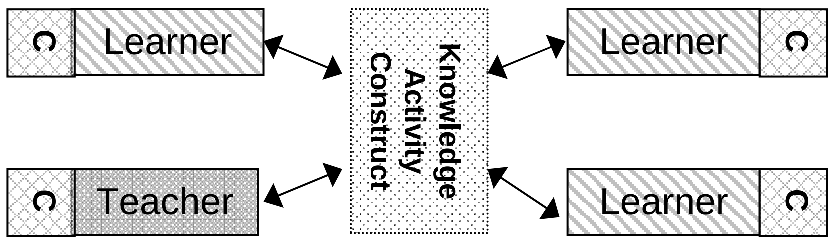
Social constructivism views learning as socially constructed through discussions and negotiations of meaning with peers and teachers. This sees teaching and learning as two sides of the same coin (Ramsden, 2003). Activity is learner-



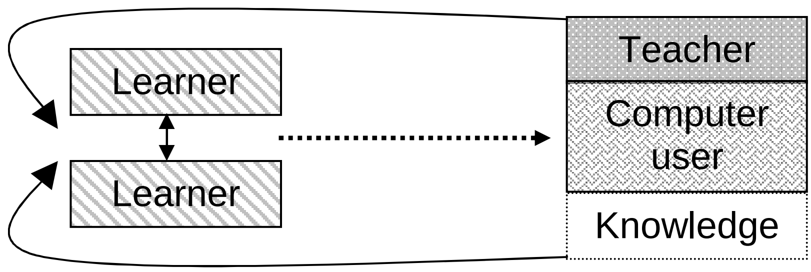
a) Transmissionist orientation



b) Individual Constructivism orientation



c) Social Constructivism orientation



d) Transformation orientation

Figure 2.4: Diagrammatic representation of teacher epistemological orientations

centred with learners taking responsibility for their learning in cooperation with teachers and other learners, to form a community of learning. This perceives individual learners as constructing meaning as their ideas are compared, explored and reinforced in a social setting [Figure 2.4(c)]. Teaching involves an integrated approach involving finding out about students' misunderstandings, intervening to change them and creating a context of learning which encourages activity to engage the subject matter. The teacher acts as a facilitator and is concerned not just with content knowledge and student activity but also with understanding of subject and how to learn. For ICT users this could involve contextualised tasks, a focus on problem solving and opportunities for discussion and reflection.

2.3.3 Transformation Orientation

Implicit in Theory 3 is transformation with the objective of helping learners change behaviour and bringing them into the community of practice (Lave & Wenger, 1991), to become computer users. Knowledge in this perspective is situated community knowledge and learning as social activity in context. Teachers, learners and subject are seen as linked together. Teachers use authentic tasks to replicate community activity. The focus is on problem solving activity in context and learners develop meaning by absorption into the community of practice through legitimate peripheral participation (Lave & Wenger, 1991) that is learners gains skills by social co-participation [Figure 2.4(d)]. The teacher is the master/expert to the learners' apprenticeship. Learning occurs through expert/novice negotiation. For ICT users, the teacher's role is as an intermediary, drawing the learner into the community of computer users. This approach is both people and subject centred and requires a strong focus on purpose of use.

There are some implications for knowledge, classroom relationships and learning outcomes according to the teacher's epistemological and teaching approach which require exploration.

2.3.4 Implications of Epistemological Orientations

Both constructivist and transformation theories emphasis social interaction as essential to learning but how that is perceived is fundamentally different. Relationships can be either symmetrical, between equal ability partners, or asymmetrical, between more and less able partners (Rogoff, 1999). From an individual constructivist perspective interactions between learners of the same ability are seen as helping learners to decentre and review knowledge. Knowledge is thus acquired through learner/learner relationships. Light & Littleton (1998) highlighted a flaw to this concept arguing that individual experience and subjectivity ensures that partners can never be totally equal. This could be particular problematic in adult classrooms where learners bring a range of previous experiences with them (Knowles et al, 2005). Topp (2002) suggested that as learners work together to solve problems they can alternate between more and less able partner as each contributes to the discussion. Thus it could be argued relationships can never be symmetrical; there will always be a ‘slightly more able’ or ‘less able’ partner.

In contrast social constructivist and transformation views of knowledge draw on Vygotsky’s work in which he argued that learning is promoted by asymmetrical relationships. Vygotsky (1978) described the Zone of Proximal Development (ZDP) defined as the distance between the actual and potential development. Thus learners could reach a higher developmental level with a more able partner, either a teacher or fellow learner, than they could on their own. This presupposes that what a learner could do today with help he would be able to do by himself tomorrow (Vygotsky in Curzon, 1997:110) and that as comprehension and skill increase support can decrease. Mercer and Fisher (1998) argued that ZPD was limited in classrooms as groups of individuals would have varying points of ZPD and that sufficient dyadic interaction between teacher and learner was impossible. This argument appears to view learning in a transmissive teacher/learner context and is weakened when viewed in social constructivist or transformative terms as here the more able partner could be any community member and is not teacher/learner dependant. Further, Moll and

Whitmore (1998) argued for a 'collective' ZPD in the classroom. They concluded that ZPD was a zone where learners engaged in collective activity within the classroom cultural environment. One example in ICT classrooms would be whole class construction of a database or web page. This could enable participants to contribute to a collective activity and achieve levels of expertise they could not accomplish individually. It assumes that what a learner can do as part of a group today he would be able to do for himself tomorrow. Such collective activity could be particular relevant in a transformative approach with its concern for community knowledge.

In addition to these social interpretations assigned to epistemological approach there are two additional implications for the adult ICT user context. The first is that categorizing approaches over simplifies the teaching/learning process and is in danger of simply replacing one orthodoxy with another (Pratt, 2002). ICT user skill needs can be envisaged as multifaceted (Clarke 2006; iSkills, 2007) therefore requiring a complex and versatile teaching approach with degrees of overlap (Pratt et al, 2001) between epistemologies. Taking a pluralistic orientation, Pratt and Collins (2001) argued five core perspectives of teaching: 'Transmission', linked to instruction; 'Apprenticeship', concerned with realistic tasks and demonstration; 'Developmental', concerned with helping people think about content using effective questioning and 'bridging' of knowledge; 'Nurturing' linked to caring about learners; and 'Social Reform', concerned with the pursuit of social change. They envisaged teaching as incorporating all five standpoints in varying degrees depending on context. The differing perspectives were neither good nor bad (Pratt, 2002) in themselves but rather were inter-related (Collins et al, 2003) each was a legitimate view of knowledge when enacted appropriately (Pratt, 2002) and conversely had the potential for poor teaching if enacted inappropriately. This multi-epistemological perspective offers a more holistic approach supporting multi-approaches encompassing all elements on ICT's three-dimensional model for skills and knowledge [Figure 1.8]. But it envisages teacher's role as multi-faceted (Day and Pennington, 1993; Day et al, 2006) requiring reflexive practitioners able to draw together the many strands of theory, practice and subject to select most appropriate approach in a given context.

The second concern is that discussion about the varying views of knowledge is generally constructed against the backdrop of children's education. Adults might be argued to have different cognitive or emotional needs. For example Meadows (1995) suggested that adults, as developed thinkers and mature learners, did not need the 'scaffold' support of a more able partner that children require. Arguments surrounding concepts of adult versus children's learning have been ongoing for many years. In recent times much of the debate has focused on Knowles's (1990; 2005) concept of andragogy. If adult learners are perceived as distinctly different learners then this could impact on the way that knowledge, teaching and social interactions are perceived and thus enacted in the classroom. Given the adult learning focus for this research perceptions of adult as learners, especially in the ICT context, need to be explored in more detail and will be the focus for the next section of discussion.

2.4 Adult learners and ICT

Originally Knowles (1984, 1990) saw andragogy as the 'art and science of helping adults learn' and pedagogy, the 'art and science of teaching children' as two parallel theories. He emphasized six core characteristics that he felt defined adult learners: 1) 'learner's need to know', adults need to know why they need to learn something; 2) 'self-concept', learners are self-directing; 3) 'prior experience', learners come with a greater background experience than children; 4) 'readiness to learn', adults know why they want to learn; 5) 'orientation to learning', focus on life needs and problem solving; 6) and 'motivation to learn', makes them more focused. In practical terms Knowles felt pedagogy to be focused on relaying content to the learner and strongly teacher-centred, typically relying on lecture, presentation, assigned reading, demonstrations and drill of prescribed exercises. Andragogy focused on process and was learner-centred with the teacher as a facilitator, procedural technician, resource person and co-inquirer (Knowles, 1996). For Knowles the teachers' critical function was to create a rich environment from which the learner could extract learning. These two opposing images have strong links with transmissive (pedagogy) and constructivist (andragogy) orientations to learning; although in the latter case concern was for individual rather than socially constructed knowledge.

Over the years Knowles has been criticised for his definition and use of the word andragogy (Davenport, 1993), lack of clarity about whether andragogy is a theory or set assumptions about learning or a theory or model of teaching (Hartee, 1984), for his use of ideas from different and opposing therapeutic traditions (Smith, 2002), for focusing on the individual and not on the practical basis of adult learning (Hanson, 1996), and for failing to address the diversity of learners, instructional contexts and changing work needs (Young and Lucas, 1999). But in terms of andragogy as a discrete theory of adult learning perhaps the most damning criticised has come from Knowles himself. As teachers began to adopt Knowles's ideas he concluded that andragogic principles could be used successfully with children and that in some circumstances, for example when the subject matter was completely unfamiliar, adults required a pedagogical approach (Knowles, 1984; Knowles et al., 2005). Knowles (1984) subsequently outlined pedagogy and andragogy as two models or approaches, conceptualizing them on a continuum (Davenport, 1993; St Clair, 2002). Such an approach might imply that andragogy was not uniquely a theory of adult learning but rather a theory of instruction (Cross, 1981; Hanson, 1996), and Rachal (2002) concluded there could be degrees of 'andragogy-ness'. This perspective aligns andragogy with Watkins and Mortimores' (1999) 'conscious activity' to 'enhance learning', and the andragogical/pedagogical debate to other oppositional discourses already discussed such as training/education or weak/strong purpose of use. Thus teachers' 'degree of andragogy' might be as much to do with teacher-centred and learner-centred orientations, depending on the context of learning, as to do with the differences between adults and children. Rather than a discrete science for adult learners, andragogy, thus, becomes simply another lens by which to examine pedagogy.

The discussion here is not concerned directly with perceived differences between adult and child learning but rather how perceptions of adult learners might be enacted against perceptions of ICT as a subject and contexts within which it is taught. The question to consider is where ICT teachers might stand on a pedagogy/andragogy continuum against understandings of adult learners' subject needs.

2.4.1 Adult learners and Subject

ICT can be viewed as a technical subject and in the case of user skills as practical, hands-on and a basic skill. Its relative newness as a subject means that learners are often perceived as unfamiliar with, or even fearful of, equipment and software. Knowles (1984) suggested that when learners were entering a new area of content, were confronting a machine they had not seen before or in basic skills classes a pedagogic approach may be more appropriate. He also concluded (Knowles et al, 2005) that learners in technical subjects may be less likely to learn in a self-directing manner, while Donnelly (1999) argued that the andragogical model is better suited to the 'soft' skills required for discursive content areas such as history. This would suggest that user skills with its possible association with mastery of machine and low-level skills might be regarded as requiring pedagogical, transmissive teaching approaches. Margolis (1984) and Boud and Prosser (1984), however, argued that a degree of andragogy-ness was also applicable in technical training. Further the integrated nature of user skills (Foley et al 2002, Clarke and Englebright, 2003) indicates that generic, 'soft' skills and high-level cognitive skills are important which in Donnelly's (1999) terms calls for an andragogical approach. This suggests a dualism within ICT user skills. Sfard (1998) similarly concluded that the acquisition and participation metaphors could work together; arguing that each has something to offer that the other could not. But this dualism could create tensions for skill acquisition and learner self-concepts.

Skill acquisition: Learners in ICT user classes are often new to specific software or computer skills, especially at the start of courses. Selinger (2001) highlighted problems with trying to cope with using a new computer program to complete a task at the same time as learning the procedural skills to use that program. This implies that as Ramberg & Kerlgren (1998:120) suggested 'superficial' aspects need to be 'emphasized and fully appreciated'. In other words as Gibson (2001) concluded low-level drill-and-practice might be an appropriate strategy when introducing new skills or concepts, to build awareness or reinforce habits. Such low-level orientation to subject culture is also implicit in Dreyfus and Dreyfus' (2005) early expert levels. Lack of awareness (Foley et al, 2002) of ICT's potential may also make it difficult for learners to be self-directing initially making them dependant on teacher expertise and didactic instruction. The concept of dualism, however, demands that at some point activity must move from acquisition to participation principles. Dualism would indicate that differing approaches to ICT teaching would be observable according to the skills content, stage of programme and the level of study. This concept argues for ICT user skills as progressive, and as the ILP (iSkills, 2007) described moving from low-level to high-level cognitive skills. For Knowles (2005) this transfer of approach needed to happen as soon as possible so that the learner became increasing self-directing and autonomous, while for Dreyfus and Dreyfus (2005) it was essential to progress to higher expert levels. Development from this perspective suggests the dualism could be non-linear and recurring, that is it moves in cycles of directed or self-directed progressions as new elements of skill are introduced, reinforced and assimilated. Such an approach would require a pluralistic, reflexive teaching approach to deal with ever changing learner autonomy.

Learner self-concepts: Assumptions of self-determination and autonomy are, however, contested. Hanson (1996) argued that in reality adults seemed to relinquish their self-determination in the classroom. She suggested adults are willing to accept an unequal partnership provided the tutor has something to offer to justify their authority which typically was their subject or teaching expertise. Knowles et al (2005) similarly concluded that autonomous adults may choose to learn in a directed way if they perceived this was the best approach to the subject but for him the freedom to choose was critical. One drawback with this supposition is that learners come with preconceptions of learning and subject. For example Hanson (1996) argued adults expected and seem more comfortable with the transmissive approaches because this reflected their previous school experiences. Knowles (1984) acknowledged this phenomenon but countered that it was teachers’ responsibility to orientate the learner to the andragogic model at the start of the course. But this requires teacher commitment and as Rachal (2002) argued part of the confusion over andragogy is that its effectiveness has not been proven. Teachers may be reluctant to implement change they perceive as experimental or their own perceptions of ICT as technical, practical and hands-on might mean that they accept a transmissive approach as most appropriate, especially if they perceive their learners to be attuned to that approach. Learners, and teachers, prior knowledge or experience thus could have a limiting impact rather than enabling autonomous learning as Knowles predicted.

For Meadows (1995) adults’ self-concepts and prior knowledge meant that they were able to ‘scaffold’ themselves through internal dialogue and reflection about their own performance. This argument appears at first to be supported by Staudinger’s (1996) findings that adults who where given a few minutes of solitary reflection after discussion gave more sophisticated solutions to problems. But this presupposes that adults have opportunities for discussion from which to develop their own solutions. If teaching is heavily transmissive there may be little discussion opportunities. It can also be argued that as ICT novices adult learners, especially in the early stages, may need support to help them to direct their thinking in the same way that children as life novices do. Further, that although adults might have generic skills they might require support to place them into the new ICT context or that they may not have the right kind of generic skills. Hanson (1996) questioned whether learners even saw self-direction and reflection as part of their agenda. She argued that, as part-time learners, adults may have limited time to devote to learning and simply want a ‘quick fix’ to achieve the end goal, that is complete the course or pass the qualification. Further that time spent emphasizing reflection might actually lead to failure of that goal. This returns discussion yet again to consideration of the ultimate goals and fundamental aims of user skill; the question remains is the outcome goal for narrow and immediate skills or for wider and long-term understanding.

2.4.2 Adult learners and Context

When Knowles wrote in the 1980s he felt that many institutions had policies, rules and regulations and traditions that were not congruent with the wider andragogical model. Since that time the lifelong learning and new governance agenda have introduced the rhetoric of individualism, autonomy and self-determination to educational institutions (Griffin, 1999b). The onus is on the individual to define their own learning needs, to develop their own learning plan and to decide which courses best fit their requirements. To accommodate this institutions have an obligation to provide flexible, clearly defined courses to suit learners' needs. The current culture of individualism and market forces in education would thus appear to support Knowles' notion of self-directing, autonomous adults.

But, ironically, the market requires transparency and accountability giving rise to structured frameworks and rigid qualification competencies (Edwards, 2002; Griffin, 1999b) which Hanson (1996) suggested leaves little room for learner self-direction. Course outcomes and content may be predefined by course designers or awarding bodies and course choices may be limited by marketability or funding (Griffin, 1999b). This might lead to limitations on pedagogy in two ways. a) Adults, unlike children, have the power to 'vote with their feet' if courses do not satisfy them (Knowles,et al 2005; Hanson, 1996). If teachers perceive learners' aims to be gaining a qualification they may feel their primary responsibility to be helping them achieve test success (Topp, 2002) and 'teach for the test'. b) Ecclestone (2002; Ecclestone and Pryor, 2003) concluded that assessment regimes encouraged teachers and leaders to interpret learning in formalised ways and to adopt assessment purposes, practices and vocabulary. Further, that such compliance was not merely a pragmatic response but became internalised into educational rationale, creating a micro-culture that legitimated assessment knowledge, values, expectations and structures, providing a ‘comfort-zone’ for its participants. Thus despite the rhetoric of individual choice there may be little leeway, or motivation, for learners to define their own learning content.

This should not be taken to imply that learners are a neutral presence in the classroom. Current understanding of adult learning theories (see Coffield et al, 2004; Rogers, 2002; Tight, 2002) and deep-surface learning approaches (see Biggs, 1999; Entwistle, 1987; Entwistle and Entwistle, 2003; Ramsden, 2003) indicate that learners approach the same task differently (Marton and Säljö, 2005) and interpret learning in individualist and profound ways so that learning outcomes cannot be guaranteed. Take for example discussions on deep-surface learning approaches. This is seen as important because approach is associated with outcomes and teaching. Thus many commentators (Entwistle & Entwistle, 2003; Knowles, 1984; Maor & Taylor, 1995; Ramsden, 2003) caution that a traditional, transmissionist approach limits outcomes and that constructivist approaches develop higher quality learning. From research with HE learners Entwistle (1987; 1988; 2003) argued that learners who saw learning as memorising or acquiring facts would adopt a surface approach, that is emphasize knowledge to complete the task. While learners with a sophisticated concept of learning would adopt a deep approach in order to find understanding in materials and ideas. Entwistle (1987; 2000; 2003) also argued that summative assessment could encourage a ‘strategic’ approach where learners organized time and effort, and possibly a combination of deep and surface approaches (Coffield et al, 2004; Entwistle, 2000), in order to achieve the best possible mark, that is ‘learning for the test’. Thus the learner’s own approach to learning could impact on outcome.

One drawback to this kind of categorising of behaviour (Coffield et al, 2004; Entwistle et al, 2003) is that it tends to over simplify a complex situation. For example the integrated nature of ICT skills means that learners may need to memorise procedures as part of the process of developing deeper understanding. Also, like teachers, learners may be influenced by a range of multi-dimensional personal and contextual orientations (Askell-Williams and Lawson, 2006; Beaty et al, 2005) and so cannot be simply categorised as one type of learner or another. A learner's approach may vary during learning depending on factors such as a) perception of needs and intended outcomes; b) depth of interest, previous experience and engagement with the subject; c) teacher-learner relationships; or d) perception of value of elements within a topic. Thus deep learning is increasingly being associated with learner motivation and engagement (Warburton, 2003) and 'powerful learning environment' (see De Corte, 2003; Entwistle and Peterson, 2005). These arguments have similarities to the user participation/engagement arguments [Figure 1.4], in that low engagement is associated with surface learning and limited outcomes, and high engagement with deep learning and high quality outcomes. A powerful learning environment is seen as one that maximises the overall engagement (Entwistle et al, 2003) of learners, design of curriculum and arrangements for learning to lead to quality of learning outcomes. It aims to stimulating interest by placing less emphasis on curriculum content and more on contextual interpretation (Warburton, 2003) and find optimum balance between operational and comprehensive learning. The complexity of the multi-dimensional influences on learning thus requires a flexible, holistic approach.

In summary, user ICT teachers may vary in their positioning along the andragogical continuum depending on a number of factors, for example their personal view of adult education and epistemological orientation, the level of skill they are teaching, the stage and level of learning, and the anticipated course outcomes. The perception of ICT as a technical subject and user skills as practical may emphasize transmissive and pedagogical practice. This could mean that teacher and learners simply accept transmissive approaches unquestioningly; it's how it's always been done. Alternatively there is potential for tensions between teachers and other stakeholders' perceptions that could influence teaching decisions. A teacher's own perceptions of 'good teaching' may be tempered by her perception of the other stakeholders needs namely the nature of the curriculum, test outcomes or learners expectations. Teachers may perceive a need to concede to these demands for fear of alienating other partners, for example learners could leave course if dissatisfied. For teachers this could require a constant balancing act involving practice, aims and outcomes.

Given ICT users possible tri-focus of functional skills (know what), structural skills (know why) and generic skills (know when) a multiple approach may be required. In reality, teachers may need to work in a variety of ways crossing teaching theory boundaries. For new or low-level skills teachers and/or learners may favour transmissionist styles but as learner skills develop teachers may need to adopt a deeper approach to encourage greater reflection and knowledge construction. This image of recurring dualism requires reflective teachers able to interpret and balance practice against theory within context. Teaching is dynamic, as Sfard (1998) noted, no two learners have the same needs and no two teachers arrive at their best performance the same way. So what may work for one teacher in one context may not work in a different context or for another teacher. Teachers, learners, institutions and society generally may all contribute to teaching choices and to successful or unsuccessful outcomes.

The researcher's own teaching background, in Primary and adult ICT, led her to question whether the problem solving approach to ICT that she had used with children might be a more affective way to teach ICT than the step-by-step approach she had seen used with adults. To seek answers, she aims to determine what teaching practices are used with adults, the reasons why, and with what implications. She is conscious that this research requires an open mind to allow the data to emerge from the participants and enable their voices to be heard. At the same time she acknowledges her place in the research process and that her own PCK and experiences could influence conclusions.

To begin she followed Robson's (2002) suggestion that when matching aims and methodology start by clarifying the purposes of the research. The initial purpose is to ascertain practices within the adult user ICT classrooms; this requires a descriptive element to provide an accurate portrait of people, events or situations. The underpinning purpose of that element of the research is to seek new insights into how adults' ICT teachers develop their professional knowledge, to ask questions about teachers' perceptions of influence on their teaching, and to find out what is happening in the relatively new genre of adult ICT user skills. This indicates an exploratory approach. The research aims, however, go beyond exploration by seeking possible historical, political, social or cultural explanations for influences and to consider possible outcomes of practice. This broader mandate introduces an explanatory aspect concerned with interpreting situations or problems. This indicates a tri-purpose focus for this research calling for a flexible and multi-dimensional methodology.

The purpose of the research underpins the strategy and type of information required but more crucially, the nature of the design can influence the types of questions that can be addressed and the nature of the evidence that is generated (Shulman 1986). This in turn can influence the value, legitimacy and trustworthiness of conclusions drawn from the data. Philosophers of science and methodology have been engaged in a long-standing epistemological debate about the nature of reality and knowledge (Patton, 2002). Within research, simplistically, this can be viewed on a framework between positivist and interpretivist. The positivist paradigm is characterised by an emphasis on there being a reality out there to be studied, captured and understood. The emphasis is on ‘hard’ data that can be counted, empirical evidences and structured, often statistical, analysis. In contrast the interpretivist paradigm is characterised by the constructivist concept that reality is in the minds of people and their interpretations (Sarantakos, 1998) and is socially constructed. The emphasis is on capturing peoples’ opinions, feelings and practice in the real-world, ‘natural’, context (Wisker, 2001). Interpretation relies on multiple, cross-discipline analysis structures and inductive strategies going beyond the data. Between the two is the post-positivist paradigm where reality is seen to exist and the researchers job is to find it (Robson, 2002), but it is acknowledged that reality can never be fully understood; only approximated (Guba, 1990). Here multiple methods are used which Denzin and Lincoln (2003) suggested was a way of ‘capturing’ as much ‘reality’ as possible.

It is not the intention of this investigation to define good practice or to measure outcomes but rather to identify what teaching strategies are evident and to offer possible interpretations for varying practice and outcomes. The concern is to understand how teachers may interpret, understand, experience, produce and constitute the ICT user skills classroom (Mason, 2002). The emphasis is on the real world mechanisms of the teaching/learning experience (Robson, 2002) as experienced by it participants. This indicates an ‘interpretivist’, naturalistic approach, concerned with trying to describe and understand events rather than measure them (Guba, 1978). Having determined the approach consideration then needs to be given to the methods to use.

Positivist and interpretivist theory is frequently voiced in terms of quantitative or qualitative research methods. The positivist is often associated with quantitative methods by which reality can be measured, tested, and confirmed or denied. In contrast the interpretivist stance has been allied with qualitative methods involving interview, observation or documents (Patton, 2002). Over the years there has been debate as to the nature of the two approaches and whether they are mutually exclusive or whether, as Tesch (1990), argued they can be mixed and matched. Lincoln and Guba (1985; 2000) stressed that interpretivists were not anti-quantitative and that naturalistic researchers could utilise quantitative methods. Kincheloe (Kincheloe and Berry, 2004) even advocated that qualitative researcher should make use of whatever tools are available to complete the task. The issue is rather one of philosophy. Within quantitative research the researcher uses instruments to measure what is supposed to be measured but in qualitative research the researcher is the instrument (Patton, 2002). And, Lincoln and Guba (1985:198) argued, ‘qualitative methods come more easily to the human-as-instrument’. It can be argued that it is through language and observation that we naturally assimilate and derive meaning of the world around us and thus it is through narrative and observational data that interpretivist researchers seek understandings.

Given the interpretivist emphasis of this research, narrative and observational data seems essential, so a qualitative approach involving interview, observation and documents was selected. The strength of a qualitative research approach is that it enables an exploration of a wide range of social dimensions, including what Mason (2002:1) described as ‘the texture and weave of every day life’. Qualitative research methods have the flexibility to enable the researcher to explore not only the ‘understandings, experiences and imaginings’ of the research participants but also to investigate the ways that ‘social processes, institutions, discourses or relationships work, and the significance of the meanings that they generate’ (Mason, 2002:1). Yet qualitative research can present some challengers to researchers. It can be difficult to define as it has a complex, interconnected family of terms, concepts and assumptions surrounding it (Denzin and Lincoln, 2003). Tesch (1990) identified 27 different categories of qualitative theory, each having separate and detailed literatures on methods and approaches. This diversity can present a quagmire of foci and definitions for the researcher to negotiate. Denzin and Lincoln (2000, 2003) offer an outline of the seven historical movements within qualitative research:

Traditional (1900-1950), Modernist or golden age (1950-1970), Blurred genres (1970-1986), Crisis of representation (1986-1990), Postmodern (1990-1995), Post-experimental (1995-2000) and finally the Future (2000 +). The 'traditional' definition was associated with the positivist paradigm and was concerned with offering valid, reliable and objective interpretations. Since then the focus and arguments for changing qualitative perspectives have been influenced by and can be traced against post-positivist and then interpretivist frameworks. Denzin and Lincoln concluded that the seven movements overlap and simultaneously operate in the present. Thus qualitative research might be conducted at varying points within the positivist/interpretivist framework, although it is generally no longer viewed from a neutral or objective positivist perspective. Such complexity presents this researcher with a range of issues concerning the nature of reality and objectivity, method and responsibility, validity and reliability to navigate each with possible impacts on this research.

3.1 Reality and Objectivity

This research explores what is currently taking place in classrooms and thus the researcher concluded a naturalistic, 'real world' context was important (Guba, 1978; Gillham, 2000a; Marshall & Rossman, 2006). From a positivist perspective this involved the researcher going into the field and returned with the story of the research location and participants. Naturalistic inquiry was seen as 'discovery-oriented', the researcher observed the events as they unfolded naturally and was open to whatever emerged (Guba, 1978). The concern was with finding the 'truth' and observing it objectivity. With the emergence of post-positivist arguments came the concept of multiple realities, that is there can be no one reality to be measured (Rubin & Rubin, 1995) as objects and events are understood differently by different people. Working with teachers' perceptions and interpretations of their teaching situations and learners there would be no 'one truth' (de Vries & Beijaard, 1999) but rather interpretations of data and events to develop possible theoretical frameworks and models of pedagogy in an adult ICT user skills classroom. Crucially, this opens new dimensions to concepts of participation and objectivity. The researcher is no longer an outsider looking in but becomes part of the research location, or event; the researcher as instrument.

The literature suggested that there were complex layers of meanings and influences that impact teachers' decision making. Teachers' professional knowledge derives from their understandings and value concepts gleaned from personal, institutional and wider social experiences. Scheurich (1997) provided a framework comprising four levels from which cultural values might be, overtly or covertly, entrenched: individual, institutional, societal, and civilizational. Teachers' do not work in isolation; the classroom process involves interaction between the teacher and the learner. The learners will similarly come to the situation with their own embedded values, understanding and expectations. Within the observed classroom there is a third partner, that of the observer who will come with her own set of values, understandings and interpretations of events. Each observed episode is thus a tripartite event [Figure 3.1] with

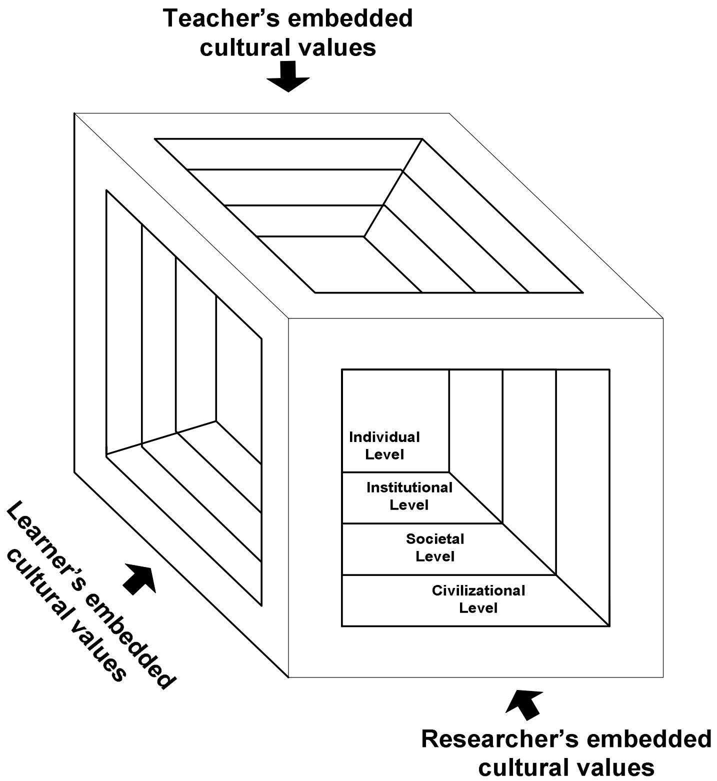


Figure 3:1: Research Value Cube: Embedded levels of cultural values within an observed classroom event

complex layers of meaning for the researcher to unravel. Multiply this ‘value cube’ by the number of observed exchanges within a lesson and then by the number of lessons observed and the complexity and polyhedral nature of the observer’s task begins to emerge. The interpretivist researcher needs to be constantly aware of these layers of influence when analysing and developing meaning from data both in terms of how they may impact on the teachers’ and learners’ perceptions but also how they may impact on the researchers own understandings.

The value laden nature of naturalistic research can be problematic to the researcher. All observations of the world are shaped, consciously or unconsciously, by the observer’s personal perspective of what is valuable or relevant and what can be discarded (Kincheloe and Berry, 2004). What questions to ask and what data is pertinent will be influenced by the personal outlook of both the researcher and the individuals or groups being researched. Just as the researcher makes value judgments about what is important to the research story so can the participants. This may influence what they say or do during the data gathering process. This could lead to flawed or bias findings as only the evidence the researcher or participants want might be sought or found, and contrary views could be dismissed or ignored. It was assumed that such dangers could be overcome by the researcher remaining neutral, reflective and objective.

Perspectives since the post-positivist recognize that it is impossible to have completely value free research and that researchers are not neutral (Patton, 2002). The researchers’ values feed into the inquiry process by their choice of research problem, paradigm and theoretical framework, data-gathering and analysis methods, context, treatment of values already resilient in the context and the format for presenting findings (Lincoln and Guba, 2000). Thus Kincheloe and Berry (2004) argued even positivist research can not be said to be value free. Patton (2002:433) described the ‘human factor’ as qualitative inquiry’s great strength and weakness, ‘a scientific two-edged sword’. The strength of value positions is that it is what drives research on. This researcher's values and beliefs from her own teaching experiences raised the questions, and advanced the ideas and arguments on which the research was based and expanded (Marshall & Rossman, 2006). She could also use that experience to bring diverse view points and concepts to ideas to encourage contrasting stances, and to recognize multiple value positions (Guba, 1978). The weakness is that bias may not be immediately obvious or recognized. The significance of data not matching the researcher's concepts may be missed or misinterpreted. This could affect the integrity of the data and subsequent analyses and conclusions. Unsound research can distort findings and issues, and lead false trails for the researcher and others to follow.

For this research the implication of the human factor is that the researcher needs to be reflexive. She needs to be aware of the social conditions that surround her research and to seek out the wider influences such as cultural, political, historical, linguistic and social powers that might subtly but profoundly influence the research. This is not only in terms of the multiple value levels impacting on her participants but also her own cultural identity. She needs to acknowledge her own subjectivity and reflect critically on the self as a researcher, the 'human as instrument' (Guba and Lincoln, 1981). This involves constantly asking herself 'What do I know?' and 'How do I know it?' (Patton, 2002). A process Mason (2002) called 'active reflexivity' and Reason (1988) 'critical subjectivity', describing it as a shift from objective consciousness to a quality of awareness of subjectivity which should be used consciously in the research process. This is more demanding than orthodox research as it requires a high degree of self-questioning, self-knowledge, self-reflection and engagement with the research process.

Lincoln and Guba (2000) described the research process as a dualism of 'writing up' (field notes) and 'writing down' (narrative). From the postmodern perspective qualitative research goes beyond the capturing of experience and relaying it in text but rather the experience is created in the text (Denzin and

Lincoln, 2003). Richardson (2003) argued writing is not merely the transcribing of some reality, but writing in the form of texts, notes and presentations become the tool of discovery of the subject and of the self and thus forms part of the active reflexivity process. This, it is argued, ‘opens the door’ to the use of far more dynamic, creative, open-ended and complex forms of writing and representing data. But, as Dadds and Hart (2001) observed, for researchers such as PhD candidates too much creativity runs the risk of failure of assessment criteria. For this research therefore the writing process may be viewed as a valuable tool to interpretation and dissemination but could be constrained by academic convention.

3.2 Method and Responsibility

With the appearance of the post-positivist the researcher has been described as a bricoleur. Lévi-Strauss’s (1966: 17) defined a bricoleur as a ‘Jack of all trades or a kind of professional do-it-yourself person’. Denzin and Lincoln (2003) compared the bricoleur to a quilt maker stitching together slices of reality, a jazz improviser creating a complex weave of emotion and interpretation, and the film maker using a montage of characters, images, sounds and understandings blended together to convey meaning. While Kincheloe (Kincheloe and Berry, 2004) saw the bricoleur as a handyperson creatively and imaginatively making use of the tools available to complete a task. These images convey the researcher as an active participant of the research process employing a wide range of interconnected, interpretive practices to find ways to get a better understanding of the subject. The principle understanding is that each practice makes the world visible in a different way (Denzin and Lincoln, 2003) and hence suggests a commitment to multiple data-gathering and interpretive practices in any one study to enable a variety of viewpoints to be explored.

This multiplicity means that the researcher plays varied roles in creation of the research story (Denzin and Lincoln, 2000, 2003). From the methodology, to the theoretical and political understandings, to interpretation, and narrative the bricoleur has an interactive role in joining the research participants and research reader. Such multiplicity implies that the researcher need not ‘swear vows of allegiance’ to any single epistemological perspective (Patton, 2002) but can work ‘between and within competing and overlapping perspectives and paradigms’ (Denzin and Lincoln, 2003:9). Kincheloe (Kincheloe and Berry, 2004) argued for no problem being exclusively an educational, psychological or social concern, but rather forming a ‘seamless whole’. He warned that by fragmenting research strategies and discipline approaches relationships could become destroyed and contexts ignored. The process should therefore remain fluid and unfold naturally. Tesch (1990) further suggested that qualitative researchers resist standardization in order to maintain this notion of fluidity which in part explains the difficulty in defining qualitative research. Research, thus, is envisaged as an interactive process shaped by the personal history, gender, class, race and ethnicity of its participants. The product of this multiple role perspective is a reflexive montage of fluid, interactive images and representations connecting the parts to the whole.

This image of multiplicity also brings with it researcher responsibilities concerning the welfare of the participant and the ways they are represented. The researcher has an obligation not to harm participants. On a practical level this concerns issues such as anonymity, confidentiality and moral and/or legal obligations to keep data secure, while at an ethical level it concerns the reporting and representation of events. This brings with it criticism that a naturalistic approach appears to morally condone what is happening (Wragg, 1999) and could present the researcher with a dilemma if she was to observe inappropriate behaviour she felt unable to report. Responsibility for representation also involves providing fair and balanced ‘voices’. Qualitative research is seen as a partnership between the contributing participants (Reason, 1988). Yet some feminists and postmodernists argue that the researcher dominates the research process (Madriz, 2003), by her power to select the topic, choose methods, propose the questions and create the research framework. To redress this balance this researcher needs to be fair and honest about the way data is collected, analysed and reported. The researcher here is representing the teachers and so needs to be truthful in reporting their views thus allowing the participants' voices to be heard as well as hers. Prejudice in data collection and analyses would be unfair to the subjects of the research, it may not truly represent the participants or their situation, and could even be detrimental if portraying the participants or circumstances adversely.

3.3 Validity and Reliability

The flexible, multi-dimensional nature of qualitative research raises issues for concepts of reliability and validity. Within quantitative research reliability might typically be related to the ability for results to be replicated, and validity to whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure. The naturalistic, multi-reality nature of qualitative research makes replication problematic; no two situations can ever be exactly the same. The human factor makes the variables uncontrollable and unpredictable. Qualitative researchers seek to interpret rather than measure findings. For Silverman (2000) validity in qualitative terms related to the extent to which the account accurately represented the phenomenon being investigated and reliability the degree of consistency in assigning categories and codes. Thus validity and reliability were related to characteristics such as trustworthiness, thoroughness, consistency, balance, fairness and rigor. The researcher becomes 'the instrument' by which the research is measured (Patton, 2002) and credibility depends on the ability and effort of the researcher.

Critics of qualitative research accuse it of being unscientific as it is too subjective and based on 'soft' data. Positivists, according to Denzin and Lincoln (2003), allege that qualitative researchers write fiction not science and that researchers have no way of verifying their 'truth statements'. Such a stance assumes there are 'truths' to be declared, that there is a stable and unchanging reality. For the interpretivist there is no one truth but multiple realities. This and the idiographic nature of naturalistic research raises issues about what researchers can legitimately claim for their research. What appears conclusive in one research environment may not hold true in other circumstances or with other players. What appears a ‘truth’ may only be a ‘truth’ for certain conditions, times or locations. Without care the researcher may, blinkered by her embedded values, find herself declaring value judgments as fact (May, 1993) or of making positivist generalized statements that do not hold true and are consequently of little value. Bassey (2001) argued that it is legitimate for qualitative researchers to make generalizations in the form of ‘fuzzy’ generalizations. The distinction is that a positivist generalization declares that ‘particular events lead to particular consequences’; while the ‘fuzzy’ generalization is expressed as ‘particular events may lead to particular consequences’. By qualifying the generalizations the researcher acknowledges the ‘value’ element of the research process and is declaring that from the evidence and her expertise she offers these conclusions. It should then be up to her audience to determine the validity of the conclusions for themselves by examining the quality of the research and the strength of the argument.

Qualitative research has been defined as inherently multi-method in focus (Flick, 1998) and that this strengthens research by enabling triangulation (Patton, 2002). This has sometimes been presented as a way of proving that data or analyses are correct. Studies that use only one method are viewed as being more vulnerable to errors, such as loaded interview questions, than studies that use multiple methods (Pattern, 2002). This seems to make triangulation a tool for validity and reflect positivist attempts to find the ‘right’ interpretation. Richardson (2003) refuted this concept of triangulation arguing that postmodernists do not triangulate but ‘crystallize’. She used the image of a crystal growing, changing and altering, and reflecting and refracting colours and patterns. Thus different methods are used to collect data on the same thing but look at it from different perspectives which can be compared and contrasted (Denscombe, 2003) enabling the researcher to tell the same tale from different points of view. Triangulation becomes a display of multiple, refracted realities simultaneously. Thus, Flick (1998) argued triangulation is not a strategy of validation but an alternative to validation.

Qualitative research might thus be likened to the mirror ball used in dance halls and the researcher to the specialist who sets it up. The specialist places the spot lights so that as the mirrored polyhedron spins it reflects and refracts shafts of light. In researcher terms this equates to looking at the multi-faceted evidence with a ‘spotlight’ perspective to gleam shafts of enlightenment. But for the observer to appreciate the effect they need to stand back and look at the whole pattern rather than concentrating on each individual shaft of light. In the same way the qualitative researcher needs to move from the minutia of single events and look at the whole pattern. The holistic approach means that the whole is understood as a complex system that is greater than the sum of its parts (Patton, 2002). The specialist, or researcher as bricoleur, can then change the colour or angle of the lights (viewpoints) and observe how these different perspectives affect the observed patterns; triangulation. Finally the specialist can experiment with different shaped mirror balls and repeat the process so that effects and patterns can be compared and contrasted. Similarly the researcher can use different cases or locations to explore consistency or contradiction of emerging theory. By using triangulation, multiple research traditions and theoretical tools researchers can introduce rigor into their research. Research methods thus become more than procedures but are, as Kincheloe (Kincheloe and Berry, 2004) termed it, the ‘technology of justification’, that is the way of defending what we claim to know and the process by which we know it.

3.4 Conclusions

It can be concluded that there are many complex and multi-layered issues to consider when designing research strategy. One of the key questions is: ‘If the audience is to judge the strength of the research and arguments by their validity how could the researcher ensure quality of validity?’ Reason (1988) argued that validity procedures need to come from the researchers and suggested that the researcher preset criteria to systematically apply to each cycle of the inquiry and in particular at the end. Returning to Silverman's (2000) concept of validity and reliability 'accuracy' and 'consistency' are seen as key features for this project.

Accuracy of representation is judged to relate to authenticity, multiplicity and active reflexivity. Rather than conceiving the research process as an input/output mechanism where the researcher develops a hypothesis, uses instruments to measure data and then outputs a theory the researcher here needs to remain mindful that the theory needs to emerge from the data itself. This involves more complex input/output routines. The input is the data which the researcher as instrument shines a perspective on developing a hypothesis as an interim output, which is then tested and retested against new input and changing perspectives. To ensure authentic input data requires honest and truthful ways of accurately recording and reporting what participants say and do. Multiplicity is seen in terms of the multiple research methods, in multiple locations, awareness of multiple value positions and use of multiple analysis perspectives and methods to enable 'crystallisation' (Richardson, 2003) of viewpoints. Ensuring quality of research requires remaining mindful of balance in terms of a) reflection and experience, moving from one to the other frequently; b) between cases, by constant comparison; c) between points of view, by also seeking out 'deviant cases' (Silverman, 2000); and d) between participant and researcher voice, by consciously looking at the whole picture. The latter requires active reflexivity and critical evaluation of data and methods.

Silverman defined reliability as the degree of consistency in assigning category. This work takes this further and concludes consistency is dependent on notions of thoroughness and rigor. Thoroughness links to multiplicity in the form of the multiple roles of the researcher. Awareness of the multiple roles and good preparation is paramount. The multidimensional nature of qualitative research requires flexibility but Berry (Kincheloe and Berry, 2004) warned there is a danger of chaos unless there is an element of self-organization. The researcher must remain systematic and organized in the way that data is gathered, recorded and analysed. Theories, codes and methods need to be carefully defined and rigorously tested and evaluated to ensure consistency and richness of data. For this research project the notion of quality is judged by the integrity and conscientiousness demonstrated through the research design, and the data gathering, recording, analysis and reporting processes.

The research design, taken to refer to the pragmatic aspects of the way the research was conducted (Oliver, 2004), is explored in this chapter under four subsections; participants, methods, tools and procedures. A naturalistic, qualitative, multi-methodology approach was adopted. It involved semi-structured interviews with individual teachers and other stakeholders for instance college managers and learners; loosely structured classroom observations; examination of documents such as lesson plans, task worksheets and manuals, work samples, college policy statements and curriculum material; and learner questionnaires. This multi-methodological, essentially qualitative approach allowed flexible examination and triangulation of the varying influences on practice. Given the research focus on teachers' professional knowledge priority was given to teacher interviews, but evidence from other stakeholders enabled the researcher to examine the whole contextual experience and observe points of triangulation of the varying perspectives, in other words use multiple spotlights. Classroom observations provided evidence of enacted practice, which Atkinson (2004) suggested may differ from perceptions of practice. Collectively, the multi-data sources were examined and analysed to explore interpretations of both perceived and enacted practice, influences and outcomes. Providing development of emergent understandings based on varied and rich data which Denscombe (2003) concluded could improve the research quality.

4.1 Participants

Participants included teachers, learners and some centre managers involved in adult ICT user skills classrooms in a variety of institutions, namely FE and HE colleges, community centres, and company training rooms, in the North East of England. The teachers' ICT teaching experience ranged from 2 to 27 years and for all but one was a change of career. Their previous professional backgrounds were diverse, with only 40% having previously worked in ICT or teaching. The teachers' educational backgrounds were equally diverse but all had some form of teaching qualification. The learner participants were taken from the observed classes and included beginners to advanced learners within an age range of 18 to 70 years and with varied occupational status. The majority of participants were local to the research area of County Durham, Tyneside and Northumberland.

The research phase took place over eighteen months from 2006 through 2007. It involved interviews with 18 teachers covering a variety of courses and skills levels. In all, 18 classroom observations were conducted at 14 different locations under the auspices of 10 different educational institutions. The context focus included 4 FE classrooms, 6 community based sessions, 4 in higher education, 3 in work based context and 1 mixed environment that involved use of an ICT room in a school for use as a local community venue and staff training. This mix of ICT contexts provided variety to the ICT environments explored. Interviews were conducted with 23 learners drawn from observed sessions and represented a cross section of ages, courses, skills levels and employment status. In addition, several learners offered informal comments to the researcher about their motivations for attending courses which were recorded in field notes. The learner questionnaire provided 96 returns from 13 different courses including examination and non-examination courses and an assortment of skill levels and course environments. Interviews were also conducted with course managers in 4 of the institutions, again with mixed context foci.

All data was from teacher taught lessons set in a specific time and place rather than drop-in or distance learning environments. This milieu was selected as teachers may have more opportunity for autonomous activity, direct interaction with learners and be less restricted by the use of printed material than in the latter environments. This implied that there could be more opportunity for variety and independency in teaching styles. The variables included teacher characteristics, student numbers and characteristics, software skills, timings, duration and level of study, and course outcomes. This diversity of environments enabled data to be gathered about a variety of contexts to explore the impact context may have on teaching activity. An alternative approach would have been to concentrate on one type of course, for instance ECDL, in more depth, however it was felt that the greater range of contexts would provide more opportunity to seek patterns of connection between behaviours and influences (Miles & Huberman, 1994).

Initially access to teacher participants was through personal and professional connections usually linking directly to the teacher (Shenton & Hayter, 2004). At this stage the teaching focus and context was not an issue and any contributing information informed emerging models. It was hoped that having made contact with some teachers it would initiate a ‘snowball’ effect leading to further introductions (Patton, 2002). In the event, the ‘rolling’ was limited and opportunities ‘dried up’. Also reliance on the snowball method of sampling alone had the disadvantage of generating an emphasis on similar locations or contexts of teaching and as breadth of environments was required the means of access needed to widen. Information was gathered from course prospectuses as to location and types of courses available in the region and centre managers, as the ‘gatekeepers’ (Shenton & Hayter, 2004) to organizations and teachers, were contacted by letter or telephone requesting possible introductions. The latter more direct approach proved the more successful. Once the aims and conditions of the research had been explained many of the gatekeepers where happy to pass on the request for help with information sheets to their teachers and leave it up to them to make contact if they wished to get involved. This enabled the researcher to link with several teachers beginning new ‘snowball’ connections to other teachers. As the research developed, more selective sampling methods were used to seek evidence to explore particular ideas or to fill gaps in the data for example targeting teachers of a particular type of course for instance CLAIT Advanced. This enabled the researcher to piece together sets of representations and to develop a comprehensive collage from which to retell the story.

Generating participants was not easy and this impacted on the scale of the research. A further concern was that access was limited to volunteers. Participation might therefore be confined to those who had a message they wished to voice or who where more involved teachers. The danger being that certain messages may be emphasized or that the sample did not reflect the diversity of teachers' views. The researcher remained alert to the teachers' motivations and hoped that the varied range of environments and data gathering methods would help to alleviate bias. This element of voluntary participation could be seen to limit the research but teachers' reasons for non-participation also contributed to the research picture. Four main reasons emerged. The first was associated with what the teacher perceived as 'fair' on the learners, for example one teacher felt that her learners on an introduction course would be embarrassed and distracted by an outsider's presence. This suggests teachers' emotional knowledge impact on their decisions. Teachers were given the option to participate in interview alone without involving learners so reluctance may have also been connected to teacher own emotions. This was evident when one teacher who had allowed access to her classroom declined a further visit to an alternative session as she felt her partner teacher would be uncomfortable with an observer in the room. Teachers may feel threatened or unnerved by the presence of an observer, perhaps because that presence is often associated with assessment and judgment processes. The third reason given was teacher workload attributed to an approaching OFSTED visit or examination marking. Finally it was also suggested by two of the centre managers that it was asking a lot of teachers on contracted hours to commit time for interview, for which they would not be paid, especially as many had full time jobs as well. Such practical reasons may hint at institutional pressures on teachers and possible links to concepts of professionalism. If these reasons were replicated widely it could explain why participation offers were low.

Informed agreement to conduct research was obtained verbally from institutions and in written form from the teachers and learners involved. One problem for the researcher was how much information about the research's aims should be divulged to participants. The researcher's aim was to explore current practice rather than effect change. The concern was that if teachers were fully aware of what was being observed or the researcher's own view point, there was a danger that they could 'tailor' responses and activities to provide the evidence they felt were required rather than those associated with normal practice. It was thus concluded that the participants required enough information to understand why the research was of value without indication of a specific direction for responses. The participants were told that the research was exploring how ICT skills were taught and what influenced teachers' decisions to add to understanding of good practice. It was emphasized that no additional preparation or procedures from normal lessons was required and that the observer wished to see everyday activity [Appendix B1]. Participants were assured that no names or direct reference to location would be published. This was to ensure the security of the participants and to help them to feel free to express ideas without fear of recrimination. Data was stored securely in lockable filing cabinets and within password protected documents on computer. It is the intention that all named material will be destroyed once the PhD publication and assessment process are complete, or within 5 years if research leads to additional publications.

4.2 Methods

A multi-methodology was used including interviews, classroom observations, documents, and learner questionnaires. It drew on qualitative, naturalistic data of the complex, flexible social environment of the classroom (Simpson & Tuson, 1995), through multiple participants and contexts (Gillham, 2000a). This allowed the research spotlights to be varied and results to be explored from differing angles.

Interviews: As the intention was to explore practice through teachers' knowledge it was felt that interviewing teachers was a useful way to find out what they felt and thought about their world (Rubin & Rubin, 1995). A semi-structured approach was selected as it is both flexible and standardized (Drever, 2003; Gillham, 2000b). Every interview was 'unique' and personal to the interviewee and yet covered essentially the same ground as other teachers interviewed. Questions were designed to gather data on biographical information and perspectives on subject and pedagogic knowledge in the context of the individual's teaching situation. This type of information was important to interpret the impact of teachers' backgrounds, subject and training experience on teaching styles and provide insights to the participants' value culture. Discussion also took place at the end of observed lessons with the aim of gathering more insight in the rationale for choices of teaching and learning methods and activities. This allowed dialogue on the researcher's and teacher's shared classroom experience (Brown & McIntyre, 1993). This was important to enable the researcher to fairly represent participants, especially where perception of practice and enacted practice seemed to diverge.

Interpretation of the teachers' perceptions alone did not appear to provide sufficient depth to determine influencing factors. Teachers do not work in isolation, other stakeholders such as learners, providers and awarding bodies all contribute to the teaching environment. It was thus felt to be necessary to interview some college managers and a number of learners to offer alternative triangulation refractions (Richardson, 2003). The original intention was for learner interviews to be conducted as focus groups. It was felt that this would allow a number of learners to be interviewed in a time-efficient technique and encourage interaction and discussion to generate ideas in more depth (Bell, 2005). Due to learner commitments, it proved impractical to arrange time outside the classroom schedule for interviews, however, teachers and learners were often happy for learner interviews to be conducted individually, informally in the classroom or during coffee breaks. The stakeholder interviews were semi-structured and designed to gather data on alternative perspectives on the teaching process and influences that may impact on teachers' decisions in the classroom. The emphasis of the college manager interviews was to determine what influenced the types and nature of courses offered. For the learners, the emphasis was on motivations and objectives of learning and which teaching/learning activity they found most helpful and why.

Observations: Teachers perceptions of practice and the reality of practice (Atkinson, 2004) may differ so it was necessary to also observe classroom practice first hand. The strength of observation was that it gave the researcher direct access to social interactions and a permanent and systematic record by which to enrich and supplement other data (Simpson & Tuson, 1995). The researcher was conscious that her presence could affect responses. Observation was non-participatory to ensure minimal intervention. It was emphasized to teachers and learners that practice should be as natural as possible. The use of observation was to record the reality of practice by observing what teachers were doing and saying in real-life (Wisker, 2001). It also enabled the researcher to share the classroom experience, to become the research tool.

Examination of documents: Examination of documents such as lesson plans, task worksheets and manuals provided more in depth data about enacted PCK and about lessons not observed by the researcher. Used along side other data documents helped developed insights into assessment methods and learning outcomes. The researcher had to remain mindful of how the documents were produced and used when interpreting meaning or representation (Mason, 2002). College policy statements and examination and curriculum material enabled the researcher to explore stakeholder voices beyond the immediate classroom. Such materials could also provide background information and understanding of issues that would not otherwise be available (Hopkins, 2002) for example comparison of primary evidences, such as examination objectives, against teachers' perceptions recorded in interview.

Questionnaire: The aim of the questionnaire was to gather data from the learners' perspective on learning objectives and outcomes. This enabled the learners not participating in interview to be canvassed and provided limited quantitative information on learners' characteristics, expectations and needs. As part of the research 'value cube' [Figure 3.1] some knowledge of the learners' intentions and subject understandings was essential to support research interpretations and conclusions. But this survey provided only limited information on learners' intentions and needed to be used in conjunction with other data, such as interviews, to be of value.

4.3 Tools

A digital recorder was used to record all interviews. This freed the researcher from the task of note taking, enabling her to really listen to, observe and interact with the speaker (Gillham, 2000[b]; Mason, 2002; Rubin & Rubin, 1995). The interview recordings could then be downloaded and saved for reference and interviews transcribed for future analyses. An interview schedule was developed (Drever, 2003) so that the outline of discussion was standardized for each interview and to ensure that the researcher did not omit areas of interest [Appendix B2]. Video recording of classroom activity, enabling a permanent record of events, was briefly considered. It was rejected as a) impractical, due to issues of cost, equipment availability, researcher technical expertise, and flexibility of location and; b) potentially disadvantageous to participants, as it could make them feel uncomfortable, or expose identities thus raising issues of security and confidentiality. Instead, field notes were used to record episodes using loosely structured, descriptive notation (Simpson & Tuson, 1995).

The development of the research tools was a process of planning, testing, observing, reflecting and revising (Wisker, 2001) largely during a pilot phase prior to the main research period. This involved trailing of interview questions with colleagues and teachers, followed by full interviews and observations on three teachers and their learners. The purpose of the pilot period was to test tools and analyses procedures to ensure validity. Validity was taken here to refer to the accuracy of the research tools to enable the researcher to actually discover the type of information intended (Schensul et al, 1999). For example to check whether interviewees interpreted questions in the way that they were intended (Foddy, 1993) or to decide the most accurate way to record observed events. This pilot phase also acted as prelude to research and signposted many of the issues that where to emerge in the later research phase.

During initial trialing two teacher interview questions, concerning the teacher's role and ICT skills, were found to be too open ended, making it difficult for interviewees to define meaning. The researcher looked for alternative ways to help focus teachers' responses. To resolve the question on teachers' role it was decided to use teacher metaphors as a starting point for discussion. These were drawn from Claxton's (1990) work because the researcher was already familiar with these images and they lent themselves to visualization [Appendix B3]. The disadvantage was the Claxton's constructivist orientation meant that the accompanying descriptions had to be adjusted to try to neutralise any bias (Foddy, 1993). It was left to the teachers to impose their own interpretation of meaning on the teacher images. To further develop discussion beyond the offered images the teachers were asked to suggest metaphors of their own. In this way it was hoped the metaphors would trigger discussion rather than dominate it. To address the ICT skills question a ranking activity was developed. The teachers were asked to rank a list of possible statements as 'Essential', 'Desirable' and 'Less important' to achieving '…effective application of ICT systems and devices by the individual' (ESF, 2004) that is the definition used by the European e-skills forum for user skills capability. By repeating this exercise first from the teacher's own view point and then from the perception of the syllabuses she worked to, responses could then be recorded and later analysed in conjunction with resulting discussion. During subsequent pilot phase these revisions proved to generate some interesting and pertinent responses from interviewees and so were adopted permanently.

A similar process was used to test and review the learner interviews and questionnaire. These two generated some minor changes, for example the learner schedule had to be revised to suit single participant interviews after the focus groups proved to be impractical. The teacher images were again used to trigger discussion on teachers' role from the learners' perceptions, thus providing an alternative spotlight on the same research face. From this piloting interview schedules and the questionnaire were formulated [Appendices B2, B4 and B5]. Space was included on the schedules for the researcher to note comments about nuances or visual clues to accompany the interviewees' verbal responses and to record points to which she wished to return (Gillham, 2000b). These ensured important points were not missed out and that the whole interview experience was recorded thus developing a conscientious and thorough research approach.

One area of concern emerging from the pilot was that the research breadth and multiple data generation methods required a means of tracking teachers, locations and documentary evidence. The researcher needed to be self-organized. Tracking and recording tools were devised to track and record activity for each teacher. Details from the tracking record were also entered on a password protected Microsoft Access database to enable the researcher to quickly recall details and activity from multiple teachers or contexts. The tracking record and database also recorded interviews with learners or other stakeholders associated with the teacher, and documentary evidence gathered from the observation. It was originally assumed that many teachers would work in a variety of venues and across a range of ICT courses requiring multiple observations but this generally proved not to be the case. The majority of teachers, with a few exceptions, were observed in only one environment. The tracking document also provided space for research ideas, theories or observations to be recorded as part of the emerging research analyses.

4.4 Procedures

As with the pilot phase the research phase involved a recurring process of planning what to look for; action in the form of interview, classroom observation or document viewing; observation and recording of activity; and reflection on meaning which could lead to refocusing or redirection of effort. The latter often involved a return to literature to reaffirm interpretations or seek alternative theories. The research process was thus envisaged as a recurring spiral (Wisker, 2001), Figure 4.1, in an iterative process (Rubin & Rubin, 1995) of action and critical analysis. Thus although the researcher worked with interview schedules these were not rigidly adhered to but acted as a guide to ensure constancy and coverage of substantive points (Gillham, 2000b). The researcher had an overall idea of what she wanted to find out but was not locked into a fixed agenda (Rubin & Rubin, 1995). Ideas emerging with one interviewee, for instance 'teachers see the difference between adults and children learning as a difference in motivation', were explored with other teachers in different contexts to test and expand or reject.

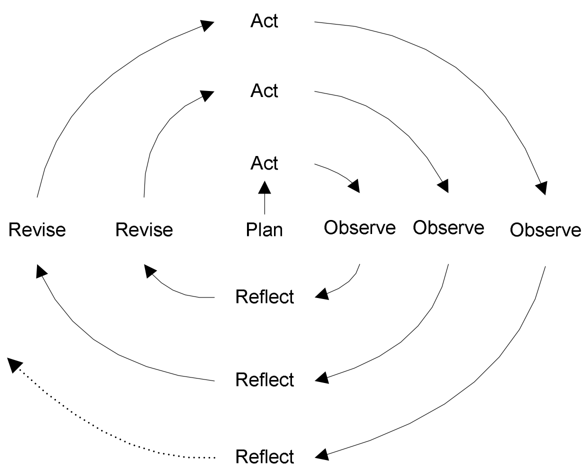


Figure 4.1: Research process spiral

This modus operandi drew on multiple images of bricoleur specifically the methodological, the theoretical, and the self-reflective. The process remained dynamic and fluid as the researcher 'tacked' back and forth between the different components of the design and assessed the implications for theories, research questions, methods and validity (Maxwell, 2005) that is the interpretive bricoleur. Such activity aimed to develop an ethos of thoroughness and rigor to ensure reliability. The procedures for gathering and analysing data were again developed and tested during the pilot phase.

*4.*4.1 Data Gathering

***Interviews*:** Prior to or at the start of each interview, teachers were asked to complete personal background sheets providing information on their own contact details, relevant training and teaching areas and institutional context. This enabled the researcher to become familiar with the teachers professional circumstances and as preliminary data concerning how the teacher's PCK may have been in part developed. Wherever possible, the interviews were conducted in quiet areas away from the classroom at the teacher's convenience. The researcher sought to create a relaxed, 'safe' environment where the teacher would be free to speak her mind and to alleviate some of the perceived power relationships that may attend interviews (Angrosino & Mays de Pérez, 2001). At the same time the researcher avoided becoming overly familiar with interviewees (Gillham, 2000b) which might cloud judgment and introduce bias. The researcher sought a middle ground, which Patton (2002) termed 'empathic neutrality', enabling her to remain in overall control of the discussion and to ensure content coverage within time constraints.

Originally, it was intended that there should be an initial interview with the teacher aimed at gathering data on the teacher's general viewpoint, followed by a post-observation interview to gather more insight into rationale for observed teaching methods. The pilot phase and early research phase proved this second interview to be repetitive with responses duplicating those of the initial interview. Also the teacher's timetable frequently dictated that time was not available for multiple interviews or that the initial interview took place after the observation. The two interviews, therefore, became amalgamated and if necessary the researcher used short, informal discussion at the end of the observation to clarify points.

The interviews were recorded with interviewees' consent and were transcribed in full using transcription tags [Appendix B6]. Following the pilot phase it was decided not all utterances were essential, for example where the speaker started to speak but then corrected him/herself, coughed, or made an aside joke with the researcher. In subsequent transcriptions these types of utterances were only included if they were felt to be pertinent. The researcher concluded that behaving ethically towards her participants did not just mean providing information or gaining consent but also involved being fair and honest about the data collected. She decided, therefore, to give the teachers the opportunity to review interview transcripts and to amend as they felt fit. This ran the risk of teachers vetoing key data but retained the balance of representation. In the event only five teachers, out of the eighteen interviewed, requested transcripts and none of them made amendments.

Learner interviews were conducted with willing learners from the observed sessions, to provide a third perspective on the shared event of the taught lesson (Brown & McIntyre, 1993). Many of these interviews, of necessity, were conducted in the corner of the classroom which was not ideal as there was the possibility of being overheard which might have inhibited learners' responses. However, as the interviews were largely concerned with learners own motivations, use of ICT skills, preferences for learning and teacher images, and thus not directly related to the teacher and her quality of teaching, it was felt that responses would not be seriously affected. Face-to-face interviews were also conducted with some centre managers. These were more informal in nature and were not recorded. The researcher made notes and transcribed these shortly after each interview.

Observation**:** Observations were with whole class groups for the duration of selected lessons and with minimal intervention. This allowed the observer to be unobtrusive and to concentrate on observing. Consent was obtained in writing from both teacher and learner participants. All learners agreed verbally to the researcher being in the room although four learners declined to take part in the research. Exchanges involving these learners were not included in the observation notes.

To ensure rigor during the pilot phase the researcher trialled various procedures for the recording of the observations to identify the method that most fully captured the ‘real’ experience. She was mindful that it is the quality of the recording rather than the quality of observation that ultimately defines the usability of the observational data (Angrosino & Mays de Pérez, 2001). Methods included: a) Recording time, activity and participants for each time the teacher changed focus or activity. This was concluded to focus too extensively on the teacher rather than the whole classroom experience. b) Recording events with time according to the nature of the event, namely all events relating to teacher interaction with the class on one sheet and those relating to interactions with individuals on another. A similar approach was tried recoding samples of activity as evidence of research themes, for instance pedagogical or andragogical activity. These methods proved to be very cumbersome and would have become more so as research foci developed. They lost the sequence and flow of the lesson and also risked the researcher missing events as she moved back and forth from one sheet to another. c) Recording activity and observations as they happened and included time evidence for significant events or changing of activity. It was decided that the latter provided the most fluid, versatile and authentic recording method. It allowed the researcher to log both teacher and learner activity and to notate with comments whilst maintaining the lesson’s progression. This method was adopted and recorded on the following grid (Figure 4.2).

Time	Observation	Comment

Figure 4.2: Grid used during classroom observations

The observations focused on pedagogic styles, learning activity, assessment procedures and social interactions used to support learning. The structure for observation remained the same throughout to provide matching evidences although the associated comments became more refined as the research progressed and coding emerged. Notes on classroom layout and learning context such as type of institution, software application, course details were also recorded. As were descriptions and comments concerning classroom documents, such as manuals, exercises or completed work samples. This data all helped the researcher to recall and contextualize the observed classroom. Field notes were transcribed immediately following observation before details were forgotten (Miles & Huberman, 1994). Comments included in the field notes or later considered important were included on transcripts in squared brackets after the observation entry [Appendix B7]. These were later coded in more detail using codes that emerged from further analysis.

Questionnaire: All learners in observed lessons were asked to complete a questionnaire [Appendix B5] distributed during the lesson and collected before the learners left the classroom. The immediacy of this approach ensured a high return rate. Out of the 100 questionnaires distributed only the four non-participants failed to complete the questionnaire. Responses from the questionnaires were recorded in a Microsoft Excel spreadsheet. A master worksheet contained all the data for full analysis, but individual summary reviews accompanied each observation transcript. This enabled comparison of learner and teacher objectives for each setting and an overall indication of learner perceptions as part of the researchers' holistic approach.

4.4.2 Data Analysis

Analyses were on-going and started during the interview with the researcher following up ideas as they arose and during the observation with the inclusion of comments. Field notes and interview recordings were typed up and examined to discover points of similarity and discrepancy with developing models (Brown & McIntyre, 1993; Stake, 1995). This included noting expected and unexpected

(Cole, 1994) events and ‘active reflexivity’ (Mason 2002), that is reflection on the researchers own performance or influence on responses. The researcher electronically tagged transcripts with comments using Microsoft Word [Appendix C1] to enable ideas and reflections to be shared with her supervisors. This provided discussion points for shared analysis and enabled the researcher’s view to become part of the data. As a quality assurance measure periodically the researcher and her supervisor would tag a transcript separately and then compare analyses. There was a high degree of consistency in the resulting observations. As the research progressed interpretations were explored and modified against further data and research foci revised or developed as necessary.

From this initial tagging process and from the literature codes began to emerge as the data grew. Data sorting software, Atlas.ti 4.2, was used to help organize and code data. By the latter period of data gathering ‘umbrella’ codes had been identified which linked to four overriding themes: teachers, teaching, learners and ICT skills [Appendix C3]. These were used for initial coding of first-level categories (Miles and Hubberman, 1994). This initial coding provided groups of data to further explore from differing perspectives, that is changing the spotlight to seek different patterns. By this process some codes subdivided, for example ‘Aims’ was found to have two sub-codes of motivational aims and teaching aims that is the wider aims that prompted learners to attend the course and the more immediate aim within the classroom. Within sub-codes, groups or categories could also be defined, for example several different motivational aims were expressed, videlicet skills needed for work, leisure, to help one’s children, to keep up to date, to gain qualification. Thus as the analysis progressed these initial codes were modified and developed and a code plan developed [Appendix C2, C3] and the data continually reviewed and recoded. This constant revisiting of data enabled the researcher to compare what different people did or said, what themes were discussed and how concepts were understood (Rubin & Rubin, 1995).

Grids, diagrams and charts to aid cross-sectional or contextual organization of data (Riley, 1990) were also used. This made data quicker and easier to read and helped the researcher organize her thinking (Mason, 2002). Data was mapped according to concepts and characteristics developed from the literature. So for example the 'motivational aims' were mapped on the grid used in Figure 1.3, while the observational data was mapped against characteristics of epistemological orientation. This kind of procedure was not intended to define or pigeonhole teachers or methods as it was anticipated that teaching activity would extend across a range of theoretical characteristics and would not neatly fall into defined patterns or category. The aim was rather to reduce the data (Miles & Huberman, 1994), enabling the researcher to make comparisons and explore areas of emphasis or neglect as a prelude to seeking explanations and further data analysis.

Exploratory Data Analysis, techniques, that is processes and methods for exploring patterns and trends in data using graphs, tables and statistics (Myatt, 2007) were also employed. This statistical approach was not intended to produce definitive evidences as in positivist paradigms. The 'fuzzy' nature of data sets within qualitative research means relevant objects can have varying degrees of membership to a set (Ragin, 2000) dependent on interpretation (Diamantopoulos and Schlegelmilch, 2000), so cannot be definitively defined. Results can only be interpretations and, as Hartwig and Dearing (1979) suggested, need to be approached with skepticism and openness. But they can be a useful additional tool to 'data mine', that is identify 'hidden' patterns and relationships (Myatt, 2007), enabling the researcher to find out more about the data (Hartwig and Dearing, 1979). In keeping with Kincheloe's (Kincheloe and Berry, 2004) call for researchers to use every possible tool, aids such as frequency distribution, scatter graphs and visual representations were developed. For example the responses to the skills ranking activity was mapped according to teacher variables such as ICT background, length of ICT teaching, nature of employment, course focus, and teaching style [Appendix C4(i)], and then according to level of qualification [Appendix C4(ii)]. The aim was to seek hidden patterns linking perceptions of ICT and teachers' backgrounds with practices. These graphical representations were then used in conjunction with interview responses to develop a more holistic and complete research picture.

The documents connected to examinations, in particular, become evident as an area requiring a means of graphically representation to aid comparison. As the research developed qualification syllabuses and test objectives emerged as a strong influencing factor on teachers' classroom practices. The nature of the test objectives was perceived as having the potential to impact on teaching style and outcomes. The researcher sought a tool to analyse the various test objectives to a) define what types of knowledge dimension was evident; b) what levels of cognitive process were emphasized; c) if and how skill level might influence knowledge dimension and/or cognitive process and; d) whether the differing qualifications varied in their approaches.

As part of their learning taxonomy Anderson and Krathwohl (2001) offered a two-dimensional grid, the Taxonomy Table, by which teachers might classify and organize objectives [Figure 4.3] to help them more clearly define learning outcomes. Objectives could be allocated a point on grid by examination of the verb and noun. The verb, the action, related to cognitive process while the noun related to the knowledge dimension. For example in an objective such as 'The learner will be able to apply formatting options in a table' the verb would be 'apply' and the noun 'formatting options in a table' would indicate knowledge of the procedures to apply formats. Thus the objective placement would be cell 3C on the grid. Airasian and Miranda (2002) suggested that the Taxonomy Table might also be used to analyse state-wide assessment objectives, so this seemed a starting point for a possible analysis tool.

Knowledge Dimension	Cognitive Process Dimension					
	1 Remember	2 Under-stand	3 Apply	4 Analyse	5 Evaluate	6 Create
A Factual						
B Conceptual						
C Procedural			X			
D Mets-cognitive						

Figure 4.3: Example of objective mapping using Anderson and Krathwohls' Taxonomy Table (2001:28)

The skills and knowledge model for user ICT was envisaged as three-dimensional [Figure 1.8]. The knowledge dimension having two elements: the practical and the thinking, covering six cognitive process categories. Some of the qualification criteria, in particular City and Guilds e-Quals and OCR CLAIT similarly presented assessment objectives, or outcomes, as practical activity underpinned by cognitive knowledge (e-Quals, 2001a, OCR, 2005a), which seemed to support the idea of two knowledge dimensions in ICT user activity. The above objective, from this perspective, needs to be examined by the verb and the noun but the latter has two elements the practical and the thinking, which may be implicitly or explicitly expressed. The practical element would refer to the procedural knowledge needed to highlight, select and apply formatting while the thinking element referred to the underlining knowledge of the purposes of formatting. A 3-dimensional, rather than Anderson and Krathwohl's 2-dimensional, grid was therefore required [Figure 4.4].

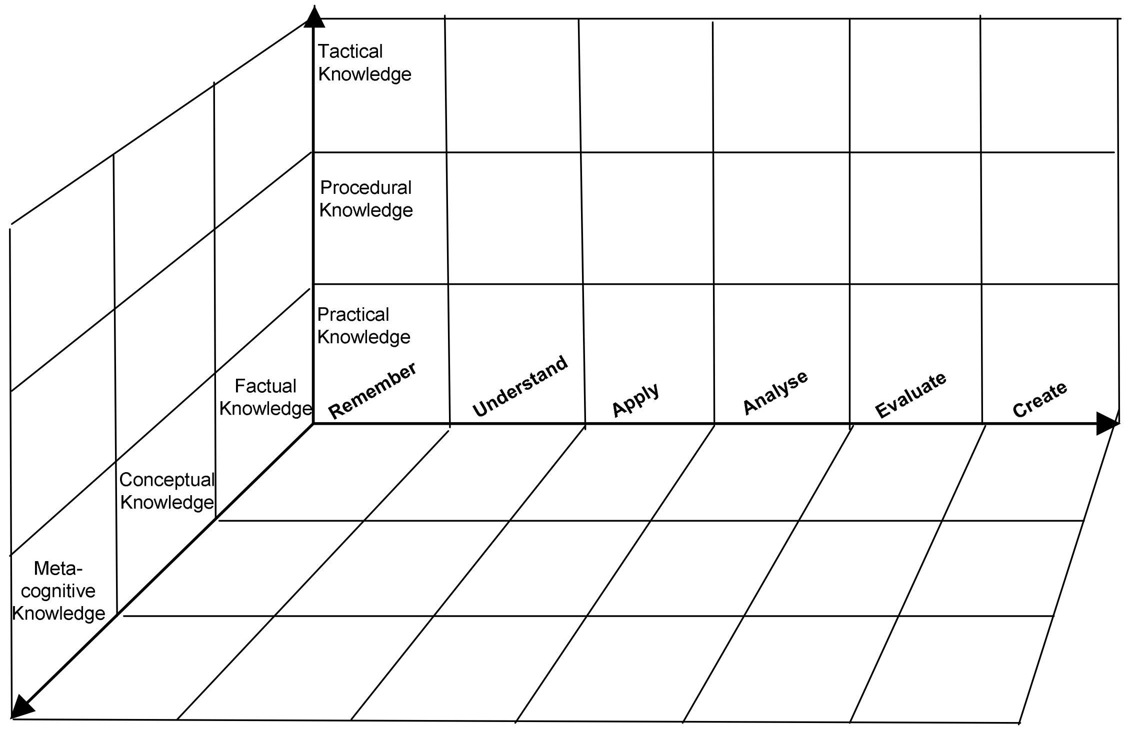


Figure 4.4: Three-dimensional grid to track user skills objectives

By assigning numerical values, for example 1-6 for the cognitive process and 1-3 for the two knowledge elements [Table 4.1] objectives could be quickly allocated a position on the grid according to the level of cogitative process and knowledge dimension. Thus the above objective would possibly score '3' for 'apply', a '2' for the procedural steps to complete the task, and '2' for understanding of formatting concepts. This would enable each objective to be mapped and positioned on the grid. Then using 3-dimensional mapping software a graphical representation could be created to enable comparison. Several modules from differing awarding bodies and differing levels of award were examined and mapped. Then a verification process with a second assessor was conducted. It quickly became clear from this process that there were concerns involving a) ambiguity of verbs; b) vagueness of outcome; c) misalignment of objective and test activity; d) lack of clear differential and; e) interpretation of content.

Cognitive process		Practical element		Thinking element	
Remember	1	Practical Knowledge	1	Factual knowledge	1
Understand	2	Procedural Knowledge	2	Conceptual knowledge	2
Apply	3	Tactical Knowledge	3	Meta-cognitive knowledge	3
Analyse	4				
Evaluate	5				
Create	6				

Table 4.1: Value system for mapping objective elements

Ambiguity of Verb: Anderson and Krathwohl (2001) had encountered problems with allocating meaning to verbs and warned readers to consider the verb-noun combination. This technique quickly revealed the extent to which the verbs within objectives had varied or confused meanings. For example the word 'create' was found to have at least four different meanings. The first, as in 'Create a document', meant 'open' a new blank document and was concerned with remembering basic practical knowledge. The second involved 'creating' a document from specific given instructions that is 'reproducing' a document. The interpretation here depended to some extent on the level of practical skill. This ranged form typing in text, which simply involved remembering basic practical skills, to recreating a document by recalling a number of procedural routines. The third, concerned objectives such as 'create a chart from a table', meant applying a change to given data which usually required knowledge of procedures and routines. Finally, 'create' could be used to describe an original document generated to complete a problem solving task. Thus 'create' could score 1, 3 or 6 on the cognitive process scale depending on the context of use.

'Create' was by no means an isolated case. Many other actions such as 'add', 'identify', 'insert', 'interpret', 'modify', 'produce', 'perform', 'select', and 'use' were all found to have multiple meanings. Classification problems were particularly noticeable when trying to define whether a verb implied remembering or applying practical skills. This may be in part because Anderson and Krathwohl's definition of 'apply' itself had a duality, defined as 'executing' or 'implementing' [Appendix A3]. Applying a procedure to a familiar task would imply a lower level of cognitive process than applying a procedure in an unfamiliar situation. The former requires recall of procedure while the latter may require analysis or evaluation of task to decide what procedure was required. It might be expected that judgements could be made about the nature in which the verb was used but vagueness of objectives compounded this duality. For example 'use formulae to calculate percentage' might vary from the formula being given so the learner only has to type it into a cell to the learner developing and applying the formula for himself. Interpreting the verbs' level of use proved quite problematic and required reference to test texts and assessment material.

A further complication occurred due to the nature of ICT vocabulary. Words like 'group', 'sort' or 'preview' were found to be used in ways that required a lower cognitive level than might normally apply. Typically to group or sort items would imply an element of understanding or analysis but when applied to an electronic activity, for example 'Sort lists' or 'Group drawing objects' then it involves remembering procedural routines which could require little conceptual knowledge to complete. Similarly 'preview' might typically be used in the context of critique or evaluating but in an ICT context is often used simply to mean 'show a page as it will appear in print' and only requires remembering basic practical knowledge.

Vagueness of outcome: Often objectives were vague and non specific, for example 'create graphs'. There is no indication here of what procedures or level of skill was expected. To interpret such objectives required multiple sources, for example test papers and marking criteria. But even then the learning outcome was not always clear due to the prescriptive and procedural nature of the tests.

Misalignment of objective and test activity: Even where the underpinning knowledge was expressed at times there appeared to be a misalignment between the stated objective and what was tested. For example using ‘create graphs’, objective 3a Unit 2 ‘Manipulating Spreadsheets and Graphs’ in CLAIT Plus (OCR, 2005a), the underpinning knowledge for exploded pie charts was expressed as ‘understanding the importance of emphasizing particular data …….. distinguish between pie charts, line graphs and bar/column charts’. The test task example read ‘Using the **Total** number of guests from each **Country** create an exploded **pie chart** …….. Pull out the smallest sector of the pie chart so that it is further away from the rest of the chart’ (OCR, 2005b). While the marking criteria referred to penalisation for ‘failure to select the specific graph/chart type’ (OCR, 2005a). The intention of the objective did not appear to match the examination task or assessment criteria. Ultimately the test was assessed on whether the learner could select the exploded pie chart option from a list option, and was related to procedural activity only. The learner could simply have followed instructions, without any understanding of the rational for using a pie chart as opposed to other graphical representations, or of the importance of emphasizing data, and they would still have passed the test. The underpinning knowledge was assumed and was never tested directly. This misalignment meant that each objective could not be taken at face value but needed to be cross referenced against the appropriate test questions and marking criteria to ensure comprehensive interpretation of meaning.

Lack of clear differential: In some cases, for example OCR Text Processing Levels 1-3, there was very little difference in the wording of the objectives for different levels of qualification. Here the qualification aims and list of knowledge, understanding and skills for each level was almost identical (OCR, 2006). The verbs and nouns used remained essentially the same and differentiation was only possible by exploration of test task or assessment criteria.

Interpretation of content: Without care and cross referencing it was difficult to ensure that objectives were interpreted honestly. On the one hand, there was a danger that taken at their face value some objectives may be allocated greater depth of cognitive meaning while others may be undervalued. Wrong allocations would undermine the reliability, *id est* consistency, of the findings.

The process revealed some interesting and valuable data; the problems outlined may themselves be of significance in influencing teaching practice and are discussed in more detail in later discussion. But the level of ambiguity and lack of clarity highlighted the possibility of lack of consistency in interpretation thus cast doubts on the reliability (Guba, 1978; Schensul et al, 1999) of this method of analysis. Distortion was possible due to inconsistency, misinterpretation and variability of scoring both for an individual analyst and between analysts. The concentration on the verb/noun relationship perhaps put too much emphasis on the vocabulary used rather than the context. This quantitative approach had limitations and another analysis method was required that included a more holistic approach.

An alternative way to analyse and compare test material was therefore required. The researcher returned to Clarke and Englebright's (2003) tri-fold knowledge for effective computer use; Functional knowledge, Structural understanding and Generic skills. Functional knowledge was seen as those skills needed to carry out the task, both the low level practical skills and the higher level procedurals skills. Structural understanding allowed the learner to predict how to do things, involving both factual knowledge and the higher level conceptual understanding of systems and structures. Generic skills went beyond the immediate computer skills and knowledge and emphasized the tactical knowledge and meta-cognitive knowledge required for applying skills and understandings. By adopting this tri-knowledge dimension the need to define the level of skill was removed making judgement easier and more reliable. Competency goals could be directly allocated to one of the three knowledge dimensions.

The test tasks also had an application dimension. For Anderson and Krathwohl (2001) working within academic contexts the level of application was not differentiated, but here the application level and context becomes far more crucial. All activity in user ICT is concerned with application but the nature of that application could vary according to the cognitive process dimension and level of learner autonomy in completing the task. The ambiguity of the verb ‘apply’ needed to be addressed. During the qualifications analysis, three levels of application had become evident. Level one applied to executing; carrying out procedures to familiar problems. Activity depended on remembering routines and procedures to complete a directed task from which there could only be one correct answer. Level two was concerned with implementing; applying procedures to unfamiliar problems. Here activity required understanding and perhaps analysis of a problem to complete a task successfully. The learners may be given task direction but needed to complete an element for themselves, for example construct the correct formula to be entered in a spreadsheet. There was only one correct result but the means of achieving the result could vary. Level 3 was concerned with problems in context. Activity was concerned with problem solving independently and learners’ solutions were individual and unique, see table 4.2.

Application Level	**Application type**	**Cognitive process**	**Example**
Level 1	Application in familiar problems	Remember	Italicise the whole of the second paragraph
Level 2	Application in unfamiliar problems	Understand Analyse	Create a formula to calculate the profit for the pears and oranges
Level 3	Application in context	Evaluate Create	Produce a spreadsheet specification from the user description

Table 4.2: Levels of Application

Thus tasks could be plotted on a grid [Figure 4.5] according to the tri-knowledge

Level of Learner **Control** →

Skill ↓

Application Dimension		***Level 1***	***Level 2***	***Level 3***
Cognitive Process Dimension		Remember	Understand Analyse	Evaluate Create
Knowledge Dimension	***Functional***			
	Structural			
	Generic			

Figure 4.5: Grid used to record test task objectives

dimension and tri-level application using Anderson and Krathwahl's noun and verb approach but with a greater emphasis on task context. The analysis of objectives alone had proved to be unreliable but this new approach used the tasks, that is the test questions, as the analysis focus with reference back to the stem objective and forward to the assessment criteria in a triple-examination process. It was anticipated that there would be a relationship between the level of application and the type of knowledge. Functional knowledge relating to level one application and remembering, structural understanding to level 2 activity, and generic skills would be required for level 3 activity. It might also be concluded that as skill level increased the level of autonomy would rise, that is learners would be able to problem solve independently as their functional skills improved. This revised approach was again trialled by the researcher and then with colleagues and was found to be simpler to use and more reliable. There was a much higher degree of agreement on the placement of task objectives which enabled comparisons to be made on differing tests types and levels.

As with data gathering certain ethical issues emerged concerning analysis. The researcher needed to be constantly aware of the place and influence of values and remain critically subjective, open and sincere so as not to prejudge situations to fit personal agendas. During this research, the researcher has gained an unique knowledge of perceptions of teaching of ICT user skills to adults and throughout the rest of this thesis there is a duty to try to represent that knowledge as accurately and fairly as possible. When presenting the finding and arguments she needed to bear in mind that the participants' values, judgments and opinions were as valid as hers and to record and present them in a balanced and faithful way. But ultimately the research belongs to the researcher (Orna & Stevens, 1995), the conclusions and interpretations that follow will inevitably be influenced by her voice as well as those of her participants. As the intention is to open dialogue, rather than to seek definitive answers, a dual voice can be a strength rather than a weakness (Talburt, 2004).

4.5 Strengths and Weakness of Design

In concluding this chapter, it is worth reiterating briefly the possible strengths and weakness of the research methods. The qualitative approach has massive potential as a way of exploring a wide range of dimensions of the social world, including the 'texture and weave of everyday life' (Mason, 2002). Through this approach the researcher can delve into the understandings, experiences and imaginings of the research participants and the ways that processes, institutions, discourses and relationships impact on them. The evidence emerges from the teaching/learning stakeholders themselves rather than from the researcher. An insider's rather that outsider's view of what is happening in the ICT user classroom (Blaikie, 2000; de Vries & Beijaard, 1999). It would be difficult from such a perspective to define good teaching practices but such research can add new, contextualised information to the discussion about good teaching.

The multiple method approach enables triangulation of perspectives on how teachers' PCK knowledge is developed, maintained and enacted. Through interview the researcher could find out how others feel about their world and to gain understanding of experiences and reconstruct unobserved events (Simpson & Tuson, 1995). Classroom observations are key to contextualising that information in the appropriate social setting. They not only enable the researcher to gain understanding and insights into how different people perceive and interpret events but also to see how they behave and interact with others in specific context (Simpson & Tuson, 1995). This taken together with examination of documentary evidence provides a rich source of diverse data for triangulation that strengthens the research's scope and validity.

The researcher's own educational background ensured that she was quickly able to relate to and immerse herself in the ICT user environment and maintain an enthusiasm for the research topic. But care was needed to ensure that her own views, expectations and values did not introduce bias into the data gathering and interpretation processes. She needed to remain mindful of her responsibility to faithfully report her participants and ensure that their voice was heard. While neutrality may not be possible, balance was in part achieved by techniques such as supervisor and peer review during analyses, and critical review of activity and reporting.

There are, however, some limitations for the research. The first is its scale and the means of attracting participants. The number of participants was small, and as participation was voluntary not all teacher or learner views or needs can be assumed to have been covered. It was hoped that the range of environments provided a snapshot of the differing contexts of user activity but should not be considered as complete or universal. The second is the qualitative nature of the research means that it is not possible to make categorical conclusions or statements concerning ICT user classroom activity, although it can provide insights into the nature of and influences on observed practice. It can offer possible interpretations, or 'fuzzy generalizations' (Bassey, 2001) on practice and outcomes. Such observations can be valuable to educational academics, practitioners and policy-makers.

Eighteen classroom observations were conducted in 14 different locations involving 17 teachers (T1-T17), T18 was not observed teaching. This included a number of different learning contexts including HE, FE, community, and work-based sessions with both qualification and non-qualification foci. The teachers similarly were of mixed ages, experience and backgrounds [Appendix D1]. This chapter aims to describe the practices observed and explore the teachers' perceptions of practice. It is concerned with the research question: What teaching practices are evident in the adult ICT user classroom and under what circumstances? This chapter examines these teachers' various approaches to teaching and learning exploring how their PCK was enacted.

5.1 Teaching Practices

Broadly, the observed teachers approach could be divided into two categories; workshop and whole group teaching. The workshop approach was characterised by individual, hands-on activity at own computer. Learners worked at their own pace through manuals, exercises or their own projects with the teacher in support to resolve problems. Instruction was individual, with one-to-one exchanges predominantly between learner and teacher [Figure 5.1]. But many of the workshop teachers also reported social contact between learners as valuable but pointed out that group work was difficult as each learner was at a different stage in the course.

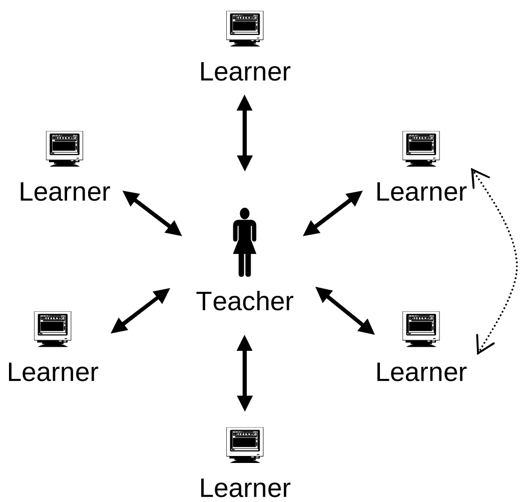


Figure 5.1: Communication focus for workshop classes

Two teachers in particular emphasized how, when possible that is when two learners were working on the same problem, they partnered learners to work together. Both teachers were observed to do this but the reality of the practice proved limited in terms of peer problem sharing. In both cases, the learners sat next to each other at their own computers and so were two to three feet apart. In both cases, they ended up working independently and then comparing results at the end of the task. The very nature of the ICT classroom in terms of size and equipment seemed to make communication difficult and inhibit working exchanges. Other learners were frequently observed talking to one another but these exchanges tended to be either brief contacts related to helping a learner to complete a procedure, in other words learners as teacher substitutes when the teacher was not available. Alternatively, learners stopped working and chatted casually about non-work related topics. Within workshop sessions there was little or no lesson planning and learners could come and go as they pleased according to flexible, individual timetables.

The whole group approach similarly emphasized individual, hands-on computer experience. Here there was a developed lesson plan which the teacher controlled. Typically this consisted of a recurring pattern of teacher led, whole group demonstrations using an interactive white board, followed by individual practice time [Figure 5.2]. During the demonstration stage the learners frequently sat at their own computer, often copying the actions as the teacher performed them on screen. Learners did ask questions but the group was spread around the room so peer discussion was restricted. Exchanges were generally between teacher and individual learner with the remainder of the class listening to responses. The follow up working pattern was very similar to the workshop approach with the teacher relating one-to-one with the learners as they had problems. As all the learners were at the same level, there was more exchange of ideas between learners but no deliberate partnering or grouping of learners was observed. There appeared to be only limited collaborative problem solving. For example in T2's lesson one learner twice left her own computer to go to help another learner but the teacher quickly interceded making the exchanges brief. The group focus appeared to be directed at social activity rather than working collaborations. Social interaction was described by T17 as making learning worth 'turning out' for and by T2 as making learning less intimidating as learners learnt from each another. But essentially, as with the workshop approach, the communication focus remained largely between teacher, learner and computer.

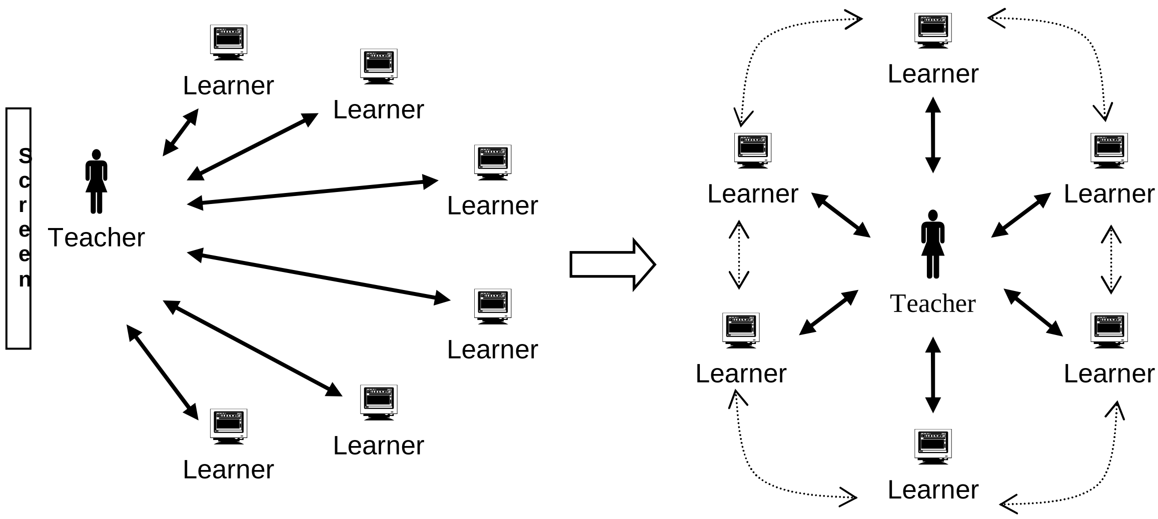


Figure 5.2: Communication foci for whole group teaching

In both these approaches there was a strong emphasis on the individual learner and his computer. This individual-learner/individual-computer approach has perhaps a more fundamental restriction to peer communication than classroom set ups. The teachers' prevailing belief appeared to be that ICT was practical and as such requires concentration of effort on operation of the machine. As one teacher said:

T4: I'm working more with a technical sort of thing rather than cerebral

The observed teachers seemed to construe ICT as hands-on; each learner was only learning when actively using a computer. Only one group of observations showed a markedly different approach to teaching and this was with three teachers in Higher Education (HE) using a whole group approach but with small groups, typically with 3 to 6 learners. Here the teacher and learners where all part of the group. The learners took it in turns to control the computer connected to a plasma screen. The teacher provided support but this pattern changed as the lesson progressed so that other learners took over the technical support role with the teacher only intervening when needed. The task was also shared and negotiated by the whole group [Figure 5.3]. This approach was partly influenced by the fact that due to its expense there was only one copy of the software available so that it was necessary to share the computer. But when one of the teachers was asked how he would prefer to conduct this lesson he replied that ideally he would like two or three computers so that he could split the learners into smaller groups and have them working together at a computer. His overall approach remained that of group problem solving and removed the individual-learner/individual-computer emphasis of other observed ICT teaching.

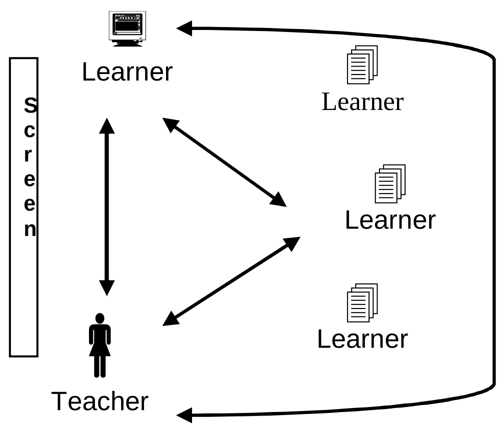


Figure 5.3: Small group communication focus

The possible reasons for and implications of this differing approach will be explored in more detail later in this chapter but first it is valuable to examine teachers' motivation for selecting differing approaches. To seek possible contextual links, the teachers were mapped according to approach (workshop or group), context (work based, FE, HE or community), focus (test or non-test based), and prevailing teaching style according to Ramsden's (2003) tri-theory [Appendix C5]. No clear patterns emerged linking choice of approach to teaching style or context, apart from the cluster of transformative HE teachers. Transmissive teaching was most evident within community teaching but the sample is too small to be able to attribute direct links. Choice was felt rather to be related to a) teachers' underlying perceptions of adult learners' needs or wants; and b) practical issues like course organization and available equipment.

5.1.1 Adult Learners' Wants

Teachers from both approaches suggested that the choice of approach was due to being what their learner's wanted or expected

> *T8: [workshop] A lot of my students don't tend to care for group work, they like to do it for themselves.*

> *T17: [group] And that's the way that we teach and that's the way that it's always been here because that's what our learners expect.*

Yet it seems difficult to see how the learners would be able to differentiate prior to attending the class. Compare the following two groups, one using a workshop and the other whole group approach. They were taught within five miles of each other, during the day, in school classrooms under a community education umbrella and aiming for ECDL qualification. Class sizes were roughly equal at 9 and 8 learners respectively. In both cases age was distributed fairly evenly in the three age categories over 37, each comprising 2 males and the remainder females. The only distinguishing feature seemed to be that the workshop group had a higher percentage of learners wanting the qualification 'for work' while the whole group class had a high percentage of learners wanting to 'find out more about ICT'. This might lead one to suppose, therefore, that learners carefully choose courses which matched their aims and the way they wanted to learn.

However, neither course prospectus indicated teaching approach so the learners were unlikely to know before hand which approach was used. Several of the learners even commented that they had no prior knowledge of how the course would be taught. Even if they had, as one centre manager confirmed, this could not be guaranteed as teachers were free to teach as they wanted. Generally the learners seem to be happy with either approach. Several of the workshop learners said that they were glad the teaching was one-to-one and that they could work at their own pace

L: [workshop] I would advise anyone to learn by this method because it's quite relaxed and you work at your own pace.

L: [workshop] I like being able to sit in front of the computer with a book at your own pace.

L: [workshop] I hoped we weren't all going to have to work at the same level, at the same pace sorry, because I think that puts pressure on.

but the whole group learners were also happy with their approach valuing group dynamics and not identifying pace as a problem

L: [group] ….. we've all worked together getting things off each other. So [name of teacher] has gone through it with us been we've been able to keep up…….. and we've been able to, like, work as a team as well. And I think that's good as well.

This indication of satisfaction with the approach to teaching may be because learners feel a loyalty to their teacher or perhaps because learners just accept the given approach rather than deliberately choosing it. However, it seems likely that it is the teachers' or institutions' perceptions of learners' wants, rather than the learners', that determines which approach is used.

Like the learners above many of the workshop teachers emphasized that their learners wanted to work at their own pace and not be slowed down by others.

> *T8: [working as a group] slows them down. And I know that I don't like to be slowed down either, having to wait for people who are slower to catch up. And some people are just wanting to race ahead to get their things done, so that's come out as the main reason people don't like it. They think it's interrupting what they could be doing.*

These teachers saw the one-to-one teaching opportunities of the workshop approach as the best way to deal with individual learner's needs and differentiation.

> *T7: ….. how we are teaching really it's all one-to-one. I think that's - you can concentrate on what that person needs. If you're teaching the whole class, in my view, you concentrate on that, but he might know and he doesn't and he knows half. So you're not tailoring it to their individual needs, you are with one-to-one, yea………. They [learners] sort of dictate what they want to know, how much in depth. Takes them differently that's the beauty of one-to-one. Teaching at their level.*

> *R: Why have you chosen that approach?*
> *T15: For the simple fact that you've got people at all different levels and ability. With IT it's very, very hard, I think very hard to keep everybody at the same level.*

About half of the workshop teachers described introducing new courses as a group but after a week or two as learner differentiation began to emerge reverting to the workshop approach. These teachers seem to view learning as a linear activity; the learner had to get from A to B and progress was to do with the speed of the journey. Or as one teacher put it

> *T14: ….. like a personal race where they all start on the starting blocks and then continue through the workbooks and they all work at different paces.*

This implies learning is a progression in which each learner's journey is the same, only the speed might vary. Such a view makes differentiation problematic. The argument goes that to keep learners together as a group you have to stop the fast movers from going forwards by giving them additional practice exercises at the same level, or you have to move slower learners on before they are ready. But for many of the workshop teachers that was unacceptable,

> *T15: They want to come out to do some form of IT qualification and I think it's wrong to keep the fast learner at the same level as the slow learner and vice versa.*

T8 explained that she had recently recent attended a course that meant that she now interpreted differentiation in terms of difficulty of task rather than speed

> *T8: I'd been taught that differentiation meant giving someone larger handouts and making extra exercises and now the swing's been towards differentiation in the difficulty of the tasks. Everybody gets the same but the task gets harder, harder and harder, and you stop at the point that you can do to in the time or ability that you've got.*

But even here she seemed to perceive the journey as essentially the same merely extended for more able learners. T16 rather emphasized learning as a process than a journey. He used 'open-ended' tasks enabling learners to develop individual solutions, thus making each learner's journey different. This approach was perhaps made possible because T16 worked in a non-examination environment. T8's subsequent remarks showed that for her, the need for learners to 'get through the exam' meant that initially everyone had to experience the set path and then the more able could 'do that little bit more' taking them beyond the examination competencies.

For examination courses an additional problem arising from the 'race' approach was also observed; that is some learners completed the set course ahead of others and wanted to take the test. This meant that in all observed workshop, examination orientated classes there was a 'rolling examination' process. While there may be advantages to learners to be able to sit the test when ready and move on to the next stage, this impacted on the social conditions within the classroom. Not only did test-takers need to be found seats away from the remainder of the class but the non-test-takers had to remain quiet thus constraining social interaction. Examination flexibility was cited as a reason for using the workshop approach but was also perhaps contributory to restricting interaction encouraging individual and isolated activity.

5.1.2 Adult Learners' Needs

The majority of the teachers advocating the workshop approach argued that it enabled flexible, independent learning. They felt this to be a feature of adult learning. Some of the teachers had direct experience of teaching children and argued that young learners needed structure but that adults were more motivated and therefore required less structure.

> *T4: With children I tend to use much more structured - umm, starter, you know you have a starter; you explain what's going to happen that day. You perhaps do a lot more showing them how it's done on the overhead, step by step…… Whereas with the adults, it tends to be a bit of a more 'suck it and see' sort of thing.*

> *T5: Again making a comparison an adult learner, post 19, is a more an independent learner. You can basically give them something and you*

> *know that to the best of their abilities they're going to work towards and try and improve on that. Where a 16 year old, where basically you spoon feed them a lot and it's more motivation for them. Where you've got the motivation built in with an adult learner.*

But there was a contradiction here. In practical terms the workshop learners had a high degree of flexibility and independence. During observations learners were seen to arrive and leave sessions as they pleased and teachers seemed happy for them to stop working and chat or go for coffee as they wished. Yet many of the workshop courses, especially those based on examinations, relied heavily on course manuals and prescribed practice exercises. The progression route through, and the content of, these materials was very rigidly structured with step-by-step instructions [See Appendix D2(i)]. From the observer's viewpoint, it seemed that rather than thinking independently these adult learners were simply following a set route and had little control over course content. Their 'academic' flexibility seemed constrained to the speed with which they travelled from 'a' to 'b'. One-to-one exchanges meant that learners might acknowledge different sights along the way but generally were not encouraged to wander off the track to experience other sights or to explore beyond the syllabus. In fact to do so could mean that they lost time or that they missed an important landmark that could impact on examination performance. Thus, ironically, the workshop approach enabled practical independence that is the flexibility to come and go as one pleased, to work when one wanted, and at ones own pace, but it did not necessarily enable independent, flexible learning.

The workshop approach was not always so rigidly controlled. Working in a non-examination context, T16 used a workshop approach but with totally open-ended tasks and without text books or exercises. Here learners were developing websites according to their own specifications and needs and the teacher, as with other workshops, was there to help learners overcome problems. T16 felt that this put the learners in control. At least two of his learners, however, seem to struggle with the lack of structure to this approach.

In questionnaire returns one openly declared a ‘more structured learning would help’, while another felt the course showed him ‘what not to do’. This suggests that the le`arners may need some sort of map to help them negotiate the journey.

For the learners in the observed whole group session there appeared to be less practical independence. It was anticipated by teachers and learners that members would arrive promptly and remain for the class’s duration, although learners were not censured for late attendance or early departure. Coffee breaks and opportunities for casual social interaction were largely at the discretion of the teacher. A focus on group activity might be seen as associated with a constructivist approach that is learning as uniquely constructed through social interaction. But, for all but the HE teachers, social interchanges seemed to be viewed from a practical rather than a theoretical stance. These teachers described social activity in emotional terms such as providing camaraderie, making learning fun, or learners less anxious rather than as an element of socially constructed learning. Learners were encouraged to share ideas and support one another but the teachers were not observed to initiate group-problem solving activities nor did they describe such actively in interview. Naturally this does not establish lack of intent, these teachers could possibly perceive learning to be constructed through social interaction but simply did not express it due to interview pressure or the way the questions were phrased, or alternatively they may use peer problem solving activity in unobserved lessons. But in observed lessons learner-learner interactions appeared limited and incidental.

5.1.3 Practical Influences

The ethos or organization of the parent institution might also influence these teachers’ choice of approach. During interview two instructional managers indicated that, while not directly dictating to their teachers, they did encourage them to adopt a particular approach. Both institutions were involved with community classes offered in a number of different venues. Manager A favoured a group approach saying that it was the institution’s ethos that classes should offer more to the learners than they would get learning from home. Thus the classroom experience should be social, fun and ‘worth turning out for’. This seems related to the market need to attract customers and provide value for money.

Manager B favoured the workshop approach for reasons which seemed bound to a market need for consistency, quality assurance and flexibility. Manager B explained that while teachers were free to teach in their own way they were expected to use specific structured course materials so that training was standardized and that learners could be sure to cover the same syllabus, in the same way, no matter what the venue or who the teacher. This approach involved teachers using courseware which was purchased from external agents or developed in-house. Manager B described how their in-house material was developed through team discussion and then written by one or two full time teachers. This process required a huge investment of time and effort. Not only was such a commitment difficult for individual teachers, especially part timers, to duplicate; it also provided further institutional incentive to ensure that the prepared materials are taken up and used by all the teachers in the group. This reliance on ready prepared material meant that a) their creators’ approach became central to course structures; and b) perhaps favoured the workshop approach especially, as in this case, if it was the approach preferred by the course manager. These types of investment and quality issues were also observed in at least two other workshop situations so was not a unique case.

Institutional organizational decisions could also impact on teachers’ choices. To make courses economically viable several providers had merged different qualification courses together so that one teacher taught 3 or 4 different examinations and different skills levels at the same time. Learners could also enrol for courses at any time, especially on courses that ran for a year, so that teachers often had to deal with learners entering an ongoing course with differing skill levels to the learners already in the group. Given this diversity of differential and outcomes it is difficult to see how any teacher could successfully conduct whole class teaching, although small group or paired activity would be possible. It is impossible to tell if managers saw these course mergers as practicable because teachers already used workshop approaches or if teachers were forced to adopt approaches to accommodate amalgamations. But certainly the teachers' perception of ICT knowledge as serialistic, that is developed in a set sequence, and the learners' need as step-by-step instruction make the workshop approach feasible.

This amalgamated and rolling-enrolment approach also impacted on the researcher. It was difficult to clearly differentiate learner's skill level and stage of learning compared to teaching style. Take, for example, T9's ECDL/Advanced group. This observation took place on the 17th of 30 sessions but one learner had been working on modules with the teacher for seven years while another started on the observation day. The remainer of the learners had been attending sessions at various points between the two. This type of variation in attendance and ability was commonplace within the workshop approach, but also occurred in two of the whole group classrooms. It was made possible by the modular nature of courses but, in most instances, made the stage in the course that the observation took place irrelevant.

Practical organizational issues were also observed to impact on teachers. Many of these teachers worked in communal and often restrictive conditions. For example, T14 shared facilities with another group meaning that she felt the need to keep her group quiet so as not to disturb the other learners especially as some could be sitting tests. Several of the teachers shared equipment or classrooms with schools or other providers and were dependent on that provider's facilities. One observed lesson took place in a school library over three levels and involved the teacher moving constantly up and down stairs from one to the other. The cost of ICT equipment was also a factor, for example for the HE teachers the limited number software copies and accompanying equipment influenced their choice of approach. Such practical, organizational considerations were described by or observed to impact on about three-quarters of the participating teachers and possibly could seriously affect the range of appropriate approaches available to teachers.

Within these two underlying approaches five differing teaching foci or styles were identified; ‘procedural’, ‘instructional’, ‘finding-out’, ‘constructional’ and ‘problem solving’. The teacher’s focus was not dependent on their teaching approach. Neither was it exclusive; teachers with a predominantly ‘procedural’ focus could also use ‘instructional’ or ‘finding-out’ methods occasionally. Many teachers had a dual focus for example procedural/instructional or constructional/finding out. The foci intersected the range of styles identified by Ramsden (2003), namely transmissive, transitional and transformative, on the continuum of teacher-centred to learner-centred activity [Table 5:1]. This chapter will now move on to explore and define these teaching styles with the aid of brief examples from the research.

5.2 Teaching Style

The ‘procedural’ focus emphasized the practical skills and procedures to operate the computer and was concerned with functional knowledge. All the teaching types had an element of procedural activity to provide the functional or practical skills required to work the computer or application. This ‘procedural’ focus had a strongly transmissive emphasis. All the teachers relied heavily on step-by-step instructions, either verbal or written, and demonstrations to tell/show learners what to do, especially when introducing new procedures. Teachers, regardless of teaching type, frequently relayed instructions while the learner performed the steps or took control of the mouse to complete to demonstrate actions. The following incidents are from lessons whose teachers’ were at the opposing ends of the teacher/learner centred continuum; firstly a teacher with a predominantly ‘procedural’ style, secondly a teacher with a ‘problem solving’ style:

Teacher Centred	Theory of Teaching (Ramsden, P., 2003)	Types of teaching foci	Definitions		Skill required (Clarke and Englebright, 2003)
↓	**Theory I Transmissive**	**Procedural**	Teacher emphasizes practical skills and procedures to operte computer		**Functional Knowledge** (Mastery of practical skills - tells you how to carry out the task)
		Instructional	Teacher provides detailed explanations of processes and systems		
	Theory 2 Transitional	**Finding out**	***Research***	Learners find solutions to problems from material provided by the teacher	**+ Structural Understanding** (Understanding of application systems and structures - allows learners to predict how to do things)
			Play	Teacher provides initial instruction then learners explore features for themselves	
		Constructional	Teacher uses questioning to encourage learners to recall and explain procedures, systems and structures for themselves		
	Theory 3 Transformative	**Problem solving**	***Structured***	Teacher posses problems and learners use the computer to find solutions	**+ Generic Skills** (Reflection on skills beyond the immediate computer skills and knowledge e.g. design skills, problem solving, analysis)
			Unstructured	Learners pose problems and teacher helps them find solutions	
Learner Centred					

Table 5:1 Summary of observed teaching types and relationship to theory

> *Observation: L calls T across. T looks at work and then tells L how to correct it. "Take that back to 1. Use defaults." T takes over the mouse and makes changes.*

> *Observation: L2 calls T across and asks about anchor tabs and how to deal with a problem on L3's website. T takes over control of the mouse and demonstrates steps.*

The similarity of these examples demonstrates the importance all the teachers placed on the hands-on, practical skills needed to master computer use but also seem to emphasis the teacher as the expert 'holder' or 'demonstrator' of those skills.

Several teachers acknowledged that the learners also required understanding of structures and applications

> *T8: You cannot just spew information out at people and hope that they'll absorb it, because they might pick up the information but they don't have the understanding that they need behind what you're telling them*

One way that teachers sought to provide that understanding was through an 'instructional' focus, that is the teacher provided detailed explanations of processes and systems to further inform the learner. The difference between these two teaching types might be exemplified by the following extracts taken from two workshop groups of learners of mixed age ranges and gender, working on ECDL and ECDL advanced, using course workbooks and preset exercises. The first teacher had a predominantly 'procedural' focus, the second an 'instructional' focus.

5.2.1 Examples of 'Procedural' Focus

- *L2 calls T across to ask a question. T takes mouse and demonstrates what to do.*

- *T then goes to L1 who is having a problem with a formula that requires an absolute cell reference. T suggests they put the formula into the first cell. T + L1 enter formula together. T then replicates the formula to the following cells but the result is incorrect because they have not used an absolute reference. T expands the column so that L1 can see the formulas for each cell in the range. T then enters the correct formula and repeats the process for L1 to see the difference.*
- *T then moves to L3. L3 has a problem because the toolbar has been adjusted and she cannot find the button she needs. T shows L3 how to use the menus to find the right command.*
- *T goes to L1. T points at screen to show L1 which buttons to click to perform actions to apply a sort on a range of cells. L1 makes a mistake. T says, "No, no. Click off it. Right now click on it again. Now drag down the range. Right now click here (points on screen). Okay now drop down list. You can do ascending or descending." L1 performs the actions as T dictates them.*
- *T moves goes across to L3 who is having a problem with saving an email T takes over the mouse and demonstrates how do it.*

5.2.2 Examples of 'Instructional' Focus

- *L10 explains what he is trying to do and shows T what actions he has been doing and explains that it's not working. T looks at the exercise sheet that L10 is working on. T explains that L10 needs to set up a relational database and describes what a relational database is. L10 goes through steps again and T fills in gaps in the procedure explaining why each step is needed.*
- *T goes to L8 who has a problem setting properties in a database. T tells L8 what to set in and explains why. T then explains why primary key is important.*

- *T goes to L6. L6 shows T the results of the practice test. T says that it is correct. T reminds L6 of three steps to mail merge needed for next part of the practice activity.*
- *L 6 leans across and asks T what 'Italian Blue' means. T explains that it is a style. T explains that it is not in the font format and how to find it in style. T goes on to explain the difference between font and style.*
- *T goes to L5 who has a query with a database. T explains about date fields and describes how to update them. T suggests that if L5 forgets how to update he can just delete it and reset it.*

In the first example the teacher offered direct, straightforward solutions while in the second the teacher provided more detailed information of the reasons behind the solutions. But in both cases the style was largely transmissive. It was the teacher who provided the solution, information or descriptions. The teacher expert passed on the necessary detail to help learners complete the task. The majority of teachers observed were 'procedural' to 'instructional' in outlook. The prevailing view of knowledge, expressed by both teachers and learners, described knowledge as being passed from the teacher expert to the learner.

L: [name of teacher]'s got the experience and the knowledge so she's, you know, pulling from what she knows and putting it into us really

T14: For the first one 'petrol pump attendant' yes I am filling students up with knowledge, you know, I've got to make sure that they take in the knowledge that they're doing for the CLAIT.

T7: 'To be able to follow instructions', you need to be able to do that, you cannot learn yourself, you cannot teach yourself you need to following instructions from whoever, whatever from the book or person

L: The tutor is knowledgeable, she knows everything and she's explaining things to us, things I've never known before.

L: Mmm, well they fill us with knowledge, the knowledge that they have which they pass on to us

Yet the last comment here came from a learner whose teacher took a distinctly different view of knowledge. This teacher [T9] was worried that it was easy to 'influence people into closed minds' and preferred to see herself as 'teaching someone to think rather than teaching them what to think'. Her teaching had a 'constructional' focus, that is she used questioning to encourage learners to recall and explain procedures, systems and structures for themselves. The following extract comes from observation of her ECDL class which she shared with T10, a like minded teacher.

5.2.3 Examples of 'Constructional' Focus

- *T9 goes to L1 who is having a problem with a formula. T9 explains that part of the formula is missing and suggest L1 look carefully. L1 looks again and spots mistake.*
- *T9 returns to L1. "Can you see now what happens because of the equals?" L1 nods. "There's one thing missing". L1 looks at the formula. "What do you want to stay the same?" L1 refers back to the question. "Oh, those" and points to the screen. T9 agrees "That's right".*
- *T10 is with L13 who is unsure of next step of the task. T10 asks, "What do we have to do?" L13 looks at task and explains what they are aiming for.*
- *L2 asks for help. T9 asks her to explain the problem. L2 continues, "When you want to do this do you do that?" They talk around the problem for a few minutes with L2 explaining the procedures to complete the task. Finally T9 concludes "And that's the bit you don't*

know. Where do you think its going to be?" L2 suggests which menu might contain the required action. "OK, have a look"

- *Later T9 goes to L1 and looks at formula. "What are you wanting to count?" L1 replies. "No, read it again" L1 looks back at exercise and realises mistake.*

The context for these two teachers was very similar to the teacher with the 'procedural' and 'instructional' focus above. Learning was largely individual, from course materials, with mixed ability and ages and aiming for ECDL qualifications. Yet these teachers' approach was markedly different. They rarely provided solutions for learners but used questions to lead the learners to the solutions for themselves. They expected the learners to provide as much of the solution as possible and where they did help learners to complete a task they were observed to use the 'undo' facility to delete the solution and force the learner to reapply it. This approach would seem to offer a more learner-centred approach as the learners were the ones doing all the work the teacher merely guided. Through this questioning style the expectation was that the learners would develop greater understanding. Yet, within workshop groups, this focus was rare. This was the only example observed. It is difficult to determine why these two teachers might have adopted this different style. T9 was an older teacher with several years experience in teaching, originally in subjects other than ICT, which may have encouraged her to adapt her previous teaching styles to ICT. T10, however, had a technical background working in an IT department of a retail company before becoming a teacher only a few years previously. It is possible that her style had been influenced by working with T9. She, however, suggested that they worked well together because they thought the same, implying that she may have adopted this 'constructional' style regardless.

The emphasis on the learner being active was evident in a secondary style employed by these teachers; 'finding-out', that is encouraging learners to explore systems and find out for themselves. Two differing approaches to finding-out were identified. A few teachers involved in examination courses encouraged learners to ‘research’ prepared course materials to find solutions while other teachers involved in a non-examination course provided initial instruction then let the learners ‘play’ with the application to explore its capabilities. The characteristics of these styles can be explored by again comparing two differing classroom observations. The first, demonstrating the ‘research’ approach, involves T9 and T10 above. The second, the ‘play’ approach, involved a group approach teacher [T2] teaching a non-examination Photoshop class in a community centre.

5.2.4 Example of ‘Research Finding-out’

Most of the teachers using the ‘research’ approach simply encouraged learners to look for information in the printed manuals but T9 had recently invested time and effort in setting-up Flash animated versions of each ECDL modules’ test exercises on her college’s Intranet system, using ‘Blackboard’. This enabled learners, either at home or in the classroom, to access correct working solutions to each question in the test practice exercises. The idea was that if they were having problems learners could view the solution and then copy procedures for themselves. Several of the learners were observed using this system in the class to self-analyse problems and seek solutions. The teachers reported that since using this system they had had better results but could not confirm if the interactive activities were directly responsible. Many of the learners commented favourably on the system

> *L: I particularly like the Internet, the ‘Blackboard’, because you can work from home as well. Also you can look at the actual - [name of teacher] has put files on Flash animation so you can actually see different exercises and go over it and see visually so that helps.*

> *L: I think the main one is on the Internet, the ‘Blackboard’, tutorials that [name of teacher] has set up. Those are a great help. It makes you understand it a lot easier because you’re actually going through it step by*

step. And you can do a test and if you're still not sure you can refer back to it. It's a great boon. It's an easy way of learning and very useful.

L: I don't use the book unless I have to refer - well now and again I'll refer back to things but I'd rather refer back to the tutorial. Yes, it's much easier. I think it's because that she's done it so that you actually have to do it. It shows you how to do it and then you go back and do it how she's done it and it sinks in better.

L: 'Blackboard' - Tutors put video clips of modules on 'Blackboard' so you can see for yourself what you are doing right or wrong without having to ask the tutor. This is particularly useful when working away from the college.

What seems to emerge from these comments is that rather than helping learners use the computer per se these activities are helping learners to pass examinations. They give the learner the flexibility and freedom to work alone and to return to 'correct' test solutions and rehearse the examination route as often as they please. This 'research' method to 'finding-out' has a transmissive element. The teachers and learners are seeking correct answers matched against test criteria. The teacher as test expert holds the knowledge and provides the answers and the learner merely has to find and remember them.

5.2.5 Example of 'Play Finding-out'

The freedom of non-examination courses enabled some teachers to offer a different type of 'finding-out' focus; the 'play' method. T2, a young teacher teaching a Photoshop course, adopted this style. The learners had been using Photoshop to create pictures and were being introduced to PowerPoint so that they could make a slide show of their work. The following is a short extract from this lesson

T2 demonstrates on screen how to set transitions on slides. Ls do it as he explains. Ls click through the different transitions for themselves while T2 talks about different ideas for transition.

After 5 minutes

T2 demonstrates colour schemes. Ls do it as T2 explains and demonstrates on screen.

T2 then shows Ls where to find the animation schemes. L start putting on transitions, colour and animations.

L3 has a query as animations are not working. T2 goes to her while others keep working. T2 explains that you have to click on the object first.

T2 then addresses the whole group to explain that you must click on the object first. T2 then goes on to demonstrate types of custom animation on screen.

Ls continue to work on own and T2 moves round the room helping as needed

Here the learner activity is very open, it up to the learner what they find out and how they apply what they know. T2 valued this ‘experiment and see’ approach and had learnt to use the computer this way himself. This freedom was perhaps only possible because, unlike the examination focused teachers, this teacher did not work to a specific body of knowledge that the learners would be tested against. Instead the prevailing ethos appeared to be to provide the learners with as much knowledge as possible about the capabilities of the application and let them decide what to do with that knowledge. But this degree of freedom might have drawbacks. Without a task focus it is possible learners merely play with the application without thinking about its structure or purpose. For example, the slideshows became so cluttered with effects some learners jokingly complained of feeling nauseous but neither teacher, nor learners, seemed to relate this to the need for good presentational design. It is difficult to know if this lack of discussion was due to the teacher's inexperience or a wider lack of connection between skills and subject.

Finally, two examples of 'problem solving' foci were observed. The first involved the three teachers in HE previous described. Here there was a 'structured' focus, that is the teachers defined and posed the problems and the learners used the computer to find the solutions. The teachers had specific skill areas they wished to cover and structured the lesson to incorporate them. The second example concerned T16, a male teacher using a workshop approach to teach a Dreamweaver course. This had an 'unstructured' focus, that is the learners posed the problems and the teacher helped them to find solutions. Each learner worked on their own project and skill areas were dependent on individual requirements. Again the characteristic of these styles can be compared using lesson extracts.

5.2.6 Example of 'Structured' Problem Solving

This lesson was part of a module for sports degree students. It was an introductory session to bespoke software, used in plantar pressure analysis during walking or running, which the students could use to record and analyse data for their dissertations. The group consisted of six learners and a teacher [T11]. At the start of the lesson the teacher involved the learners by allocating roles, one as 'guinea pig' to be wired up and perform actions, others to attach the equipment to him and another to operate the computer. The computer operator was changed periodically during the course of the lesson. Each learner worked from a handout charting the data required and on which they recorded results. At first the teacher directed the learners with step-by-step instructions and explanations.

> *T11 explains that they have to set up and calibrate equipment. T11 dictates actions as L3 carries out instructions. T11 demonstrates how to connect radio equipment to receiver, step by step, and L2 performs necessary actions on the equipment strapped to L4.*

But as the learners became more familiar with the equipment and task the teacher adopted a ‘constructional’ style, guiding the learners by questioning them then stepping back and letting the learners work out what to do.

> *L5 had automatically saved the second run but now needs to delete it. T11 asks group how they think that might be done. Ls make suggestions and L5 performs actions but procedure does not work. T 11 asks, “What else could you do?” L6 offers a suggestion, L3 tries it but again unsuccessful. T11 says, “What about the minus?” L5 looks at screen and moves the cursor, “What here?” T11 agrees and L5 deletes file.*

Eventually the teacher handed over control of the data gathering, recording and analysis to the learners and only intervened if there was a problem or if he wished to raise a point.

> *L4 repeats jog and L5 saves data. L5 then displays and searches data and gives Ls details as they request it. He needs no help with software this time. T11 stands to the side and lets group work on its own.*

The learners took control of the task and became the ones who supported the computer controller.

The other HE teachers worked in a very similar way but these teachers were the only ones observed to use this ‘structured’, group problem solving approach. The context of these sessions could account for this differing approach. The learners were young and may have had some computer skills already. The teachers, however, reported that some learners had limited computer skill which is why they rotated who controlled the computer to give as many as possible hands-on experience. The group was small but other observed groups were equal in size. The focus for learning was work based and therefore specific but other work based classes were observed which did not adopt this style. HE teachers may have additional educational aims, for example developing problem solving or communication skills, or more opportunity to employ autonomous approaches as their learners are more confident or more able. But, one factor which appears significant is the nature of the subject focus. The subject focus was on gathering and analysis of the data rather than the software. The teachers' concern was to develop sport professionals, not developing computer users per se. The computer and software were the tools to help achieve that goal and more specifically as a tool to manage data. In other observed ICT classes, the emphasis was on 'how to use a computer' but for these teachers the emphasis was on 'how to gather data for a dissertation, using a computer'. The end purpose was explicit and transparent possibly making it easier for the teachers to match style to aim.

5.2.7 Example of 'Unstructured' Problem Solving

This lesson was workshop based but unlike the majority of workshop lessons this was not examination orientated and did not use printed course materials. There were six learners and a teacher [T16]. Each learner worked individually, at their own pace, on their own webpage project. The learners decided how they wanted their website to be and what skills they needed to achieve desired results. The teacher moved around the room acting as a trouble shooter, helping learners solve problems and demonstrating how to use Dreamweaver to create the desired effects. T16 explained that in the past he had used a more structured approach, with taught sessions and handouts, but had found that often learners were spending time learning material that they did not need for the kind of websites they wanted to build so he had adopted this more flexible, individualistic practice.

The degree of this individualism was highlighted by an interesting feature of this particular lesson. One learner who was attending the course for a second time had taken it upon himself to act as unofficial learner mentor. He moved around the room helping other learners as a teacher substitute, when the teacher was busy, or as a partner to problem solving activity. His learning had thus become bound, not just with his own project, but also by those of his fellow learners.

Although this mentor role was not initiated by the teacher, it fitted well with his declared socially constructed view of knowledge.

> *T16: …. this business of underpinnings of teaching as being something to do with the business of interpersonal communication, how people relate to each other and how meaning is generated by these social interactions…… I think this is the* ***crucial core*** *of what this is all about.*

For this teacher knowledge was not passed from the teacher to the learner but was a process dependent on social interaction

> *T16: ……. putting people into situations where they can experience a process that leads them to understand* ***how*** *a particular system works ………. [and] what I refer to as the dialectic, the constant byplay of ideas back and forth between the student and the teacher, student, teacher, student, teacher all the time*

He felt that this put the learner in control

> *T16: and it allows you feel as if it's your process not somebody else's. …….You need to know you're steering yourself through not just the* ***knowledge*** *but the* ***understanding*** *of the knowledge in practical terms, the application of it.*

This teacher had for many years also been involved in teacher training. He had perhaps, therefore, developed a greater theoretical knowledge than many of the other participants which might, in part, explain his developed commitment to constructivist understandings of knowledge. Like T9, T16 was a teacher whose experience covered a range of subjects so his teaching style may have been adapted from his non-ICT teaching experiences.

This chapter has described observed practices in the ICT user classroom. Two underlying approaches, workshop or group, have been identified. Within these approaches a variety of teaching foci have been described and explored. The majority of the teachers were predominantly, although not exclusively, ‘procedural’ or ‘instructional’ in style and concern seemed to emphasis functional knowledge and structural understanding. For these teachers attention to competencies beyond operational skills appeared vague and dependent on individual teacher/learner interaction. A few of the teachers adopted more learner-centred approaches and actively addressed problem solving activities. To explore why there might be these differences discussion will now move on to examine the influences on these teachers’ professional knowledge and their perceptions of the teaching/learning environment. The following three chapters will examine these influences through the teachers’ experience and understanding of subject, pedagogy and context.

This research aims to go beyond a description of current practice and seeks to explore and explain practices from the teachers' professional knowledge perspective. The next three chapters, therefore, move on from what practices were observed, to the teachers' experience and perceptions of teaching as revealed in interview. Discussion is concerned with the two research questions a) 'How did these teachers of adult ICT developed and maintained PCK?' and b) 'How did these teachers construe ICT teaching and what factors informed their vision?' This chapter is largely concerned with the first of these questions in relation to subject constructions. It will first explore how the participating teachers may have developed their professional identity, then how that identity is maintained through CPD opportunities and finally how the teachers' define their subject role. The following chapter will move on to explore the teachers' interpretations of pedagogy and the teaching role. Finally discussion will explore the wider institutional or social influences the teachers described as impacting on practice.

Twelve full interviews [Appendix B2] were conducted involving 14 teachers. Due to lack of time T5 and T6 had a joint interview as did T9 and T10. The sample is small so can only provide a snapshot into teachers' PCK. Exploratory data analysis methods were used to help seek hidden patterns in responses but findings ought to be treated cautiously (Hartwig and Dearing, 1979). They should not be seen as conclusive as a number of 'invisible' factors, such as the method of data gathering and analyse could influence results. The discussion here essentially describes how these teachers replied in interview and the researcher's interpretation of that data.

The teachers' experience of teaching ICT ranged from 2 to 27 years. The majority (70%) had taught ICT for between 5 and 10 years but were perhaps older than these years of experience would indicate, as for all but one this was a second or third career. Only four teachers had experience of teaching other subjects. To explore whether there was a discernable relationship between experience and style, the teachers' years of teaching experience, length of ICT teaching and teaching style were represented graphically [Chart 6.1]. Style was allocated a number between 1 and 5 according to those identified during observation and relative position on the teacher/learner centred continuum [Table 5.1]; 1 being teacher-centred and 5 learner-centred. Allocation was according to the most dominant style observed during classroom observations. It should be remembered that the teachers often displayed use of more than one style and that all of the teachers used procedural, transmissive techniques at some point during observation. They may also use other styles and approaches in other, unobserved lessons or situations.

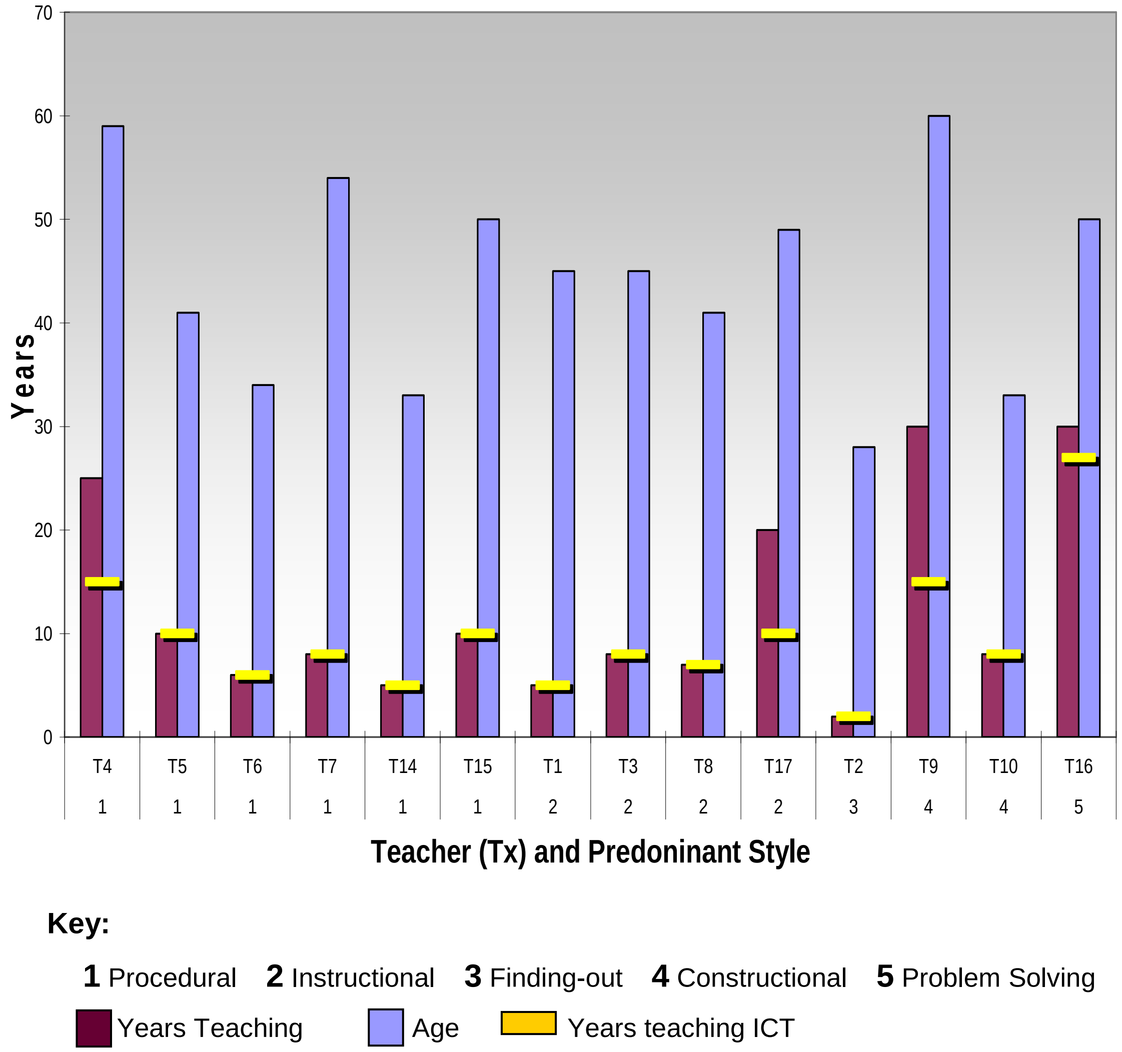


Chart 6.1: Comparing teachers' teaching experience and style

For these teachers there appeared to be no obvious link between years of ICT teaching and style. However, T9 and T16 with the longest and most diverse teaching experience had styles that reflected the learner-centred end of the range. This was counter balanced by T4 who had similar experience but used a teacher-centred style and T10 and T2 who had far less experience but exhibited learner-centred styles. Such differences could be explained by factors such as T9 and T10 working together, or T2 as the most recently qualified perhaps trying out new ideas and theories, or that T4 taught text and word processing courses aimed at typist skills rather than more general computer use. Thus a complex range of factors, other than level of experience, appear to be shaping the teachers' choice of style for instance the nature and type of their previous experience, training or working context, and the kinds of courses they taught. This chapter aims to explore how these teachers' subject and teaching background, training, or subject understandings might impact on their professional knowledge and perceptions of computer user. It will start by examining the teachers' professional backgrounds in both subject and teaching, move on to explore their training and CPD and then explore how the teachers' perceive ICT skills and subject.

6.1 Professional Backgrounds

The teacher participants came from a diverse range of professional backgrounds. Only T2 begun his working life as an ICT teacher but even then his main career focus was in fine arts and he used ICT teaching as financial support. For all the other teachers it was their second or third career. Their previous work experiences were as varied as lorry driver, retail manager, self-employed, secretary, civil servant, and countryside warden. Only two of the teachers had worked as schoolteachers, both with experience of teaching business studies. Three teachers, only 20% of the sample, came from IT professional backgrounds.

The reasons the teachers gave for become ICT teachers related to wanting a change of occupation (38%), seeking new work after being made redundant (39%) or after a change of personal circumstances such as divorce or having children (23%). When asked how they became an ICT teacher phrases such as ‘fluke’, ‘accident’ and ‘it’s an interesting story’ were frequently used. Stories of being in the right place at the right time, knowing people in training and spur of the moment responding to advertisements seem to prevail rather than deliberate decisions to become ICT teachers. The teachers with previous teaching experience seem to have made more conscious decisions to become ICT teachers often motivated by broaden their subject portfolio, thus raising their employability, or because their institution was introducing computers and needed teachers. This is not to imply that the teachers were not committed. The majority of the teachers showed high levels of commitment but these roundabout routes to becoming ICT teachers could suggest that commitment is to the learners rather than the subject.

Adults’ teachers’ professionalism has been argued to be bound to their subject matter (Clow, 2001) but for these teachers there was a multiplicity of subject background. This reflects the myriad of different contexts and situations in which computers are employed and the diversity of use. The majority of the teachers (71%) learnt their initial ICT skills as part of their work needs. However, the ICT work experiences of the secretary are likely to be very different to those of the IT professionals, or the retail manager, or the teachers learning the skills to teach others. Moreover, 29% of the teachers were previously novice computer users who learnt their skills by completing user skills examinations:

> *T3: So I went to a technical college to study IT because I’d never done any IT at all. And I quickly got drawn in by* ***them*** *[college trainers], who suggested I did a teaching course.*

T8: I went and trained and did a few IT courses and liked the look of what the teachers were doing and went on and did a teaching qualification.

T7: And there was an ICT course in the dole office for an extra tenner so I went and did it and I was in the right place at the right time, they wanted somebody to help out. I helped out.

These teachers were neophyte users with no background experience of ICT use. The teachers could therefore be divided into two categories of ICT user 'experienced' that is with previous work or leisure use of ICT, or 'inexperienced' that is without previous work or leisure use of ICT. Both routes appeared to be accepted by stakeholders as equally valid as preparation for teaching yet could perhaps provide the teachers with very different views of what it was to be a computer user. This multiplicity of experience and professional background could create challenges for professional identity for ICT teachers. It is difficult to be bound by a subject identity if that identity is not previously established, is variable or is difficult to define.

The quotes above highlight another element of teachers' professionalism, namely their teaching background. Not only were these teachers inexperienced ICT users, they had no teaching experience before becoming ICT teachers. To help identify teacher experience the term 'greenhorn' will be used to describe teachers who had no prior teaching experience and 'old hand' to describe teachers who had teaching experience of other subjects. In this research sample only 4 of the teachers were 'old hands'. Thus nearly three-quarters (71%) of the teachers were 'greenhorns' whose initial teaching experience was bound closely with ICT user skills. Moreover, a little over half of the teachers had only ever taught ICT user skills. This need not be a problem in itself but given that ICT can be seen as a practical subject related to functional skills this narrow subject perspective could, if combined with a restricted professionality as described by Hoyle (1975) lead to a narrow teaching methodology. The practical, single subject emphasis may not put the teacher into situations that challenge their practices and encourage them to reflect on teaching activity.

Part of an expert's induction to subject is through qualification. It may be valuable, therefore, to explore the types of ICT and teaching qualifications the teachers held and explore if the level or type of qualification affected their teaching style or perceptions of teaching.

6.2 Professional Qualifications

6.2.1 ICT qualifications

The teachers' ICT qualifications covered a range of differing levels on the NQF from 3 to 7. Eight of the teachers held NQF level 3 qualifications as their highest-level ICT qualification. Three-quarters of these were user-based courses such as advanced ECDL or CLAIT, the remaining were low-level ICT trainer courses. One might anticipate that teachers would hold higher specialist qualifications or degrees in their subject, so this level of subject qualification seems low. But ICT user qualifications are only offered to NQF level 3 so these teachers had gained the highest-level qualification specifically for user skills.

There are two implications for this low level of qualification. The first concerns the perception of ICT as a subject. This cut off level perhaps reflects the low status of user skills compared to other ICT courses. It reinforces user skills as practical and thus requiring low-level academic or technical understanding. The second concerns the teachers and their subject confidence. Two 'experienced' teachers with low-level user skills qualifications clearly indicated their concern for their level of subject knowledge. The first felt insecure about his technical base and the second about application knowledge.

> *T1: And I think this is where my clay feet show [laughs] because I'm out of my comfort zone and they're going to expect me to just go [clicks fingers] oh yes that's the answer.*

T15: Mmm. I know. I mean, with CLAIT they have web design in. I don't actually touch on web design ……. I know the basics of it but it's not something I delve into very, very often …… I tend to shy away from it.

Both teachers, however, felt very secure and confident with the ECDL and CLAIT courses that they taught of which they had first-hand experience. But these low-level qualified users were not the only ones to express concern for subject knowledge. T14, a part-time teacher, was an experienced user with a higher-level qualification but lacked confidence with applications she only experienced in class.

T14: And then some of the packages I don't use on a full time basis, I only use them when I come to college to teach them, and if they got stuck on a question would I have the knowledge to the standard that they require to explain why something isn't working or why it works in a particular way. So I maybes lacked a little bit of confidence in myself in my IT knowledge

All these examples emphasized the teachers' need to feel comfortable and confident with what they taught. This need for comfort extended to comfort with syllabus and test procedures. T14 further described how she took on new courses very cautiously

T14: when I first started teaching I only used to do beginners courses because I didn't feel confident enough to go on and do CLAIT and ECDL ……. I was frightened, in case, because I wasn't familiar with the curriculum or the questions.

This building of course repertoire was reported by the majority of teachers and several described being nervous about working with new syllabuses or test procedures. This may indicate that teaching confidence could be as much to do with familiarity with syllabus content and procedures as with ICT skills. From this perspective, teachers with low-level user skills qualifications are not disadvantaged as they have first-hand test and syllabus experience.

The data was examined for relationships between ICT qualification levels and teaching style [Chart 6.2]. Each teacher's highest-level qualification for ICT and for teaching was plotted according to the scale on the NQF and style was coded 1-5 scale as above. Seven of the 8 teachers with NQF level 3 qualifications also had predominantly transmissive, teacher-centred styles, either 'procedural' or

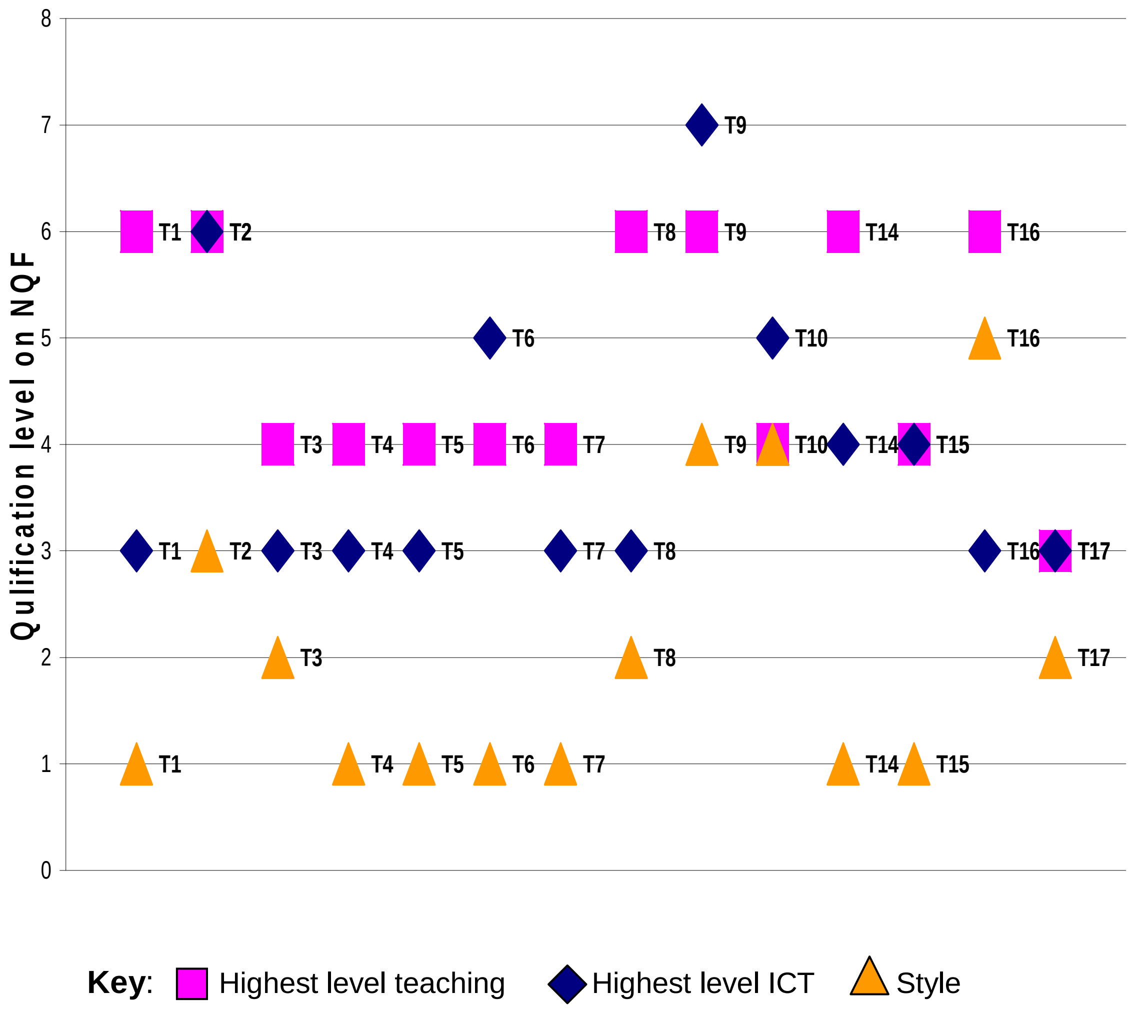


Chart 6.2: Exploring relationship between teachers' level of qualification and teaching style

‘instructional’. The exception was T16 who had a predominantly problem solving style. Despite his low-level ICT qualification this teacher had a high level of ICT expertise, being self-taught over a number of years he regarded ICT as a hobby and therefore was an experienced ICT user. The link between level of ICT qualification and teaching style seemed to be supported by T9 and T10 who had high-level ICT qualifications and high level of learner-centred style. However it was contradicted by T6 and T2 who despite high level ICT qualifications taught predominantly in transmissive or ‘finding-out’ styles respectively, the latter with a high transmissive element in the form of group demonstrations. This suggests there could be other influencing factors on style than ICT qualification. For example T6 was a relatively new teacher and had worked exclusively in a workshop, examination-based environment with two inexperienced, greenhorn teachers, both of whom also had transmissive styles he may thus have adopted their style. T2 was also a new teacher, with only two years teaching experience, and so may have still been developing his teaching style. The data is too narrow to be conclusive, although there appears to be possible link between levels of ICT qualification and teaching style it cannot be assumed that generalizations can be made. Factors such as context of teaching and teacher confidence with subject and/or teaching may also be contributory factors.

6.2.2 Teaching Qualifications

There was less variation of NQF level between the teachers’ teaching qualifications. Half the teachers had a Certificate of Education and 6 had education degrees or PGCE qualifications. The only teacher with a lower teaching qualification was T17 who held two Bachelor degrees and a PhD in non-teaching subjects and had concluded there was little advantage to gaining higher teaching qualifications. There did not appear to be a correlation between teaching qualification and teaching style. T16 with a degree taught in a problem solving style while T1 and T14 also with degrees taught in a ‘procedural’ style.

Perhaps of more significance was the teachers' reaction to their initial teacher training (ITT) courses. When asked how well they felt their training had prepared them for their teaching role all but T2, the most recently qualified, responded negatively.

T1: I don't think it did, really!

T4: To be honest, not a great deal.

T5: The Cert Ed, [shrugs shoulders] yea I suppose it did what it said on the tin [everyone smiles]. But as far as classroom management it's a non-starter. Absolute non-starter.

All of the teachers, including T2, felt that they had gained more by being in the classroom and emphasized the practical experience of teaching.

T1: my teaching skills have improved, more through experience and discussion

T4: The most important things I got out of it were the teaching practice

T14: I think I got more experience when I got out in the classroom.

T17: To be honest my experience prepared me more than the formal qualification, but obviously you have to have the qualification. So from my point of view there was an element of jumping through hoops. Yeah, there was a large element of jumping through hoops.

Teaching skills were described, either implicitly or explicitly, as gained through classroom experience and 'trail and error'. One greenhorn teacher [T1] went as far as to suggest that teaching qualities were within one and not learnt. Many of the participants perceived courses, especially the lower level courses, to be helpful for orientation to the teaching community of practice by providing understanding of jargon, but felt they did not necessarily provide teaching skills.

> *T1: I can speak the language now and that – that //helps me to fit in//[quick] but I don't think that my ……….. teaching improved because of the structure of the lessons that we were having*

> *T6: It gets you in the way of teaching and thinking about teaching and assessment and [short pause] delivery but >*

> *T14: The 730 prepared us with the lingo, it got you practising standing up in front of a group of people, which I found to begin with a little bit intimidating. So that was nice, but the actual **teaching** I think I learnt more once I got my own class and interacted with learners.*

Some teachers felt these types of course to be more practical and therefore of more value than higher-level more theoretical courses.

> *T3: I think the OCR qualifications, the TTAIT and the TCOS, were absolutely brilliant. The Cert Ed more theoretical and although it makes you think about some issues I think a lot of it wasn't relevant to anything I've ever done. Subsequently, the OCR qualifications more practical and I think without them I would have found it much harder.*

> *T16: 730 asked a lot of you, //it asked me to solve problems as I went along// [bangs on table with finger to emphasize words] That was a good preparation for what I was to do later.*

But many of the courses, especially the higher-level courses were criticised for not providing the 'right' skills, although descriptions of deficiencies could be contradictory for example T8 felt there was too little attention on course administration while T14 felt there was too much. For many workshop teachers criticism stemmed from a perception that courses were oriented towards whole group teaching and so did not address their personal teaching needs.

T6: It's not really designed for facilitating classes like we do. It's more the direct tutor lead teaching.

T7: we do two different sorts of classroom. We don't teach standing in front of the classroom. So that sort of teaching I've never had the chance to put into practice,

This latter type of criticism hints at a lack of engagement with theory; these teachers seemed not to apply theory to their different context. Only T2 and T16, who were newly qualified or worked as a teacher trainer respectively, directly related their teaching to theory. The majority of the teachers appeared dismissive of theory. For some it was because they felt themselves to be practitioners and perceived theory to be difficult and not relevant

T4: I'm not a theoretical person I'm a ***doer****. I suppose from - I like the* ***doing*** *of it,*

T15: [sigh] I'm not one to talk in long words or anything like that so I found the jargon, the terminologies and things like that, found that quite hard going.

But for T9 who trained before beginning teaching the problem was that she felt she lacked the practical experience to be able to understand the theory.

T9: an awful lot of the theory, I'm not sure because I knew so little about teaching, that it made that much sense.

When asked if she had considered returning to a theoretical course now she was experienced she replied that she could see no reason too, perhaps again indicating a low value given to theory. From his experience as a teacher trainer, T16 took a dual approach to training. He argued that good teachers could provide trainee teachers with a ‘superb training’ experience but that the educational process could be too concerned with attainment targets and standards which he called a ‘press this button and get your money back’ approach which did not necessarily provided teachers with the right kinds of experiences to become good teachers.

> *T16: you will end up with is something which* ***looks*** *good, maybe even sounds good, maybe even gets more results [laughs] but at the end of the day - you know in terms of actual number of people passing certificates - but doesn’t actually produce good teachers.*

T16 favoured practical problem solving activity which he felt was offered to him in his initial low level teacher training experiences.

Teachers’ professional training is not located solely in ITT but is ongoing through CPD courses. The teachers were also asked about their CPD opportunities over the previous two years.

6.3 Continuing Professional Development

The majority of the teachers had attended some form of CPD course within the previous two years although about half indicated that they had not attended many events. The teachers reported several barriers to attendance, the most frequent of which was lack of time and money. The teachers felt themselves committed to their session timetables

> *T8: [full time] because I teach so many hours I often find it’s limited which ones I can attend.*

And for contracted and part-time teachers attending CPD meant giving up their free time or taking time off their day work. Several teachers reported that their institutions had limited funds for CPD and so had to prioritize. Only those courses that were felt to be of immediate value were likely to be paid for, although many of the teachers felt that their line-managers did try to get them on the courses if they could. Funding could be especially problematic for contracted teachers. One described how her institution paid for full time employees to attend CPD courses but she, as an agency contracted teacher, although not compelled to attend courses, had to fund herself if she did.

> *T3: So I've just paid, … £90 to take a course at [name college] although it's for my professional development here.*

Such differentiation could alienate part-time teachers and inhibit CPD opportunities. For one teacher the accessibility to courses was also a stumbling block.

> *T4: Plus we have complained but there's not a lot in this region, it tends to be Leeds or you have to go much further south which is adding more money on which, you know, makes it more expensive.*

For some of the older or more qualified teachers the nature of available courses, especially if concerned with developing theoretical knowledge, was a deterrent. They perceived theoretically based courses to be related to gaining higher qualifications. They concluded that, as they were nearing retirement and/or further qualification was not essential to their teaching role, such a huge investment of time, commitment and money was 'not worth it'. Two teachers who were already highly qualified with non-teaching degrees felt that it would be gaining qualifications 'just for the sake of it'. Such arguments again seem to confirm that many of the teachers saw theory and practice as separate; the unspoken assumption being that higher qualifications would not make them better teachers.

Many of the institutions offered in-house training days or events on topics ranging from lesson planning to drugs awareness. Not all of the teachers took advantage of these, but those who had frequently described them as unhelpful and lacking relevance, for example the contracted teacher who had to attend a compulsory two-hour session on how to take the register. T9 felt that the problem with many compulsory sessions was that they came from 'the top down' and that it would be more helpful if the teachers could choose the topics themselves. This reflects issues raised in the literature discussion as to whether it is institutions, teachers or both that instigate CPD and the nature of change that CPD affects.

Broadly speaking the kind of CPD these teachers attended can be categorised as practical or theoretical. The former were courses largely concerned with practical changes within the classroom while the latter were courses concerned with developing ideas and constructions of how the teaching process might be improved which could subsequently lead to practical changes. Impetus to attend courses could be driven by the institution or by the teacher [Figure 6.1].

	Practical focus	**Theoretical focus**
Institutionally driven	e.g. changes to administration, curriculum or test procedures	e.g. changes to practice aimed at improving learning
Teacher driven	e.g. changes in use of technology or to support learner	e.g. changes aimed at self development and teaching effectiveness

Figure 6.1: Matrix indicating impetus to attend CPD events

6.3.1 Practical Focus

Institutionally driven: Courses concerned with practical changes within the institution were the most frequently attended. These typically were to do with changes of administration procedures, test procedures or curriculum. Courses connected to administration included lesson planning, schemes of work, record keeping and taking registration. They often related to preparation for OFSTED inspection, for example one workshop teacher [T7] described how his institution conducted 'mock' OFSTED observations during which the observer had been concerned about his lack of traditional lesson planning. He subsequently attended a lesson planning course but had found it unhelpful as the workshop approach did not fit the 'normal' lesson pattern. His learners came and went to their own timetable and worked individually through different work manuals, so his lessons did not have introduction or plenary sessions and lesson activity and outcomes were individual to each learner. In the event OFSTED were satisfied with his paperwork so the need for training seemed more to do with the institution's fears and concern about gaining a good OFSTED report than about improving teaching and learning.

Many of the examination-based teachers reported attending course to familiarize them with changing syllabuses or test procedures.

> *T4: I had to teach CLAIT. I actually went myself to a college, ………. and paid for myself to go through the CLAIT, CLAIT Plus and IBT III. So I actually did them myself.*
>
> *T14: No, the only course that I've done was the CLAIT one. But I wouldn't say it was a teacher development. It was more to look at the new curriculum that CLAIT had issued.*
>
> *T3: the college asks us to do continuing professional development and to study and take assessments in new curriculums, as they come through. So we've all been working on the CLAIT new 2006 CLAIT Plus.*

These courses were in response to external changes imposed on the institution and teacher and indicate the importance given to their role as administrator or interpreter, but highlight two issues. For the teachers, it was important for them to have first-hand experience of, be confident with, and understand changes to syllabus and procedures. This enabled them to empathise with learners and to guide their learners through the test, to make sure they follow the correct path. If the teacher made a mistake in interpreting competencies or procedures it could have a detrimental impact on the learner's ability to pass the test. For the institution, it showed their commitment to examination courses which attract funding and customers, so appeared to be related to market forces.

Teacher driven: Some of the teachers also initiated practical courses. These included courses that related to technology used in teaching or to learner characteristics such as dyslexia, differentiation or equal opportunities. The technology based courses generally related to teachers learning how to use technology to help the learners, for example T9 attended a course to enable her to set up her intranet support systems. The learner orientated courses were seen as improving learner needs awareness and were often associated with the emotional element of teaching rather than directly with teaching methods.

> *T2: [looked] at issues to deal with, not direct teaching itself, but sort of like the outside issues that will affect learner or student or even a teacher. And they are sort of important issues.*

But some of the teachers commented that these types of course while interesting did not directly change the way they taught. T8's differentiation course, for example, caused her to rewrite some of the exercises so that they got gradually more difficult but she did not describe a reflection process impacting on her whole teaching style. The changes she reported seemed almost superficial and again outside of the teaching itself.

6.3.2 Theoretical Focus

Institutional driven: Given that ICT is a relatively new subject one might expect exploration of teaching methods to be actively promoted and an institutions emphasis on active research or reflective practice to explore and develop effective learning and teaching methods. None of the teachers reported any involvement with courses or initiatives that could be categorised in this way. Nor did they indicate availability of CPD courses specifically orientated to teaching ICT. It is difficult to know why there may be this lack of study into best practice. It might be that teachers and institutions perceive current methods to be successful and therefore do not perceive a need for change. Alternatively it could be that that the subject is still in flux, focusing concern on staying current with changing content, applications and skills rather than alternative teaching methods. The answer could, however, be even simpler and be related to finances. Given limited funding, institutions may place more precedence on expenditure to improve their accountability with OFSTED, awarding bodies or learners than improving teaching methods.

Teacher driven: Some teachers attended courses that were more theoretical in nature either to develop personal ICT skills or educational knowledge. Three teachers had recently undertaken courses to develop ICT skills, for example T17 was attending a course on Virtual Learning Environments (VLE) in preparation for a change of role to e-learning coordinator. T16 had just completed a course on online training and T3 a degree in ICT. These latter two were self funded and aimed to keep skills marketable and improve job prospects. Three other teachers were working towards degrees or masters in education. In each case the impetus came from the teachers and at personal cost. The teachers seem to view these activities as self development and some how independent of classroom practice.

> *T1: So, and what I've learnt is that these courses although normally very interesting, ….. I don't feel that I'm any better teacher now than I was five years ago.*

T14 similarly felt her degree to have been of limited value to her role as a part-time teacher of ECDL and CLAIT in a workshop environment

> *T14: the first year was quite beneficial but then the last two years was more about developing a course and the running of a course rather than the participation and teaching of a course ……… 'Cos with CLAIT and ECDL we've got a set curriculum and a set scheme of work, ………. then obviously we've got the work booklets that the students work to with the pre-prepared examples and exercises*

This hints at possible constraints to teaching autonomy for examination-based teachers, especially as in this case, in a workshop environment dependent on pre-prepared materials. This teacher felt little autonomy over structure and content of the lessons. Her role was as a trouble shooter helping the learner when they encountered problems along an externally preset route. This seems to align her expertise with the test, syllabus and set learning materials. The teacher as 'ICT expert' with detailed knowledge of the syllabus and route needed to pass the test, as opposed to an 'ICT user expert' bringing the learner into the community of ICT users. This might explain, or be reinforced by, the emphasis on teachers' attendance on courses concerned with tests and test syllabuses change.

The prevailing view of CPD within this research sample was towards the practical in terms of both teacher and ICT skills. Courses attended seemed to be associated with accountability and ultimately profitability, or concerned with understanding the learner and providing an easy learning environment, and in some cases led to only superficial changes. Courses with a more theoretical base or encouraging reflective practice that might ultimately lead to more fundamental changes of teaching style seemed limited. Those teachers involved with theoretically based training were often self-funded and seemed to view learning as for personal enrichment rather than improved teaching. Such a disconnection of theory and practice might have implications for subject understandings and consequence for the teaching role.

6.4 Subject Understandings

During interview the teachers were asked to grade skills statements according to whether they felt them to be ‘essential’, ‘desirable’ or ‘less important’ for achieving ‘effective application of ICT systems’. This was designed as a stimulus to discussion on skills needs. Results for each question were mapped according to autobiographical teacher variables, such as qualification, to seek hidden patterns linking practices and perceptions of skills [Appendix C4]. There was a reasonably high level of agreement about which skills were seen as important and which less so. A few differences were noted but no distinctive patterns linking teacher characteristics and allocation of skill value emerged. Slight variations were observed when the data was explored by teacher ICT qualification types but these were generally felt not to be important. Such variations could have been influenced by factors such as the way that the teachers interpreted the task or statements, for example T5 and T6 working together were finding the task difficult until they realised one was construing skills from learners’ needs and the other employers’ needs. The level of course that the teacher was working with may also have impacted on responses, for instance T17 observed that page properties was not important for beginners but was for more advanced learners. The following observations about the teachers’ perceptions of ICT literacy and skills needs are drawn from the analysis of the task responses and subsequent interview discussion.

6.4.1 Images of ICT Literacy

Despite the agreement on which type of skills were valued there seemed little consensus of how ICT literacy might be defined. Many of the teachers described literacy as individual and dependent on how the learner wanted to use the computer.

T7: to get by to exist in the present world, in their world. See I have to be very computer literate, extremely so, where Joe Smith comes in and does a letter I mean he does a letter you see nothing more……….To be computer literate one needs sufficient knowledge to perform the tasks that they want to perform.

This seemed to envisage ICT literacy as on a sliding scale depending on individual needs. For some of the teachers who frequently worked with beginners this pitched literacy at a very low level, perceiving ICT literacy to be acquisition of basic skills:

T15: to be able to switch on, use the keyboard and navigate with the mouse.

T16: Computer literacy is the ability to be able to use basic aspects of the hardware, such as switching it on, using the keyboard to do what you want to do and be able to manipulate the mouse to do what you want. So you're in charge as you might say. To me that's ***basic*** *computer literacy, anything above that is not basic.*

Other teachers argued for a functional literacy, that is individuals who were extremely proficient at one particular program could be regarded as ICT literate if that fulfilled all their computer skills needs.

T5: You could argue you've got a particular student who only uses word processing that's all they will ever do in their job and that's all they ever need for their personal life. And they're at a very high standard with that. Would you not class that person as computer literate?

T6 contested such definitions, and described engineers that he had worked with who were incredible skilled at drawing engineering designs using CAD but could not send an email. He felt they were not ICT literate because they could not use the ‘main packages’ such as Internet, word processing and spreadsheet. A similar view of literacy as related to having experience of a variety of packages was echoed by many of the teachers.

> *T4: I feel if your talking generally about being computer literate then I think people need to have at least an understanding of what each program does, not necessarily be able to use it but to be able to know which program you should be using for a specific task and perhaps a little bit of knowledge about it.*

About 60% of the teachers rated an overview of a variety of programs to be essential. While having a detailed knowledge of one particular package was rated as low priority. ICT users with single program knowledge were felt to be less effective and that it was useful to be able to ‘dabble’ in a variety of programs. But for at least one ECDL teacher a more detailed knowledge was required to be effective

> *T17: Well you should have a fairly detailed knowledge of them **all** for effective application of ICT.*

Several of the workshop teachers, despite personally feeling that variety was important, defended the learner’s right to concentrate on one package. One teacher described how he had a learner who was adamant she only wanted to learn email and nothing else. Working at the time in a community workshop, non-examination based environment he was able to accommodate this learner’s wishes. But the ECDL teacher, T9, related a recent incident where a prospective learner wished to take just the spreadsheet module and had been refused permission by her institution. This angered her as she perceived the institution’s decision to be purely financially motivated, in that the institution only gained funding for completed qualifications which for ECDL meant passing 7 modules. These financial imperatives were echoed by other workshop teachers who said that older learners often just wanted to learn the skills and did not wish to sit tests but were forced to do so to enable the institution to gain funding. Thus the teachers, who were focused on the individual and the individual's wishes, could sometimes find themselves in conflict with their institution's needs.

T2, who frequently worked with beginners, took a different stance on varied program experience; he felt that variety was important to provide the learners with insight into what ICT could offer them.

> *T2: I consider that important because they then become aware of what they would like to use the computer for.*

This comment highlights a problem. The learners, especially if beginners, may not know what the computer is capable of or how it can enhance their lifestyle until they have computer experience. This can be exemplified by a story T1 related concerning one of his on Microsoft Excel learners. The learner owned a bridal shop and had been advised by friends that she would find Excel useful. Towards the end of the course she still struggled with understanding how using Excel could benefit her. T1 asked her to bring in data from her business and over the next week he developed an exercise based on her own data. From this personalized approach the learner suddenly saw the program's potential and carried on to use Excel on a daily basis. This account indicates that learners may not always be in the best position to appreciate the computers possible benefits to them. This learner needed to experience, understand and problem solve in context to fully appreciate the ways that the application could be used to her advantage. The implication is that providing a broad, varied and deep experience could expand learners' engagement with and awareness of ICT.

> *T1: it's opening up the possibilities of ICT use, rather than possibly what they've come for. They may have come to learn how to use Word in order that they can write about their autobiography, but if in fact you talk to them*

> *about communication possibilities they might be able to email it to a college, something like that.*

Conversely if learner experiences and ICT literacy is perceived in narrow terms that is defined either as achieving basic skills, individual's functional needs or passing the test, then there is a danger engagement with and appreciation of ICT could be similarly narrow and areas of potential could be overlooked. Yet three-quarters of the teachers who had learnt their ICT skills through user qualifications gave less priority to learners 'appreciation of how applications could be used', perhaps hinting at narrowness of approach.

A higher level of ICT literacy was offered by some of the teachers in that they related literacy to being able to create something new, linking it to higher cognitive processes. This definition would require more than functional skills or manipulation of application but also creative and generic skills.

> *T4: I suppose somebody who's really computer literate is somebody who can not only access information, perhaps manipulate the program to suit themselves, you know, to be able to make it do things that are not necessarily set up, you know. They can actually go into it in a much deeper way to do all sort of more complicated things that I don't touch on really.*

But T4 concluded the text and word processing courses she taught did not require this type of creativity. Unlike T5 who felt that the City and Guild's courses he taught required the learner to create and thus supported this view of ICT literacy. Hence examination syllabuses, or at least the teachers' perception of them, might vary in their interpretation of ICT literacy which could in turn have an influence on the nature of the teaching and learning experience. This is of concern because often the examination syllabuses and skill needs seemed to link closely to the teachers' perception of ICT, thus when the examination-based teachers referred to offering a variety of packages this was frequently automatically discussed in terms of a variety of modules

T6: I say to the students, I say, "If you do four units including the IT principles, which is the file management, including word, Internet and spreadsheets you can go to an employer and say, "I am computer literate"".

T14: If people come to me, when obviously we do our initial assessment to find out why they're on the course, if they're wanting to do it for a professional qualification for the workplace, I recommend that they do the word processing, spreadsheets, database and PowerPoint within CLAIT…….. those four I do seriously recommend.

Thus level of ICT literacy became related, by the teachers and learners, to the number of modules completed or the nature or level of examination

T4: computer literate I look on more like things like doing the CLAIT [rather than her text and word processing courses]

The inference being that higher qualifications automatically meant higher ICT literacy. If the examination syllabuses, however, do not require creativity but are concerned with procedural knowledge then ICT literacy could be seen as related to the number of procedures one could perform rather than effective or creative implementation.

6.4.2 Skill Needs

Despite this variation of conceptions of the ultimate aim for ICT teaching there was general agreement about what skills computer users required. A very high level of importance was given to skills concerned with manipulation of data and applications.

> *T7: is basic to everything. You've got to know how to do that or you'll get nowhere.*

> *T5: You cannot do much without that. It's fundamental isn't it?*

The majority of teachers saw this element as essential but those teachers who gave it slightly less weighting were teachers whose ICT qualifications had a teacher training element. This lower emphasis was especially obvious when concerned with the more complex application skills such as setting page properties. This difference of emphasis could perhaps reflect the teachers' own syllabus experiences or their teaching focus. All the teachers with ICT teaching qualifications expressed strong concerns for learner welfare so perhaps this was their main teaching focus rather subject.

The technical aspects of computer use were generally given low priority, while the statements concerned with skills for work and skill transfer were generally perceived as important. The majority of the teachers perceived their learners as attending courses to gain work skills although several also commented that many of their learners did not work and so sought leisure skills. The teachers found it difficult to predict if the courses provided the skills their learners required as each learner's context and needs were perceived as different. The conclusion was that it was up to the learner to decide which skills would be useful and how to apply them. As this comment from a learner who was a teacher in another institution implies

> *L: And things like IF statements I've absolutely no [coughs] I've nothing to do with that. I'll pass that knowledge on.*

The teachers role thus might be seen as to 'passing on' the procedural knowledge and the learners to apply and transfer that knowledge. This seems to position the teacher's role, as T7 described, as providing a grounding from which the learner developed according to his own needs.

T7: It should give them enough basis to go on and fumble about themselves………It's a grounding for everything, so you've done all that grounding you should be able to progress yourself.

This emphasis on the individual taking responsibility for transfer could sometimes have the effect of making discussion about how transfer was achieved seem vague and assumed, especially among the more transmissive teachers

T5: We would like to think that all of our students could transfer their skills

T16 from his non-examination, problem solving stance directly linked transfer to problem solving activity.

T16: They've got to physically experience it to do it, but not only that, see it in a variety of different contexts. So in order to do word processing they must word process but not just word process they must have a lot of different kinds of word processing. They must also come up against problems that they can solve.

Regardless of their style, many of the teachers saw transfer of skills as important and often related to use in real life situations.

T3: ….it's a tool, people have to be able to use it. It's one thing to be able to set up, put a header or a footer on, but it's another thing and ***much*** *more essential to know what its for and how you fit it in your work place. ……. So real life situations - certainly transfer of skills I think are probably the most important issues there.*

T17: To practice on tasks orientated to real life situations, it's not going to be effective if it's not about real life. [and] It's not effective application if you cannot transfer your skills.

> *T14: One thing I do think is really important in making sure that your tasks are orientated to real life situations and that they can transfer skills across.*

However, observations of examination based classes revealed an emphasis on test based scenarios. All the teachers in the City and Guild's syllabus felt that the test scenarios were based on real life but the responses for other syllabuses seemed mixed. Some suggested that test based scenarios could be unrealistic but that it did not matter as it was enough to 'allude' to real life situations or explain that in the test it was 'done this way' but in real life 'done that way'. This was observed in T8's 'instructional' style classroom when she explained to a database learner that although the exercise required one field for telephone numbers in real life she would use one field for area code and another for the number as this made searches easier and more flexible. These teachers felt that they could also compensate for a tests lack of 'authentic' practice by providing their learners with practice exercises based on real life situations, for example T1's bridal shop exercise which he had subsequently used with a number of learners. But during observation of examination based classes, both workshop and whole group, the vast majority of practice exercises appeared to mirror test scenarios [Appendix D2(ii + iii)] and were practice runs for the test. If, as some teachers reported, the tests do not reflect 'real life' practices then learners may not be gaining 'real life' experiences unless their teachers deliberately indicated or discussed the differences. But given the workshop emphasis on individuals working independently through the manuals such timely teacher based interjections may not always be possible or practical. But failure to do so could lead to learners under achieving outside the classroom.

This emphasis on the teacher as responsible for sign posting knowledge at appropriate points of learning was reflected in how the teachers perceived their role in relation to skill development. Knowledge was seen as wide-ranging and progressive and part of the teacher's role was to ensure content was covered.

6.4.3 Skill Development

Many of the teachers, regardless of their teaching approach or style, associated themselves with the parent bird breaking down knowledge into digestible chunks or the watch maker building parts into a working whole. Knowledge was seen as extensive and thus teachers needed to break it down into manageable chucks to present to the learners.

> *T2: I would say that I'm probably a parent bird. Sort of putting out the knowledge to learners, but I always make it so that each week a sizable chunk of activities for them to do, not too big as to overwhelm them and not too small where they could finish half way in and get bored or what ever*

> *T14: The 'parent bird' I normally break things down and the description I say is I don't give you a Mars bar to swallow in one whole bite; I give you little fun sized bites. So I use a similar metaphor there.*

Several of the teachers talked of 'building' knowledge. T2's own metaphor of teacher was as a set of steps which the learners ascended at their own pace.

> *T2: And it works practically well with ICT teaching because that is what you're basically doing when you are learning ICT, you are stepping from basic level and then using those kinds of skills to do more advanced things. You cannot do the advanced until you know the basic and so on and so forth, and so you can keep building up your knowledge and skills in a step by step way.*

This staged development combined with the image of breaking down knowledge into manageable chunks created an image of the teacher as a bricklayer building the individual bricks of knowledge into a wall and emphasized ICT skills as progressive

T14: I think anything with computer it's very logical in the process and you cannot do step 3 before you've done step 2. So again them bite sized chunks do naturally lead on to another and obviously without even thinking that they've done it they just do little bits at a time till they're getting the whole.

This quote identifies the progression as serialistic; that is each step is clearly defined and has to be experienced in the right order. Such an image is explicit in step-by-step manuals and was echoed by several of the teachers. This serialistic emphasis again associate learning progress as linear route and could contribute to the prevailing models of differentiation discussed earlier.

The component nature of the tests also appeared to reinforce the perception of serialistic progression.

T4: I suppose the watchmaker; I'm building the component parts into a working whole. You teach them how to do cut and paste and then feed it into what they need to be able to do with their bit of text or whatever.

T17: It has a lot to do with the course as well. I mean for example something like the HEFC course there's a big element of the parent bird because there's so much stuff that they've got to get through and you've got to give it to them in manageable chunks each week. And there's a syllabus that they've got to achieve in a very, very short time space so, you know, there's a lot of this is the little bit that you need to get through this week. Put all the bits together and you'll get your qualification.

The bricks of knowledge were seen as coming together to form the whole but in this instance could also refer to filling gaps in knowledge.

T4: my ladies really don't need a huge amount of teaching. They've kind of dabbled in a lot of the things, it's just that they're perhaps not sure on odds *and ends and there are certain things that we have to be able to do just to get through the exams, you know.*

T1: I would get people who are –quite confident with IT and what I'm doing is possibly not filling them up but 'topping them up'. So they've got a half tank and I'm - , because they are self taught and have the confidence to find it themselves, but there are chasms in their knowledge

The teacher's role here appeared to equate to applying the pointing to fill the gaps and finish off the wall. The concern is, as these examples indicate, that the gap filling might be more to do with filling in examination knowledge gaps than developing ICT user skills. This again places the teacher as examination expert rather than ICT user expert.

To conclude there was generally agreement on what skills were valued for ICT users. The practical skills to manipulate applications were seen as very important. The teachers whose ICT qualifications involved teaching skills seemed to place less emphasis on these skills perhaps indicating that they were more concerned for the individual learner than for subject skills. By and large, the teachers placed strong emphasis on skill transfer statements, especially the 'old hand' teachers which might indicate they had a greater understanding for the need for subject application. But these differences were not marked and may not be hugely significant. Despite their personal emphasis on skill transfer many saw the syllabuses as placing less emphasis on this area. It seemed, then, to be up to the teacher to signpost transfer and to ensure skills were acquired in the 'correct' sequence. The concept of teacher as bricklayer was an example of the way that the teachers' perception of teaching was influenced by their understandings of subject but perceptions of learner and institutional needs also impacted on teaching style. Chapter 7 will continue to explore how teachers construe ICT teaching by examining the teachers' pedagogical understandings, while Chapter 8 will explore wider institutional influences such as funding and syllabuses.

Moving on from the teachers' subject constructions, this chapter will explore their pedagogical interpretations. Teaching and learning combine to form the classroom experience, the learners' perspective, deduced from questionnaire and interview, will therefore also be considered. The discussion here is concerned with the perceived aims of ICT user education, the teachers' professed responsibilities and the teachers' and learners' interpretations of their respective roles and will begin with a brief profile of the learners involved.

7.1 The Learners

The 96 learner participants, taken from the observed classes, completed a questionnaire [Appendix B5] and 23 also submitted to short interviews [Appendix B4]. They came from a range of lessons from beginners to advanced, examination and non-examination, and workshop and whole group contexts. Seventy of the learners were female and 26 male. To aid analysis the learners were categorised as beginner users (20%), intermediate users (60%) and advanced users (20%) according to their declared previous computer courses and/or experience. Ages ranged from 18 to 70 years, grouped into five age bands. Questionnaire responses concerning motivation were plotted according to learners' gender, age and level of experience [Appendix C6]. The least populated age band was 18-25, 8% of the sample, containing 5 female and 3 male learners. Given that these individuals would have experienced computers during their, comparatively recent, school education it was surprising that they were present in adult classes at all. The main motivation for these younger learners was for work skills and/or qualifications. The most populated age band was 36 to 45, 30% of the sample, 86% of whom were female. Many of these females were seeking work skills which could perhaps be linked to retraining as they returned to work after raising a family. The over 55 age band represented 20% of the sample of which 53% were male. This group contained the highest male percentage and examination of motivation suggests these learners were retired and seeking leisure or personal skills. There were also a higher percentage of beginners in the older age group. The reasons behind the learners' attendance and the teachers' perceptions of their aims and motivations could be an influencing factor on the teachers' teaching decisions.

7.2 Motivations

The aims typology [Figure 1.3] predicted four key aims, either individually or society driven and concerned with leisure or work skills. Comments from teachers and learners concerning aims were analysed and allocated a position on the matrix indicating the number of occurrences. This was not intended to provide a statistical picture but rather a visual representation of trends. It quickly became apparent that for the examination-based participants of this research there was an additional motivational aim not identified on the original matrix, that of qualification [Figure 7.1].

<table>
<tr><th colspan="6">Individual driven</th></tr>
<tr><td rowspan="2">Informal (non-employed)</td><td>Type A
▼▼▼▼▼
▼▼▼▼▼
●●●●●
●●●●●</td><td>Type C
▼▼▼▼▼
●●●●●
●●●●●
●●</td><td rowspan="2">Formal (employment)</td><td>Type E
▼▼▼▼▼
▼▼▼▼▼
▼●●●●</td><td rowspan="2">Qualification (employability)</td></tr>
<tr><td>Type B
▼
(▼▼▼▼
●●)</td><td>Type D
▼●</td><td>Type F
●●●●●
●●</td></tr>
<tr><th colspan="6">Society driven</th></tr>
</table>

Key: ▼ Teacher ● Learner

Figure 7.1: Motivation matrix

This provided two further motivation categories which could be either individually or externally driven. Type E motivation related to the individuals' aims of gaining qualification. The teachers often emphasized the learners as wanting the skills rather than qualifications but on the questionnaire about a fifth of the learners recorded 'gaining an ICT qualification' as their aim.

L: So I just want to have this certificate at the end of the day, you know.

R: What are your aims for the course?
L: I hope to pass the exam

Many learners were extrinsically driven, perceiving employers to want qualifications as proof of skills, Type F motivation. Several learners were being sponsored by their employers to attend courses and talked in terms of employers requiring qualification as the proof of success. Both teachers and learners perceived qualification to improve job prospects.

L: And in every job I went to apply for they wanted RSA and that skill mmm I don't have it but, you know, I still applied for it anyway [laughs]. But I do want the certification.

L: Basically because I used to work for the NHS and everybody working in the NHS had to do ECDL. I've since ceased working for the NHS but decided that I still had to do it basically for future references for a new job.

L: I hope to pass this course, because I'm at present looking for another job anyway. So I'm hoping it will help me in the future to move up in admin.

L: I'd like to have the qualification just to apply for jobs really. If I've got it in the future if I need it for any jobs it gives me more choice to apply for [laughs].

T4: I think most of them are after getting the qualifications to go for the better jobs. And I think that, I mean, a lot of places now put quite an emphasis on it.

These learners' aim became to gain qualifications as a passport to employability rather than improving skills for improving work performance.

Within examination-based courses, the prominence of this perception, of success as measured by achieving qualification, impacted on the teachers' aims. Even where the teachers described the qualification as a 'by-product' or 'bonus', ultimately success was seen as providing learners with what they wanted or helping them achieve their goals which was seen as passing the test.

T15: At the end of the day if they've enrolled for a CLAIT qualification they want a CLAIT qualification. To achieve what qualification they've enrolled for ……To get them to their goal

T14: Is to ensure the students get what they want from the course and that they're successful in their aims. So if they come to me and they want to gain the qualification, be it CLAIT or ECDL, when they leave me I want to make sure that I feel they're competent in that unit

T4: It's [the exam] my total, that's my raison d'être really, you know. That what we're aiming for

It is perhaps not surprising that learners should largely focus on individual motivation, namely skills for personal work or leisure use and examination success. What was surprising was the degree to which the teachers also seemed to focus on individual motivation rather than wider subject aims. The teachers seemed to see the process very much in personal terms, specifically satisfying individual learner's needs. Teachers' aims referred to giving learners what they wanted, building confidence, helping learners achieve both the test and skill development, and making learning fun. The teachers saw the learners as motivated by personal and/or work needs but few voiced the bigger picture of society's social or economic needs. Only T16 directly discussed learning in terms of social inclusion,

> *T16: The purpose of adult education is to provide/create an inclusive society. So you and I and everyone else can connect with the society in which we live.*

although other teachers and learners did hint at it (shown in shaded format in Figure 7.1) by concluding that ICT skills were important for every day life. They identified ICT as a life skill that children and adults needed because in the future 'everything is going to be done on computer'. Two learner-centred teachers also talked about ICT being part of the wider need for individuals to engage with learning. These types of comments indicate some awareness of the democratic discourses of lifelong learning. It is difficult to determine to what extent the teachers' lack of discussion about wider ICT issues was representative or simply the response to specific questions. Possibly teachers and learners were conscious of, and considered societal needs, but did not express it. The concern is that if they are not responsive to wider issues they may not be contextualising skills in terms of purpose of use. Their focus could remain narrow and for the immediate. The community of practice might then become focused on the classroom community and not the wider community of computer users.

For greater understandings of learner motivations the researcher turned to the learner questionnaires. Taking the questionnaire returns overall about 44% of the learners reported that their main aim was to acquire work skills, 36% personal skills, and 20% an ICT qualification. The latter was often linked to work needs. Definitions of personal skills broke down into three sub-categories. The largest of these was 'finding out about ICT', often because the learner had children or grandchildren and wanted to 'keep up' with them or simply because they wanted to know what the computer 'could do' for them. Alternatively learners described having a computer which they needed to ‘learn to use’. The next largest subgroup was learners seeking leisure skills such as using the Internet or playing games. Third were skills for self development. The learners’ reported taking the course for ‘general interest’, to ‘update’ skills, or for some older learners to ‘keep the brain working’. The learners thus came with a diverse range of intentions and motivations.

The teachers’ responses from interview and the learners from the questionnaire were plotted according to course and examination/non-examination focus [Appendix C7], to enable comparison. While the majority of learners aimed for work skills, often linked to qualification, of the teachers only T4, involved in the vocationally orientated text processing courses, directly aimed for developing work skills. Older learners tended to be concerned with developing leisure skills, finding out about ICT or self development. The teachers did not directly aim for leisure skills but strongly emphasized helping learners to find out about ICT and learner self development as key aims. This was often expressed in terms of making learners comfortable with ICT so that they developed the confidence to use it. The non-examination based teachers were solely concerned for personal skills and confidence, as were T9 and T10 the ‘constructional’ style, examination-based teachers. The remainder of the examination-based teachers, however, reported providing learners with test skills to be an additional essential aim.

These findings indicate a potential mismatch of focus between learners’ and teachers’ aims. The majority of learners were aiming for work or leisure skills. The teachers acknowledged these aims but focused on developing confidence and/or test skills as a means to achieving them. Such a strategy carries with it potential risks in terms of wider subject knowledge, dependent on the nature of the test. If, as some teachers suggested, tests lack ‘authentic’ practice the teachers’ emphasis on confidence and test may not give learners the range of skills required in real life work or leisure situations. Discourses on education for capability (See Stephenson, 1992) suggest that, to be effective, confidence to use the computer has to be supported by confidence with dealing with contextualised problems. Lack of practice in context could impact on learners' ability to transfer skills into the contexts for which they aim.

None of the learners reported problems with transfer of skills. Especially for those learners currently working, they were happy and confident that they could apply skills to their work contexts. But in terms of developing adaptive computer users able to exploit systems there were some warning indicators. If learners are responsible for skill transfer then they need to have awareness of what computers can do for them. But often the learners appeared vague about their reasons for joining classes or how they intended to use the skills. This was especially the case with learners seeking personal skills. Here learning seemed to relate to the more nebulous characteristics of building confidence, updating skills, finding out about ICT or having fun. Echoing those characteristics expressed by the teachers. Even the work orientated learners spoke of 'needing the skills for work' without clearly defining what skills might be required. This vagueness may in part be due to learner lack of awareness due to inexperience. This implies that they are dependant on the teacher and/or syllabus to define the required skills and signpost application. Yet generally the teachers appeared to be focused on procedural skills and learners rather than wider application issues.

When learners were asked how they used their new skills, 20% replied that they did not currently use them but might do in the future. Like skills for employability this speaks of a postponement of use that is skills are ready to use if required but could suggest lack of awareness of potential. For those using their skills in the home context, application often appeared to be limited to activities such as writing letters, using the Internet or household accounts.

> *L: [home use] Basically Internet and letters. Word processing and accounts sometimes in spreadsheets. Mainly just that sort of thing. I have done other programs but I don't always have a lot of time at home, no.*

About two-thirds of learners employing skills did so at work. These learners described implementing some procedures immediately and holding the rest in reserve for future need. Implementation again could be limited; a) because systems were set up so that workers were simply entering data rather than creating documents.

> *L: [work use] So packages are already there and every thing is just to put information into rather than* ***me*** *doing something with the computer itself and starting a new document or a new piece of work.*

> *L: [work use, currently studying spreadsheet] I use this once a fortnight to do the carers' pay but it's all set up for us. So all I do every week is just save it and put a different date on. So although I can use it and alter it, it was all set up for us.*

For these learners the skills they required for work were limited and essentially procedural rather than creative. Under such circumstances they appeared not to need higher-order skills and transfer was unlikely to be problematic. b) because networked environments meant some learners had to limit the use of skills to those their fellow workers could manage.

> *L: [studying ECDL advanced] Referencing. Referencing I just wouldn't use it at all because other people [in work] cannot use that document if they don't know how to do it. So I cannot use it.*

This suggests that in some situations the workers are under skilled and unable to exploit computer use to the full. This diversity could make it difficult for teachers to clearly define purpose of use and might perhaps explain their focus on building confidence to use ICT rather than use in specific contexts.

Given these perceptions of aims by teachers and learners the discussion will now explore how teachers perceive their responsibilities in achieving those aims.

7.3 Responsibilities

Responses to the question 'to whom do you feel responsible?' were allocated a score one to five according to the priority the teachers gave them and plotted [Chart 7.1].

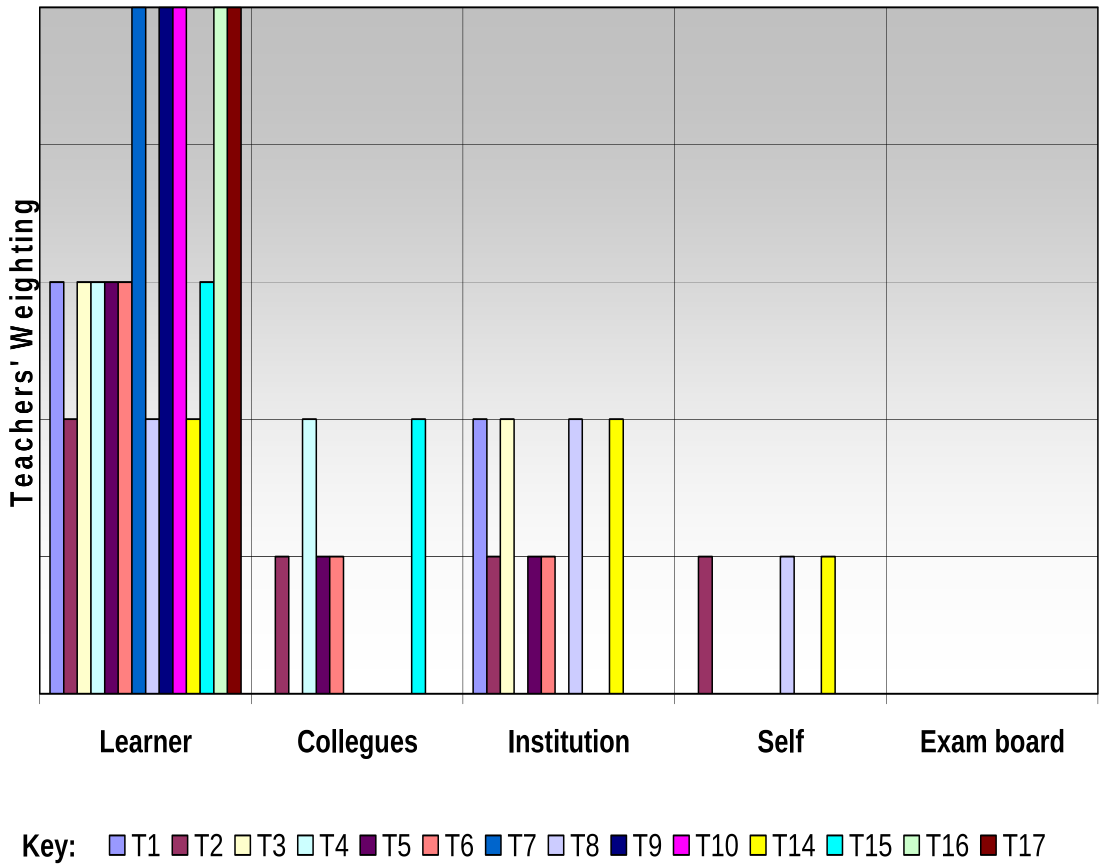


Chart 7.1: Showing teachers' response to the question 'to whom are you responsible?'

All the interviewed teachers felt their main responsibility was to the learner to help them 'reach the goals they want' or 'reach their potential'.

T5: The students are our number one priority. That's what we're here for and that's what we get paid to do.

T2: First and foremost that's the responsibility that I have, is the learners and their learning

Five of the teachers emphasized the learners as their only responsibility and that by fulfilling their responsibility to the learner they also fulfilled other perceived responsibilities to employing institutions.

T17: so by being responsible to them [learners] and doing the job well I'm responsible to the people I'm technically responsible to in the workplace, because it's all part of the same thing. Because ultimately we are all responsible to the learners.

T16: I feel responsible to the students and only responsible to the students. I mean don't tell the boss [looks over shoulder to door]. Bottom line is that, it always has been, it cannot be anything else. They may pay me but at the end of the day it's the learning that matters. They're paying me to do this job. The job is about helping people to learn what they want to learn, or what society demands of them perhaps at the end of the day but I mean that's who I'm responsible to. I mean, I know management probably thinks I'm responsible to them in real terms, in terms of co-ordination, planning and all the rest of it, quality and so on. But we may go through that routine, we may pay lip service to it but if you want the absolute and unvarnished truth it's the students that I'm responsible to.

When questioned further as to what that responsibility involved, the majority of examination-based teachers expressed responsibility to the learner in terms of getting them through the test and gaining the qualification.

T4: Initially I feel responsible to my students and they look on me as somebody who's going to get them through these exams one way or another and that's what they're here for and that's what they pay for.

T7: I suppose the qualification at the end. Teach them that. Learning them how.

Responsibility was also expressed in terms of customer satisfaction and value for money.

T8: Also I feel more responsible when I know that they've paid a lot of money for their courses. Because I would hate to think that they thought they hadn't had the attention that they deserved when they'd spent a lot of money coming and a lot of their time invested in coming to the course.

R: As a teacher who do you feel responsible to and for what?
T9/T10: [Together] Students
R: For what?
T9: I would say for them value for money however you would define that.
T10: I was just going to add that, how would you define that?
T9: To walk out saying, "I'm glad I came".

Some teachers took a wider view and felt their responsibility involved developing knowledge or providing a fun experience.

T17: Which is for most of them [learners] an enjoyable learning experience. So I like to think that they go out with new skills, I'm deliberately not saying qualification because that's a by-product. They go out with new skills, new friends, they've enjoyed themselves, they've had a good time, they want to come back for more, they want to develop, they want to sign on for more courses. So that's who I work for.

T14: I feel that I have a commitment to them to try and make sure that they understand the syllabus and that they can take on board as much as they can and use it as best they can.

T5: Definitely we're responsible to the student. To give them the knowledge what them have joined up for.

The latter two examples are from an examination-based context so, although the teachers did not directly attribute their responsibility to achieving examination aims, the 'syllabus' and 'knowledge' they refer to could be that required for the test. Two teachers who had both been involved with HE went still further and expressed their responsibility in terms of transforming the learner.

T16: If they're going to have this experience, when they come off the experience at the end they have to feel they got something positive out of it. Or if not positive at least it's been life changing.

T17: …… you're still getting people to think in a certain way.

This kind of attitudinal change was approached more superficially by some of the teachers and appeared to be related to test readiness.

T14: 'Sculptor', obviously I've got to sculpt their mind into thinking logically. I've got to get them to think the right way for a PC, read the question, break them down and it's moulding the mind to focus on key factors and that will help them.

Yet from a transformative perspective, learning involves attitudinal change. The fact that so few teachers saw their role in this light may again indicate a lack of engagement with the wider subject culture.

Only T16, from his problem solving, non-examination context, actually voiced his responsibility as developing independent computer users. For him, problem solving activity was the way to achieve that independence.

T16: They must also come up against problems that they can solve. It's that process that gives them the independence to move on without you later on. Because if they're still //dependent on you// [taps table to emphasize] at the end what's the point in doing it?

It is difficult to know whether other teachers did not explicitly voice aim of independent use because they perceived it be self-evident or because it was not a conscious aim. Two teachers, from technical backgrounds, emphasized making learners comfortable with help systems to enable them to find help for themselves, suggesting they too valued independence. But several other teachers gave using help systems a low priority, saying that it was too difficult for learners. This perhaps indicates that they were more focused on the learner in the classroom than users' needs beyond the classroom.

Although all the teachers saw their main responsibility to learners, many also expressed some responsibility to the institutions for which they worked. For some this responsibility was personal and related directly to their immediate boss or line manager, often because they felt that their boss supported them and therefore they wished to support their boss. A responsibility to support and help other teaching colleagues was also articulated. About half the teachers described a wider institutional responsibility. This was expressed in terms of doing the job 'correctly' and often related to getting the learners through the examination. The teachers were aware of their institution's business needs. Success rates in the examinations were seen as attracting funding and therefore necessary for the institution to survive.

T8: I feel responsible to my bosses because at the end of the day they are paying me to get people through their exams and we're a business now like everywhere else is and we've got to get the money rolling in.

T3: Big responsibility to deliver what the college requires in order to be able to continue, because if we do badly funding is cut, we cannot do what we're doing, so that's a big responsibility as well.

Three of the teachers also expressed a responsibility to themselves as workers to do a good job or to develop their teaching ability. Not surprisingly two of these teachers were working towards higher qualifications. This seems quite a small percentage and may again point towards a lack of commitment to developing theoretical understandings or pedagogical change. Alternatively the absence could simply be connected to the way the question was phrased, to the nature of interview, or size of sample. So this lack of discussion about personal development may or may not be significant.

From these fundamental perceptions of teacher aims and responsibilities several images of the teachers' role emerged. Teacher metaphors were used as a starting point for discussion with both teachers and learners. It was not the metaphors themselves that were important but the participants' interpretation and responses to the images. For example the image of a parent bird was defined by some participants in terms of breaking down the subject and by others as nurturing the learner. The responses were thus grouped by characteristics of teacher/learners' role rather than by choice of metaphor.

7.4 Teachers' role

One strongly emerging theme was the diverse and complex nature of the teacher's role. Teachers were often described, by both teachers and learners, as a mixture of all the images offered and rarely did interviewees select just one image. The teachers themselves also offered several alterative views of the teaching role including counsellor, confidence giver, staircase, bridge, image-maker, communicator and performer. The majority of these emphasized the emotional element of teaching and for some teachers changed according to individual learner's needs.

T1: I'm different roles to different students, depending on the approach that they need from me.

T15: Marriage guidance, careers adviser, bereavement counsellor, I've had all of the hats on. …. I've cried with them, we've laughed together and things like that.

T14: Truthfully, I would say I've got an element of all. You cannot just pitch and hold to one type it depends on what I'm doing.

Teachers and learners were generally in agreement about how they perceived the teacher's role, although concepts were not always followed through in enacted classroom practice. The roles identified can be grouped under five headings: personal trainer, builder, expert guide, environment creator and examiner.

7.4.1 Teacher as Personal Trainer

Emphasis on the needs of the individual learner seemed to position many of the teachers, especially those in a workshop environment, as a sort of personal trainer. The teachers emphasized getting to know their learners, building relationships and understanding their needs.

T4: Trying to - it takes a week or two but kind of, you know, get into the head of what worries them, what doesn't, what do they need, what do they not need, how do they liked to be talked to, how do they not, would they rather be left on their own, or do they want me. Some people like to tease it out themselves a little bit, other people just like you to sit there and tell them exactly what to do. So awareness of the student's needs.

The teachers repeatedly used words such as 'empathise', 'nurture', 'advise', 'encourage', 'help' and 'support' to describe their relationship with learners. Many of the teachers took this 'caring' commitment beyond the classroom by giving learners their private telephone numbers, calling learners to offer help if they missed lessons, and arranging sessions outside class time for learners to sit tests. Often this out-of-class support was unpaid, especially if the teacher was part-time or worked contracted hours. This again emphasized the importance teachers seem to place on personal interaction and one-to-one relationships.

Yet the role of a personal trainer might be seen as more than assessing and understanding individual learner’s needs. It also involves negotiating with the learner to develop an individualized training programme to match needs. The workshop teachers appeared to equate learners ‘working at their own pace’ with this individualization of programme. Yet in observations, the learners working through a manual were, in reality, working a universal programme just at different speeds. Teachers did personalize the sequence by providing backup exercises and, in the case of T4, individually prepared packs of exercises based on examination examples. But again, generally, these exercises were collective, drawn from a bank held by the teacher and rarely personalized to the individual learner. This was not exclusively the case, as the example of the Excel exercise developed exclusively for the bridal shop owner by T1 demonstrated. This example again illustrates the high level of teacher commitment to learners but given the numbers of learners and the lack of preparation time would be unsustainable in the long term. This concept of individualized training could indicate a misinterpretation of learner autonomy.

Learner autonomy was evident in the practical freedoms such as when to work and when not, or how content was applied outside the classroom, but generally there was little autonomy of learning content and application as experienced in problem solving activity. In all observed workshop sessions, apart from T16’s webpage design lesson, the teacher or the workbooks directed or controlled task sequence. The workbooks provided the stepped phrases while the teacher decided who needed more practice, the nature of that practise and which exercise to use. Despite emphasizing that it was the learners who did the growing, that knowledge was not just passed to the learner and that learners had a role in interpreting how 'knowledge' was used, both teachers and learners seemed to perceive independence in terms of being able to work at their own pace rather than autonomous activity.

T5: Again making a comparison an adult learner, post 19, is a more an independent learner. You can basically give them something and you know that to the best of their abilities they're going to work towards and try and improve on that.

L2: She [teacher] says there's a module, there's the book work your way through it if you need me come and ask me.……She's not forcing ya, she's not making you go in a certain direction, your doing it at your own pace.

The teacher's control could also extend to examination readiness and assessment. Frequently it was the teacher who decided when learners were ready to sit test or controlled the order in which modules were taken

Observation: T tells L1 she is doing well and should be ready to take the test paper by half term but to keep practising exercises as the more exercises she completes the more likelihood of experiencing every type of problem she may encounter in the exam.

T17: I say things like, "Well, I'm not going to give you another resit until I've seen another couple of practice papers and we go through them together".

T14: [Teacher describing how one learner was struggling with a module] I'm quite sort of strict in ECDL as to which path they follow, and he was losing interest so what we've done is we've come to an agreement that I will ***allow*** *him to have a break and work on a different unit but then he's got to back to the unit he doesn't like.*

Although there were also examples of joint decisions about learner readiness and at least two examples of learners overruling the teacher and negotiating additional practice tests before sitting the examination. In all observed examination-based workshop sessions it was the teacher who marked these practice papers, reporting back in detail question by question to the individual learner. The teachers regularly led discussion and told the learner how to improve. However, two examples of greater learner involvement in assessment were observed. T9 and T10, with their ‘constructional’ approach, had developed a self revision system whereby learners could view an interactive replay of the task and check ‘correct’ solutions. Similarly, the whole group teacher, T17, went through a test paper [Appendix D4 (iii)] with the class showing them correct answers and explaining marking procedures. But even in these examples activity was teacher led and based on specific criteria laid down by awarding bodies.

There are two possible explanations for this narrow approach and control of assessment. Firstly, the perception of ICT skills as serialistic could mean teachers feel it important to ensure the ‘right’ steps are followed in the right order, especially those to pass the test, the teacher as bricklayer. The teacher thus is perceived as needing to carefully direct learners to ensure they do not stray off ‘route’. This may be further compounded where the institutions perceive quality in terms of guaranteed, standardized programme delivered through prescribed, universal teaching materials. Secondly, it may be bound with perceptions of the traditional role of teacher, thus both teachers and learners simply accept teacher control without question. Teachers may perceive transmissive teaching styles as what learners want or expect. The learners in this research certainly frequently relate learning to being ‘filled with knowledge’ and passing knowledge on, regardless of their teacher’s approach, as these learners from T9’s ‘constructional’ approach class indicate:

L: Definitely fill us with knowledge, I would say, definitely petrol pump attendant.

L: That one also [points to petrol pump attendant] …….
R: So if the teacher is filling you with knowledge what's your role, do you think?
L: Oh. [long pause] Possibly to pass the knowledge on from them to other people, you know that I work with

The need for 'conformity' was expressed by several of the teachers who were concerned that if they taught in a way that threatened learners too much the learners would 'vote with their feet' and leave. Two teachers involved with CLAIT described how the new syllabus introduced file management concepts at an earlier stage. They felt this to be too complex for the level of study making learners uncomfortable and quoted it as the reason several learners had abandoned courses. Loss of learners from courses could have financial consequences for institutions and teachers if courses were cancelled due to low numbers. T15, a contracted teacher, described how her institution had recently combined two of her classes due to low attendance. This meant that she now had to teach a class which could have up 16 learners in it and she had lost payment for three hours per week. Such concerns and consequences could contribute to teachers not challenging methods they perceive as traditional, safe and successful in terms of test results. It also links back to perception of teaching concerned with personal relationships and the emotional elements of teaching.

7.4.2 Teacher as Builder

The teacher's role as builder can be seen in terms of knowledge and learner. The knowledge builder breaks the knowledge down into manageable segments and then builds the bricks of knowledge on the learner's previous foundation of knowledge to make the whole wall. The learner builder is concerned with building confidence both in terms of using ICT and in terms of learning generally and is related to the emotional element of teaching.

The idea of the teachers as confidence builder was a recurring theme. The teachers emphasized again and again how they felt their role was concerned with building learners' confidence to use the computer and to pass the test. The teachers described how learners were afraid of computers and of doing something wrong. This was strongly emphasized for beginners

T2: A lot of the learners I have had a general fear of computers, they get frightened that they might break it or they get scared - they get panicked because they have done something wrong or what ever.

T8: Building confidence with the beginners' classes and the CLAIT classes is a really big part of the session.

but was also attributed to more advanced learners

T3: the sherpa one, I think, particularly when you get into the higher levels, the level 2 and the level 3. People are going out into frightening areas in IT where they think they are doing extremely complex things and it's all just a case of understanding and tutor guiding them to - to show them ***how*** *this connects with what we've already done and how you can, sort of, lift off from that and move forward to this, what seems like frightening world of more advanced skills which are actually quite straight forward if you relate it, sort of, to previous learning.*

and more able users learning new software.

T5: I sensed a lot of nervousness about the new system and so looked to see how it would be best to do it. By showing them on the screen that I could do it and it wasn't 'rocket science' and then letting them have a go I thought it would keep them feeling confident that it wouldn't be difficult.

This building of confidence was often related to making the learners comfortable with using the computer or having a go.

T16: they should be comfortable with ICT. I mean the confidence business is the most vital aspect of the lot and the most difficult to get. By confidence I mean that when someone comes up against things - aspects of ICT that ***looks*** *complex but they're not, phased by the complexity - they can feel confident that they can work their way through or can find the information or can get help to be able to do something about that. …… So getting that confidence to be able to say, "Hey, I can deal with this", is one of the most important aspects of it.*

But this emphasis on confidence was not confined to the use of technology it extended to the whole learning process.

T3: The garden one definitely, because in adult education half the - well more than half the job probably is not the - the knowledge itself ………. I think a great part of our job is really working with confidence and to help students to understand that they can do these things.…… Not just to achieve the potential but to know that they can, I think that is the thing that - err, to me seems to be the most important thing that we're doing. Anyone can pick up a book and learn something if they feel able to so. Our job is to show them and to encourage them, help them to understand that they can do these things.

T6: I think mature students as well, I think they lack confidence and need reassurance more than the other students. They lack confidence in their ability.

For teachers involved in qualification courses fear of the test itself was emphasized. Teachers felt that by practice and familiarity with the test material they could help learners overcome test fear.

T4: For some of my slightly older students they may, like myself, not have sat an exam in a very long time are very frightened of that sort of, you *know, but realise that really it's not that dreadful. I would hope that it would give them a little bit of confidence.*

Some teachers described learners leaving because of examination fears and several reported giving very nervous learners tests without them knowing it by telling them they were practicing a mock test when in fact they were sitting a live paper.

T5: We've had people who's actually withdrawn when it comes to the assessment time, simply because of the pressure of an assessment or an exam or however people perceive it.

T6: We try to find out people like that, identify them and give them the test without them knowing.

T14: For people with exam nerves I tend not to tell them they are doing an exam. I take [laughs] I take all the headers and footers off the exams and tell them, "We'll do this ***like*** *an exam", and they do everything in exam conditions thinking their doing another exam practice. And once they've done that once and passed hopefully, touch wood, it gives them confidence and when it comes to the next exam they're not so frightened.*

This practice was actually observed. Such activity perhaps points to a potential conflict of interests for the teacher who, on the one hand, feels responsible for getting the learner through the test and, on the other, is the first assessor of that test.

This building of confidence went beyond the immediate computer or examination knowledge and for many teachers related to general confidence to learn or grow and develop as a person, this latter view being practically evident for the non-examination based teachers. Several teachers felt that, for many of their learners, previous learning experiences had not been rewarding and that they thus feared learning and the learning experience. A number of the teachers felt the learners' biggest hurdle to learning was actually getting started and taking the decision to enrol on the course. T7 described how it had taken one of his learners three days of returning to the college before she could bring herself to actually open the door and walk in. The learners could be seen as vulnerable and intimidated by the classroom experience and the teachers' role was thus to help these learners overcome those fears.

> *T2: And some of the learners are very sensitive as well, because they have been in a learning environment before they sort of feel they have that sort of fear. I've seen the kind of fear that they will not be accepted by their peers, scared of the learning process, or scared of the tutor, or something like that.*

> *T5: I think influential would be some students who come for the first time, say a 50-60 year old, they haven't been in a classroom since they left school and the terror on some of their faces you never - I didn't expect that. Some people are just so scared of coming back into education for the first time. I didn't realise that at first.*

> *T9: You get these women in. They've left school at 15, they've got no qualifications but more so they've got no confidence. And they've been in classes with, I think, teachers who patronize them and it makes them feel stupid. And essentially you aren't teaching them* ***that much****, you are teaching them to believe in themselves.*

> *T1: The main/ difficulty is lack of confidence. Particularly for people who are just starting out. Not only their lack of confidence with IT but lack of confidence, just generally. ….. for years they've been told they're been stupid or for years the teacher wrote them off as they walked out the door, that sort of thing. And, umm, something simple like, oh I don't know, an entry level certificate can mean a huge amount to somebody.*

This role of confidence giver relates closely to the teacher's role as creator of the learning environment. The emphasis here was on making learning non-threatening with teacher as friend, empathiser, and supporter.

7.4.3 Teacher as Creator of Environment

Both teachers and learners strongly emphasized the teacher's role as creator of the classroom climate. A good classroom climate was described as relaxed, informal, calm, fun and non-threatening. The workshop teachers especially felt that the classroom should not be 'teacher led' but rather that the teacher should be a friend. This was observed in practice with the teachers laughing and joking with the learners, making coffee and constantly reassuring learners in a relaxed and informal way. This approach was not confined to the workshop approach, in teacher led sessions the teachers also were relaxed and friendly.

For several of the teachers, especially those involved with workshop classes, the learners' fear of learning related to perceptions of the traditional teacher's role. They perceived school teachers as authoritarian, domineering and belittling. Traditional teaching was perceived as about power issues with the effect that learners felt intimidated and stupid.

> *T2: some teachers have that sort of power issue, where the teacher is sort of up there and learners down here [Shows high and low with hand] and I try to sort of close that. I know there still is a power issue obviously 'cos I'm the tutor and that, but I try to close that, push that sort of narrow sort of space between it.*

> *T9: I mean we get kids in sometimes who have gone through school just being told, "You're stupid, you're stupid, you're stupid, you're stupid" and they believe it, they actually believe every single - We get adults like that who actually say, "I can't do this. I just can't do it"*

These teachers therefore perceived their role as confidence builder as related to 'dispelling myths about teacher and what the teacher ought to be' [T1] and offering an alternative teacher image of equality and friendship, teacher and learner as equals. Learning from this perspective was about overcoming previous fear and developing a new self esteem.

> *T9: Goes back to what I was saying to you earlier, for me. I want someone who has previously been made to feel stupid to actually stand up, and say and* ***believe****, "I'm as good as anyone". That, to me, is the beginning and the end.*

Social interaction between the learners was also seen as important by many of the teachers. This often seemed more to do with learners, and teachers, getting to know each other and enjoying the group than to do with construction of knowledge through social interaction.

> *T2: Well, particularly with the vulnerable students, with fears and that sort of thing, I usually get them into like a group setting where we have like a talk and a chat ……… most of my discussions are informal in the class session, where they'll sit down with coffee and we'll have a chat and things like that. I'll chat about things like what do they want like out of the course, what they would like to learn and that sort of thing. And sort of build up all kinds of rapport with them and build up their confidence.*

Many of the teachers encouraged coffee breaks so that the learners could chat. This group forming dynamic was seen as important in making a relaxed social event.

> *T10: Yeah, it's a bit like a social group, our Thursday night, isn't it? Where they bring sweeties and all have a bit of a natter or one thing or another*

> *T9: One of the ways I and [name T10] make the group is we, effectively, nominate someone to bring sweets and the sweets get passed round the class, people chat and then they start helping each other and then they stay*

Several teachers felt that many of their learners come to class in part as a night out.

> *T4: The four girls who are doing the keyboard I think they're just out for a night. And then the two that were sitting [laughs] the girl that usually does that [waves at the audio player] obviously they were, they said it was the only night they get away from their husbands so obviously>. ……. 'Cause some of them just look on it as a night out*

Yet few opportunities for learners to work as groups were observed. The predominant emphasis was on the individual learner working at an individual computer. Individual hands-on experience was assumed and valued by both teachers and learners. Even when teachers did partner learners to work on a problem each learner remained at their own computer which appeared to restrict interaction. Thus the emphasis on the learning environment looked to be connected to learner welfare rather than social construction of knowledge.

7.4.4 Teacher as Expert Guide

The teacher was often seen, especially by the learners, as the expert who passed on the knowledge. Both teachers and learners valued the teaching qualities of being knowledgeable, approachable and articulate in explaining knowledge. Teachers were often described as a guide to knowledge.

> *L4: Well, she's just there as a guide to point out the error of my ways on previous things, and you know, tell us how to do things better and just give you the confidence to keep trying and just encouraging you to do work.*

T5: I would say the unexplored terrain, definitely, because people are like literately 'press the button' [mimes]. They've never been on a PC before so anything's an adventure for them. So the sherpa, yes.

T8: I would say probably a Sherpa because they teach a lot of beginners who know nothing, so they are a knowledgeable guide in an unexplored terrain.

But these images of guide do not appear to reflect Claxton's (1990) constructivist interpretation of Sherpa, that is the guide and traveller made the journey together, but rather as a kind of Satellite Navigation (sat-nav) system. The teacher has the route knowledge and directs the learner, who is making the journey, with step-by-step instructions of how get there using the quickest or shortest route.

T1: I want them [learners] to be able to follow instruction in as much as, in order for them to follow a designated route that we've set out for them to gain whatever it is, whatever knowledge we had hoped they would achieve at the end and to therefore get the qualification

The danger is that sat-nav system can encourage drivers to blindly follow the route without thinking for themselves. Take the example of the school bus driver (Leroux, 2007) who ended up in Hampton Court, a side street in north London, rather than his destination of Hampton Court Palace 18 miles away. Or the ambulance driver who took his patient on a 400-mile journey to reach a hospital 20 minutes away. Learners may likewise become dependent on following their guide teacher's directions and not think for themselves. If they wanted to make the same journey again it could be difficult for them to remember the way without re-using the sat-nav.

The 'instructional' teachers perceived the learners to require more than route instructions; they sought to provide background, structural information for their learners. Their role was rather more like that of enhanced sat-nav systems which indicate tourist points of interest along the way. This could make the journey more satisfying and signpost the key points so that it was easier for learner to make the same journey again. But this may not necessarily encourage the learner to reflect on the route for themselves. Navigating the route by the points of interest is only helpful if the learner is making exactly the same journey. If the learner gets diverted by road works or has to make a similar but unfamiliar journey those route markers may no longer be helpful and the learner could get lost. So while such an approach may help learners to direct themselves through the repeat routes of the test it may not be helpful in enabling them to negotiate real world problems and contexts which are far less predictable.

7.4.5 Teacher as Examiner

Despite the acknowledgement of the teacher's role as administrator, first assessor to tests and interpreter of syllabus none of the examination-based teachers declared any responsibility to the awarding body. This omission seems significant. It appears to place the tests outside the classroom, something that has to be done but not directly related to the teachers' role. Yet observation and discussion revealed the extent to which course content, competencies and activity was geared towards the tests. The whole group ECDL teacher, T17, described the examination as a 'by-product' emphasizing that the learners came for the skills and to enjoy the learning experience. She taught a year long course of 30 two-hour sessions. The observed lesson, the penultimate lesson of the year, consisted of an hour long mock-test, followed by an hour reviewing the mock test as a group. To be followed the next week by the real test. T17 explained that this was her normal method of conducting the test process. During the year, five modules had been completed which meant that 15 hours, a quarter of the allocated course time, was devoted purely to test activity. This did not include additional time spent on re-sits or practicing test papers and examples. This seems to be a very high percentage of time allocated to something that was described as a 'by-product'.

This issue of time spent on examination preparation was raised by other teachers

T3: At some point you've actually just got to say, "Right everybody it's time you did a mock test, and so you cannot carry on doing whatever it was you were doing, it might have been really interesting, you've got to look at this mock test. We've got to talk about those specific issues and work towards the live assessment."

While other teachers simply seemed to accept that they taught for the test.

T4: I have to be honest I mean I've talked to a number of people who teach the same thing as me and we now teach literally to the exam. We teach what is necessary to get them through the exams and that probably is pretty thin on theory, to be honest.

T5: To a certain extent we are working for teaching towards the end goal which is the assessment. So we are just giving them, then, the competency skills to pass an assessment, it's not - we're not giving them the competency skills for anything other than just that, we're working fully towards assessment only.

T7: We teach them how to do these skills so that they can pass the test. We don't teach them extra to what they need to pass the test. We're told what to teach them, what they need to cover that and we just stick to what they need to cover, yeah.

T8: everybody's got competency goals that they've got to meet. So, yes, we have got to, in a sense, train them to meet those goals.

The test influence was also acknowledged to impact on the teaching role creating an opposing dualism.

T1: But at the end of that section, and I cannot think what the trigger is, but at some point I'll turn from the parent bird into the lion tamer for that person because there is an assessment to go through. I need to make sure that yes they can do it but can they do it to the level required in order for them to have something that says that they are, uhm, err, competent.

On the one hand they were focused on the individual learner and saw themselves as guides or creators of environment for learning, qualities which are evident in Knowles' andragogical model. On the other hand the need to get the learner through the test positioned the teachers with the 'lion tamer' metaphor, training the learner to perform well at competency goals, which reflects the pedagogical model. This seems to position the teachers at opposing ends of the andragogy/pedagogy models continuum at the same time. It could imply that teachers need to pick and choose the part of each approach they feel best fits the teaching needs of the particular courses they teach rather than applying a particular theoretical approach.

Given this emphasis in examination teaching and testing it is interesting that no teacher expressed a responsibility to the awarding bodies controlling those examinations and for whom they act as first assessor. Rather the teachers express their examination role in terms of their responsibility to the individual learner. They are the 'assurer', ensuring that the learner get through the examination successfully. The teacher is thus the interpreter of the examination syllabus, papers and skill needs.

T3: Quite a lot of our job is to make sure that people understand what is required and how it's going to be expressed on the paper by the exam board before they actually go in to take that live assessment. That a big issue there.

T14: I feel that I have a commitment to them to try and make sure that they understand the syllabus and that they can take on board as much as they can and use it as best they can.

This interpretation of role appears to position teachers as a intermediary for learner and awarding body. The examination is something that is being put on them rather than something they are part of. Several teachers expressed the desire not to have examinations but described them as inevitable and themselves as powerless to change things.

The teacher's role is thus seen as complex and multifaceted. Emerging through all the various images of teacher is the teachers' focus on and commitment to the learner. For the participants teaching and learning was seen very much in terms of the relationship between the teacher and the learner, and yet time and again the predominant influence of the institution was observed. Institutional decisions such as courses offered, classroom organization and assessment needs all impacted teaching perceptions and, more importantly, practice. The teachers may feel powerless to control these decisions yet their aims and responsibly can be deeply influenced by them. The next chapter explores these institutional influences in more depth. Discussion has already revealed the extent to which examination syllabus and assessment procedures can shape practice. So following a general discussion on teachers' perceptions of institutional influence the chapter will explore the nature of ICT user examinations. Drawing on syllabus and test paper documentary evidence, issues such as how differing examinations may vary, what type of knowledge and skills are emphasized, and how competencies are assessed will be investigated. Such knowledge is important to help contextualize influences on subject content and learning outcome.

Teachers do not work in isolation. In addition to the classroom influences affected by learners and the teachers' perceptions of learners, the teacher decisions about practice can be influenced by wider external influences in the form of training institutions or government policy. Discussion will explore what external factors the teachers identified as influencing practice and those observed, and then examine how external syllabuses and assessment activity might impact on practice.

8.1 Influences on Practice

All the teachers, bar T16, felt that they were able to teach the way that they would like. They described having the flexibility to work how they wished and being comfortable with their style. The general consensus seemed to be that their teaching style was developed over a number of years, it 'worked', and that the learners would soon let them know if it did not deliver what they wanted.

> *T4: I have to feel comfortable with what I'm doing because I suppose over the years I've got it to the point where I feel, whether they're learning or not I don't know, but they seem to be okay and it works for me.*

> *T15: Yeah, yeah. I'm quite comfortable with my style of teaching. And my students seem comfortable with it. If they don't they usually tell me, you know.*

When questioned further and asked directly what might inhibit practice, about half the teachers felt there were either no restrictions on their approach or quoted practical considerations such as technical problems with equipment, the level of learner knowledge, or classroom layout as impacting on their teaching. But the most dominant influence, identified by all the remaining teachers was lack of time.

T3: The only constraint really is limitation on guided learning hours, so if you're teaching a ten week class you've got to get everyone to the end in ten weeks. That's probably the biggest limitation.

Time restrictions were connected to funding systems. Each course was allocated guided learning hours, that is the number of hours needed to complete the course, and funding and learner fees were calculated against this time frame. This pressure of time affected all contexts and was not confined to courses with set syllabuses such as examination-based courses. T16 quoted lack of time as a reason for not being able to teach the way that he would like

T16: there are circumstances in which I haven't got enough time. Sometimes you are asked to teach five week courses two hours a week, ten hours and you're supposed to do basic word processing. Well after five weeks the basic is really very, very basic. You have to rush through material that you would rather concentrate on.

This teacher went further and also concluded that syllabuses could restrict his teaching

T16: Or sometimes the syllabus just doesn't include the material you would want to put in, you know. I've taught on courses before where I haven't had control over the material that's been taught and ended up skipping what I thought were important issues

For this teacher his professionalism was defined by having control over what he taught as well as the way that he taught. Yet many of the other teachers seemed not to make this distinction, or at least did not express it. They defined professional control in terms of freedom to control the way that they taught and did not directly attribute syllabus content as influencing practice. Those teachers who did acknowledge syllabus influences talked about practical problems such as time constraints and helping the learner grasp the syllabus. But discussion and observation revealed that the syllabus could have a subtle but profound influence on the classroom experience. The examination syllabuses and competencies ultimately appeared to dominate course content and skill acquisition. The nature of the examination content and assessment could thus be very important in terms of subject perceptions and aspirations. It is for this reason that the nature of the examinations will be explored in more depth later in this chapter. Overall external factors identified as influencing practice can be categorised as classroom, level of learning, funding or syllabus orientated.

8.1.1 Classroom

Classroom setups and equipment were often out of the teachers' control and could be organized by institutions other than the teachers', for example when teachers shared facilities with local schools. One or two of the teachers talked of sessions where ICT systems had collapsed making lessons impossible. While T2 from his non-examination perspective talked of being frustrated because the software available to him was not always capable of achieve the tasks he planned. Generally such technical problems were short lived or overcome in other ways and so did not seem to hinder teaching significantly. T16, however, highlighted the dominance of Microsoft software as a technical influence that significantly impacted on subject content. He argued that in the early years of computer teaching no one software predominated which meant that a variety of different programs could be used to teach a topic such as spreadsheet. This variety he concluded provided a broad base for ideas and ways of doing things which gave learners a better understanding of ICT. He felt that the current concentration on a limited number of Microsoft packages limited the range of skills and understanding taught and had implications for adaptive computer use.

> *T16: Nowadays there seems to be only one way of doing **everything** and you tend to get the same ideas recycled over and over again which narrows down the skill range so if anybody comes across any little system that's not a standard ones they're phased by it.*

Further evidence for this argument of dominance of a few packages might be seen in the way that some of the teachers defined ICT literacy in terms of using the ‘main’ packages. T1 also commented on the ‘only-one-way’ effect in respect of his learner who owned the bridal shop. He felt manuals always presented spreadsheets in a ‘horizontal’ manner that is working across the page, while this learner required a ‘vertical’ approach, that is using the worksheets like an index system, to make it do what she wanted. This emphasis on narrow ideas, packages and task concepts is a concern as it implies that commercial enterprise, in the form of software manufacturers, awarding bodies, publishers or educational institutions, could cloud or shape ICT skills needs.

> *T16: We’re driven by commercial and marketing concerns rather than by the **rea**l skills issue*

Yet without the right kind of skills workers and individuals may not achieve the real potential offered by ICT systems. Further these influences are outside of teacher control but impact on practice.

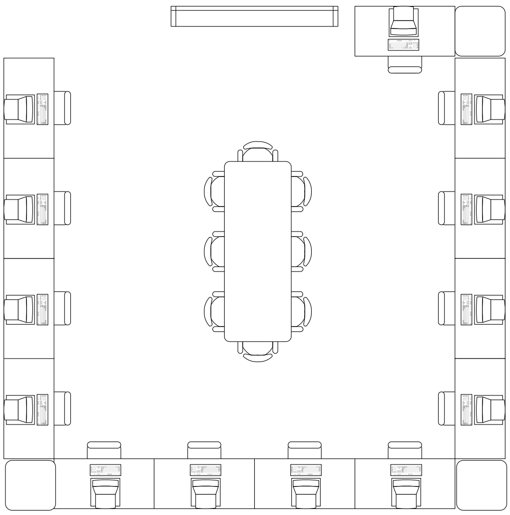
In addition to the equipment and software available the layout of the classroom was also identified as an influencing factor. A few of the examination-based teachers described the practical problems of separating learners during tests and the need for the remainder of the class to remain quiet while individuals were tested but T9 and T10 identified another issue concerning the ICT classroom in that the nature of equipment and the size of room meant that learners could become isolated.

> *T9: I think computer room layouts are designed to keep people apart rather than together.*
> *T10: All you can see is the screen. You can’t even see over the screen to a colleague over from you or next to you. There’s no work room, is there?*
> *T9: [nods] I also think size. That room is too big.*

Their concern seemed to be for developing a group environment but from the observer's viewpoint room layout could also have subtle and disturbing implications for teaching and learning.

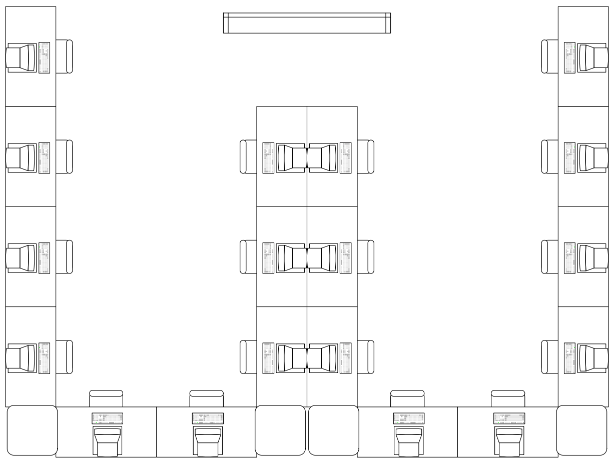
In all of the observed classrooms, except the HE 'structured' problem solving class, the layout of the room was a variation on the 'U-shaped' format. Desks were either arranged around the walls of the room or for large classes in U-shaped bays which could be either vertically or horizontally arranged [Figure 8.1(a+b)]. In all cases the learners where sitting with their backs to other learners and the teacher. Even where learners faced one another, as T10 observed, they did so with computers between them. This effectively limited the learner's communication to the learner next to him, but even then learners were two or three feet apart making prolonged discussion difficult. For effective conversation the learner needed to move from his computer to join another learner or call a learner or teacher to him. In some of the school-based classrooms there were seating areas, obviously designed to enable discussion. The adults' teachers may have used these areas for this purpose in unobserved sessions but during observations they were only used during coffee breaks when the learners sat to chat. The effect, amplified by the perception of ICT user skills as individual and hands-on, was to make the computer the learner's main focus. This was especially evident in workshop based classrooms but even in the group approach the learners remained at their computers during demonstration and discussion, often with their back to the teacher and whiteboard. The learner worked interacting one-to-one with the computer with only occasion interventions by teachers or other learners. This made the main learning relationship learner/computer which could isolate learners from other class members. The social interactions to enable social construction were spasmodic or indirect in the form of written material.

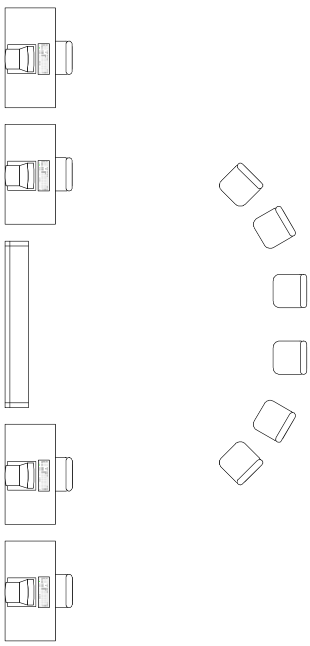
With their limited software and computer resources the three HE teachers' classroom had a distinctly different layout. The computers were again against the wall but the learners were not tied to them in a one-to-one relationship. The



a) ‘U’ layout around walls of room

b) ‘U’ layout in bays





c) Layout in ‘structured’ problem solving class

Figure 8.1: Types of classroom layout in observed class

learners sat away from the computer [Figure 8.1(c)] and shared computer interaction on the whiteboard in a one-to-many relationship. This release from hands-on, individual experience also enabled joint problem solving through group social interaction. Even during a working session exploring on-line software these learners were observed working at computers in pairs and not individually. The disadvantage for these learners was that they had less opportunity for practical hands-on experience and mastery of computer functional skills. This could be a problem for learners especially if new to computers or learning new application skills.

8.1.2 Level of Learning

The types and level of courses available appeared dependant on institutional decisions based on learner demand and/or profitability. The teachers had choice in whether they accepted a commission or not but, unless they were involved as unit leaders, appeared to have little input into which courses were offered. The teachers reported that the level of study impacted on their teaching style. They perceived beginners to require a ‘softer’ touch and were concerned to build confidence and eliminate fear of ICT and/or learning with these learners. They felt beginners required a strong structure to learning and more support and that too much challenge at this stage frightened learners away. Whereas more experienced learners had more confidence, could be challenged and generally required less help. This meant that teachers felt more confident about using terminology and questioning techniques with these learners.

> *T16: The higher the level the more I ask of them, the more technical it gets, the more I’ll use jargon. The lower the level the more likely I’ll use metaphors and jokes and stories to get the context right, so they understand how things work. The more it will be about confidence building. And the more it will be sort of like its more [pause] more sort of* ***very laid back****.*

T6: Yes, I try to encourage, especially level 3 students to work a bit more independently. To try - a level 1 student if they cannot do it they'll just ask straight away and we'll come over and help them. A level 3 student should be trying things and when it doesn't work then ask. They should be problem solving, attempting to problem solve, before they ask.

T5: You probably pose more of a question [at level 3] rather than give them the answer. Whereas a level 1 student, yes, it's more of the kid gloves scenario.

T8: One can set higher challenges for the people doing their advanced stuff and they understand straight away, hopefully, what they are required to do. With the beginners it's taking things slowly. …….And the higher up they get I let them do more for themselves and say "Right you've covered this and I want you to have a go at this" and set them a challenge….. With the beginners I wouldn't dream of doing that [laughs] because they'd not come back next week.

T3: the higher you go up the scale teaching, people tend to be much more focused …….. So they tend to be more self motivated and you tend to spend more time talking about the technical aspects of what they're doing rather than dealing with wider issues of confidence and things

How this might work in practice can be clearly seen by comparing two lessons taught by T16. Both sessions were partway through 10 week courses, the first for beginner Internet users and the second intermediate users' introduction to webpage design. In the beginners class the learners were given tasks which required them to find answers to specific questions on the Internet [Appendix D2(iv-a)]. The results although not identical were very similar. The teacher constantly circulated the group checking on progress and telling learners what to do. When T16 felt the learners to be sufficiently confident he provided a slightly more open task based on planning a holiday trip [Appendix D2(iv-b)]. Here the learners were presented with short scenarios which built into an overall project but were still guided as to what type of information was required. The responses were more varied and dependent on the hyperlinks learner chose to follow with the teacher less evident but still carefully monitoring in case of problems. In contrast in the webpage class the nature and appearance of the website was left completely to the learners. They made all the decisions about the website and the teacher only intervened when they requested help with a new process or had a problem. Each website was unique. T16 described the difference between the two levels as follows:

> *T16: They [more advanced learners] were not only developing the ideas and producing this material, they were designing it as they went along and also dealing with the problems. So a lot of it was about initiative. Having an idea and following it through and at that particular level, those particular levels I would expect people to be able to do that, whereas the earlier ones a lot of it would be hand held. A lot of it peering over other people's shoulders like I was doing today, checking to see they weren't getting themselves in a fix and tweaking them as they go…….. and also the tasks tend to be quite routine and repetitive at those particular levels. So it does differentiate very largely between simple stuff which is very repetitive and the other stuff which is past that stage where they're wanting to take those ideas and build them into imaginative scenarios.*

In this case the differences were observable but for the more transmissive teachers the distinctions were far less clear. This could in part be because the descriptive nature of observation recording did not enable subtle nuances of language or activity to be identified, or because the mixed ability grouping made it difficult for the observer to identify differing learner levels. What was observable was that learning routine, involving step-by-step manuals, demonstrations and prescriptive exercises, remained the same regardless of level. The processes and procedures became more complex but the pattern of learning remained the same with the learners producing identical copy. The teachers were observed to simply tell the beginners what to do but with more advanced learners tended to wait longer before stepping in, for example these two exchanges

> *Observation [T6 and C&G level 1 learner]: L asks for assistance. T6 goes the L and looks a problem, "What you have to do is….". T6 tells L what to do.*

> *Observation [T6 and C&G level 2 learner]: T checks L okay, then watches what L is doing periodically offering comments "stay away from the edges it makes it easier - no centre line and heading - bold - it's already bold - change the size to 16". L does actions as T instructs. T asks L to scroll down to bottom of page. L performs an action. T says, "That's just making it bigger. Scroll to the bottom of the page". After a few seconds T takes control of the mouse to show L what to do.*

But in both cases the teacher was seeking the one correct answer which merely required the learner to recall previously learnt procedures, and ultimately he provided the answers. The teachers generally appeared to provide more complex answers for more advanced learners and used 'instructional' style more frequently. It was difficult to see to what extent this was because advanced learners were able to cope with more information or because the more complex procedures required more explanation. However, the more dramatic change of learner control of task, evident in T16 classes and description, was not evident in the majority of cases. This was especially apparent in the examination-based classes and could be related to the nature of the examination task and assessment.

8.1.3 Funding

The impact of funding on teachers' CPD opportunities has already been described but in the classroom the impact could be even more profound. The teachers contributed practical influences such as organization and amalgamation of classes, time allocations, choice of courses offered, and learner access to funding issues. They felt funding to pervade the institutional ethos, and several were critical of government and institutional hierarchy, perceiving them to be uncaring and having a ‘bums on seats’ approach. The feeling was that the institution saw education as a process which the learners needed to pass through as quickly as possible and were only concerned for profitability.

> *T7: Some places it’s like bums on seats and once they’ve [learner] paid they [institution] just what to get them out, you know.*

> *T5: current policies regard learners as lumps of meat with pound signs attached*

This was felt to conflict with the teachers’ own caring and nurturing approach.

> *T10: I took the job at the college because I believed it was all like education for educations sake and it was for the students’ sake but it’s just not. It’s very disillusioning, I think, when you come into teaching and realize it bums on seats, make money and it doesn’t matter what happens in the classroom or anything. If you’ve got those bums on seats and you retain them you get the money. That’s it.*

> *T16: [After suggesting learning should be life changing] And sometimes management doesn’t grasp that. It sees it as purely input/output, you know. Did you get enough students through this course? Did they stay? Which can really get your goat on occasions.*

The government’s recent changes to funding, attaching funding to accredited courses and making young learners the priority, was seen to intensify this problem. Both teachers and centre managers were concerned that such measures were restricting learners’ course options and learning time while increasing the learners’ financial contribution and the emphasis on examination-based courses. The longer serving ICT teachers and those involved in community learning where especially concerned about policies which divert funding to 16 - 19 year olds meaning that many of the adult education classes, especially leisure-based courses such as digital photography or genealogy would have to ‘pay their own way’ to survive. It was feared that learners either could not or would not pay the full costs which would mean that such courses would cease to exist. T8 had already had several of her ‘Genealogy Online’ courses, a previously popular class, cancelled due to lack of applicants. Loss of courses was not confined to community based courses. T9 in the FE sector feared that her ECDL advanced course was also in danger of being priced out of existence. Funding was seen as a serious issue

> *T8: I* ***do*** *worry about it [funding] quite a bit [laughs]. Knowing the way things are with government taking funding more to the 16-19 year olds rather than adults and seeing that the pot seems to be just draining and draining away. And worrying about how much we are going to have to charge the students.*

> *T16: Oh, an enormous issue [funding]. We spend all our lives just thinking about it all the time. Not just thinking about that but thinking about what the next course is going to be. For part-timers that is like bread and butter. And it’s worse this year than ever before and in the autumn we’re going to find it very difficult. This centre hopefully will still have a course programme supported via the local council* ***but*** *that’s all guess work no one’s 100% certain about that.*

Loss of courses was seen as not only impacting on learner choice but also on teacher security.

> *T1: 16-18 is king, we are the poor relative and our staff are dissipating and dissolving because there’s no funding there to support it.*

Many of the community based institutions were therefore turning to examination-based courses to secure funding. This was seen to disadvantage the older and/or non-working learners, who may not be seeking work skills or qualification, by restricting the types of courses available and offering them course which might be unsuitable for their needs.

> *T4: I know it's all to do with funding - but it actually constrains what they learn. We have a lot of people who would like to learn things which there isn't a qualification suitable for so they can't do it.*

> *T17: the way it's going there's emphasis on certain courses, certain types of provision which don't suit all learners……….. concessions have gone for older learners. The fun courses have gone for the older learners, you know, the old joke about the underwater basket weaving, you know a lot of the community courses have just been killed off now.*

Funding policies were observed not just to tie learners to particular programmes of study but also to examinations which for some learners was seen as an ordeal. The teachers felt that some learners withdraw from courses because of examination pressures but that they had no option other than making learners complete tests as funding was attached to examination success.

> *T5: No, no, our hands are tied as far as that's concerned, because the funding's by LSC. The end product is working towards a qualification and we would* ***love*** *to go back what six, seven, eight years ago to when they had the old non-schedule two stuff, brilliant days but no - no longer. As blunt as that is, it's a fact. We are simply governed by achievement.*

For the majority of the teachers this meant that one of their main foci became making the examination less intimidating for learners and ensuring examination success.

T8: At the same time, obviously, because everything's tied in with money now they've ***got*** *to be able to get through the exams. So my main aim also has to be to actually give them the skills they need to get the qualifications*

Examination success for the learners and financial success for the institution became inexorably linked. As another examination-based teacher put it, getting the learners through the examinations was the means of providing the money to continue teaching other learners.

Funding also tied learners to time frames which were described as narrowing the learning experience in three ways. Firstly the time allocation was perceived as 'tight' so that often there was insufficient time to cover subject content beyond the syllabus.

T3: because there's a lot to do in ten weeks by week five or six you've got to start the mocks etc, etc. You end up sidelining things that you consider to be very important simply because you've got to just push the student towards the assessment and meet the deadlines for your student's time, the time, the guided learning hours for the course that their on. That's quite frustrating.

This meant that subject information the teachers perceived as important may not be covered. Secondly, while for some learners there was no problem other learners were felt to require more time to complete the syllabus, they needed longer to make the journey. In the past teachers in workshop courses had had a degree of flexibility in time but were now finding themselves more restricted.

T1: [Pause] We used to be able to give someone as much time as they needed in order to be successful and that stopped …..Some people that's important they need that time …… And that can be a little bit tight for some people, and it would be nice to have the facility to extend it.

This meant that some learners had to be 'rushed' through the work and on occasions forced to sit examinations before they felt comfortable or ready. This was again felt to particular disadvantage older learners who were perceived to work more slowly requiring more time. Thirdly, previously some workshop-based teachers had learners who attended sessions over a long period of time systematically working through a variety of modules. These learners were now being restricted to just those modules they needed to gain qualification. For ECDL this was not perceived as a problem as the learners needed to complete modules in at least 6 different applications but for other qualifications, such as CLAIT, this could be as few as 3 [Appendix A5]. Given that the teachers emphasized variety in application knowledge as important for effective application, this narrow focus was of some concern.

Despite these concerns the teachers appeared quite philosophical about the current emphasis on examination-based courses within ICT. Both teachers and learners seemed just to accept the need for and the nature of the examinations and syllabuses.

> *L: I know when I was at school everything was based on your exam and that was it, so for me, you know, that I've got to come into an exam and that's it I've got to do it I've been used to that.*

> *L: I think it's pointless doing anything like this unless you get the qualifications at the end of it.*

> *T17: And the bottom line is that you do something properly. Usually that goes hand in had with being able to pass a test ……… And obviously, you know, if we didn't have these qualifications then I wouldn't be sitting here.*

Several of the teachers, especially long serving ICT teachers, regretted that they were forced to teach examination-based courses but obviously felt powerless to change or influence it.

T3: As I say I would like a more open system where learning wasn't dependant upon gaining qualifications, but that's not going to happen.

T8: It's time really. I would like more time and not be constrained so much by having to get the exams in. But because the way funding works I know that cannot be changed, so [shrugs]

The concern is that this lack of power could lead to examination content and subject content becoming one and same. If examination content is the only subject content learners experience then they may come to associate subject skills and knowledge wholly in those terms. This makes the examination very influential for curriculum.

8.1.4 Curriculum

As part of the discussion on skills teachers were not only asked to arrange skills statements as 'essential', 'desirable' or 'less important' according to their personal view they were also asked to review the exercise according to how they perceived syllabuses to view them. The differences were recorded and compared according to the number of occurrences. Each teacher's response to each question was then plotted according to nine category codes [Appendix C8]. The codes each composed two initials; 'E' for 'essential', 'D' for 'desirable' and 'L' for 'less important using upper-case for the teacher's own view and lower-case for their interpretation of syllabus view. Thus 'E-d' represented a teacher's view of the skill as essential but a perception of the syllabus as seeing it as desirable. These coded categories were then used to map responses exploring institutional characteristics such as syllabus (type of examination or syllabus), working approach (workshop or group) and institutional focus (community or FE). Where teachers had been undecided and placed statements between priorities, for example between 'desirable' and 'essential', the higher level was used. These results were presented graphically to enable a quick comparisons and to identify levels of (dis)agreement [Appendix C9]. A summary chart showing the degree of variation for each question can be found in Chart 8.1.

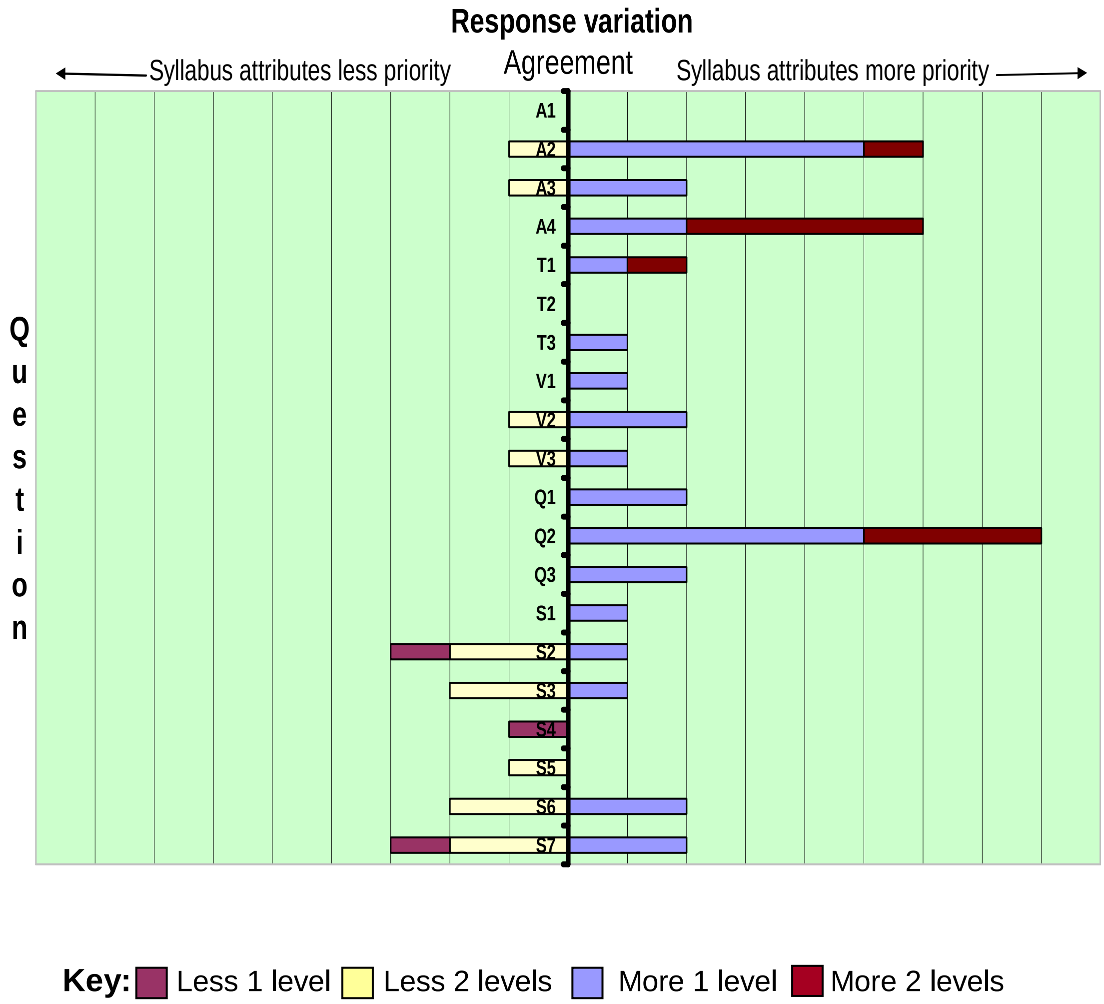


Chart 8.1: Summary of variance between teachers' view of skills and their perception of syllabuses' view of skills

This process revealed that generally there was a fair level of agreement between teacher and syllabus perceptions of ICT skills need. Changes of priority were slight, typically only one level of disagreement, either higher or lower. This level of disagreement was thought to be unimportant, especially in isolated instances. Two levels of change could, however, be meaningful, particularly if reported by a number of teachers. Some statements registered no change. Three ECDL teachers identified no differences between their personal and syllabuses perceptions of skills. It is difficult to know if this was because they felt the course covered all skills needs, if their skills perceptions were bound to the syllabus, or because they were not involved with the task. Overall, no distinctive patterns linking teacher, institutional characteristics or priorities emerged. Both teachers and syllabuses placed a strong emphasis on application processes skills and a lower emphasis on the technical aspects of computer use. The syllabuses were felt to place slightly more emphasis on the more complex procedural skills such as page properties and file management than the teachers (A2 and A3). While the teachers generally placed emphasis on skill transfer (S statements), many felt syllabuses placed less emphasis on this area. This was most evident for the word and text processing teacher, T4, perhaps because of the narrow focus of secretarial skills for this course. A third of the teachers perceived the syllabus to be less concerned with tasks orientated to real life situations (S2). But this was not perceived as a huge problem as it was felt the teacher could signpost transfer and real life use and point out where test tasks did not reflect real life practice. In addition, transfer was seen to be outside of the classroom and dependent on the learner's personal needs. Two statements, however, showed a more marked change between personal and syllabus perceptions. These were statement A4, 'Having a detailed knowledge of one particular application', and Q2, 'Gaining computer qualification skills'. There are possible implications for these differing emphases.

More than half the teachers had identified an overview of a variety of programs to be essential for effective application and to provide insights in to the computer's capabilities. None of the teachers saw a detailed knowledge of one particular package as priority, yet 83% felt that syllabuses saw this as 'essential' or 'desirable'. The examination concentration on one package perhaps links to the modular nature of qualifications based on specific topics, namely spreadsheet, database, presentation. Learners experience one package at a time and depending on course or module choice may only experience a narrow range of applications. T16 and T1 suggested, this could, promote an inward looking ethos; emphasizing only one way of doing things. Such limited experience could make it difficult for learners to adapt to new packages or activities. Knowledge and expertise become bound to one application. Workers may be less effective if they are unable to utilise a range of different applications, for example having completed a design, T6's engineers are only effective if they can share those ideas with others which may require e-mail, Internet or PowerPoint skills.

Some situations may not only require users to be able to work with a variety of packages but also be able to integrate packages, especially in a networked office environment. T3 explained that previously some qualifications, for example Integrated Business Technology (IBT III) the precursor to CLAIT Advanced, had a multi-package approach with assessment across a range of applications at once but that this type of assessment was no longer available. The emphasis now was on learning word processing and being tested on word processing, then learning spreadsheet and being tested on spreadsheet. This seemed to treat ICT knowledge as discrete blocks but this knowledge orientation does not represent the authentic practice of integrated working. Thus unless the learner makes the connection for themselves, or the teacher signposts the interactive nature of applications, this feature of real world ICT use may be lost to the learner. Knowledge could remain confined to each application, in turn limiting effective application. Three of the ICT experienced teachers identified this area of ICT syllabus content as of concern and said that if they were to design their own syllabuses they would include integrated processes.

The teachers viewed gaining computer qualification skills as low priority yet two-thirds of them perceived the examination syllabuses to see this as 'essential'. The teachers described the skills as the prominent aim and the examination as secondary. The examination was regarded as a 'by-product' or 'added 'bonus' to the main function of skill acquisition. Yet the need to maintain pass rates to accrue funding, the perception that learners' and employers' ultimate aim was test success, and the restriction of time to deliver syllabus knowledge all served to promote the prominence of examination skills. Throughout observation a considerable amount of time, effort and focus were seen to be devoted to test achievement regardless of the teachers', or learners', skills priority. The examination took over and as T4 phrased it became the 'raison d'être'. The teachers end up teaching for the test and the learners end up learning to passing the test.

This need not be a problem if the examinations skills, knowledge and activity reflect and support those required outside of the classroom. But if, as suggested above, the examination skills or syllabuses limit the learners' experience then it could be a problem. If learners and teachers are concentrating on how to pass the test they may not be concentrating on engaging with the subject or adapting and transferring knowledge. T16 suggested that learners could come away with good examination knowledge but not necessarily good working skills.

> *T16: So people coming off the end of CLAIT tend to have a very good knowledge of what the course is all about and have a very good knowledge of the things that CLAIT teaches but they're very inflexible as to the way in which they work with ICT generally. So you tend to find that, you know, as long as it's within the remit of whatever they've been taught, tested on then great, but everything else …… throws them.*

Further, the dominance of the syllabus versions of knowledge seemed to weaken the teachers' and learners' control of course content, format and skills emphasis. Within this research the non-examination based teachers were seen to have more freedom of approach and/or content for instance T16's problem solving classes or T2's Photoshop class with a play approach. Several of the long serving examination-based teachers reported that the courses they felt were most successful or satisfying were those they had taught that were not examination-based where they with the learners had total control over content.

T18: We did a PowerPoint class once at [name of place] and they had a ***whale*** *of a time with it. Brilliant time and we got all sorts everything through American holidays, through florist, through making cakes, everything. They just picked their own subjects and off they went and they really enjoyed it.*

T9: I did a course once previously which I really enjoyed. They sent down, because it was a moments' notice, a group of about 12 men and all I knew was that they wanted to learn spreadsheets. So I spent the first hour saying, "Okay, I know you want to learn spreadsheets. What do you ***want*** *to learn?" And that was a superb course because they said what we do is A, B, C and D and therefore what we need to know is how to do.*

But for examination-based courses syllabuses and task format was observed to pervade the course content. Yet often the teachers seemed not to openly acknowledge this influence. Some teachers were surprised by the changes they made to the skills statements allocations but merely shrugged it off. The teachers seemed to pragmatically accept that the examinations were there and they just had to live with them. They also seemed to underplay their influence emphasizing them as a 'by-product'. The examinations, however, were observed to be far from the neutral presence in the classroom that the term 'by-product' would suggest.

Key to this discussion is to what extent the examination activity reflects or supports real ICT activity. The teachers seemed divided on this and generally argued that their own examination syllabus offered the right kind of skills while others did not. Thus for some teachers CLAIT 'had it right', while for others it was e-Quals or ECDL.

T14: ECDL I actually think it is quite a nice, its got quite a nice flow to it.

T7: Ours [e-Quals] is definitely a little bit different, whereas you've got to do it yourself, create something, start with a blank and make something *yourself, ours is a little bit better. But then do they [ECDL] not make it easier so that people will pass? Ours is a good qualification not everybody passes.*

R: Do you think the kind of skills in the exams are the kind of skills they do need in their work environment?
T8: Mostly. If you're looking at your ECDL course, yes definitely. CLAIT I don't think covers enough. So some are some aren't

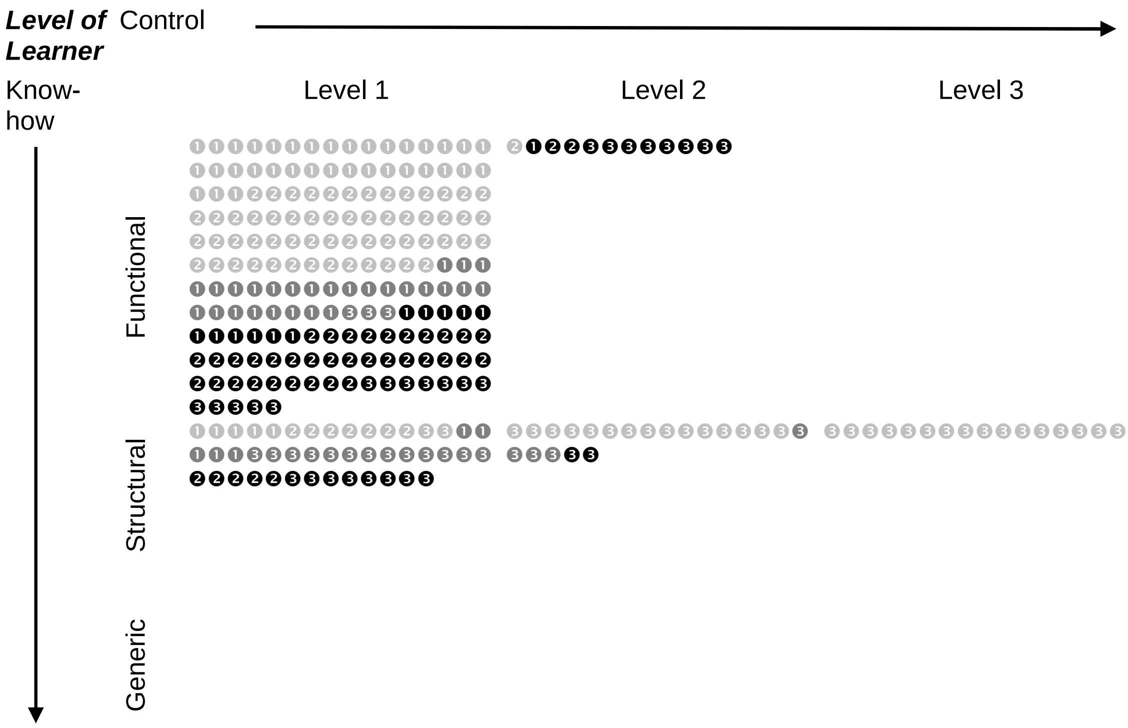
T5: Because of the qual what we offer the 7262 [e-Qual] in my opinion it's a gooder IT as what's on the market……..our students walk out of here knowing a lot more than what they need to. And because of the structure of it, because it all work based scenario led it's as if these people were working in an office type environment.

This could be because teachers choose to work with courses they liked, because familiarity meant that the teachers connected with course content, or because there were genuine differences between the courses. The teachers had defined practice of examination tasks as vital for examination competence and familiarity. This made the nature and expectations of tasks influential in the teaching process. If some qualifications offered more 'authentic' practice or more 'realistic' skills, or conversely 'unauthentic' practice or skills, this might be reflected in classroom practice. It was therefore decided to analyse examination tasks in more detail. The aim was to a) define what types of knowledge dimension was evident; b) what levels of cognitive process were emphasized; c) if and how skill level might influence knowledge dimension and/or cognitive process and; d) whether the differing qualifications varied in their approaches.

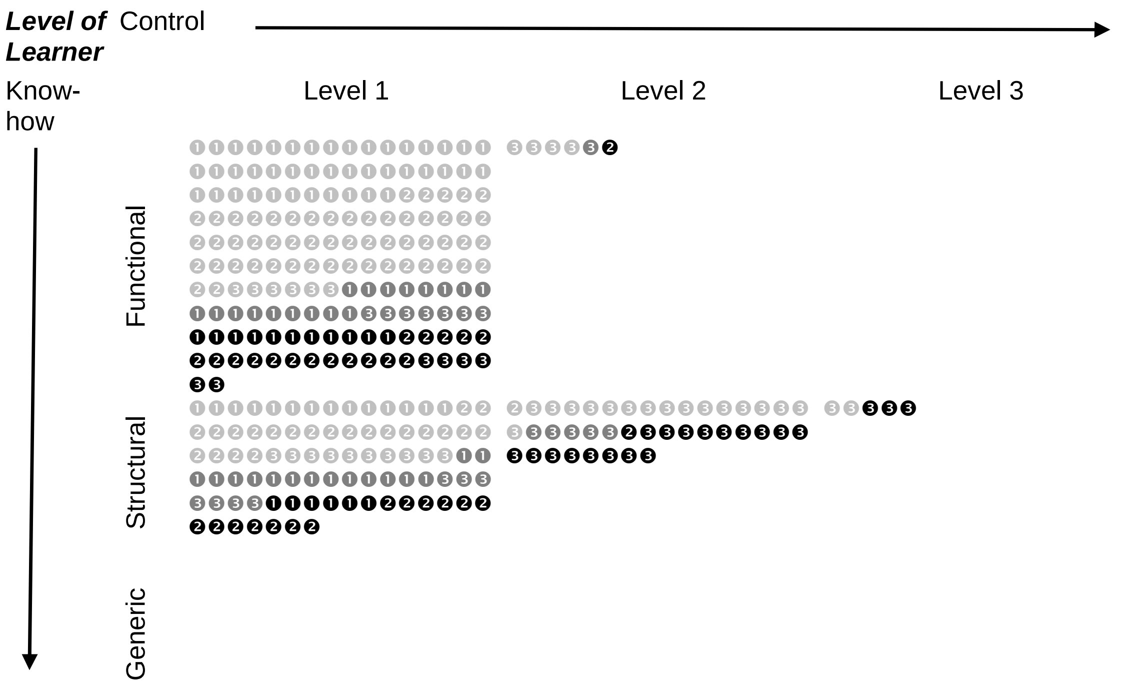
Three of the leading examination syllabuses, CLAIT, ECDL and City and Guilds e-Quals (e-skills, 2004b), were selected for analysis [Appendix A5]. The modules for word processing, spreadsheet and database were chosen as these were most frequently quoted as important by the teachers. Each was examined at levels 1, 2, and 3. In addition, the presentation module was included as this had the potential to have a more creative application focus. The e-Quals qualification, however, did not offer this module at level three. The examination tasks were examined against stem objective, task activity and assessment criteria and plotted on a grid [Figure 4.5] against knowledge dimension and application level. The occurrences were then plotted by examination type and NQF level [Chart 8.2]. Each of the examination papers had different structures and number of test tasks so the number of occurrences was not significant but rather their location on the grid. It should be noted that examination boards frequently review and revise examinations. These findings relate to the syllabuses and test tasks used and discussed by the teachers during the main body of the research period. In autumn 2007 the e-Quals 7262 syllabus was replaced by the 7266 version. These changes implemented by e-Quals after the main research period are also discussed and displayed in Chart 8.3.

According to Anderson and Krathwohl's (2001) revised taxonomy, modern understandings of learning based on constructivism would envisage a spread of task objectives for a programme of study scattered across the grid at all levels of learning. T16's description of ICT user learner needs, however, would predict a gradual movement from the top left corner of the grid associated with recall of functional skills to the bottom right corner requiring creative application in context as experience and skills increased. What was revealed was a strong concentration of tasks requiring recall of functional or structural knowledge in all qualifications and topics, especially at levels 1 and 2. For ECDL this focus remained at level 3 but for CLAIT and e-Quals there was a movement towards more learner control of tasks. The indication of skills beyond the computer, such as presentation or problem solving, was extremely limited and rarely assessed. The only example was the use of multi-choice questions by ECDL to assess learners understanding of issues of audience reaction in the presentation module at level 3. These emphases seem to closely mirror the reported perceptions and/or actions of the examination-based teachers within this research and could indicate the power of the examination syllabuses over teaching practices. It raises issues about the nature of the task, assessment,

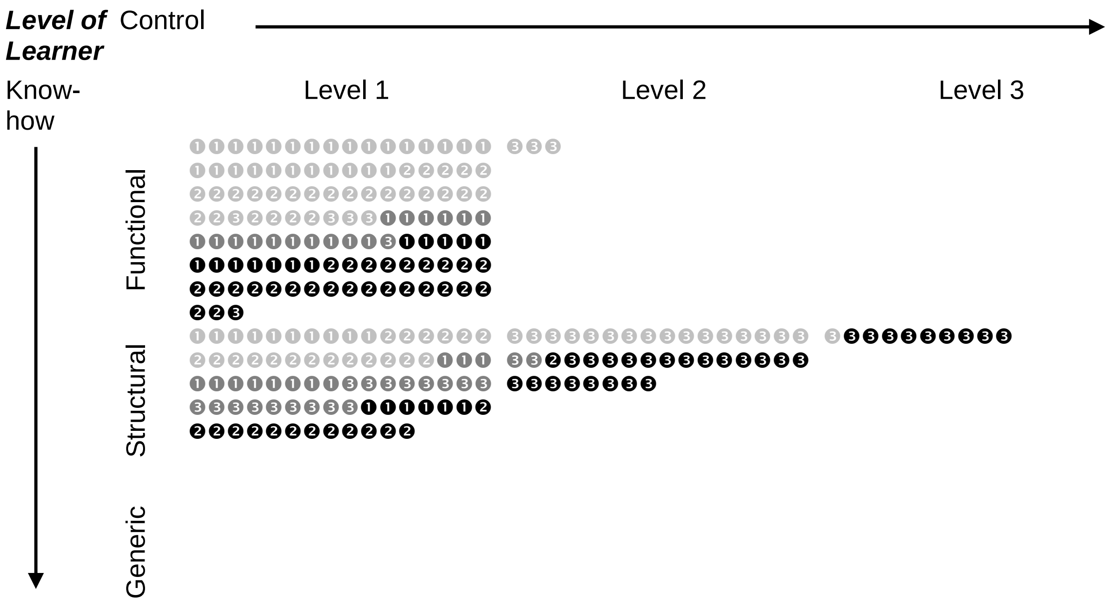
a) Word Processing



b) Spreadsheet



c) Database



d) Presentation

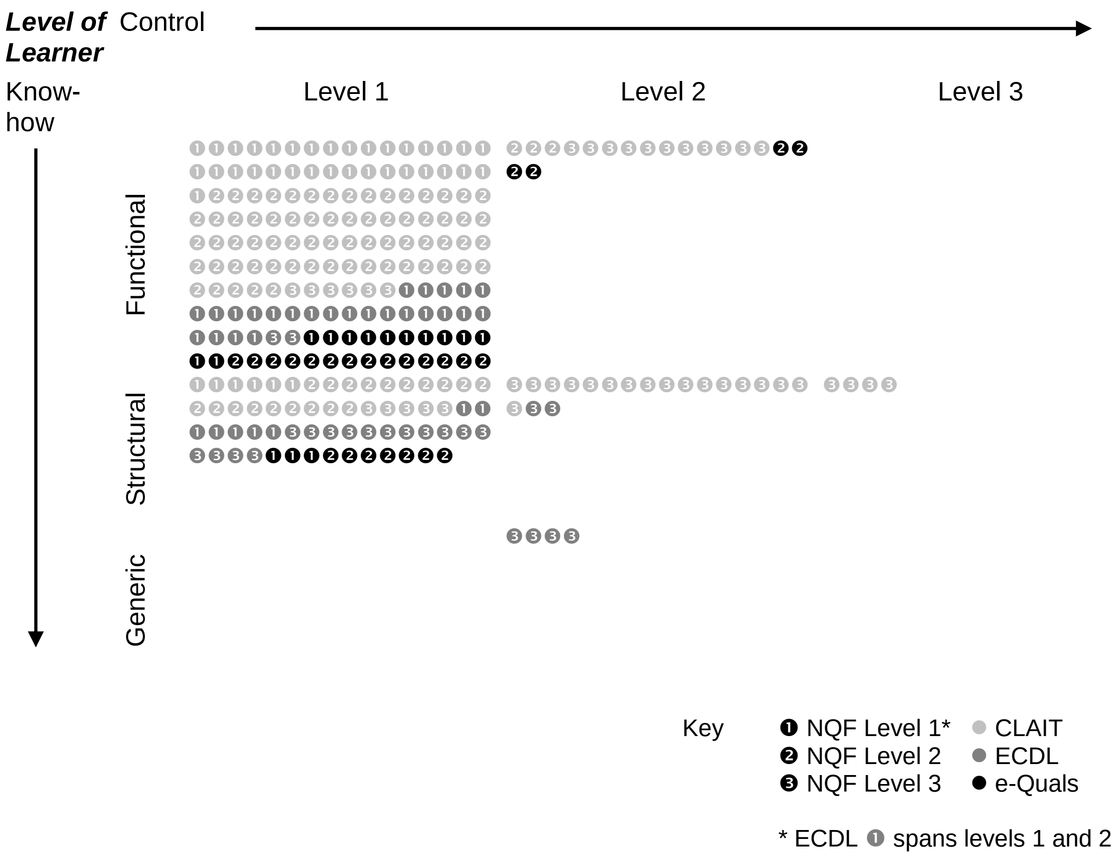


Chart 8.2: Showing nature of task and assessment for leading ICT User qualifications

and learners' control. A very high proportion of the tasks, in all three qualifications, were prescribed and controlled by the test question, for example

> *[ECDL Word processing] Apply the font colour blue to the text* ***To the members of the Keepfit Badminton Association*** *(ECDL, 2003:30)*

The learner was told what to do and simply needed to recall and perform the procedures to complete the task. At higher levels the procedures were often more complex but the control of the task remained with the test question

> *[ECDL Advanced Word Processing] Create a character style called* ***title*** *using the font Arial, size 16, bold. Apply the style to the text* ***New Stadium Research*** *immediately below the footballer image in the plans.doc document. (ECDL, 2006a:4)*

The learner had more complex functions to recall which may require some structural understanding, for example to appreciate the difference between format and style, but they were not required to make any choices or decisions about how to complete the task. There was only one correct response and assessment was allocated accordingly, for example was the correct text blue or was a style created and applied to the correct text. Each learner was expected to produce an exact copy according to specific instructions. Success lay in being able to perform procedures and follow instructions. The importance of the latter was evident in T6's description of failure by some of his younger learners. He reported that sometimes he had young learners who had learnt computer skills at school but wished to take the test and gain the qualification to boost employability. He started by giving them mock tests which they invariably failed because they did not follow the instructions.

> *T6: They'll do the exams and it's an absolute pile of rubbish. They haven't read it they just take everything for granted, you know.*
> *T5: They think they know everything.*

> *T6: Mmm, it's just a total mess and they haven't followed the instructions.*

One might question what was being assessed in these circumstances. The learners here had the skills to use the computer but failed the test because they misread instructions or because they lacked examination technique. T5's comment implies that 'knowing' what to do was not just related to knowing procedures but was also about knowing about test routines. This indicates that examination know-how has an important role in achieving examination success.

This control of learner actions throughout the tasks seemed at times to negate the objective, take for example this mail merge task in CLAIT Plus. The assessment objective was

> *save files in appropriate format*

and the underlying knowledge was defined as

> *understand the use of master documents and know how to economise on usage of disk space when saving files (for example not saving merged files) (OCR, 2005a:30)*

While the task read

> *You have been asked to print the notices for the January events. To save disk space, normal company policy states that merged documents should not be saved. On this occasion you will be required to save the merged file ……………….As an exception to normal policy, save this document as **jannot**. (OCR, 2005c:6)*

and was assessed according to whether the merged file had been saved as instructed. In this case the task goes against the 'good practice' concerning usage of disk space indicated in the objective. Further the learners understanding of the concept was not assessed at all. The learner was told by implication what might be considered good practice and then told to implement, and was assessed on, an ‘inappropriate’ format. This was to enable assessment of other actions within the task and merely assumed the learner understood the objective. The learner meanwhile could not only have completed the task successfully without any understanding of the objective’s concepts but might even assume the saving of merged files to be an ‘appropriate format’ as this was what he had been asked to do.

There were many such examples where understanding was assumed. Correct completion of action was taken to mean understanding and ability to apply in context. But correct completion of action often required little more than recall of processes. Learners were told how to format text to enhance presentation, the cells to include within formulas, or the fields and criteria to query a database. The learner’s process of problem solving was controlled. The learners merely implemented pseudo-problem solving activity with given solutions. In some instances the learner did not even need to take action to solve the problem or they could complete tasks manually without using computer tools. An example of the former is in a spreadsheet test where the learner was asked to format numbers to the left and then to format text to the right. Many spreadsheet packages, for example Microsoft Excel, have a default setting that formats data in this way automatically. These tasks required no response from the learner, they were thus pseudo-tasks. Indeed if the learner attempted an action he was in danger of undoing the correct solution. The most frequent example of the latter involved proof-reading or editing of documents. Objectives indicated that if instructed to check a document’s spelling or replace a word it was anticipated that the learner would use ‘spell checking’ or ‘find and replace’ tools. The learner, however, could perform both of these tasks manually without using the computer tools at all and still produce the exact copy required to pass. Such pseudo-tasks seem not even to guarantee functional recall or action.

There were differing approaches to the test formats between the three qualifications. ECDL qualifications used pre-prepared files and asked the learner to make changes to documents, while e-Quals and CLAIT presented more detailed scenario cases and required learners to develop documents from scratch. The teachers working with e-Quals perceived this scenario focus to be more authentic and representative of a creative ICT literacy.

> *T6: [in ECDL] you might have so many file on this disc and you open up, say a spreadsheet and then you do one thing on it and then you close it again and you'll get marked whether you've done that or not. Whereas e-quals you've got a work based scenario that your manager has asked you to do this because of this, and then you've got two tasks to do from scratch…. You're creating it from nothing like you would have to do in a realistic working environment. It's unlikely that your boss is going to say, "I've done this spreadsheet, just change that* ***one*** *cell for me will you?", you know, especially at level 1. It's so important that someone can create, that's what it's about.*

The tri-examination showed that, at levels 1 and 2, the task was ultimately controlled, and assessment was according to creation of exact copy. Learners were asked to create documents rather than use prepared files but this was according to prescribed content

> *[e-Quals Level 1 Word Processing] Create the Enquiry Form as shown in attachment 1…….Apply the formatting and text enhancements as indicated in attachment 1 (e-Quals, 2002:2)*

The learners were not so much creating as recreating. The level of creativity was thus an illusion, a pseudo-creating activity.

The e-Quals did, however, offer an element of creation at all levels through drafting which was not seen in the other two examinations. Learners were asked to plan a document on paper before creating it using the computer. Some interesting features emerged from this activity. Firstly, although learners were asked to design documents the exact details of the structure and content of the design were clearly defined. The learners' problem solving process was again controlled and illusionary. The draft was marked according to whether the named elements were present rather than on the degree of creativity or practicality. Where the learners were asked to make decisions about the content for example font size

> *[e-Quals Word processing level 1] Indicate on the sketch which fonts and font-sizes will be used……. (e-Quals, 2002:2)*

the quality of those decisions were not assessed. Thus they could have made completely inappropriate decisions without penalty. The emphasis was on including the named elements rather than providing usable, practical solutions.

Further the e-Quals teachers indicated that their learners did not 'see the point' of these draft activities.

> *T6: They don't understand why they going to do it. 90% of them do it on the computer first and then just copy it down on a piece of paper.*

> *T5: 'Cos their argument is, "Well, I've come here to learn IT. I know what one of them is [picks up pencil] and I know what that is [points to a sheet of paper] and I can use it so why are you making us design this now when I want to be creating it on there, on the screen".*

It is impossible to know whether the learners objected to this process because it was on paper or because it lacked meaningful assessment. Other institutions must have reported similar responses because in the 7266 syllabus the draft element was removed due to negative learner feedback. It was replaced by activity based on pre-prepared files similar to the ECDL format. The four

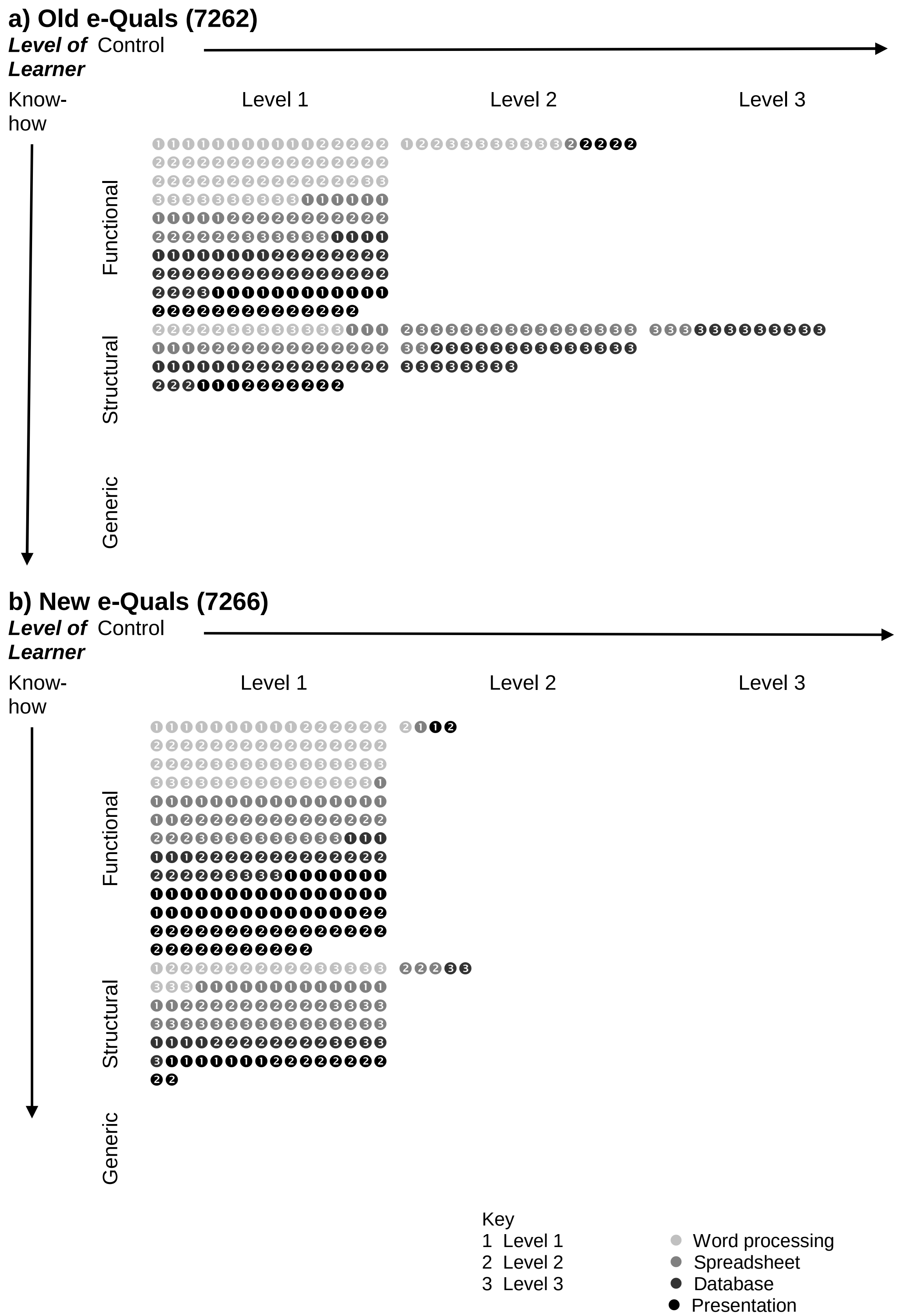


Chart 8.3: Comparing the nature of task and assessment criteria between e-Quals 7262 and 7266

modules, word processing, spreadsheet, database and presentation, for the 7262 and 7266 were compared [Chart 8.3]. The new syllabuses have a much stronger emphasis on recall of functional and structural know-how, making it comparable to ECDL. The e-Quals tends to introduce use of more complex tools than ECDL especially at level 3, for instance the goal seeker tool in spreadsheet, but competencies again relate to knowing the correct procedures for using the tool rather than its use in context. City and Guilds described the changes as reflecting the skills employers wanted (e-Quals, 2007), but the advantage T6 quoted in terms of creativity and realism to working environments disappear. Even the illusion of creativity is now missing. Thus a cynic might conclude that the changes are related to making the qualification attractive to learners and thus maintaining profitability rather than with 'real' work skills.

The e-Quals competencies were remapped to reflect the new syllabuses [Chart 8.3]. The revised chart clearly showed the increased emphasized on functional knowledge and structural understanding. Consequently, of the reviewed qualifications, only CLAIT Advanced (level 3) now contains a strong element of tasks involving contextual problem solving [Appendix C10]. Here learners are either provided with a brief scenario and asked to develop a solution to a problem, or developed solutions to real life problems from personal contexts. T18 who worked with this examination, reported that about half of her learners choose this latter option. At first glance CLAIT Advanced would appear to address the limitations on the use of generic skills and application in context missing in the other levels and examinations, but deeper examination revealed that the amount of task information and the method of assessment could restrict application. The scenarios and problem orientation was limited, vague and ill-defined, take for example the following scenario

> *You are employed at **Claire's Call Centre**. This call centre provides call centre services to corporate organizations, including ZP Bank and Macrolink Web Providers…………Produce a presentation to be used at*

> *meetings by sales representative and also to run automatically in the reception (OCR, 2005d:177)*

The learner had to develop the problem context and the data content as part of the solution. T18 felt that for the learners working with these limited scenarios it was difficult to develop contextual application, but learners who worked on their own projects had more direction which she felt meant they were more successful.

> *T18: It is a lot easier if you're working with a work scenario because you know what you want out of it. And the ones that we have had who have done their own work scenarios have come up with some brilliant stuff…….But somebody else that is taking a scenario that I've given them they're not as good because they're not in the situation where they might know - they've got more information if they're in a work situation, they know what is wanted and what they don't want. Whereas if they're working blind just from a scenario - if you've not worked in that situation - they need more guidance about what is expected of them*

The assessment focus further limited application in context. Assessment was against production of evidences according to a tick list. Solution content was controlled by the need to produce certain competencies but the quality of content was not assessed. Thus learners might be asked to 'identify and record the aims' (OCR, 2005d) but were only assessed on whether three aims were included and not on the validity or value of those aims. The teachers, as first line assessors, were not required to make value judgements on usefulness of content. Their role was to check that all elements were included and worked, for example that formulae produced the correct result. Thus, T18 observed, for learners working on the test scenarios problem solving activity could become bound with meeting assessment objectives rather than contextual solutions. For example, 'Do I have a working IF function?' rather than 'Is an IF function the most effective way to solve this problem?'. The use of generic skills was left up to the learner and was not assessed or required for examination success. For the learners working on their own projects the opportunities for realistic, effective solutions appear greater. They were applying skills in context and even though they had to manipulate the solution to include all required competencies they also had to think about effectiveness and usability. These learners were perhaps more likely to consider and employ generic skills such as presentation. Thus, for these learners the mapping [Chart 8.2] might well move in the generic range.

The type of knowledge and the level of cognitive process within these three dominant qualifications, thus, seemed dependent on the level and type of qualification and the learner's approach. None of the learners participating in this research was involved with CLAIT Advanced and only T18 had experience of it. There was evidence that teachers and learners avoided such problem solving qualifications. The teachers working with the e-Quals 7262, which offered a problem solving element at level 3 [Chart 8.2] preferred to use ECDL at this level. They gave two reasons for this; a) that problem solving was too difficult to teach in a workshop environment and b) that it was beyond the needs of their particular learners and that the learners would thus refuse to do it. The first of these reasons seems dubious given that T18 also taught using a workshop approach and reported that her learners had no problem transferring their knowledge to the problem solving task. But she also report that her learners seemed to favour the more practical modules, such as spreadsheet or presentation, and avoided the more theoretically-based modules such as 'IT solutions', which included the word processing element, because it required more analyse and evaluation of problems [Chart 8.2]. During discussion, T18 reported that CLAIT Plus could also be tested using scenarios but this took longer to assess so she always used the test papers with her learners. Teachers and learners may therefore be persuaded by convenience of assessment rather than authenticity.

While the nature of the examinations can have an influence on the learners they also may have implications for teachers and their teaching decisions. The mismatch between objective and test task may mean that, like the researcher, the teachers have to rely on the test tasks and assessment criteria as guidelines to syllabus aims. This could perhaps lead to a concentration on the task and assessment rather than the underlying subject knowledge. Like the awarding bodies they may come to assume that completion of the tasks implies understanding and ability to transfer skills. The teachers' focus becomes equipping the learner to pass the test rather than becoming a computer user. Even that, ultimately understanding is unessential as long as the learners can pass the test, take for example this comment during an ECDL class

> *Observation: T demonstrates how to insert a field and tells Ls to practice during the week as they may be asked to do this in the test the following week. T says, "You only have to remember it for another week".*

Unlike the researcher, the teachers are unlikely to have the time or reason to explore test tasks, objectives or assessment in great depth. They may take syllabus aims on trust and not appreciate the illusionary nature of the tasks. Where task and syllabus use ambiguous words such as 'create' the teachers could assume that creativity is implicit, as T5 did, and attribute more to the syllabus than it really offers in terms of application experience. Even when teachers, like T16, expressed concerns about test short comings their role as assurer of test success means that they feel responsible for preparing the learner for the test. This means not only acquiring functional skills but also test technique and familiarization with test tasks. The teachers thus end up teaching for the test task.

Over the last two chapters a number of influences on teachers' practice have been identified. These included influences within the classroom derived from perceptions of learners' needs and external influences imposed by government policy, institutional needs or organization, and awarding bodies in the terms of syllabuses and test formats. The current funding policies would seem to ensure that such influences will predominate for the foreseeable future. The following chapter will consider the outcomes of the practices and influences observed during this research and discuss how they may impact on ICT literacy and effective ICT use outside the classroom. It will begin by describing how outcomes are defined within this research and then explore possible implications for outcomes in the context of the research findings.

Outcomes of ICT teaching were not measured within this research as it was not a research aim to quantify the effectiveness of practice. Outcome in this context is rather reflection on possible outcomes of practice in terms of aims and eventual computer use. It is not the intention to define ‘good teaching’ or to judge teachers and institutions. The participants of this research were concerned to do their best for their learners. Practices had been developed and refined over a period of time and ‘produced results’ within currently defined contexts. The objective is rather to encourage discussion about what skills and knowledge ICT users need and how best to achieve them, and explore whether alternative practices or contexts may be applied. In this light there are three areas of discussion; subject, learners and teachers, which will be examined in detail beginning with subject.

9.1 Implications for Subject

9.1.1 Literacy

It is evident from participants’ responses that definitions of ICT literacy can be varied and vague. The teachers offered definitions ranging from simply using the computer, to being able to apply skills in a variety of contexts, to creative computer use. All were firmly grounded in the practical use of computers. The teachers even used the term ‘computer literacy’ rather than ICT or digital literacy. Definitions did not extend into wider knowledge or attitudinal notions such as information literacy or empowerment to join the computer debate. This lack of consensus for ultimate outcome casts doubt on the helpfulness of using terms like ICT literacy. Each stakeholder has a different understanding and vision for literacy. The government seeks inclusiveness, employers seek effective workers, the teachers seek to provide learner ICT confidence, and learners seek personal work or leisure skills. Yet none clearly characterize skill outcomes leaving them imprecise and ambiguous. Without clearly defined goals, however, it is difficult to know how or if they are achieved. In these circumstances, there is a danger that a) aims become associated with immediately measurable goals, such as the number of learners who successfully complete the examination or that b) the strongest voices dominate discussion.

9.1.2 Aims

In terms of aims the teachers were focused on individual skills for personal, work or test needs. Examination syllabuses focus on employers' needs, part of which is qualification as a benchmark of skills. Plotted on the motivation grid [Figure 7.1] the two foci coincide at motivation Type E, individual examination competencies [Figure 9.1]. The shared goal becomes examination

Individual Needs		
Type A (personal performance)	**Type C** (professional performance)	**Type E** (qualification)
Type B (social inclusion)	**Type D** (organizational performance)	**Type F** (benchmark skills)
Societal Needs		

Key: Teacher focus Syllabus focus

Figure 9.1: Outcome for learning motivations

competencies and learner employability which potentially encourages a narrow focus on examination skills. Achievement was rarely defined in terms of more efficient or effective ways of working as might be required by Nixons et al (2006b) employers (Type D model), or as directly related to social inclusion (Type B model). This latter could be because the awarding bodies' connection with employers helps work skills dominate or because ambiguous definitions of ICT needs make social needs difficult to interpret. Either way it has the effect of promoting examination aims and sidelining the purpose of use.

This examination focus was reinforced by the teachers' descriptions of their institutions' need to maintain profitability and credibility. Success was defined by getting funding for courses, attracting and keeping learners, or maintaining examination achievement. Teachers and centre managers predicted this emphasis would increase over the next few years due to recent government policies. This all promoted measurable outcomes and encouraged examination-based courses. Analyses of three mainstream qualifications revealed that examination tasks and assessment generally were prescriptive in nature and concerned with procedural competencies. The focus thus was for explicit functional skills required to complete tasks or to gain set competencies, rather than the implicit structural knowledge and generic skills. This has two impacts. Firstly, it delineates ICT as a skill emphasizing narrow training characteristics such as mechanistic processes, low-level knowledge and predictable uniform output [Figure 1.10]. Secondly, it envisages learning as linear and progressive. This combination could curtail development to a serialistic, progression of increasingly complex procedural skills rather than enabling the low-to-high-level knowledge progression envisaged by the ILP. Outcomes in these circumstances could be restricted and narrow, concerned predominantly with functional skills rather than wider digital literacy understandings and attitudinal change.

In terms of Clarke and Englebright's (2003) tri-elements the teachers visualized this linear progression as functional skills, supported by more detailed information to provide structural understanding, followed by application. The functional skills acted as the foundation from which the other elements could develop. This functional, hands-on foundation could be compared with acquisition of other practical skills such as driving a car. Car drivers learn the practical skills to control the car, accompanied by understanding of road rules and then apply skills in different road contexts. In this latter respect ICT skills, especially in test contexts, were seen to differ. Practice for these learners was often by repetition of the same procedures in mirrored contexts, they worked the same problem in different guises. The focus was on reinforcing procedural skills and not on increasing contextual experience. The underlying supposition seemed to be that by acquiring functional skills, augmented with structural understanding learners would be able to develop application independently. By inference, learners were assumed to have generic skills making transfer of skills to differing situations unproblematic. This had the effect of separating outcome, how the learner would use skills, from the teaching process [Figure 9.2]. Using T16 input/output analogy the teacher was involved with the input of functional skills and structural understanding, the what to do and why, but output, the when and how, was separate and up to the learner.

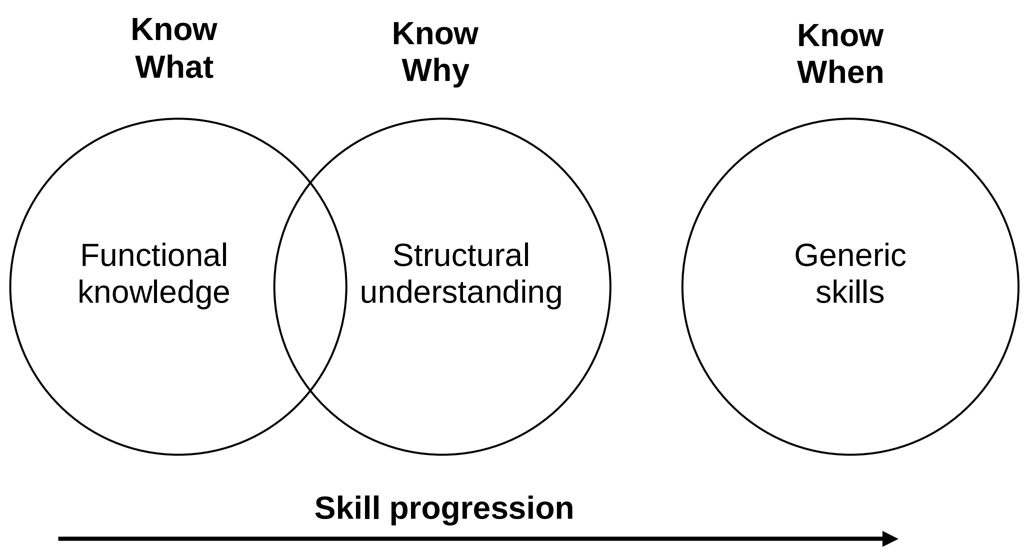


Figure 9.2: Observed progression of tri-element model for ICT user 'know-how'

This fragmentation of skills and context could have several limitations on outcome. Returning to the learner driver metaphor, the repetition of same context problems equates to learning to drive and be tested in the closed environment of a test track. By repetition the driver would be able to predict problems and practice solutions so easily pass the test, but this would not prepare him for the unpredictable and varied problems of real world driving. Yet, for ICT learners, this model was observed in the majority of test-based classes. Learners repeated step-by-step instructions and practiced prescriptive, test exercises until they were able to effortlessly pass the test. The learners effectively memorize the test ‘track’ but as T16 concluded this might make learners very good at the test skills and contexts but may not prepare them for complex real world contexts.

The teachers did not perceive this lack of context as problematic and felt that they could signpost application. However, as T3 and T16 pointed out time restrictions meant that often non-test activity took second place or was missed out altogether. This again means that the learners have to attribute context themselves. But success then may depend on the approach the learner takes towards learning. The literature suggests a learner with a deep learning approach or an immediate purpose for skills may reflect on and apply skills in contexts beyond the classroom. But if the learner took a surface or strategic approach or if they had no immediate purpose for skills this could mean that they remained focused on the functional test skills. Given that many of the teachers felt the test contexts did not truly reflect real life application this second approach could provide a poor foundation for transfer of skills.

Leaving transfer of skills to the learner assumes that they have previous or current experience that will enable effective application. The teachers’ description of learners as fearful of ICT suggests that many of learners begin as subject novices. As such it seems risky to automatically assume that they will have acquired accompanying generic skills, for example the web design learners might have little experience of page design issues unless they had previously worked in publishing. They could be as much a novice in the context of use as they are of the functional skills to produce the website. Further as subject novices they may be unaware of what skills are required or ICT’s potential, as seen with T1’s bridal shop learner who needed help contextualizing her spreadsheet skills to utilize them. From a constructivist or transformative view of knowledge the purpose of use and skills cannot be separated. To do so introduces a lottery effect where learners with requisite generic skills will be able to transfer skills but those without could fail.

All these factors might do more than isolate functional knowledge from application they could inflate the role of functional knowledge and reduce the significance of generic skills. The examination emphases further complicates this dynamic. It creates a dual focus for outcome; the immediate and measurable outcome of test result and the long term outcome of computer skills beyond the classroom [Figure 9.3]. The immediate outcomes of test result are

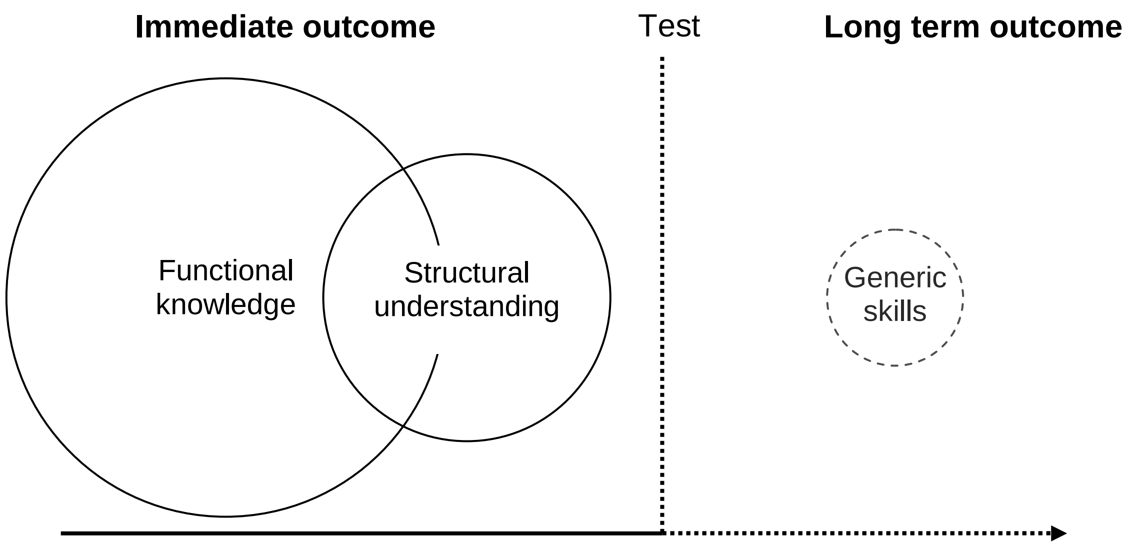


Figure 9.3: Impact of observed tri-element procession

visible and clear but the long term goal can be nebulous and diverse as they differ for each learner and context. This could create a partition effect encouraging stakeholders to focus on the clear, immediate and measurable classroom outcomes. As long as learners are successfully passing tests government, awarding bodies, institutions, teachers and learners may convince themselves that they are being successful. In real terms, however, this can make what happens outside the classroom appear less import and long term outcomes insecure. To paraphrase T16's description of teacher education, one could end up with something which looks good, sounds good and even gets results in terms of number of people passing certificates, but does not actually produce good computer users. Transformation literature concludes that transfer requires a more holistic approach, involving the whole teaching/learning spectrum. This suggests the three elements need to be conceived as a tripartite system and that transfer can not be left to chance.

Ultimately such a narrow, skills related aims could have implications for effectiveness. The opposing end of Roger's (2002) learning/teaching spectrum is indoctrination. An over emphasis on functional skills could act like a kind of indoctrination so that, as Thompson (2007) suggested, 'this is the 'right' way to do it' becomes 'this is the 'only' way to think [do it]'. The effects could be specific, predictable and uniform behaviour rather than reflective, adaptive and creative. Such an outcome could have long or short term effects for user participation [Figure 1.4]. In the short term the learner may not change their computer practices profoundly leading to limited use, in the long term they could disengage from ICT. This issue of the benefits of ICT raises questions about what kinds of skills are really required by workers and/or non-workers; whether current qualification system adequately provides them; and to what extent external pressures of funding, lack of time, and stakeholders' expectations contribute to accentuate the importance of the immediate classroom outcome of test success. Input in these circumstances involves not just ICT skills but examination skills. Output is determined by the nature of the test task and assessment. This version of outcome can in turn determine the nature of the teaching and who controls subject content.

9.1.3 Content Control

Learning has been described as a relationship between teacher, learner and subject (Gardner & Boix-Mansilla, 1999; Shulman, 1987). Within this research setting, there was a fourth partner, the institution, in the form of training provider and examination body. This created groups of partnerships: learner-subject-teacher, teacher-subject-institution and learner-teacher-institution [Figure 9.4]. In test-based classes the teacher acted as interpreter between learner, subject and examination.

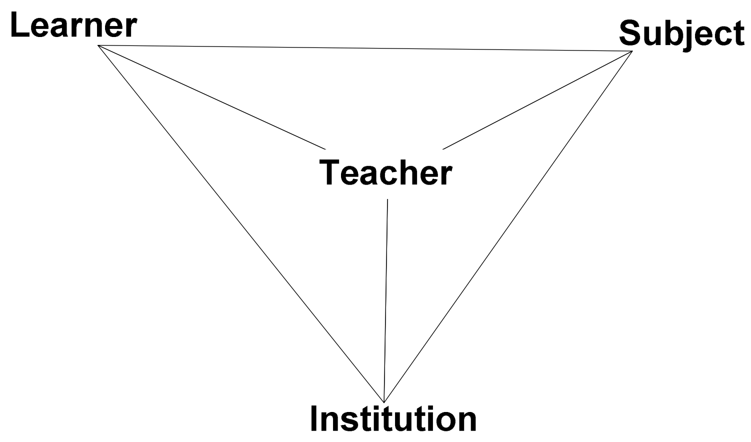


Figure 9.4: Model for ICT user classroom relationships

Learner-subject-teacher relationship: These learners and teacher identified the teacher as the holder of knowledge. The teachers perceived themselves responsible for helping the learner acquire adequate knowledge for their own needs. The knowledge perceived as important was influenced by specific software, as was apparent in the way that participants talked of ‘Excel’ as opposed to ‘spreadsheet’. This led to a focus on software capabilities. The results of this was evident in T5’s Microsoft office and T2’s Photoshop sessions where they demonstrated multiple software functions without exploring potential application or contextualizing use. A kind of, ‘the software can do this, I don’t know what you’d do with it, but I’ll show it to you anyway’ approach. The teachers did not generally see this purely as an input/output process, typical of transmissionist orientation. They perceived the learner as active. The learner was described as working independently. He was deemed to be in control of understanding and was expected to request help from the teacher or other learners as needed. He was also responsible for interpreting software knowledge to fulfill personal needs. The prevailing view of knowledge was towards individual constructivism [Figure 2.4(b)], except for the problem solving teachers who demonstrated a transformative orientation [Figure 2.4(d)]. Yet observations revealed that activity may not have been as interactive as the teachers believed. The extensive use of step-by-step instruction, demonstrations, individual hands-on activity and constrained peer interactions all suggest a more transmissive element to the learning process. In these circumstances, despite the teachers' possible intentions, there were limited opportunities for social construction of knowledge.

Within qualification contexts the process was observed to be even more complex [Figure 9.5]. Here teacher's knowledge was constructed from their

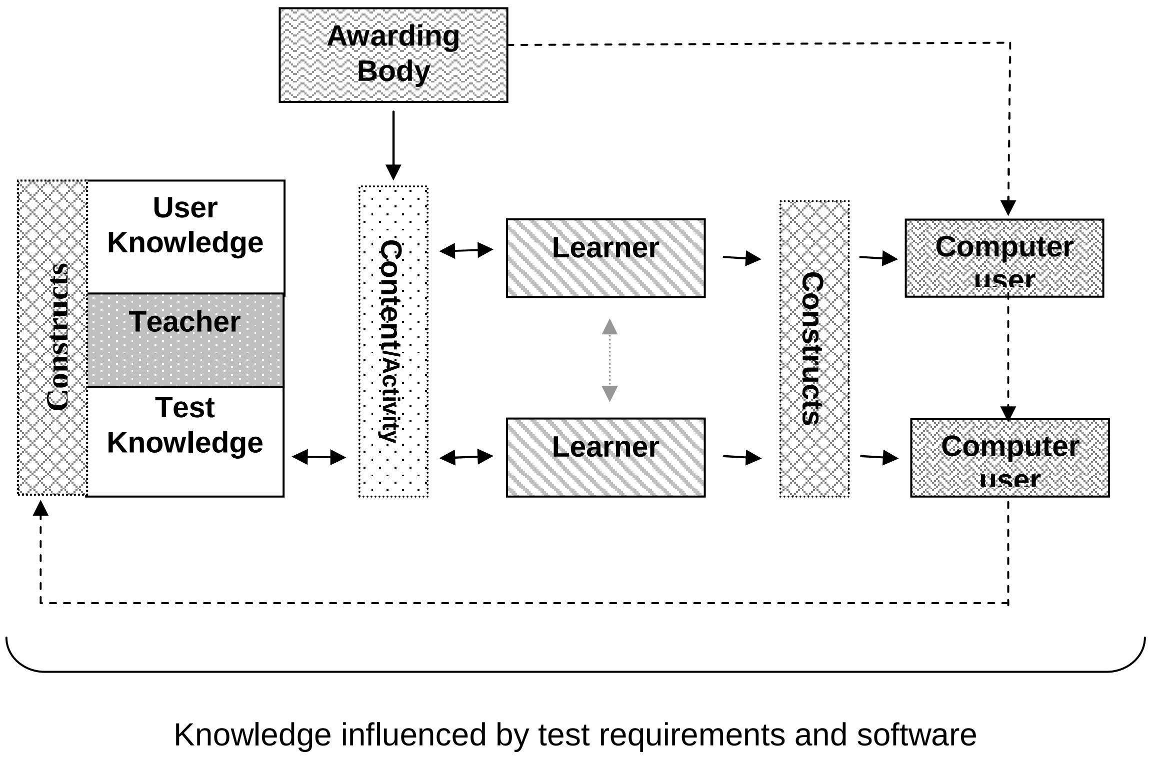


Figure 9.5: Epistemological orientation in qualification-based courses

understandings and experience of both ICT and test. For about half of these teachers their previous lack of ICT experience in the work place meant that the test experience largely constituted their computer know-how. For them the test and ICT knowledge were indistinguishable. In examination-based courses the content and activity was determined by the awarding body in the form of the syllabus, test tasks and assessment. The content was given to the teacher who interpreted it in terms of the software and learners and then passed their interpretations to learners via work manuals, practice of test tasks, and mock assessments. Neither teachers, nor learners, had the power to control subject content significantly. The perceived need to familiarize learners with test knowledge meant that activity was identical for each learner and content was directly influenced by those awarding bodies had identified as important. Images of being a computer user and knowledge constructions were inherently bound with test skills. Subject outcomes, as Ecclestone and Pryor (2003) described, became associated, implicitly or explicitly, with drawing individuals into the community of successful test candidates rather than community of computer users. The teacher's role as subject expert was dominated by their role as test expert. From this perspective for test-based courses the tests agendas and knowledge concepts significantly influenced subject agenda and constructions with the teacher as technician implementing outside policies

Analysis showed test knowledge to be predominantly functional/procedural orientated. Solutions to problems were given, or strongly indicated, and depended on recall of procedures. Learners were often able to complete tasks by simply following instructions. In real life situations this controlled activity was unlikely to be available. For example in database tasks learners were told which fields to create to form the database, the output, and then asked to input data into the resulting table. In a real situation this process is reversed. The learner would have the data, the input, and would have to decide the required output before they could define which fields were required. Real world computer users are not told the solutions; they are expected to define the problem and then find creative solutions for themselves. The prescriptive and pseudo-authentic nature of the test tasks revealed in this research would seem to support arguments that examination tasks do not represent real subject knowledge but rather a classroom version of that knowledge. Yet, this inauthentic version of knowledge dominated practice for many of the participants, suggesting that subject outcomes could have limited validity in real world contexts.

Learner-teacher-institution relationship: The range of teachers' and learners' backgrounds revealed in this research is evidence of the diverse and multi-setting context of computer use. There is no one community of practice but multiple communities each requiring variations on skill sets and application knowledge. This is true for all three skill elements. For example, the functional knowledge required for those learners working in the NHS is different to that needed by the retired learners. The structural understandings supporting functions for the learner working in a small doctors' practice is different to that required for the learners working in large organizations. The accompanying generic skills required by the learner designing presentations are different to those required by the learner running her own restaurant. While such diversity of use is in itself an argument for a more reflective approach to the teaching of ICT it also means that there is no definitive body of knowledge. Further, perhaps due to the newness of the subject area, there is no organization accountable for skills and no professional body to oversee knowledge content. National standards are only now emerging. This lack of uniformity has implications for awarding bodies, teachers and learners.

With no professional body to oversee knowledge content it was often down to individual awarding bodies to define required skills and competencies. Syllabus content has grown and developed as new systems and software emerged leading to changing syllabuses for example the new CLAIT syllabuses in 2006. The examination boards have taken their authority from consultations with employers. Four serious limitations are highlighted with this approach. Firstly as employers' needs are diverse and varied conflicting conclusions about which functions, structures or generic skills are required seems inevitable. The learners' responses showed that some employers require limited, standardized skills, for example the spreadsheet learner who worked on ready designed systems requiring data entry only, while others required complex, creative skills for instance the learner who needed to maintain her school's website. This may in part account for the emphasis on the functional skills required to operate software as these skills are relatively consistent. The assumption being that each learner can adapt these skills to apply them to their own situation.

Secondly, computer usage is in a constant state flux as new hardware and software are developed. As Cheuk (2002) suggested employers may not be familiar with technological concepts or able to predict its influence on future work practices. For example the webpage learner above was a school secretary with responsibility for producing the school's newsletter. In the past this had been a paper copy typed on a stand alone computer and illustrated with predesigned clipart. Technological advances meant that the school now wished to publish the newsletter on the school website. The secretary now required skills to maintain and upgrade the site and insert and manipulate digital images. As her skills developed, however, she was increasingly realizing that she also needed to understand issues of copyright and security to maintain the integrity of the site and the safety of the child contributors. This example shows that the level and complexity of skills required to be effective has, in certain circumstances, increased making it difficult for employers and awarding bodies to keep pace.

Thirdly, there is a skills/application conundrum. Employers can only predict what skills they need for current practice. They may not be able to predict the potential of applications to improve or change working practices until they have workers skilled enough to devise and implement changes. In other words until workers are skilled enough to solve unfamiliar problems in unfamiliar contexts they are unable to predict what skill they require to do so. But syllabuses are concerned with those functional skills employers have predicted workers need for current work practices, they tend not to encourage learners to explore unfamiliar solutions and Hammond (2004) suggested they react slowly. Consequently there is a danger for employers that the potential of computer applications may not be realized because the skills employees require for innovative use had not been predicted and so are not addressed.

Finally, depending on employers' definitions of computer skills may not address the needs for non-working computer users. A fifth of the learner participants were over 55 and were not seeking work skills. For these learners pre-prepared solutions to problems were not available. They needed to be able to create solutions for themselves, evaluate e-services or develop hobby skills such as digital photography. Yet within many observed classes these kinds of skills were only addressed incidentally and were not part of syllabus content. Further the changes to funding meant that choices for these learners where becoming more limited. As T17 concluded they were being forced to accept vocational solutions even though this may not be a genuine solution for their needs.

Awarding bodies are not completely autonomous, however, they are accountable to their customers, that is providers and learners, and to the government in terms of the NQF. The learners had some degree of power to influence institutions through their financial clout. They could choose to join or not to join classes. For providers this encouraged them to go for the courses that they felt would be profitable, what T5 termed the 'cash cows', such as ECDL, and to reject the more risky leisure courses. So ironically the learners' financial power was limiting their choice of courses available; Griffin's (1999b) quasi-market. For awarding bodies this meant providing products that attracted learners and thus providers, hence the changes to the e-Quals syllabus following learners' complaints about the drafting element. But learners may not be in the best position to know what is best. Like the employers, they may not appreciate what skills are required until they need them or encounter problems. They do not know what it is they do not know, implying they rely on syllabuses and subject experts to define skill needs. There is a danger that this mutual dependence could result in skills deficiencies if subject content is left to market forces.

Awarding bodies' syllabuses and qualifications have to be accredited on the NQF to attract government funding and remain commercially attractive to providers. The overwhelming perception of ICT user skills as a practical subject impacted on outcomes within this context. The NQF is based on a linear progression from lower-to-higher-level thinking [Appendix A1]. User skills as a practical subject are only offered from entry level to level 3 and therefore are associated with remembering, understanding and applying as demonstrated in the user qualifications' syllabuses and assessment activity [Appendix C10]. The awarding bodies are thus fulfilling their obligation to the NQF but in doing so demarcate user skills as basic and low-level. Modern interpretations of digital literacy and the interactivity of technology, however, call for a more reflective, high-level approach to application. Further, modern understandings of knowledge and learning, for example Constructivist, argue for more holistic approaches. ICT user skills in this context are not simple, functional constructions but complex, multi-constructions that require analysis, evaluation and creation regardless of qualification level. This research suggests that current alignment of skills with the NQF may be inadequate for effective ICT and that the way the subject is perceived may need to be revised. This could entail awarding bodies having to review and adjust the nature and substance of their qualifications.

Another outcome of the low position for ICT user skills on the NQF is that there is no higher academic body of knowledge or professionalism in this subject. Higher level qualifications in ICT are concerned with e-practitioner or e-business skills not user skills. For the majority of disciplines subject experts and professional organizations define and disseminate skills requirement. For example in mathematics, syllabuses are based on higher academic mathematicians' definitions of subject and skill needs. The subject knowledge was developed first and then interpreted into syllabuses. Professional bodies oversee mathematic skill, research into best teaching practice and circulation of findings to teachers, a top down approach. User skills grew from a bottom up approach. Syllabuses have developed with changing software, perceived employer needs, and learners' feedback rather than higher academic expertise. Adults' teachers are drawn from other subject areas or other professional backgrounds. There is no professional body or organization overseeing subject or teaching knowledge and to date little research into best practice for teaching of ICT skills, especially for adults. Consequently there is limited culture of subject or pedagogical interpretations leading to a curtailed environment concerned predominantly with provision [Figure 9.6]. This has three potential

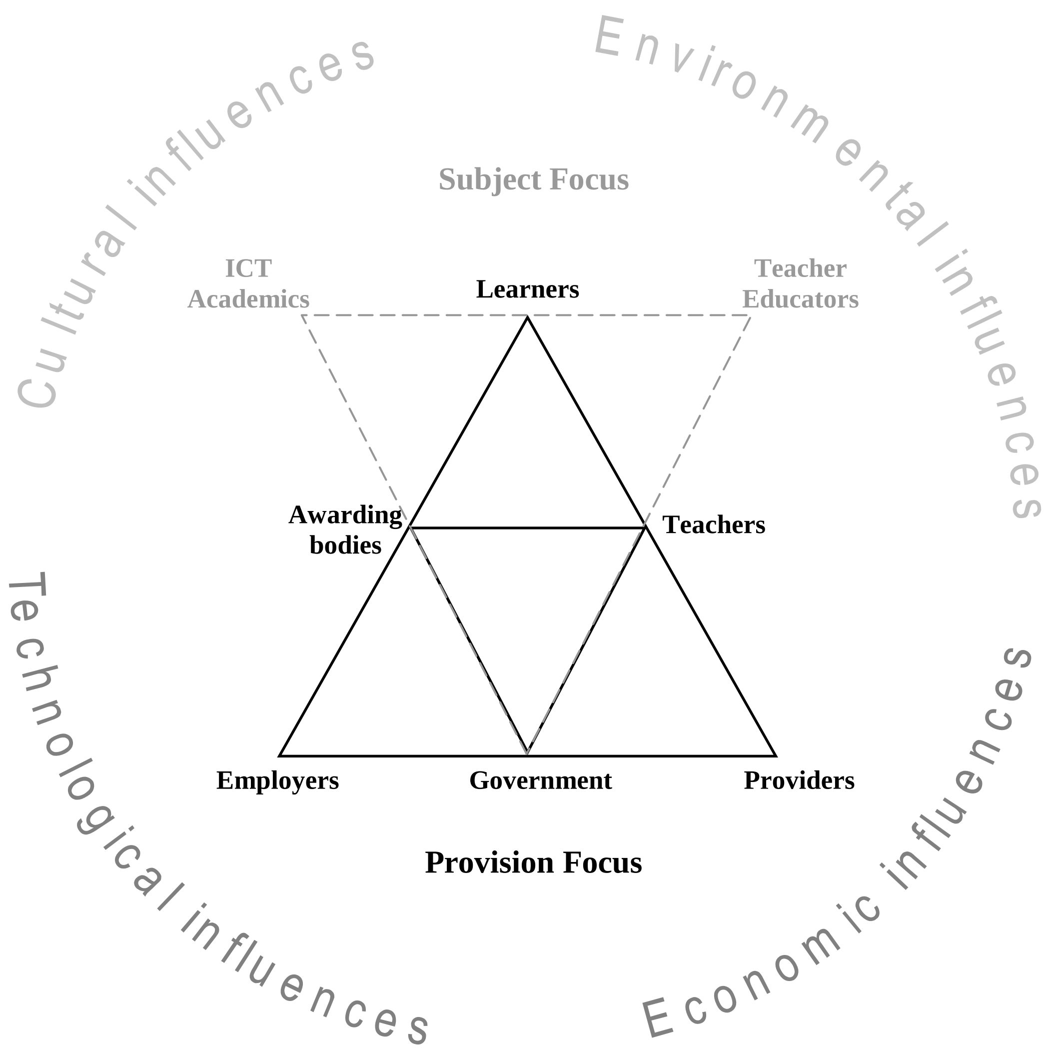


Figure 9.6: Observed network for stakeholder relationships

outcomes: a) it creates a pedagogical distraction, which Alexander (2000) suggested enables the government to attribute outcome failure to poor teaching while teachers blame government policy and resources, rather than focusing on pedagogical structures; b) it weakens subject focus so that expertise becomes defined by institutional criteria, such as the ability to use software and/or achieve set competency goals, rather than academic definitions such as digital literacy; c) it creates an imbalance in the stakeholder network relationship making those concerned with provision the more dominant. Such a bottom up approach promotes commercial imperatives or institutional needs which might ultimately undermine subject aims.

Teacher-subject-institution relationship: For these teachers the influence of the institution on subject content was powerful. Within non-examination courses there was a degree of control over content, for intance T2 and T16 had the freedom to negotiate content with their PowerPoint and webpage learners. But this type of freedom appears to be under threat as courses seek accreditation, for example T2 was having to review and revise his PowerPoint course to track it against the new national standards. In addition examination-based courses increasingly dominate the ICT user setting as other types of courses, for example T8’s genealogy courses, become non-profitable and are dropped. The awarding bodies would claim not to dictate teaching style, content or methods. In reality the need for test techniques, as seen with T6’s youngsters, and lack of time means that teachers felt obliged to focus on preparing for the test. Under these circumstances teachers, and learners, have limited power to determine course content, objectives or processes. In terms of subject needs their voices are muted. Institutions in the form of government policy, institutional choices and awarding bodies’ syllabuses appear to be the dominant voices determining subject knowledge and content. But this instructional dominance may ultimately impact on learner competency outcomes.

9.2 Implications for Learners

Kay (2008) identified the two underpinning competency outcomes, literacy and independence, which within this research the teachers related to learner confidence and autonomy. Learners were generally described as lacking confidence with ICT or learning generally and were felt to be autonomous and independent learners. The learners were perceived to know what they wanted from learning and to be self motivating. These two concepts greatly influenced practice but the impact on outcomes may not be as the teachers envisaged.

9.2.1 Achieving Literacy

Whereas the teachers defined success within the subject context as passing the test, success in the learner context was seen as developing learners' confidence. For many of the teachers this was an overriding consideration, putting emphasis on the teacher-learner-institution partnership and the emotional element of teaching. A recurring theme was that adults' previous learning experiences had undermined their confidence and the teacher's role was to overcome the resulting fear of learning. The teachers' response to this was to create an environment where the learner felt unthreatened and valued, where adults were treated as adults. They associated teaching with Pratt's (2002) nurturing perspective. Teachers described learner achievement as relating to self esteem for instance T9's early school leavers who she felt had been belittled; confidence for example T16's emphasis on 'having a go'; and self efficacy for example the nervousness of T5's work based learners when presented with new software. Yet this concentration on the individual's wellbeing, Avis and Bathmaker (2004) predicted, reduced focus on subject and could ultimately be doing the learner a disservice.

Stephen's (1992) competency model envisaged a matrix of familiar and unfamiliar contexts and problems. Effective skills were seen as those that enabled learners to deal with tasks in the unfamiliar-context-unfamiliar-problem quadrant. These teachers' perception of learners as fearful of computer contexts and problems meant that they sought to reduce fears by a routine of didactic instruction and repeated practice of tasks. It was anticipated that this process would led to a comfortable familiarity with both computer procedural skills and test techniques thus boasting confidence and self efficacy, leading to test success and ultimately self esteem. The teachers thus created a comfort-zone not only through their caring, non threatening environment but also by familiarity of context and problems [Figure 9.7].

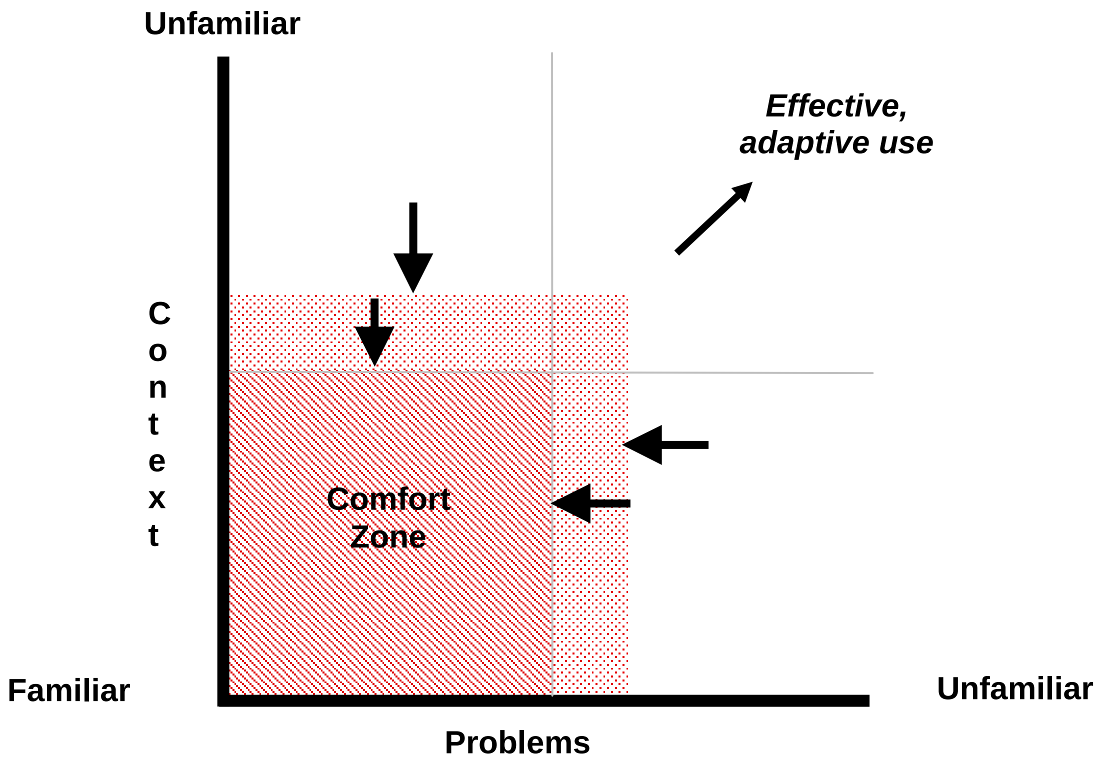


Figure 9.7: Observed learning matrix (After Stephenson, 1992:4)

As Gibson (2001) concluded, for early learners this approach is reasonable and appropriate. But, as T16 described, one might expect that as learners' confidence grew so would the opportunity for encouraging experience of the unfamiliar. However, what was frequently observed was that the nature of the test tasks meant that even in higher level qualifications the learners continued to use serialistic, step-by-step instruction manuals and predictable practice routines. The concern for familiarization remained, discouraging teachers from introducing learners to new or taxing problems at which they might fail or which required time to explore. The comfort-zone increased but the focus remained ‘inward’, making problem solving routine and simplified rather than unusual and complex. This could disguise the fact that ICT is complex. As T16 observed learners completing test courses might assume they know it all, when in reality the nature of the test meant there may be gaps in their knowledge. The teachers were observed to be remarkably adept in the examination translator role and ‘getting learners through the test’, but ultimately this may not be helping learners to develop the skills they need to become effective, adaptive computer users.

The teachers’ previous ICT and/or work experiences may impact on this model. The multitude of ICT environments means that it is impossible for the teachers to have a detailed knowledge of them all. T1, for example, may have only been able to offer his bridal shop learner a different experience of spreadsheet because his own background as a retail manager gave him the experience necessary to think in ICT retail contexts. For other teachers, like T14, their only experience of certain applications was in the classroom as a learner or teacher. The researcher surmises this could have implications for their teaching/subject confidence. If a teacher’s only experience of spreadsheet is in the classroom their understanding is likely to be bound by the syllabus or classroom versions of knowledge. They have not personally engaged with the community of spreadsheet users and so perhaps cannot fully understand what it is to be a spreadsheet user. They are likely to be uncomfortable, or even unable, to move out of the familiar problem or context zone. Teachers may thus consciously, or unconsciously, control activity to stay within their own comfort-zone [Figure 9.8] rather than encouraging learners to explore challenging material. Working outside ones’ comfort-zone could expose one’s shortcomings, or as T1 phrased it show ones’ ‘clay feet’. It would take an exceptional teacher to be willing to deliberately expose their own lack of expertise to learners. The teachers, thus, reaffirm their own skills. The learners' experience may, therefore, be bound not only by the examinations boundaries but those of their teacher. For many of these teachers these two were linked. The teachers were test experts reaffirming test experiences. Following Ecclestone and Pryors (2003) argument, this could secure the procedural knowledge inherent in test activity as the acceptable, unquestioned knowledge base. Meaning that teachers, and learners, simply accept the status quo as the way things are done and not to reflect on its shortcomings.

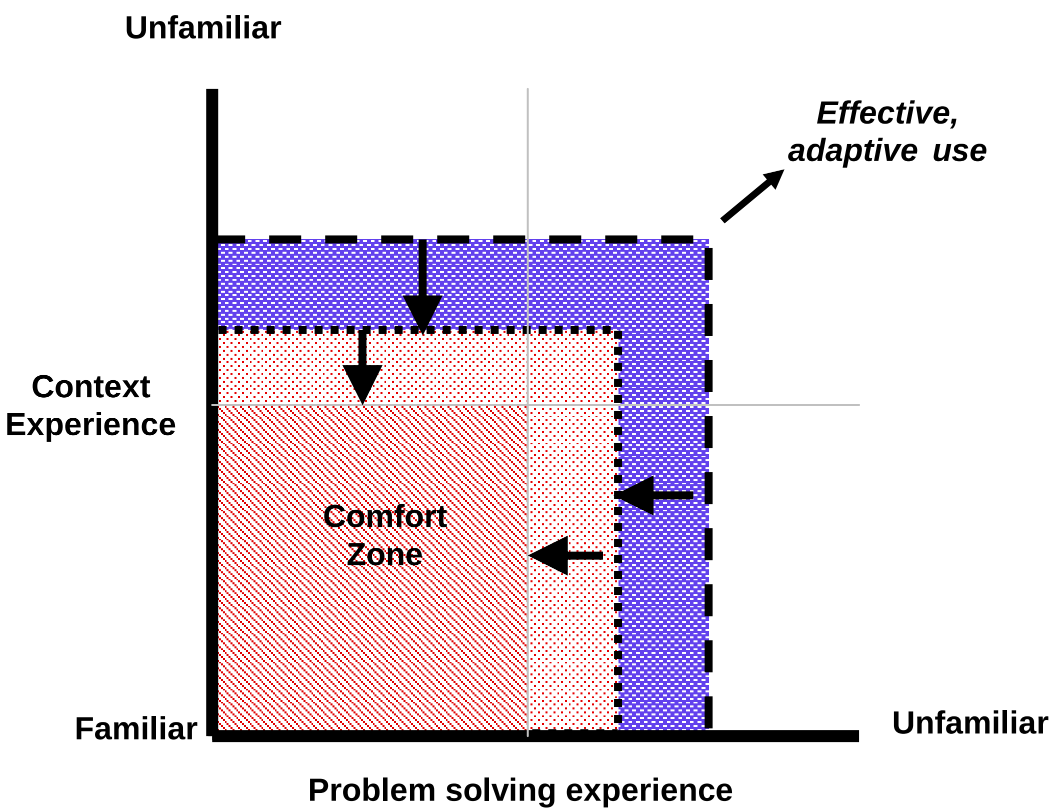


Figure 9.8: Effect of teachers' comfort-zone approach

Further some of the teachers, for example T14, expressed anxiety about challenging learners. Just as the teachers felt uncomfortable working outside their comfort-zone so they perceived their learners to feel uncomfortable outside the zone. The teachers feared that discomfiture could cause learners to leave their course which might have financial implications for teachers and institutions. But challenge can be argued to be essential for intuitive, flexible application of skills. For Dreyfus and Dreyfus (2005), activity within the familiar-familiar zone may enable learners to be 'competent' users, able to deal with routine ICT problems, but would not provide sufficient challenging problem solving activity to develop 'expert' users. This suggests that learners could lack the skills required for adaptive, creative behaviour or that their skills become disjointed from context. The effects of this was evident in T5's work based training to introduce Microsoft Office 2007. All the learners used computers on a daily basis but the change to a new version of software was making them anxious and disorientated. Their self-efficacy was bound with a particular system and was lost with change of software. This required their organization to provide re-training for every worker to overcome fears. If learners were encouraged to deal with unfamiliar problems and routines, that is were presented with challenges, as part of their ICT learning they may be less intimidated with the unfamiliar when they encounter it. Ultimately their subject confidence could be increased.

9.2.2 Independence

Learners' independence has relevance in terms of enabling autonomous learners and developing independent ICT users. The teachers described the teaching of adults as different to children. 'Adultness' was expressed in terms of freedom of choice and self motivation, the rhetoric of Knowles' (1984) andragogical model. The teachers, especially those in workshop situations, frequently emphasized that adult learners did not need to be directed or controlled in the classroom. Learners decided for themselves if they worked or not, when they arrived in the class, when they left, and how hard they worked while there. But this was a false andragogy. Ironically the reliance on step-by-step work manuals and set tasks used to enable this flexible approach meant that the learners had a lack of freedom about how to approach and complete tasks or subject content. Each learner followed the same path, and produced identical results and had little freedom of choice about what or how they learnt.

The researcher described this as the ‘sat-nav’ approach and concluded that it could encourage dependency. This false autonomy could impact on learners’ potential for independent use and engagement with ICT.

In test-based, workshop classrooms [Figure 9.9] potential ICT use was seen as

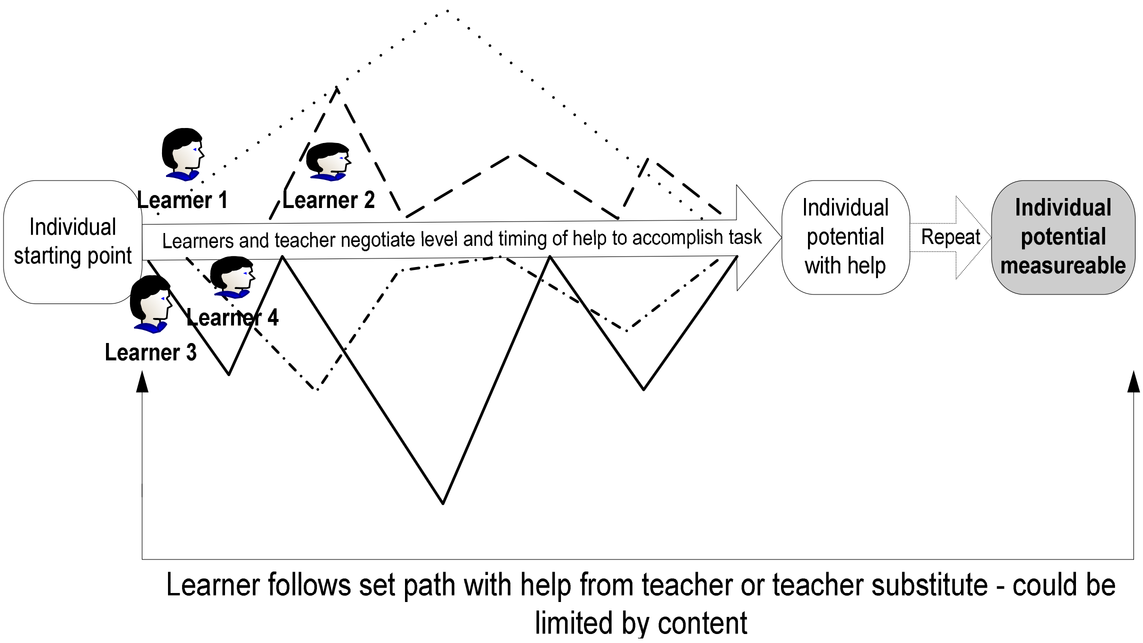


Figure 9.9: Model indicating learner potential for use and engagement with ICT within workshop, examination-based ICT user classes

individual and focused on achieving the measurable outcomes of test criteria. The teacher, or teacher substitute in the form of manual or fellow learners, like the sat-nav, provide directions when the learner needs help. But just as drivers may blindly follow the route without thinking for themselves so ICT learners may blindly follow their guide workbook and may need to repeat the journey several times to be able to recall it unaided. Further, given the pseudo-problem solving nature of tasks learners often did not actually need to reach the point where they completed tasks unaided. Solutions were always explicit or the teachers were available to solve problems. By this repetition of the task learners become familiar with the route but it can a) encourage the perception that there is only one route and b) may not prepare them for dealing with new, unexplored routes. This prescribed activity could thus limit potential for ICT use outside of the classroom [Figure 1.4] with learners lacking the awareness, skills or experience to fully engage in ICT.

Given the current qualification requirements for prescriptive content and competencies, autonomous activity could be difficult to implement and may not serve learners, as test candidates, well. T9 and T10, however, offered a compromise in their ECDL class with their ‘constructional’ approach. These teachers worked with the same test constraints as other examination-based teachers. But they used questioning to encourage the learners to recall and describe the route even though they were not free to define it. The learners picked out the landmarks and signposts for themselves with the teacher gently steering them in the right direction. Thus, although written instructions were similarly step-by-step the learners were presented with a degree of challenge. They had to reflect on and interpret skills and knowledge rather than simply being told answers. This research cannot provide the answer as to whether this approach was more effective. More research is needed. But it proposes two positive potential outcomes from such an approach. Firstly learners were required to reflect on procedures against outcomes which may strengthen opportunities for reflection and structural understanding. This may in turn encourage learners to engage with and think about application in more detail. Secondly, by encouraging reflection the teachers accustomed learners to thinking about ICT problems and solutions which may enable them to reflect on and solve unfamiliar problems later. This approach could help in providing balance between immediate and long term outcomes.

The teachers involved with non-examination classes were not so tied to prescriptive activity and were able to give their learners more self-directing opportunities for example T16’s webpage learners developed their own websites and T2’s Photoshop learners had opportunities to self-explore applications. To some extent these teachers asked the learners to plot their own route. But even here the emphasis on the individual and one-to-one teaching meant that the pattern for learner/teacher negotiation of help was similar to the examination-based workshops [Figure 9.10].

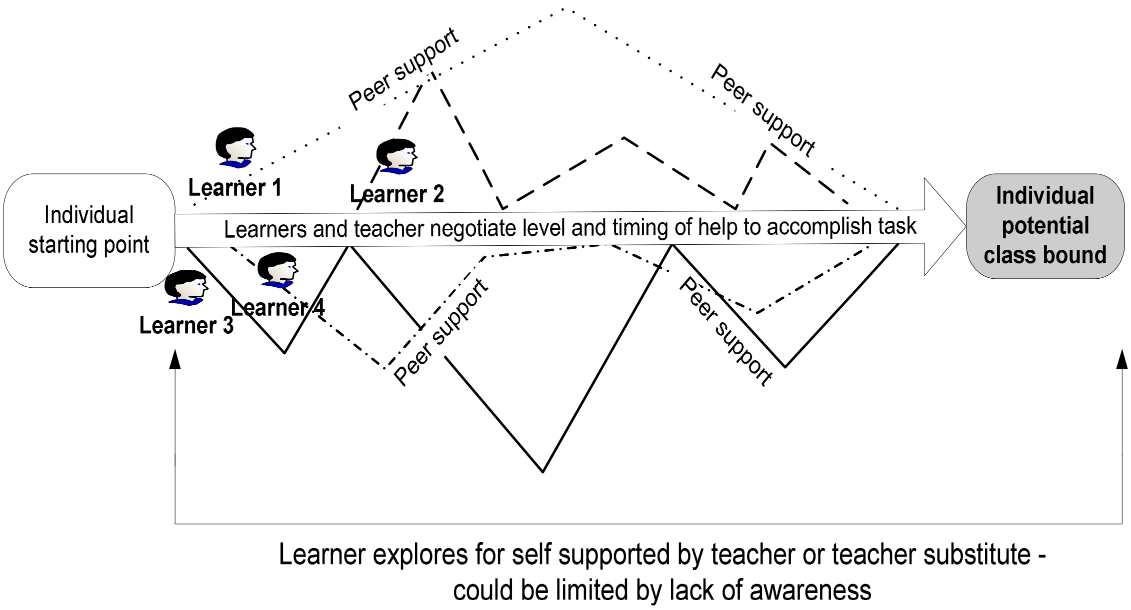


Figure 9.10: Model indicating learner potential for ICT use in non examination-based ICT user classes

There was more opportunity for peer interaction, for instance the learner in the webpage class who moved round the room as a teacher substitute, and a successful learner was seen as one who completed the course rather than the test. But in both cases the marker point for learner potential appeared to stop at the classroom door. Possible limitations on potential ICT use here was less likely to be in the content but rather in learner awareness, for example the two learners in the webpage class who were struggling to find focus. In these examples the learners needed to know where they wanted to go to be able to ask for help in direction.

The group of teachers who presented a totally different perspective on potential was the HE teachers. Here [Figure 9.11] the whole group supported one another and potential was seen as group potential to achieve the immediate classroom outcome, followed by individual potential to use those skills beyond the classroom. Potential and engagement did not stop at the classroom door. The purpose of use was clearly defined, specifically use of bespoke software to enable data gathering and analysis in the short term for a dissertation and in the long term as sport professionals. Each learner's potential was different and would be expressed in differing ways depending on their future tasks. Rather than individual repetition and drill to reach a set outcome these teachers used group activity to enable learners to release individual potential.

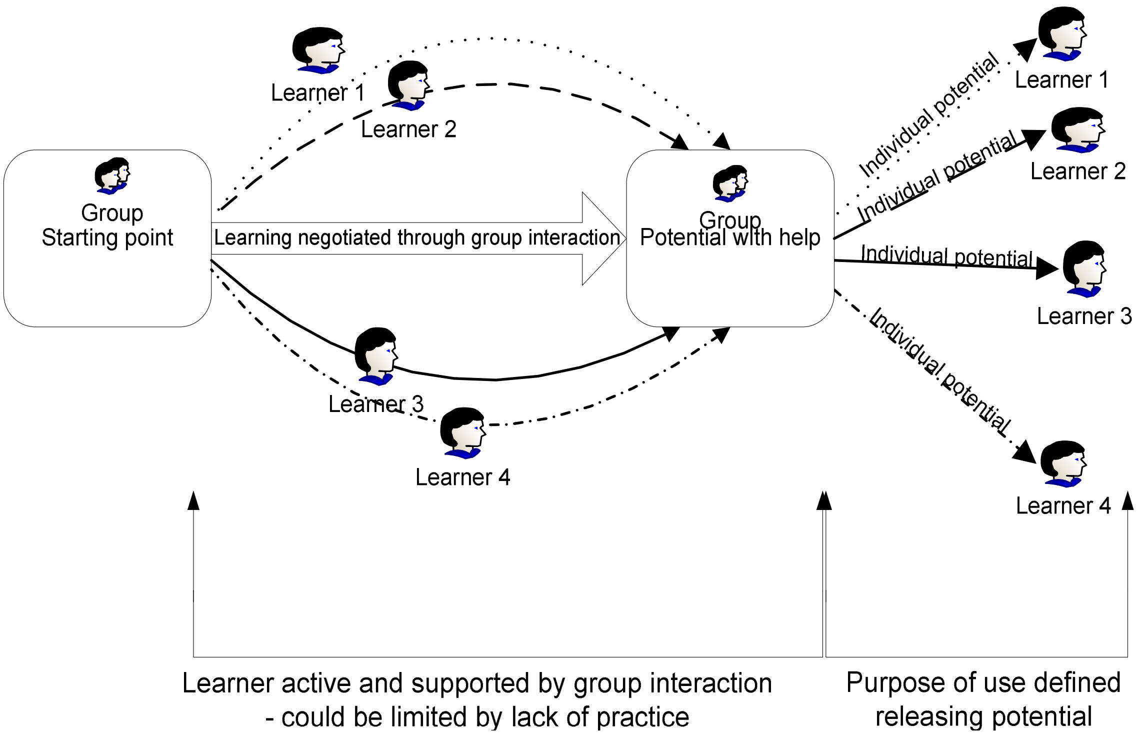


Figure 9.11: Model indicating learner potential for ICT use in 'structured' problem solving ICT user class

It could be argued that this example is not relevant as the teachers sought to develop sports professionals rather than ICT users and because these learners' academic confidence or ability may be greater giving the teachers more approach options. Alternatively it might be seen as significant for a number of reasons. It demonstrates ICT skills can be envisaged in ways other than individual and hands-on. The group working as a whole to achieve a project can be valuable and has been observed in child classes (Topp, 2002). The need for constant hands-on experience thus may be over exaggerated, especially for learners with some functional knowledge. This is not to suggest that hands-on experience is unimportant. These learners typically needed a follow-up session before using the software independently. The difference is that the group experience made learners aware of the software's potential and how it could be used to fulfill needs before they gained practical experience. The purpose of use preceded the experiential and so outcomes for practice and need for engagement were clear.

This example, along with T16's web learners, demonstrates that ICT user skills can have a problem solving focus. That is procedures need not be the main focus of activity. This agues for a change in the way that ICT is envisaged. Instead of thinking of learning as 'How to use a computer to search the Internet' perhaps thinking should be in terms of 'How to search the Internet using the computer'. This brings the purpose of use to the fore and the computer becomes the tool to achieve it, as it was for these HE teachers and learners. If the task is the emphasis the generic skills and structural understandings needed to complete the task become more visible as it did for the school secretary learning website skills. Using this approach the interrelationship between the tri-skill elements will emerge naturally.

Perhaps its main message is that there are a number of ways to approach the teaching of ICT skills. Teaching does not have to be an either/or experience. Teachers need to seek best fit. As Pratt (2002) concluded there is a legitimate role for a transmissive perspective of knowledge and for a nurturing perspective, but there is also a legitimate role for the developmental, apprenticeship and social reform perspectives. The challenge is to find the ‘right’ balance. The conclusion of this research is that the enacted balanced appears too frequently weighted towards the transmissive and nurturing. A more holistic approach employing an amalgamation of teaching styles and greater range of methods and techniques may help learners to appreciate the multi-faceted nature of ICT skills and purposes. But as Pratt concluded, to achieve balance teachers must reflect on what they do, why they do it and on what grounds actions and intentions are justified, id est be reflexive. This could present challenges for those teachers who perceive teaching as practical, bound with the immediate classroom and who have limited involvement with theory.

9.3 Implications for Teachers

Two main teacher outcomes emerged from this research. The first was the influence of the perceptions of the teachers’ role or professional image. The second was the perceptions and influence of teachers’ professional training.

9.3.1 Professional Role

Clow argued adults’ teachers’ view of themselves as professionals come via their subject experience. For these ICT teachers this could be problematic due to the lack of subject culture and theory base and the diversity of ways ICT can be used. For all the teachers in the research project, teaching ICT was a second career, often chosen for convenience rather than a strong desire to teach. Their previous professional experiences were diverse and ranged from lorry driver to computer analyst. For many, their own computer skills were acquired in courses such as those they were teaching. Their professional image may not, therefore, be bound with ICT user professional knowledge. Indeed, it seems unlikely that a definitive knowledge exists due to the diversity of situations in which computers might be used. But for many, neither was professionalism aligned with education. Few of these teachers had taught other subjects. Most started teaching and then completed educational qualifications, often because they had to rather than because they felt it would improve their teaching. For these teachers their PCK was largely developed from practical classroom experience. This ambiguity concerning professionalism may in part explain the focus on syllabus competencies and procedural teaching activity. Without strong theoretical subject or educational backgrounds these teachers simply accepted their role as examination technician or as a giver of knowledge because it matched their previous ICT learning experience. They lacked the theoretical engagement needed to challenge such an assumption. This argument might be supported by some of the contradictions; for example in terms of teaching experience T16 and T9 who had both taught other subjects tended to teach in a more learner-centred orientation [Chart 6.1], T2 who had a higher level of ICT teacher training gave his learners greater freedom to explore applications, and T16 from his strong educational theory background argued for problem solving activity. Thus teachers with stronger teacher professional backgrounds appeared to be those who had a less ‘procedural’ style.

Further, throughout this research some discrepancy between what the teachers perceived they offered and the reality of practice was evident. For example the teachers using the workshop approach felt that they were learner-centred by offering practical flexibility but the enacted reality meant that learning was rigidly controlled through step-by-step instructions. At the other end of the spectrum, T16’s ‘unstructured’ problem solving approach aimed to provide learners with the freedom to develop their own projects. But for some of his learners who had no personal focus, this freedom left them struggling due to lack of direction. As Hammond and Mumtaz (2001) found with their trainee ICT teachers, how these ICT teachers positioned themselves on the ‘weak to strong purpose of use’ continuum was not always how they taught. A number of external influences were identified as contributory, for example the nature of the equipment layout encouraged isolation; institutional organizational influences such as amalgamated classes encouraging workshop approaches and prescriptive materials; while funding issues impacted on time, courses, syllabuses and examination expectations. To the observer this could lead to a divergence of teachers' philosophy and behaviour.

The degree and nature of this divergence, for workshop, examination-based teachers, can be seen by summarising findings [Table 9.1]. The teachers used the vocabulary of learner equality and learner control but in terms of subject and task content this could be restricted. The area of greatest match between teachers' preferred characteristics and enacted characteristics was within providing hands-on experience, creating a relaxed environment and teachers' nurturing disposition. The aim of hands-on experience was perhaps more easily obtainable because it was explicit in awarding bodies' assessment competencies. The development of classroom climate was, however, directly the teachers' responsibility. Knowles (1984, 2005) suggested that classroom climate was the andragogical characteristic most frequently addressed and achieved because he concluded it was the easiest to implement. This thesis suggests an alternative explanation related to more profound issues of control and professionality. For these teachers it was up to them how they organized their classroom and related to learners. They were thus able to create classroom atmosphere according to their personal beliefs. They had control over these spheres of activity in a way that was not always possible for content or task. This was, therefore, an area of activity in which they might have felt empowered and in which they could influence outcome.

This could explain why the teachers stressed the emotional element of teaching during discussion. Their emphasis on teacher as friend, counsellor, or guide through the learning process may be as much to do with their perception of self as to do with their perception of learners. That is, they defined their professionalism through their 'caring' and emotional links with the learners rather than by their subject knowledge. Avis and Bathmakers' (2004) commodity of 'caring labour' was what these teachers felt they contributed to the learning experience. Perhaps, when they talked of being able to teach the way they would 'ideally like to' they were referring to the fact that they were able to fulfil

Preferred Characteristics (deduced from interview)	Enacted characteristics (deduced from observation)
Teachers' disposition	
Caring, empathic, nurturing	
Encouraging	
Friendly, having a good laugh	
Knowledgeable	
Supportive, helpful	
Relationship with students	
Creating a safe/relaxed environment to develop confidence	
Equality and lack of hierarchy	Inequality, teacher holds knowledge, and controls task and content
Giving learners choice and control	Tasks set and prescriptive, no or little choice
Independent learners	Learners dependent on teacher and/or workbook, do not need to think for self
Non authoritarian, teacher as guide	Teachers and workbooks knowledge authority - control knowledge content
Responsive to learners	Set tasks do not address individual needs
Classroom activity	
Hands-on experience	
Drawing on individual experience	Generic skills not required for task
Learner involved in transforming data	Data transformed in mechanistic ways
Learners able to solve ICT problems	Pseudo-problem solving, solution given
Learners support each other	Previous knowledge often not shared with other learners
Tasks based on real life	Tasks often inauthentic, prescriptive, pseudo-tasks
Tasks enabling ICT creativity	Pseudo-creative - learners product the same, generic skills not addressed
Curriculum	
A curriculum that allows for growth	A restricted curriculum geared to examination
Helping learners to develop skills for life	Tasks de-contextualized. Transfer assumed
Provides varied experience	Limited experiences and narrow procedural skill sets
Responsive to learner needs	Examinations work orientated not suitable to all learners, loss of leisure courses for non-workers

Table 9.1: Summary of research findings comparing workshop, examination-based teachers' declared and enacted characteristics

the personal, caring commitment by which they defined themselves as teachers. Subject content, often outside of their personal control, was not concluded to be part of the '***way***' they taught, merely '***what***' they taught. Interestingly none of the teachers reported enthusiasm for subject to be a preferred characteristic of ICT teachers. The subject matter and wider learning outcomes seemed to take second place to the immediate classroom and emotional needs of the learner. In effect they prioritized those areas where they felt influential over those they felt unable to influence.

This concentration on individual learner had the effect of limiting practice to immediate time and space, characteristic of Hoyle's (1974) 'restricted' professionality. The emphasis for teachers' professional knowledge was on creating the right climate to enable learners to achieve the immediate classroom outcome. These teachers perceived achievement to be enabling individuals to overcome ICT or test fears and to gain ICT confidence. But as Avis and Bathmaker (2004) suggested, in terms of reflexive professionality or reflective ICT practice whilst valuing the individual is important it does not necessarily encourage the teacher, or learner, to locate learning in the wider contexts. Meso or macro development requires critical understanding of institutional or social/political perspectives. This revisits a question posed by Nias (1997), 'Would teaching improve if teachers cared less?', and indicates that the many elements of teachers' professional knowledge need balance.

Part of the problem with finding balance could be because diversity of ICT experiences make it difficult for teachers to define long term outcomes. The computer experiences and expectations of a teacher from a secretarial background, like T4, may be very different to a teacher from a technical background, such as T6. Teachers therefore looked to syllabuses for confirmation of skill needs. Apart from T16, the teachers seem largely just to accept external syllabuses. Hence the example of the learner who was also a teacher who explained that he could see no personal use for 'If functions' in a spreadsheet but he would pass it on to his learners. As with software capabilities, the assumption seems to be, ‘I don’t know what to do with this but maybe you can find a use’. But this has the effect that that learning is controlled by standards meaning examinations drive rather than support learning.

Methods of assessment further strengthened these teachers’ ties to examination knowledge. The teachers acted as first assessor in all the examination-based courses. This hastens the process for awarding bodies whose role becomes one of verification and ensures that learners have immediate chances for re-sits. For example in ECDL learners are allowed three attempts at live papers, each of which is assessed by the teacher, and the most successful attempt is offered for verification. But it has the effect of reinforcing the teacher’s role as examination interpreter and examination manager or administrator, thus emphasizing teaching for the test. The teachers felt responsible emotionally and practically for getting the learners through the test. Failure to achieve is immediately obvious to the teachers and could even cause a disconcerting conflict between their roles as ‘caring’ teachers and assessor as evident when teachers gave learners tests disguised as mock tests.

Part of the examinations procedural focus is driven by assessment needs. To ensure conformity, transparency and consistency of assessment by the large number of first assessors there is a need for clear cut and precise assessment criteria. If there is one correct answer there is little ambiguity. A more problem solving approach would require teachers to make more ‘value judgments’ about competencies. Yet in school environments, teachers are expected to make value judgments and to assess application as well as functional skills. One reason for this difference might be the background experience of school teachers as opposed to adults’ teachers. Training of specialist ICT teachers began in 1997 (Hammond, 2004) so that nowadays many ICT teachers in school are ICT trained. Within this research, only T2 had been specifically trained to become an ICT teacher. The majority acquired ICT skills, often by attending courses similar to those they were teaching, and then started to teach user ICT because they knew how to use a computer. Their subsequent teacher training was general and not subject specific. This may make 'value assessment' more problematic for awarding bodies and teachers, especially given the diversity of ICT activity and teacher knowledge backgrounds. Without professional experience of display or presentation, adults' teachers may feel uncomfortable in judging display criteria. Teachers and awarding bodies may therefore value uniform assessment methods.

Within this research, the focus on summative assessment was echoed in the formative assessment activity, thus replicating Ecclestone's (2002) findings. In the observed qualification classes it was generally the teacher's responsibility to assess work and report back to the learner. This is in marked contrast to school classrooms where peer or self-assessment techniques have been frequently observed by the researcher. There are a number of factors which might account for these differences. As test interpreters, teachers may feel they are best placed to interpret the assessment criteria; they carry the authority for criteria translation. They may be concerned that if learners are left to assess practice tasks they would miss things and not mark 'correctly'. This could impact on their ability to produce the correct solution in live tests. Using other learners as markers might be considered to partly overcome this problem as learners may be more able to spot others mistakes than their own. But the emphasis on individual activity would make it difficult to organize peer assessment as learners are always working on different sections of the course. In addition the teachers described the learners as being more comfortable with a 'traditional' teacher as marker approach. T17, however, did offer a form of self assessment. She went through the mock test question by question providing solutions as the learners marked their own work and raised questions about the marking criteria. T17 felt this gave the learners a greater understanding of test requirements as they were involved with the assessment process. Her learners did not seem uncomfortable with this form of assessment but seemed just to accept it as part of the learning routine. This could suggest that learners will simply accept teachers' interpretation of best way to assess practice tasks.

So perhaps there are two more fundamental, insidious contributory factors to teachers' control of assessment related to teachers' comfort-zone and teacher performance. Teachers may attribute their own feelings about assessment to their learners, that is it is the teachers who are more comfortable with a traditional approach. The teachers' own ICT learning experiences may not prepare them to consider other assessment options; they simply assume assessment control is part of the teacher's role. This could be important because examination success could be deemed a measure of teaching ability. Achievement is connected to how many learners you can successfully get through the test and ultimately is the criteria by which teachers are judged by their institutions. The teachers reported insecurity of tenure which could make them seek measurable results to offer employers as evidence of effectiveness. The teachers are themselves being judged. Outcome here becomes about fulfilling the teacher's assessment criteria not necessarily about best practice.

9.3.2 Professional Knowledge

Many of the teachers felt that the educational training courses they had attended had done little to prepare them for the teaching experience. For some this was because they felt that the training was aimed at classroom teaching and not the one-to-one workshop approach that they used, for others because it did not deal sufficiently with the administrative tasks they had to complete, or for others because it dealt too much with administration and not enough with teaching. Only T16, who worked as a teacher trainer, and T2, who had recently qualified, actively related their practice directly to theory during discussion. The other teachers were generally dismissive of educational theory or felt that it was not relevant to them. Their self-image was as a classroom practitioner, hence T4's comment that she was not a theoretical person but a doer. This image indicates that they perceived practice and theory as separate; teaching as intuitive, a craft developed through classroom experience rather than a science to be learnt. Consequently, there appeared to be very little reflexive practice that is PCK developing through mediation of experience and theory. The teachers' reflections centred on how to help individual learners and classroom practice as developed through trial and error. ‘Successful’ practice was repeated until it became intuitive and no longer consciously considered. This positions the teachers as experts, in Dreyfus and Dreyfus’s (2005) terms, but this level of expertise had drawbacks. The teachers appeared to no longer consciously reflect on practice; it just became something they did and it worked. This in turn could lead to a superficial engagement with both subject and pedagogical knowledge, and ultimately practice as it discouraged change. In these circumstances PCK became dominated by ‘general pedagogical knowledge’, bonded to the practical classroom, and lacked vitality or balance.

Lack of reflection: An example of this lack of reflection and engagement with theory was the degree of teachers’ control over task and assessment. Some of the teachers seemed to accept practices without looking for alternative ways or considering implications. Yet even small changes in practice could encourage greater learner involvement in the choice of task or assessment without jeopardizing flexibility or performance. For example by notating practice exercises teachers could create ‘banks’ from which learners could select their own task, thus enabling learners to take control of skills practice. Or learners could self-mark mock test from copies worked by the teacher. If teachers fear that learners may miss mistakes this could then be re-marked by the teacher thus replicating the verification process used in the examination itself. The problem is that the teachers seem not to perceive that practices may be restricting learner autonomy. They described learner flexibility, that is freedom to work at their own pace, as autonomy. This indicates a lack of true understanding of learner-centered concepts. This could be due to the teachers’ perceptions of ICT learning from previous experience, lack of engagement with theory, or lack of opportunity to attend subject specific courses which encourage reflection on practice. But this lack of engagement with theory could also indicate a problem with the way that PCK is maintained and changing practice initiated.

Superficial engagement: Change seemed frequently to be initiated from outside the classroom. These changes often involved external changes to administration, test or curriculum. With limited resources both teachers' and institutions' CPD focus was for practical courses which responded to immediate classroom needs [Figure 9.12]. For institutions this often involved external changes to test or administration necessary to maintain accountability with awarding body or government. For the teachers, it was connected to their 'caring' role and aimed to make the learning process run smoothly for learners. In both instances the teachers seemed to graft the new practice onto their previous practice. Take for example T8's changed exercises following a course on differentiation; change here appeared not to initiate reflexive practice or fundamental changes to pedagogical style, but rather reflected Evans' (2002) superficial functional change. The teachers expressed initial concerns, for example the teachers changing to the new e-Quals 7266, but appeared to quickly adapt or absorb changes into their existing comfort-zone and routines. The concern with this comfort-zone approach is that it treats PCK as inactive. That is, the teachers developed ideas and beliefs about subject and teaching before or during early subject/teaching experiences and carry those unaltered beliefs with them. They shoehorn changes to fit beliefs and practice rather than using change as a catalyst to re-evaluate and modify pedagogical/subject understandings or practice. The teachers adopting this approach are implementing change but not engaging with it.

Only a handful of the teachers had attended courses with a more theoretical perspective. Few of the courses seem to be involved with or lead to developing teaching activity leading to improving learning, and none of the courses quoted were specifically related to refining the teaching of ICT. Lack of money and time was often quoted as reasons for not attending more CPD, especially for those teachers working part time or on short contracts. But the researcher also sensed disinclination and lack of association of theory to practice. One teacher studying for a MA in Education summed up the feeling when he said that theory

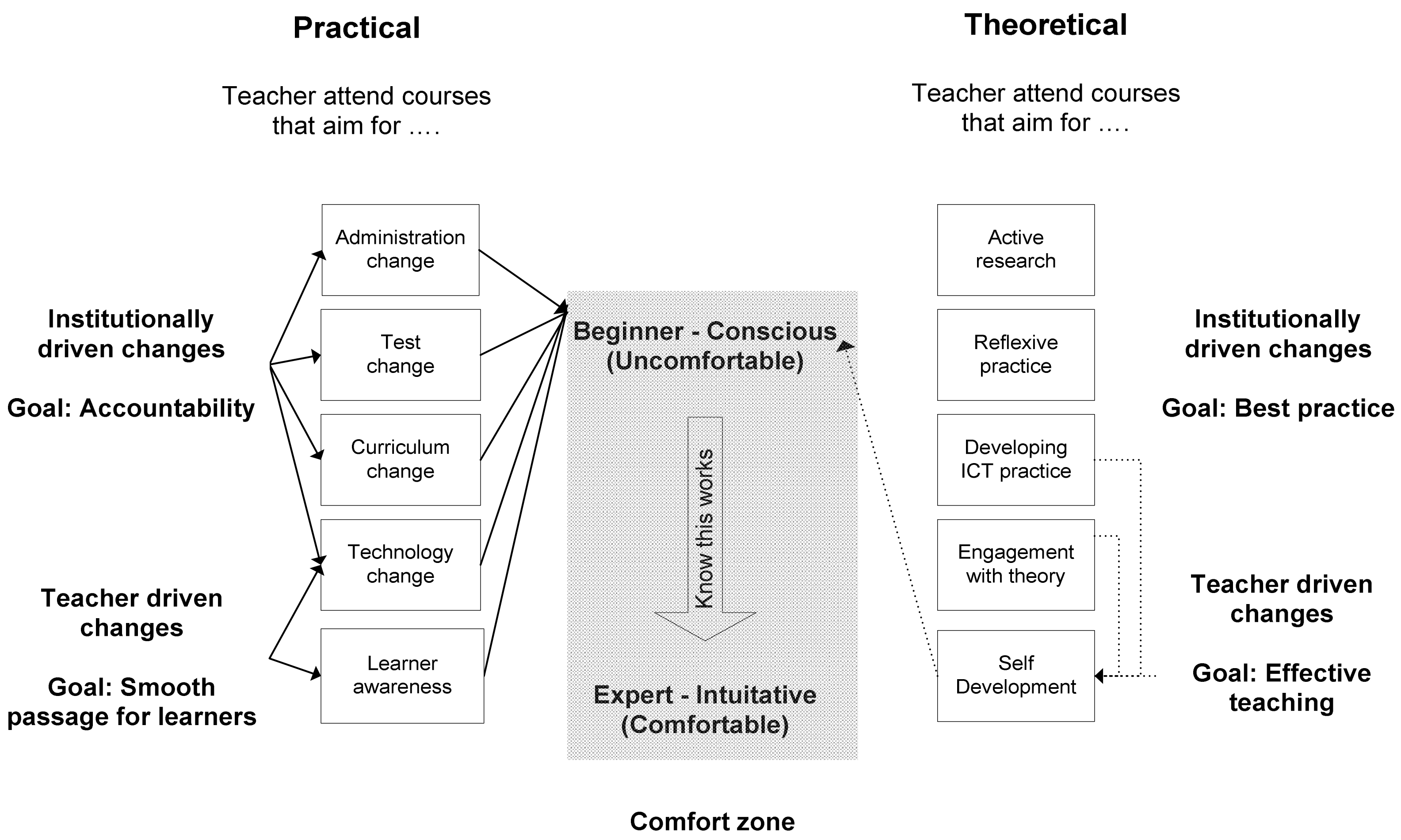


Figure 9.12: Diagram showing observed relationship between teachers' CPD opportunities and classroom change

was interesting but did not help him to be a better teacher. Shulman and Shulmans' (2004) five conditions for change, suggest such limited opportunities and lack of engagement with theory could mean that these teachers were unlikely to accommodate change. This could have implications for teaching constructions and outcomes. The teachers may implement practical, superficial change imposed on them but may not seek or implement change grounded in theory aimed at improve practice. This could further separate theory from practice and weaken the development of a comprehensive theoretical base for this new subject area.

As described at the start of this chapter, this research cannot quantify outcomes or define good ICT practice. It sought to describe and interpret the complex milieu of adult ICT user skills education and to identify influences on practice. It has been able to offer snapshots of current practice and interpretations of those images. In doing so it has identified some concerns for outcomes of practice related to transfer of skills, subject control, and teachers' professional identity. The concern is that by concentrating on computer functions there is a danger of loosing sight of the purpose of ICT skills. Learning becomes about the computer and not what the computer can do to enhance the lives or effectiveness of individuals. This raises questions about power relationships. Not just about the control of subject content, institution authority, or learner/teacher relationships but about the role of ICT itself. Computers are tools to be used by humans. Learning can be seen as not just about learning how to use the computer but how to empower the user in their daily lives. Without some sort of improvement of circumstance there seems little point in engaging in ICT education but in terms of how best to achieve it this research seems to raise more questions than it answers. The final chapter will explore the implications for findings and offer some suggests for future discussion.

The initial aim of research was to determine whether a perception of adult ICT user skills as individual and procedural was justified. The research identified a number of teaching approaches and concluded that these characteristics were manifest within observed contexts. It also fulfilled its second aim by identifying a number of influences on practice. From this view point the research has successfully addressed the research questions concerned with identifying practices and influences, be it only for a very small number of teachers. In doing so it raised a number of further questions related to the relationship between practice and outcome, the third research focus. The limitations of the research's size and concentration on adult education means that it cannot generalize on practices beyond the observed, while its qualitative nature suggests only interpretations, Bassey's (2001) 'fuzzy generalizations', are possible even within this research group. Thus the offered conclusions represent, as Wolcott (1994) phrased it, ***a*** point of view not ***the*** point of view and aim to stimulate further discussion. In the previous chapter the researcher offered some possible implications for outcomes and raised concerns about subject control, skill transfer, and teacher professionality. Several issues raised mirror those identified by Hammond (2004) in his discussion on the teaching of ICT as a subject in schools, specifically lack of definition about the nature and scope of ICT as a subject, the absence of a strong research base into the nature of ICT teaching, and worries for teachers' subject background and pedagogical knowledge. This chapter will consider the implications for these concerns, identify areas for further research and discuss some potential problems involved with change of practice. In other words, the emphasis for this chapter is exploring where to go from here.

10.1 Nature and Scope of ICT as a Subject

For the researcher a key question was 'How might computer expertise be defined or achieved?' The conclusion of this research was that ICT use is complex and requires more that practical computer skills. Yet the research revealed a heavy emphasis on hands-on, practical skills aimed at the operation of software. Further, the purpose of these skills appeared to be confused and ambiguous. For the teachers, purpose was almost universally rooted in the individual; that is use as dependent on personal context and needs. The awarding bodies meanwhile, despite rhetoric of social needs, focused on work contexts and their interpretations of employers' needs. Many of the learners seemed vague as to skills needs perhaps lacking the experience to be able to define purpose of use. They were dependent on the teachers or awarding bodies to delineate needs. The researcher observed that the impact of ICT seen primarily as practical, the conflicting and vague interpretations of long-term outcomes, and the frequent disconnection of skills from context might inhibit learners' ability to engage fully with ICT and become 'extensive' ICT users [Figure 1.4] able to exploit use in personal or professional situations.

The limitations of user ICT teaching appears rooted in the nature of its development as a subject. Its association with ease of use and non-specialist software and practical office-skills courses has emphasized a perception of ICT as a basic skill. This, and the subject's bottom up development has lead to powerful external influences, for example: a) the ICT industry which promotes skills as easy to acquire; b) awarding bodies which define competencies; and c) course designers who link skills to office competencies such as keyboarding. All of which, perhaps, perpetuates user skills as a 'low knowledge high practice' activity. In more established subjects the power of such commercial, external influences may be balanced by the teachers' professional knowledge. This research indicates that for user skills teachers' professional knowledge is diverse, lacks a pedagogical base, and may by the nature of ICT skills development and teacher recruitment be grounded in the 'Application' phase. By reaffirming their own skills, experiences and understandings teachers sustain the ethos of practical skills, easily gained and used. For example T5, whose whole focus was on emphasizing ease of use and non-threatening nature of the new software being introduced into the work place. This research has argued that ICT user skills are not just practically orientated but are complex. It contends that, returning to Tanner's (2003) definitions, ICT can no longer be seen only as a basic skill or resource but needs to be envisaged as a subject in its own right, underpinned by understanding of concepts such as data management, information literacy and presentation. This interpretation of user ICT cannot be learned solely through interaction at a machine but requires opportunities for reflection on and evaluation of use. This thesis suggests that given increasing technological changes and Internet use, user skills needs to move into Martin's 'Reflective' phase. This requires a review of ICT perceptions and greater consideration of what it is society and/or individuals really require from ICT user learning experiences.

Part of this review would involve more discussion, firstly about ultimate outcomes and how ICT literacy might be defined, and secondly about the implications of practice on outcomes. What skills do employers really require of their computer users? What skills do individuals need to function in society? Do the courses currently offered deliver those requirements? This discussion is not unique to adult education; Hammond (2004) similarly raised it in his review of school ICT teaching. Without clear definitions of aims it is difficult to see how best to achieve them. If the government is genuinely committed to universal computer competence then questions such as what skills, under what circumstances and why need to be addressed. Research to explore what skills individuals and employers require and where deficiencies lie is indicated. As skills, use and problem solving needs may vary depending on context, for example whether retired, working in an office, or requiring specific professional expertise like T6's engineers it would never be possible for courses to be all things to all people. But this thesis advocates that a change of emphasis from recall of functions to application in context, namely increased problem solving activity, could help learners to reflect on how knowledge might be applied in their personal contexts.

Frequently the government has voiced concerns that lack of ICT skills will lead to social, economic and political exclusion. They have emphasized access and skills as the solution and more recently discussion had turned to why having apparently gained skills learners remain disengaging with ICT. Many of the teachers in this research argued for agency, that is individuals having the right to choose levels of engagement and define individual computer use, which reflects Selwyn's (2004b) arguments for individual choice. The researcher does not argue with this position but is concerned from what background such decisions might be made. The limited use of ICT suggested by many of the learners might be connected to lack of understanding or awareness rather than lack of need, take for example T2's bridal shop owner who despite training still could not visualize benefits without help. This thesis suggests that prescriptive activity could discourage learners from thinking beyond the familiar or achieving their full potential. The argument here is not about whether individuals are able to access, use or even engage with ICT but rather whether they are able to 'utilize' ICT to enhance their personal and/or professional lives. Only when they really understand ICT capabilities can they make informed decisions about computer usage. Nothing can guarantee success but this thesis concludes that a more holistic approach may encourage learners to think creatively about computer use and deal with unfamiliar problems. More research is required to confirm or refute such conclusions. Part of the problem is that, as yet, there is a limited research base on which to base pedagogy.

One of the limitations of this research was that, rather like the teachers, the researcher was concerned for outcomes beyond the classroom but focused on the classroom experience. A key unanswered question is 'Is the emphasis on functional competencies and 'procedural' teaching really problematic?' Perhaps given the fact that adults choose to engage in learning, and are investing time and money in it, they approach activities with Knowles' (1984, 1990) self determination. Or as Meadows (1995) suggested, with greater life experience they are able to 'scaffold' their own learning and develop structural understanding themselves. They may already have the necessary generic skills and therefore can easily apply functional knowledge to their own situations. Certainly for some learners, transfer and application in context will not be a problem. There are indications that this may not always be the case, however.

The e-skills UK (2004) research reported that 23% of employers describe a user skill deficiency in areas such as data manipulation and presentation and the demand for skills in information and business analysis are increasing (e-skills UK, 2008). Cheuk (2002) concluded that many employees lack information literacy skills and De Saulles (2007) estimated that this cost UK small and medium business £3.7 billon per year on wasted time and ineffective information. Further, as only 8% of workers currently have advanced user skills (e-skills UK, 2004) and it is anticipated that the need for advanced-user and ‘super-user’ (higher than level 3) skills will increase over the next three years (e-skills UK, 2008) there is potential for greater skills deficiencies. Perhaps it is time for user skills to be taken seriously as a subject and for greater consideration of what skills are required, both for work and leisure needs, and how best to teach them.

10.2 Nature and Scope of Research Base

As an evolving subject ICT user has as yet a limited research base. This research highlighted several areas for further investigation and discussion a) within the classroom, b) beyond the classroom and c) within assessment.

10.2.1 Within the Classroom

This research was small scale and so in response to the question ‘What practices are evident?’ raises issues about how general these findings might be. The research aimed for variety of contexts to offer a diverse picture of activity but does not presume to be fully representative. The teachers may use other approaches in differing circumstances, for example T9 and T18s’ problem solving approach in non-examination classes. It is also not possible to know if the didactic emphasis is simply a local phenomenon derived from characteristics unique to the North East of England. For example: a) local low levels of educational attainment (Nixon et al, 2006a) lead teachers and providers to assume that learners have previous ‘bad’ educational experiences (Smith, 2008) and therefore fear learning and require greater support and encouragement; b) As an economically deprived area (Townsend, 1979) access to and use of ICT is perceived as problematic requiring flexible, non-threatening approaches such as workshops; c) The tradition of heavy industry placed little emphasis on ICT skills but its subsequent decline has led to high unemployment (Nixon et al, 2006a, e-skills, 2005a) and ICT skills gap (e-skills 2005b) which initiated retraining schemes. This could have inflated the emphasis on ICT training and required a higher level of recruitment of previously inexperienced teachers than other areas. Some of these teachers, like T5 who had worked for the Coal Board, even gained their ICT skills through these initiatives. The researcher's previous observations (Topp, 2001; 2002), however, were in the south of England and drew similar conclusions indicating that the picture may be typical. More depth of research is required to compare findings for other geographic or ICT contexts to fully construct a portrait of ICT adult user education. In addition the researcher had perceived ICT skills to be taught differently with younger learners (Topp, 2002). Further research is required to contrast the various age groups and to explore the reasons for any differences in approach.

This research focused on the teachers' perceptions and activities. The learners' perceptions of ICT skills and purpose of use were secondary and constrained. Additional research into this area is also required to explore learners' motivations and perceptions of ICT skills. This would turn the 'research light' from teaching to learning to develop greater understanding. How do learners actually learn ICT skills? What learning approaches do they adopt? Research is needed to explore the other side of the same mirror ball.

10.2.2 Beyond the Classroom

One vital question that this research could not answer was; do the different teaching approaches make any difference to either short term or long term outcomes? The research concluded that advanced questioning techniques employed by the 'constructional' approach teachers, T9 and T10, could support learners and help them reflect on learning. The classroom observations within this research were descriptive and not intended to minutely examine teaching techniques or exchanges. The findings indicate that further research into ICT teacher's verbal scaffolding techniques could be useful in interpreting teacher/learner exchanges. Such research might help define the teaching foci outlined in this research more comprehensively and lead to better understandings of the kinds of support adult learners need and what might be considered good practice.

Linked to these research issues is the question of transfer. The research implied that current practice might hinder transfer of skills but lacks evidence to substantiate such conclusions. In fact, the participants indicated that transfer was not a problem. More research is needed to examine what happens after learners leave the classroom. Other researchers have already begun to explore computer use for example Selwyn (2003, 2004b) and Angus et al (2004) but they have not directly related findings back to types of learning experience. The question for follow up research from this project is; does teaching approach impact on transferability of skills beyond the classroom?

10.2.3 Assessment

The research sought to identify influencing factors on practice. One dominant influence identified in this research is the growing dependence on qualification activity and prescriptive competency assessment. These are suggested to impact on skill perceptions and to influence teaching approaches. The current emphasis on qualification as an indication of ability, and its links with accreditation and funding, means that assessment and certification remain a given. (Although if a truly ICT literate society is the end aim, there may be an argument for making ICT a special case so that funding for courses are not directly related to accreditation. This would enable the reemergence of leisure courses and courses directed at specific groups of learners.) To move to the 'Reflective' phase would require awarding bodies to review their assessment processes. A call echoed in a recent report (Kay, 2008) which identified similar gaps in test competencies and requested awarding bodies to take into account modern interpretations of digital ‘literacies’ and increasing practical demands. From this perspective, ICT competencies can no longer simply involve application competencies but require context, that is understanding of input data, and analyses and evaluation of data handling processes leading to the creation of appropriate output. By reflecting these changes assessment, as Gardner (1999) advocated, would be for the students’ benefit. AERA (2003) concluded even quite small changes of wording could redirect focus, for example changing ‘Format the heading to 14 pt, bold’ to ‘Format the heading appropriately’ shifts the cognitive demand to the learner. The former is explicit and requires little thinking while the later increases the challenge and is related to application. This focus is more realistic thus reducing the discrepancy between subject and classroom knowledge. This in turn may reduce the need for the teacher as an interpreter of examination meanings and objectives and perhaps increase the teacher’s role as subject expert working with the learner to define ‘appropriate’.

This thesis advocates a more problem solving orientation to ICT user activity and assessment. The CLAIT Advanced course showed that this type of assessment is possible but could go further in terms of recognizing ‘appropriateness’, that is attribute value to the appropriateness of solutions. The use of portfolio assessment, such as that used in ITQ, might encourage a more ‘open’ approach to tasks and assessment. The lack of research base within ICT user skills means that the benefits of these approaches are unproven. For example, within CLAIT Advanced, do learners who opt for their own project develop more advanced skills and understandings than those who work on a given scenario? Does the ITQ qualification enable better skill transfer than classroom based qualifications? Currently these types of activity are vocationally based; can they be used effectively in non-vocational contexts? Independent research is required to explore these questions as part of an emerging best practice culture.

The literature, for example Hammond (2004), suggests there could be tensions between curriculum and subject knowledge. This arises because curriculum focuses on the materials and syllabus, while the wider subject knowledge is generated and established within the subject. The rapidly changing nature of ICT and the diversity of use introduce two potential flashpoints for this tension. It is difficult for curriculum to keep up with practice and stakeholders may have conflicting concepts for outcome. The teachers acknowledged the first of these tensions by suggesting additional modules, such as digital photography, and extended ways of working, such as a multi-package approach which they felt should be added to syllabuses. But, apart from T16, they did not express tension with curriculum visions of outcome. This thesis surmises that this lack of tension emerges from weak and vague theory bases, concluding that a fragmented subject background means that subject knowledge becomes generated through curriculum rather than the wider subject understandings. Further research and discussion about skill needs can help build a strong subject culture. But effective approaches to teaching do not just reside in institutions in the form of research, syllabus and/or assessment changes it also requires assimilation to and by teachers.

10.3 Nature and Scope of Teachers' Professional Knowledge

A core question for this research concerned the development and maintenance of ICT teachers' professional knowledge. This research concluded that the current lack of research base means that teacher training within ICT lacks a subject specific theoretical base. Alexander's (2002) work suggests that a lack of pedagogy is not unique to ICT user skills but rather a general condition within the UK. But user skills' additional weak and confused subject base, conflicting subject interpretations, and rapidly changing technological culture could accentuate the effects further undermining its knowledge base. The teachers within this research generally saw themselves as practitioners concerned with practical activity within the classroom. Their PCK appeared to develop in early teaching interactions and then become fixed. Movement into the 'Reflective' phase would require teachers to adopt a more reflexive approach. They would need to see beyond the classroom and embrace broader social and digital contexts. This would require engagement with subject goals beyond the classroom and with pedagogical theory. Two conditions would need to be met to enable this to happen. Teachers would need to be given opportunities to develop a subject specific knowledge base and be encouraged to explore new ways of approaching teaching.

10.3.1 Developing Subject Base

The researcher offers an alternative model of teachers CPD [Figure 10.1] from that described in the research [Figure 9.12]. Core to this model is increasing teacher opportunities to engage with subject specific training at either ITT or CPD levels. This is envisaged as far more than developing subject skills but rather comprises Kennedy's (2005) action research and transformative models. This involves opportunities to explore, analyse, reflect and enact a range of pedagogic models, such as those Alexander (2000) observed in other countries videlicet health, social and moral welfare, ethics, and the relationship of society and individual, evaluated against broad subject orientations and discourses, such as digital literacy. It is hoped that this could redress the current learner-teacher-institution emphasis and bring the subject to the fore whilst providing teachers with alternative visions of subject pedagogy, methods and techniques with six potential effects: a) strengthen the subject culture; b) emphasize PCK as dynamic; c) develop teachers as learners, continually increasing skills and capabilities; d) encourage teachers to find what Dadds (1997) termed their 'inner wisdom' by reflecting on practice; e) create balance between teacher knowledge elements; and f) strengthen professional identity by encouraging Sach's (2003) democratic participation. Questioning of practice may be threatening to teachers but it can be argued that discomfort is a necessary part of effective change as it can lead to dissatisfaction with current practice and identification of problems. It could thus provide the vision Shulman and Shulman (2004) felt necessary to motivate change but also present challenge

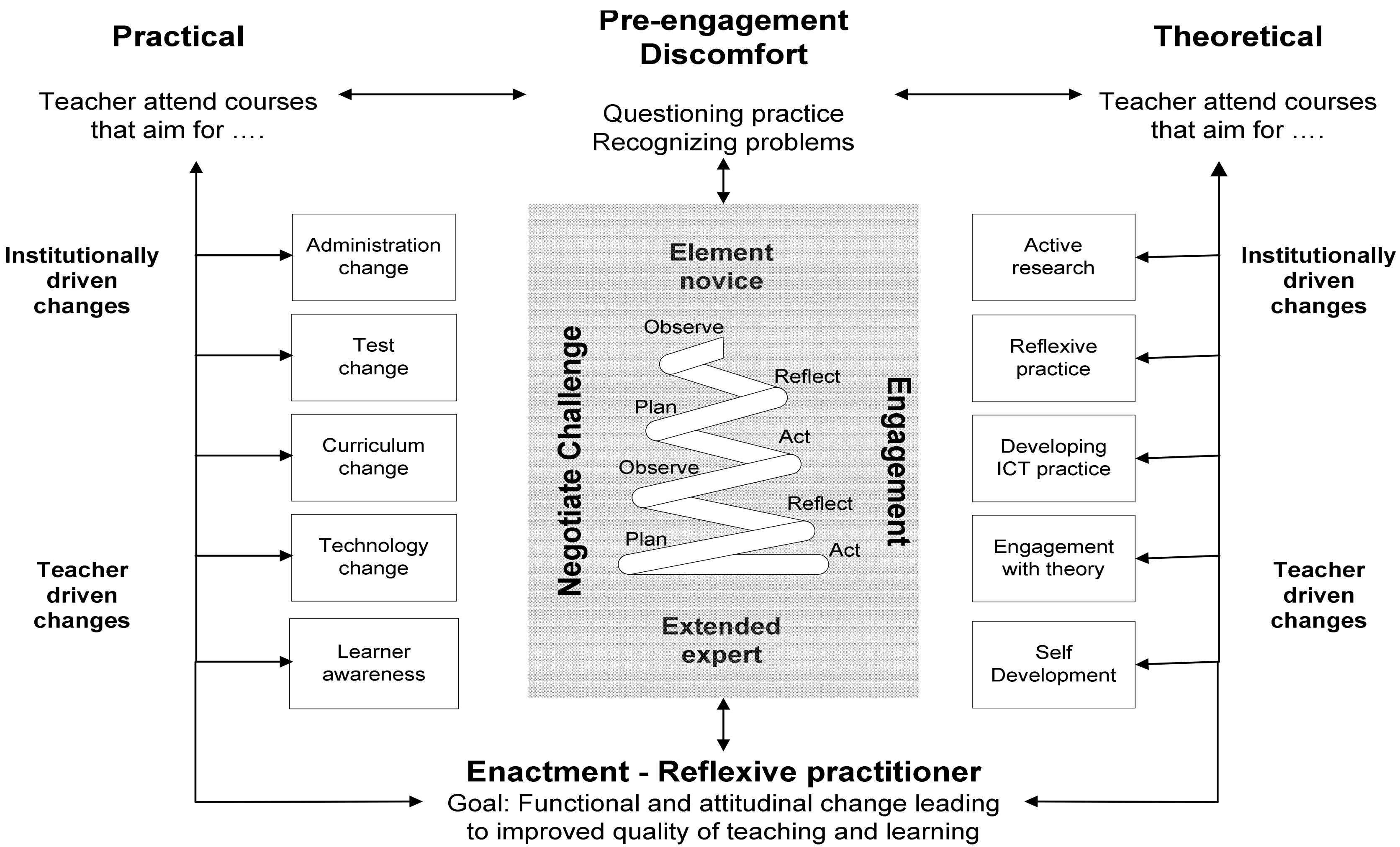


Figure 10.1: An alternative model for teachers' CDP and classroom change

which Dreyfus and Dreyfus (2005) concluded was essential to developing and extending ‘expertise’.

10.3.2 Developing Professionality

Greater engagement with a theoretical base could help teachers become reflexive practitioners by marrying the practitioner and the theorist. Such a stance might move change from something imposed on the teacher to a professional element that the teacher deliberately encourages, develops and researches for herself, in other words teacher as an action researcher. Change in this context becomes an exploration of alternative pedagogical constructions negotiated by the teacher with the aid of a reflective, research ‘spiral’, similar to that used in this research project [Figure 4.1]. Such development would involve Frasers’ engagement elements developing deeper understandings of problems and solutions, and extending levels of expertise. This holistic approach sees PCK as dynamic and changing, and teachers as contributors to a developing subject theory. Perhaps the greatest benefit of this approach would be that the practical and the theoretical would no longer be separated. Their interrelationship would be acknowledged and visible. Thus even when institutional changes were imposed on teachers, by employing this ‘reflexive’ approach, the teachers would be in a better position to question change and/or implementation. Concern would be directed at seeking best practice through Evan’s (2002) functional and attitudinal change. This could shift the focus of caring beyond that of individual learner and confidence building, to wider social needs and developing user potential.

The kinds of changes suggested in this chapter would not be without problems. They are likely to be resistance from three factions, institutions, teachers and students.

10.4 Challenges to Change

Teachers, learners, providers and awarding bodies may not see the need for change. The systems have grown up over a number of years and seem accepted by all the stakeholders. These teachers had developed teaching approaches they felt worked for them and their learners. The learners seemed to accept those approaches without question for instance both workshop and group learners expressed satisfaction with approach. As in Ecclestone and Pryors' (2003) research, assessment structures had become accepted as the norm. There seems a general acceptance by all parties of the learning and assessment structures. Transfer is not acknowledged as a problem, especially by the learners. There may be resistance to changing something that is perceived to be working, especially as change is costly and time consuming.

Shulman and Shulmans' (2004) five conditions for change would suggest that without vision and motivation to change teachers and institutions are unlikely to initiate change. Change thus must come from external sources. Typically, in this research, change came from institutions such as awarding bodies or providers. Such changes were often commercially rather than theoretically motivated. In addition the current lack of subject theory base and supervisory body means that theoretical stances are not promoted or easily available to awarding bodies or teacher. This all inhibits vision, other ways of looking at ICT teaching are not considered. This lack of shared vision led to superficial implementation of change. To implement effective change would require the stakeholders to perceive a need for change.

The stakeholders expect qualification systems and as T16 concluded assume that qualification ensures certain skills. This thesis has suggested that a more reflective, problem solving approach to assessment might help individuals develop broader skills and adaptability. However, open, problem solving activity is more difficult to assess and administer. This could be problematic for institutions and teachers. Institutions may resist such changes perhaps fearing inconsistency of marking. To maintain consistency could require implementation of verification systems that would be expensive. From the teacher's perspective, assessment of problem solving tasks is more time consuming and exacting, hence T18 did not offer scenario assessment for CLAIT Plus. A change of approach could place high demands on teachers requiring changes to teaching style, greater pedagogic knowledge and deep subject understandings. Further, teachers would need to be prepared to relinquish their role as provider of knowledge and accept the far more diverse role of advisor, mentor, and guide. Each learner group would be unique and the teacher would have to respond accordingly. Teachers may question the necessity for such challenging changes to working conditions given that current practices achieve test success. Ultimately they may prefer to continue with the methods with which they were comfortable and can perform with relative ease.

Finally the learners may not be prepared for self-directed learning. The learners in this research, as Hanson (1996) suggested, seemed not to seek content autonomy and appeared comfortable following a prescriptive route. They accept a didactic teaching situation as familiar and expected, especially the learners in workshop classes, perceiving their autonomy to be bound with the freedom to work at their own pace. But alternatively the majority of T16 learners also seemed comfortable with his 'unstructured' problem solving style and T18 felt that her learners easily adapted from the prescriptive tasks of CLAIT Plus to the problem solving task of CLAIT Advanced. This may suggest that learners are adaptable and can quickly orientate, as Knowles et al (2005) argued, to andragogical self-direction, or that they simply accept the approaches that teachers offer provided they perceive progress and/or value. One might conclude therefore that even with initial resistance to a problem solving approach learners might come to '……experience release and exhilaration when they realize they can take control over their learning' (Petty, 1998:187).

10.5 Concluding thoughts

This research project was born out of the researcher's dual professional backgrounds of primary teacher and adult ICT user teacher. It is difficult to predict to what extent conclusions have been influenced by these contrasting experiences. They are offered in an open, honest atmosphere. It is hoped that the voices of the teacher and learner participants are heard and not masked by the researcher's own. For the researcher a key question was 'How might computer expertise be defined or achieved?' Such discussions have emerged in relation to children but less so for adults. This research offers a starting point for dialogue about adult ICT education especially given its premise that the dominance of practical, hands-on activity and emphasis on qualification competences may not provide an adequate base to develop users able to exploit ICT use to its full potential for their personal or professional use.

The research sought to identify what practices are evident in the adult ICT classroom and in what context. Various ICT teaching environments were described, including workshop and group approaches, and 7 differing teaching styles identified. The teaching model developed in this thesis provides a tool by which researchers can compare and contrast teaching situations to build a comprehensive picture of adult ICT user teaching. It is anticipated that future research will further develop the model to provide greater understanding of how adults are taught and how they might best learn. To date such observations have related to schools but this research provides a missing element by exploring the adult environment. As such this research is a vital element to developing a full pedagogical history and evolving understanding of ICT as a subject area.

When exploring what influence teachers' decisions chapters 6 to 8 revealed a complex ranch of influences on both practice and subject culture. The thesis concluded that as an emerging subject, adult user skills have lacked depth of subject and pedagogical theory. Consequently environmental influences, such as commercialisation and learner fear, have become the main focus for practice. This thesis calls for a redressing of this imbalance to enable a deeper subject culture to emerge. As ICT moves from its subject infancy to a more mature position it is envisaged that these observations will contribute to the ongoing discussion and signpost ways that practice may be developed.

At the heart of this research is the question of how adults' ICT teachers develop and maintain PCK. The research concludes that a robust theory base is important to provide balance between subject, pedagogy and emotional elements of PCK and contributing depth to teachers' professional knowledge. Without it PCK, can become fixed and could eventually stagnate. The changing nature of ICT suggests that it is particularly important for teachers to develop a dynamic PCK in this subject area. Yet, this research found vague and limited subject theory which it suggests contributes to a superficial engagement with subject. This means that the teachers generally did not question the narrow, practical perception of user skills or the restricted versions of skill competencies within tests. The subject matter became something which was passed to them and they in turn passed on to the learner. ICT's weak pedagogical theory base also constrained teaching. It was those teachers with experience of teaching other subject areas, namely T16, T9 and the HE teachers, who demonstrated the more learner-centred approaches. Many of the teachers had difficulty aligning the educational theory they had encountered in ITT to their ICT environment leading them to dismiss theoretical perspectives. This suggests that exposure to educational theory alone is insufficient to enable teachers to transfer knowledge from the classroom to their teaching context. Theory needs to be contextualized with subject and situation. Teachers' professional knowledge is a reflexive process involving subject, pedagogy and environment. This work contributes to understandings of how PCK is developed and enacted in this new and under-developed area. Such understanding is essential to building a robust professional knowledge base and developing ways of improving teaching.

Finally to the question of how practice may impact on outcomes. Obviously, as indicated in this final chapter, considerable work is required to test the validity of this research's conclusions. Clearly there is still a continuing debate about how to define ICT literacy, what skills are required and how to achieve them. During this discussion the teachers' own experiences and subject constructions cannot be ignored but at the same time contributors need to be alert to alternative views and interpretations. Such alternatives have been voiced here for consideration. Only through a process of informed debate can a culture of best practice for ICT be developed. Without such a culture, ICT as a subject is destined to underperform and ultimately to fail to deliver.

A1: Comparison of Learning Taxonomy and NQF

The National Qualification Framework (NQF) has a clear, progressionary outline which correlates with cognitive progressions from literature. It sets the levels against which a qualification can be recognised in England, Wales and Northern Ireland. It is intended to help learners make informed decisions about the qualifications they want to pursue. Public funding can only be obtained for those qualifications accredited on the NQF.

ILP (iSkills, 2007)	Anderson and Krathwohl's Revised Taxonomy (2001)	National Qualification Framework (NQF, 2006)	
Create generate information by adopting, applying, designing, inventing or authoring information	**Create** put elements together to form a coherent or functional whole	8	• Opportunities to develop new and creative approaches that extend or define exiting knowledge or professional practice
		7	• Highly developed and complex levels of knowledge enabling original responses to complicated and unpredictable problems and situations
Evaluate make judgements about the quality, reliance, usefulness or effectiveness of information	**Evaluate** make judgements based on criteria	6	• Specialist knowledge to enable you to use own ideas and research in response to complex problems
		5	• Ability to increase depth of knowledge and understanding of subject so you can respond to complex problem and situations • High level work expertise
Integrate interpret and represent information	**Analyse** Break down information + seek structures or purpose	4	• Specialist learning, involving detailed analysis of information and knowledge
Manage organize and classify schemes	**Apply** carry out or use a procedure	3	• Ability to gain and apply range of knowledge, skills + understanding, at a detailed level
	Understand construct meaning from information	2	• Good knowledge and understanding of subject • Ability to perform tasks with guidance
Access knowing how to collect or retrieve information	**Remember** recall relevant knowledge	1	• Basic knowledge and skills • Ability to apply with guidance • May be linked to job competence
		Entry	• Basic knowledge and skills • Ability to apply in everyday situation • Not geared towards specific occupations

A2: Knowledge Dimensions in ICT user skills

PRACTICAL ELEMENT		THINKING ELEMENT	
Major type and subtypes	**ICT Examples**	**Major type and subtypes**	**ICT Examples**
Sensory-motor Knowledge - The basic physical skills learners must acquire to be able to operate machinery		**Factual Knowledge** - The basic elements students must know to be acquainted with to solve problems	
• Knowledge of how to operate equipment	Keyboard and mouse skills	• Knowledge of terminology	Technical vocabulary
• Practical skills	Typing	• Knowledge of specific details and elements	Paper sizes, details of hardware and software
Procedural Knowledge - How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques and methods		**Conceptual Knowledge** - The interrelationships among the basic elements within a larger structure that enables them to function together	
• Knowledge of procedural routines to complete actions	Sequence of steps to set page margins	• Knowledge of classifications and categories	Forms of document layouts
• Knowledge of subject-specific skills, techniques and methods	Using Cut/copy/paste in differing situations	• Knowledge of principles and generalizations	Page layout and presentation principles
		• Knowledge of theories, models and structures	Use of formulae in spreadsheets
Tactical Knowledge - Understanding of how and when to apply procedural knowledge to solve problems and implement solutions.		**Meta-cognitive Knowledge** - Knowledge of cognition in general as well as awareness and knowledge of one's own cognition	
• Knowledge of criteria for determining when to use appropriate procedures	Problem solving activity to complete tasks	• Strategic knowledge	Understanding of structure of problems and solutions
• Having the skills and adroitness to complete tasks	Able to manipulate items within a document	• Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge	Understanding of when to apply procedures in context
		• Self knowledge	Awareness of one's own knowledge level

Adapted from Anderson and Krathwohl (2001:29)

A3: The Cognitive Process Dimension for ICT User Skills

Cognitive Processes	Categories	Practical Element Examples	Thinking element Examples
Remember - Retrieve relevant knowledge from long-term memory	***Recognising***	Remembering skills to operate machinery e.g. how to hold the mouse	Recognise terminology e.g. knowing that log-on refers to starting computer
	Recalling	Perform actions e.g. move curser on screen using the mouse	Recalling facts e.g. able to name hardware components
Understand - Construct meaning from information presented	***Interpreting***	Perform actions from oral or written instructions e.g. double click mouse.	Interpreting instructions e.g. follow help menu instructions
	Exemplifying	Sketching out a plan or document from given requirements	Giving an example of different document layouts
	Classifying	Selecting items from menus	Naming different document layout and describe purpose
	Summarizing	Apply a criteria for a sort procedure on a list of items e.g. sort alphabetically	Understand that + - * and / can be included in formula following the same basic formation principles
	Inferring	Performing the basic principles of cut/copy/paste in a variety of situations	Recognising that the same procedures may be used in a number of different situations e.g. cut/copy/paste
	Comparing	Adapting procedures as necessary in differing applications	Compare applications e.g. similarities and differences of file menu in Word or Excel
	Explaining	Able to describe to others actions required e.g. "If you double click the mouse the window will open"	Explain why text and numerical data appear differently in spreadsheet cells
Apply - Carry out or use a procedure in a given situation	***Executing (Carrying out)***	Applying a procedure to a familiar task e.g. printing	Demonstrating understanding of when and how procedures are applied e.g. affects of bold and normal text on a page
	Implementing (Using)	Apply a procedure to an unfamiliar task e.g. print sections of a document	Solve problems e.g. use of formulae in spreadsheet

Cognitive Processes	Categories	Practical Element Examples	Thinking element Examples
Analyse - Breaking down information into its component parts and determining how the parts relate to one another and to an overall structure or purpose	***Differentiating***	Develop effective page displays e.g. apply own formatting to text	Differentiate between good and bad practice e.g. use of white space, text or graphics in page display
	Organizing	Select skills need to complete task e.g. whether to use tabs or a table to organize information in a word processing document	Developing formulae to complete a calculation e.g. define sum required and structure formula
	Attributing	Assessing validity of information on the Internet	Breakdown tasks e.g. understand whether to create a table in Word or Excel to fit purpose
Evaluate - Making judgements based on criteria and standards	***Checking***	Testing a formula in a spreadsheet e.g. building, applying and testing an 'If function'	Understanding why a formula may not be working and seeking solutions
	Critiquing	Judging text format e.g. applying differing texts formats to find most effective one to use	Evaluating product e.g. is the page display the most effective to convey information or message
Create - Putting elements together to form a coherent or functional whole; to produce new and original work	***Generating***	Generating original work e.g. building a questionnaire in a word processing application	Constructing a questionnaire hypothesising on question responses
	Planning	Design a document e.g. plan a PowerPoint presentation	Devising procedures to complete a task e.g. planning content and design of a PowerPoint presentation
	Producing	Performing procedures or actions to complete a task or problem e.g. producing a PowerPoint presentation	Considering how to produce a product fit for purpose e.g. how to best convey the intended message of a PowerPoint presentation

Adapted from Anderson and Krathwohl (2001:67)

A4: Characteristics of models of Professionality

Restricted professionality *(Practitioner - Micro focus)*	***Extended professionality*** *(Reflective practitioner - Dual micro/meso focus)*	***Holistic professionality*** *(Reflexive practitioner - Tri micro/meso/macro focus)*
Skills derived from experience	Skills derived from a mediation between experience and theory	Skills derived from a mediation between experience, theory and society
Perspective limited to the immediate in time and space	Perspective embracing the broader social context of education	Perspective embracing the broader social context of education but adapted to immediate time and space
Classroom events perceived in isolation	Classroom events perceived in relation to school policies and goals	Classroom events accommodating school policies and goals but adjusted to individual and/or society needs
Introspective with regard to methods	Methods compared with those of colleagues and with reports of practice	Methods developed by reflection on those used by colleagues and with reports of practice but adapted for specific circumstances
Value placed on autonomy	Value placed on professional collaboration	Value placed on autonomy of decision making within professional collaborations
Limited involvement in non-teaching professional activities	High involvement in non-teaching professional activities (especially teachers' centres, subject associations, research)	High involvement in non-teaching professional and subject activities (especially teachers' centres, subject associations, research)
Infrequent reading of professional literature	Regular reading of professional literature	Regular reading of professional literature and reflexive thought about implications for practice and outcomes
Involvement in in-service work limited and confined to practical courses	Involvement in in-service work considerable and includes courses of a theoretical nature	Involvement in in-service work considerable and includes courses of a theoretical nature leading to reflexive implementation of practice
Teaching seen as an intuitive activity	Teaching seen as a rational activity	Teaching seen as intuitive application of rational theory

Adapted from Hoyle, 1975:318

A5: Qualification Profiles (Current during research period)

British Computer Society Certificates for IT Users (BCS, 2006)	
Examining Body:	British Computer Society
Description:	In addition to the traditional ECDL qualification, the BCS offers two qualifications which came into effect in September 2003. These are BCS Level 1 Certificate for IT Users (ECDL Part 1) and BCS Level 2 Certificate for IT Users (ECDL Part 2). They incorporate units mapping directly onto ECDL modules. They are both in the NQF enabling centres to access funding. Level 1 aims is to give an initial overview of computer use for the beginner. Level 2 is designed to give a more in depth knowledge and understanding of computer use.
Modules:	***Level 1: Three units*** 1. Concepts of Information Technology (ECDL Mod 1) 2. Using the Computer and Managing Files (ECDL Mod 2) 3. Information and Communication (ECDL Mod 7) ***Level 2: Five units*** 1. Word processing (ECDL Mod 3) 2. Spreadsheets (ECDL Mod 4) 3. Database (ECDL Mod 5) 4. Presentation (ECDL Mod 6) 5. Using IT
NQF Level:	Level 1 at level 1 Level 2 at level 2
Guided Learning Hours:	Level 1: 40 Level 2: 90

New CLAIT (OCR, 2005e)	
Examining Body:	OCR
Description:	A basic introduction to the use of IT. Caters for the full range of learners in IT, whether in school, college, training, further education or employment. Developed in consultation with partners in industry, further education and schools. Aims to provide a nationally recognised standard in IT assessment that is accessible and flexible whilst also being reliable, consistent and valid.
Modules:	***Certificate: Core unit + 2 optional units*** ***Diploma: Core unit + 4 optional units***

	Core unit: File Management and e-Document Production ***Optional units***: Creating Spreadsheets and Graphs Database Manipulation e-Publication Creation Create an e-Presentation e-Image Creation Web Page Creation Online Communication Computing Fundamentals Key Applications Living Online
NQF Level:	Level 1/Foundation
Guided Learning Hours	20 per unit

CLAIT Plus (OCR, 2005a)

Examining Body:	OCR
Description:	An intermediate level course CLAIT Plus is suitable for those who already possess basic skills in the use of IT and who wish to further develop their ability. It is suitable for learners in full-time education, those on part-time courses and those in employment who wish to develop skill in one or more specialist areas in order to meet the needs of their workplace situation. Developed in consultation with partners in industry, further education and schools. The qualification aims to prepare for the needs of the IT-based workplace in a comprehensive manner.
Modules:	***Certificate: Core unit + 2 optional units*** ***Diploma: Core unit + 4 optional units*** ***Core Unit*:** Integrated e-Document Production ***Optional Units***: Manipulating Spreadsheets and graphs Creating and Using a Database e-Publication Design Design an e-Presentation e-Image Manipulation Website Creation Electronic Communication
NQF Level:	Level 2

Guided Learning Hours	30 per unit

CLAIT Advanced (OCR, 2005d)

Examining Body:	OCR
Description:	Designed to recognise the skills, knowledge and understanding of those who use advanced IT skills. The qualification is suitable for those who already possess intermediate skills. It is suitable for learners in full-time education, those on part-time courses and those in employment who wish to develop skill in one or more specialist areas in order to meet the needs of their workplace situation. Developed in consultation with partners in industry, further education and schools. The qualification recognises complex and specialist skills in the use of IT in vocational contexts.
Modules:	***Certificate: Core unit + 2 optional units*** ***Diploma: Core unit + 4 optional units*** ***Core unit***: Creating an IT Solution ***Optional Units***: Analysing Spreadsheets and Graphs Relational Databases e-Publication Production Professional e-Presentations e-Image Production Website Authoring
NQF Level:	Level 3
Guided Learning Hours	60 per unit

E-Quals (City and Guilds 7262) (e-Quals 2001b)

Examining Body:	City and Guilds (E-quals)
Description:	Launched in June 2001, e-Quals has quickly gained a reputation for being a flexible and up-to-date suite of IT qualifications that meets the needs of both learners and employers. The Computer User e-Quals certification is also known as C&G 7262. The qualification is offered at three levels covering beginners to advanced users.

Level 1 - Certificate for IT Users
Level 2 - Diploma for IT Users
Level 3 - Advanced Diploma for IT Users

Modules: ***Level 1: core unit + 2 optional units***

Core unit:
IT Principles

Optional units:
Word Processing
Spreadsheet
Databases
Using the Internet
Presentation Graphics
Using e-mail
Desktop Publishing

Level 2: core unit + 2 optional units

Core unit:
IT Principles

Optional units:
Word Processing
Spreadsheet
Databases
Using to Internet
Presentation Graphics
Computerised Accounts
Desktop Publishing
Integrated Applications
Multi media
Website Design

Level 3: core unit +2 optional units

Core unit:
IT Principles

Optional Units:
Word Processing
Spreadsheet
Databases
Integrated applications
Website design
Relational databases

NQF Level: Corresponding Levels 1-3
Guided Learning Hours 30 per unit at level 1
40 per unit at level 2
60 per unit at level 3

European Computer Driving License (ECDL) (ECDL, 2006b)

Examining Body:	British Computer Society
Description:	The European Computer Driving Licence (ECDL), known as the ICDL outside Europe, is the global standard in end-user computer skills, offering Candidates an internationally recognised certification that is supported by governments, computer societies, international organizations and commercial corporations globally. The ECDL / ICDL is the world's largest end-user computer skills certification programme, with more than 6 million candidates in 146 countries. A beginners to intermediate level qualification but prospective Candidates should ideally have used computers and the common software applications before.
Modules:	***Completion of seven modules***: ***Theoretical test***: 1. Concepts of Information Technology ***Practical tests***: 2. Using the computer and managing files 3. Word processing 4. Spreadsheets 5. Database 6. Presentation 7. Information and Communication
NQF Level:	The traditional 7 module ECDL qualification is no longer included, however see BCS Certificates for IT Users
Guided Learning Hours	30 per module

European Computer Driving License Advanced (ECDL Advanced) (ECDL, 2007)

Examining Body:	British Computer Society
Description:	Designed for learners who have completed ECDL and want to progress skills. The aim is for 'power users' to demonstrate higher level computer skills, and show employers that they are confident, competent and efficient in a range of applications.
Modules:	***Advanced Certificate:*** Modules can be taken individually to receive an advanced certificate for that application ***Expert Certificate***: On completion of all modules

	Modules: Word processing Spreadsheet Database Presentations
NQF Level:	Level 3
Guided Learning Hours	Not specified

ITQ (e-skills UK, 2006)

Examining Body:	e-skills UK Sector Skills Council
Description:	ITQ is the National Vocational Qualification for IT Users which demonstrates staff competence in the use of IT in the workplace. It is a nationally recognised qualification and is offered at levels 1, 2 and 3. The qualification has been developed by e-skills UK and employers, for employers. The qualification is set by employers to meet their standards at work, and allows employers and learners to choose what new skills need to be learnt and how to learn them. It also allows learners to include their existing IT skills, at any level, in the assessment. ITQ is more than just a new qualification - it is a new way of thinking. It is a journey of skills development supported by a framework for recognising achievement. Aligned to the needs of business, it allows employers and learners to take control of the learning experience. ITQ is seen as delivering the skills employers needs and raising IT user skills of the workforce to address skills gaps and shortages.
Modules:	The qualification is awarded according to the number of points accrued **Level 1 = 40 points** **Level 2 = 100 points** **Level 3 = 180 points** ITQ consists of a menu of 18 modules, each at Level 1, 2, and 3. Employers and learners can combine modules according to a rule structure and work needs. Points are awarded according to level and module selected. A typical ITQ would consist of the mandatory module and 5 or 6 other modules

	Mandatory module Making Selective Use of IT ***Optional Units*** Using IT systems Operate a computer IT trouble-shooting for users IT maintenance for users IT security for users Use IT to exchange information Internets and intranets E-mail Word processing Spreadsheets Databases Websites IT artwork and images IT presentations Specialist or bespoke software Evaluate the impact of IT Sector specific unit
NQF Level:	Level 1 - Level 1 Level 2 - Level 2 Level 3 - Level 3
Guided Learning Hours	Not specified

OCR Text Processing Suite (OCR, 2006)

Examining Body:	OCR
Description:	The OCR Text Processing suite of qualifications are industrially recognised, vocationally-related qualifications. They are designed for learners who wish to work in text-processing and administrative related roles. The Suite has 3 levels and each level can be obtained as certificate or diploma awards. Level 1 is aimed at learners new to text processing. Level 2 is for candidates who have sufficient skills, underpinning knowledge and command of English to carry out the production of business documents without supervision. Level 3 is for learners able to carry out production of more complex documents.
Modules:	**Level 1** ***Certificate - Mandatory core unit + optional unit*** ***Diploma - Mandatory core unit + 3 optional units*** ***Mandatory Core Unit*** 1. Text Production (basic)

Optional Units:
2. Audio-Transcription (Basic)
3. Computer Keyboard Skills (Basic)
4. Shorthand Speed Skills (Basic)
5. Speed Keying (Basic)
6. Typewriting (Basic)
7. Word Processing (Basic)

Level 2
Certificate - Mandatory core unit + optional unit
Diploma - Mandatory core unit + 3 optional units (to include Unit 11)

Mandatory Core Unit
1. Text Production (Intermediate)

Optional Units:
2. Audio-Transcription (Intermediate)
3. Business Presentations (Intermediate)
4. Legal Text Processing (Intermediate)
5. Mailmerge (Intermediate)
6. Medical Audio-Transcription (Intermediate)
7. Medical Word Processing (Intermediate)
8. Shorthand Speed Skills (Intermediate)
9. Speed Keying (Intermediate)
10. Typewriting (Intermediate)
11. Word Processing (Intermediate)

Level 3
Certificate - Mandatory core unit + optional unit
Diploma - Mandatory core unit + 3 optional units (to include Unit 8)

Mandatory Core Unit
1. Text Production (Advanced)

Optional Units:
2. Audio-Transcription (Advanced)
3. Document Presentation (Advanced)
4. Legal Word Processing (Advanced)
5. Shorthand Speed Skills (Advanced)
6. Speed Keying (Advanced)
7. Typewriting (Advanced)
8. Word Processing (Advanced)

NQF Level:	Corresponding Levels 1-3	
Guided Learning Hours	35 Level 1 Certificate 65 Level 2 Certificate 95 Level 3 Certificate	70 Level 1 Diploma 130 Level 2 Diploma 190 Level 3 Diploma

B1: STUDY INFORMATION SHEET

My name is Amanda Topp and I am a full time PhD research student at Sunderland University. I am currently researching teaching styles used in the teaching of ICT user skills to adults. To achieve this I need the help and co-operation of teachers and adult learners involved in computer skills lessons.

You are invited to take part in the study. Any help is useful so if you are unable to commit to the full range of activity outlined below, please think about offering a more limited access. Before you decide it is important for you to understand why the study is being done and what it will involve. Please take time to read the following information. Ask if anything is not clear or you require more detail.

Study Title: Teaching practices, influences and outcomes, in the adult ICT user skills classroom.

Reason for research: To determine how best to teach ICT skills we need to understand how skills are taught, what influences teachers' decisions and what skills are required for computer literacy. This research aims to examine these issues in the adult ICT user skills environment.

Participation: Teachers and learners in ICT user skills classes are asked to become participates in a case study approach. For teachers this will mean committing to interviews and class observations. For learners it will mean classroom observations, completing a brief questionnaire and perhaps taking part in a focus group discussion. Participation is entirely voluntary and you are free to withdraw from all or selected activities at any time without giving a reason or without penalty.

Procedures: No additional preparation or procedures from normal lessons is required. I wish to observe lessons as they would normally happen and I am not looking for special activities or behaviour. Copies of lesson plans, task worksheets and manuals or learners work samples as produced in the routine running of the lesson may also be collected and examined. The researcher will not participate in the class but observe and record activities discretely. Interviews and focus groups will be organized at participants' convenience.

Confidentiality: The results of the study will be confidential. The findings will be published as part of a PhD thesis but the names of institutions and participants will not be disclosed. Data will be stored in a locked cabinet and within password protected documents on computer. All named material will be destroyed once the PhD publication and assessment process is complete, or within 5 years if research leads to additional publications.

Contact for Further Information: If you would like more information please contact the researcher at amanda.topp@sunderland.ac.uk or her supervisor john.grey@sunderland.ac.uk.

Complaints: Research procedures have been approved by the University of Sunderland Ethics Committee. If you have concerns or complaints about the way that the research is being conducted you may contact the researcher's supervisor (Dr John Grey) or the Chairperson of the Ethics Committee of the University of Sunderland. (Dr R. Pullen).

B2: Teacher Interview Schedule

Name:

Date: Time: Location:

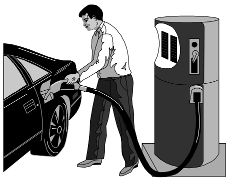
Questions	Notes
First I'd like to find out about you and your professional background. **How did you get to be here as an adult ICT teacher?** *Prompts:* • *What is your subject background?* • *What is your teaching background?*	
Do you have or are you working towards teaching qualifications? If yes: Can you tell me about your teacher training? *Prompt if yes:* • *what qualification* • *how obtained* • *at what stage of their career* • *how long ago* • *structure of course* How well do you feel your training prepared you for the classroom experience? • *Did the experience of the classroom match your expectations?* • *How relevant have the theories of education, you studied, been to your practical teaching?* • *It is quite often said that you don't learn to teach until you get in the classroom. How far would you agree with that?* If none: What is your teaching experience? *Prompt if no:* • *How did you start teaching* • *How long ago* • *What interested you about teaching* • *Has the experienced initially matched your expectations? Why?* **Can you describe some experiences, either in training or in the classroom, that you feel have helped you develop as a teacher?**	

Questions	**Notes**
Within the last two years, what teacher development opportunities have been available to you? **Do you think these experiences have affected the way that you teach? How?** • Can you describe some ways that you changed your teaching due to courses (or reading) that you undertook.	
Have you seen Claxton's metaphors for possible teacher images? (give copy of 'Teacher Images' to interviewee) Using the metaphors here I'd like you to think about your image of a) your place in the learning process b) your relationship with learners **How do these metaphors apply to your practice in different situations?** *Prompts:* • *Are there metaphors that you are more comfortable with than others?* • *Are there others that you feel constrained to adopt because of circumstances?* • *What circumstances led to these constraints?* **What metaphor, either from this list or your own, would you say best describes your ideal image of a teacher?** • *Are any more or less important?* • *What might limit you being able to achieve it?*	
Regarding your current situation, what kinds of difficulties do your students encounter? **What ways can you, as the teacher, help them overcome these problems?**	
I'd like to think about computer skills now. **How did you acquire your own ICT skills?** *Prompts:* • *What training experiences have you had?* • *What professional experiences have you?*	
The European e-skills Forum defines ICT user skills as "…the capabilities required for effective application of ICT systems and devices by the individual." **I'd like you to look at these statements and decide which ones <u>you</u> feel are necessary for effective**	

Questions	Notes
application of ICT systems. Please arrange the statements under the headings: essential, desirable, less important. • *To be able to enter data accurately* • *To manipulate data within documents e.g. cut/copy/paste* • *To be able to set up page properties e.g. headers and footers* • *To have a detailed knowledge of computer hardware* • *To be able to touch type* • *To have an appreciation of how applications can be used* • *To gain computer qualification skills* • *To understand and use file management systems* • *To understand computer programming* • *To have knowledge of the history of computing* • *To practice on tasks that are orientated to real life situations* • *To become proficient at skills essential for current work situation* • *To have an over view of a variety of programs* • *To have a detailed knowledge of one particular package* • *To be able to transfer skills to a variety of different situations* • *To be comfortable with ICT* • *To understand issues surrounding ICT e.g. data security* • *To be able to follow instructions e.g. from a computer manual* • *To be familiar with help systems* • *To be able to use communication applications* **You have selected ……..as essential can you tell me why?** **Are there any skills or understandings that you think are missing, and would like to add?** **I'd like to think about the types of courses and syllabuses you teach. Do any of your priorities have to change to meet the course criteria?** (If yes) **Which and why?** **If you were designing your own syllabus what things would you put in or take out from those you currently use?**	

Questions	Notes
In your correct situation, what are your main teaching aims?	
What kinds of teaching/learning activities do you typically use? *Prompts:* • *What kind of tasks might you use?* **Do you think that the level of skill difficulty affects your choice of activity? In what ways?**	
Do you think you teach in the way that you would ideally like? If not **What factors or pressures influence what you do?** *Prompts:* • *Room layout* • *Syllabus* • *Exam pressure* • *Student needs* • *Time*	
As a teacher who do you feel responsible to? *Prompt:* • *Students* • *College* • *Exam boards* • *Yourself* • *Employers* **What do you feel responsible for?** *Prompt* • *Getting students through tests* • *Giving students skills for work* • *Making learning fun* • *Helping students to become computer users*	
Is there anything you would like to add?	

B3: Teacher Metaphor Sheet

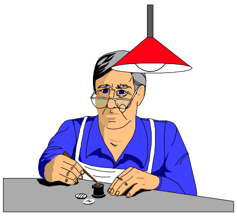


- **Petrol-pump attendant**
  who fills up learners with knowledge

- **A parent bird**
  a regurgitator of knowledge - interpreting and organizing knowledge into digestible chunks for the learner 'chick'

- **A lion tamer**
  training the learner to perform well at competency goals

- **Sculptor**
  moulding the mind into the desired shape



- **Watchmaker**
  building the component parts (knowledge) into a working whole

- **Gardener**
  learners are the plants that do the growing and the teacher creates the right conditions for growth

- **Sherpa**
  a knowledgeable guide to an unexplored terrain

Adapted from Claxton (1990) "Teaching to Learn: a direction for education", London, Cassell

B4: Learner Interview Schedule

Question/activity	Notes
Q: **Why did you choose to attend this course? What are your aims?**	
Q: What is it you want to take with from this course beyond the qualification/course? Q: W**hat kinds of skills or knowledge do you think you need to learn to accomplish these aims?**	
A: There are a number of metaphors used to describe the teacher/learners relationship. Layout cards with the metaphors on and explain. Q: **What metaphors do you think best match the teacher/learner relationship in this classroom?** Q: **Thinking back to before this course began what did you expect the teaching to be like? Has the teaching style matched your expectations or have there been some surprises? What has been different to what you expected?** **Q: What way do you feel you learn best?** **Q: Does this method of teaching match you learning style?**	
Q: **What activities or techniques do you find least helpful?** Q: **What other kinds of activities do you think might be helpful?**	
Q: (Depending on learners' previous ICT experience) **I'd like you think about other ICT courses you have taken. How did you find the teaching in those courses and how successful were they in improving your ICT use?**	

B5: Learner Questionnaire (N.B. contracted to fit page)

My name is Amanda Topp and I am a full time PhD research student at Sunderland University. I am currently researching teaching styles used in the teaching of ICT user skills to adults and the implications for learning outcomes. To achieve this I need your help. I would be grateful if you would complete this brief questionnaire and returning it to me or your tutor at the end of the lesson. Your responses are anonymous.

- Title of course:

- Age: (*Please tick the appropriate box*)
  - 18 – 25 ☐
  - 26 – 35 ☐
  - 36 – 45 ☐
  - 46 – 55 ☐
  - 56+ ☐

- Sex: (*Please tick the appropriate box*)
  - Male ☐
  - Female ☐

- Why did you choose this particular course? (*Please tick the appropriate boxes*)
  - ☐ Need skill for work
  - ☐ Need the qualification
  - ☐ Need skill for leisure activity
  - ☐ To find out what ICT is about
  - ☐ Other (please specify)______________________________

- What computer experience did you have before this course? (*Please list any courses you have taken*)

- How well do you feel the course is fulfilling your needs and in what ways?

- Which kind of activities have you found most helpful to learning?

- Do you find that you use the skills you are learning when away from the classroom?
  If yes: In what kind of activities? **If no**: Why not?

Thank you very much for your help

B6: Tags used in Transcription

R: Researcher

T#: Teacher

L#: Learner

?: Unidentified speaker

[ ] Comments added to transcription

…. Material omitted

you Stressed words

[pause] pause in speech

- change of focus

( ) Inaudible section

(?) Uncertain

> Trail off

= Interrupted speech (at beginning or end of utterance)

/ Onset of overlap

//word//[description] definition of how words spoken

B7: Example of Observation Transcript

Observation: #####

Location: #### Institution: ####

Date: ##### Time: ######

Lesson orientation: This was an ECDL course and was conducted on a workshop basis. The course ran for a year and the learners were at working on different modules and at different stages of the programme. The teacher worked contracted hours on a part-time basis. One learner was sitting a test but was very nervous so the teacher took set the test up to look like a practice test so that the learners would not be aware that was a live test.

18:30
2 Ls enter room, shortly followed by 3 more. Each L sits down and logs on. L4 and L5 go out to the vending machine and then return to the room with food.
[Adultness - relaxed]

T introduces R. T goes to L1 and sets up computer and tells L1 she is going to sit a mock test. While she is preparing she chats to L1 about her dog.
[Climate - relaxed, friendly. T perceive some Ls to be nervous of test and go to some lengths to alleviate nervousness including give 'blind tests']

18:41
L6 enters room. T starts L1 off on 'mock' test. T then moves round the room checking what Ls are doing.

L5 has a query about the spreadsheet she is working on. T asks L5 to explain the problem. L5 shows T the procedures she has done. T agrees right procedure, "You're nearly there", but element missing, "Highlight and then control".
[L poses question, procedural. T tells learner answer, transmissive]

T comes to centre table and gathers papers for a mock test that was done the previous week. T explains to R that she always goes through practice test question by question with the learner to show them what they have done correctly and what lost them marks. T sits next to L4 and goes through the test question by question. Occasionally L4 asks question about a procedure or task where she was unsure when doing the test. T tells her the 'correct' actions each time.
[Teaching for test, procedural, one right answer]

T goes to another computer and copies files on to a floppy disk to set up a live test for L4. T starts L4 off on test.

As T passes Li asks her for help with a problem. Because L1 is sitting the test unawares T is unable to answer the question but in stead asks open questions to encourage L1 to find the solution, "If you are going to find something what are you going to do? What's it telling you? It's giving you the information, read the question".

19:05
T goes to L2 and looks at screen. L2 has a problem with a formula in a spreadsheet. T looks at screen "What can you see", T points at screen. L Explains that she needed to add a number of cells. T explains that rather than lots of '+' signs one can use 'cell : cell' reference. T demonstrates on computer how to enter cell references using the mouse and clicking into the cell. In this formula the references need to be absolute so T tells L2 to then go in and put in '$' signs. T then stands over L2 while she puts in the formula. Again the T reminds the L to make the cell references absolute. L2 seems confused. T says, "You have to make the cells absolute because you're going to drag them down. Go into the formula bar and put in a '$' before the reference to make it absolute". L2 completes formula and T moves away.
[T tells learner - transmissive - procedural and descriptive. T checks procedural actions but appears to accept conceptual information is understood]

T goes to L1 and asks if L1 is okay. L1 is having problems but T says, "Read your questions. You know you can do it, I know you can do it."
[Teaching confidence building, friendly, reassurance. Ts perceive exam failure to often be about interpreting the question rather than lack of skills.]

19:15
L3 packs up and leaves the room.
[Adultness - choice to work or not]

T sits next to R and talks about exams. T tells R there is a problem with ambiguity of test questions. She had recently worked through a CLAIT test paper but when she compared it to the set solution had found her copy to be different, the L had a third interpretation. The T had missed out a question and the L had misinterpreted a question but only an exact copy of the set copy was acceptable. T continues that 'File Management', the test L1 was sitting, was especially difficult as the activity was on in context and seemed at odds with real life activity. L6 had been working on this module but had got so frustrated with it that he had temporarily given it up to work on Spreadsheets.
[Exam problems = ambiguity, closed tasks and lack of real life context or problem solving. If learning is focused on exams does this provide realistic skills?]

L5 calls T across. T goes across and tells L5 what to do.
[Teacher tells learner - transmissive]

T then goes across to speak to the teacher teaching in the other side of the room.

19:24
T returns to L1 and tells her to stop as time is up. L1 is unhappy she had left some questions out because she could not work out what to do. T reassures her and says she will mark the paper and then go through it with her. T tells L1 to start looking at the spreadsheet module while she marks the test. T crosses the room and works at another computer.

C1: Example of Interview Transcript with Comments

Item: ###################
Teacher ########

Date: ############ Time: #########
Location: #########

R: First of all I'd like to find out a little bit about you and your background. So how did you actually get to be an IT teacher?

I: I went and trained and did a few IT courses and liked the look of what the teachers were doing and went on and did a teaching qualification. I did a Cert Ed first and then I went on and did my PGCE. And while I was training to do my Cert Ed, I did it at [name of college], formally [name of college], and I asked if I could do some teaching hours for them voluntary. And within a few weeks of doing voluntary work they offered me some tuition, so some paid.

> **Comment [A E1]:** Adult ICT teachers often seem to come to teaching ICT after attending ICT and as a second career rather than setting out to become a teacher
>
> Q: Does this affect teaching and how?

R: So what kind of work were you doing before?

I: I've done some administration work and I've also done managerial, in retail.

> **Comment [A E2]:** As above

R: And how long ago was that?

I: Seven years.

R: So you were doing the training side while you were starting to teach?

I: I did, yes.

R: How well do you feel that the training you were doing actually prepared to you teach?

I: Prepared you quite well for the physical side of teaching but not for the paperwork. They didn't - well the course I did for the Cert Ed they didn't teach you anything about preparing for a scheme of work. They didn't go very into depth into lesson planning, I didn't think. We did more about how to get inductions started and how to get your students involved in the lessons and how to assess them, rather than how to plan out the structure of the course. I know that they do do that now but they didn't when I did mine, seven, eight years ago.

> **Comment [A E3]:** Interesting. This is a contrast to T5 where it was felt training did not prepare them for the practicalities of teaching but rather more for administration

R: And do you find that that paperwork side is as important as the =

I: Definitely, yes, because if you don't have your paperwork and tracking then you certainly don't have your grades with ALI and OFSTED. And you don't know how well your students are doing if you cannot track them, affectively. I think the paperwork is probably as important as the teaching.

> **Comment [A E4]:** Teachers role as administrator
>
> Importance of 'audit culture' on teaching

R: Within the last couple of years what opportunity has there been for you to do teacher development?

I: Just from here? From both my colleges, because I work from two colleges.

R: From either?

I: From either. From both there's been a lot of opportunities to go and do it but because I teach so many hours I often find it's limited which ones I can attend. But there are always lots going on. The developments have been in different things. From the Learning Alliance, they've put on all sorts in the last two years. There's been things on differentiation, lesson planning and schemes of work and at [name of college] we've had training with the data protection act and with freedom of information act when that came out. Yea, there's been quite a wide range.

Comment [A E5]: CPD may be restricted for FE teachers - same as T4

Comment [A E6]: Administration emphasis - only differentiation might directly affect quality of teaching

R: How do you think those affect your actual teaching? [I: does not respond immediately] When you go on a course, for example differentiation, how does it affect what happens in the classroom?

I: It's help me to plan things better. It's help me understand better the way students are working as well, I think. A lot of the time before hand, I'd been taught that differentiation meant giving someone larger handouts and making extra exercises and now the swings been towards differentiation in the difficulty of the tasks. Everybody gets the same but the task gets harder, harder and harder and you stop at the point that you can do to in the time or ability that you've got. So things like that have been really useful.

R: I know that you have done a lot of the modular handbooks

I: I write the books.

R: Has that meant you have rewritten things because of that?

I: It does yes. I've changed, particularly the end exercises, I've added extra things in and changed the format of them so they do get gradually more difficult. Some students just cannot cope with that degree of difficultly and can do the first part of the exercises, and it's enough to get them through the exams, but for others it nice to add in the extra and get them doing that little bit more. And it prepares them for moving onto the next courses as well, because they're doing that little bit extra it gives them more confidence.

Comment [A E7]: From the few e.g. observed more difficult tasks involves more complex procedures rather than more open questioning

Comment [A E8]: Progress viewed in terms of passing next test

R: Do the students like that kind of challenge?

I: They have done, yea. And I've done a lot more target setting with them this year than I've ever done before, as well. More often I've done it verbally, but not recorded it but this year I'm recording it as I go along, you know [laughs] having done a session on that and seeing how important it was and all the research that's gone into that. I've found this year that my students have gone through things quite a lot faster.

Comment [A E9]: During the observation I asked to see the target setting sheets. Appeared to be tick lists completed by the tutor and/or learner to record skills covered and those yet to be covered

C2: Example Coded Interview Transcript

Item: ########
Teacher ######

Date: ####### Time: #####

Location: #####

R: First of all I'd like to find out a little bit about you and your background. So how did you actually get to be an IT teacher?

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Professionality
P = Background - ICT
PD
Professionality
P = Background - Teaching
P = Background - Training

R: So what kind of work were you doing before?

I: I've done some administration work and I've also done managerial, in retail.

Professionality
P = Background - Previous

R: And how long ago was that?

I: Seven years.

R: So you were doing the training side while you were starting to teach?

PD

I: I did, yes.

R: How well do you feel that the training you were doing actually prepared to you teach?

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PD

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Professionality

R: Within the last couple of years what opportunity has there been for you to do teacher development?

I: Just from here? From both my colleges, because I work from two colleges.

R: From either?

I: From either. From both there's been a lot of opportunities to go and do it but because I teach so many hours I often find it's limited which ones I can attend. But there are always lots going on. The developments have been in different things. From the Learning Alliance, they've put on all sorts in the last two years. There's been things on differentiation, lesson planning and schemes of work and at [name of college] we've had training with the data protection act and with freedom of information act when that came out. Yea, there's been quite a wide range.

PD
Influences

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PD
Differentiation

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I: It does yes. I've changed, particularly the end exercises, I've added extra things in and changed the format of them so they do get gradually more difficult. Some students just cannot cope with that degree of difficultly and can do the first part of the exercises, and it's enough to get them through the exams, but for others it nice to add in the extra and get them doing that little bit more. And it prepares them for moving onto the next courses as well, because they're doing that little bit extra it gives them more confidence.

Differentiation

Learners

Aims
Aims =Confidence

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Teaching
Teaching methods

R: So are they setting the targets?

I: We do it together, I set with them.

Teaching
Teaching methods

R: I'd like you to look now at this sheet. [R gives teacher metaphor sheet to I and reads through the different metaphors] Which of those if any best describes the way that you teach?

I: [Long pause will I looks at sheet] Probably gardener. I like the idea of the parent bird in interpreting and organizing knowledge into digestible chunks but not being a regurgitator. That implies, more that you're lecturing at people, I think, rather than helping them to learn.

Role

R = Personal trainer
R = Builder - Knowledge

So I think I'd go probably more for gardener. And occasionally a weeder [laughs].

R: So in what way are you the weeder?

I: So as well as nurturing the people that are growing, weeding out the ones that are not on the right course and getting them in the right direction for what **they** need. Maybe they're not on a low enough course or a high enough course, it works either way.

R= personal trainer

R: You say you don't like the idea of regurgitating so how do you encourage the learners to find their own path - if you're not regurgitating the information how are they finding that information?

I: I'd like them to do it through discovery learning rather than being told first, all the time. Being told part of what they need and then having to find out the rest for themselves with the help of their workbooks and any notes that they've made during demos. So I do do part demo. All our classes are workshop style, but we put demonstrations in as well. They're not just left to fend for themselves with the workbook, which I don't think is very good either. I like to see a bit of both and a little bit of group work. A lot of my students don't tend to care for group work, they like to do it for themselves.

Teaching
Teaching method
T = Finding/research

Learners
L = Autonomy - practical
Differentiation

R: Have they said why?

I: Because some of them, it slows them down. And I know that I don't like to be slowed down either having to wait for people who are slower to catch up. And some people are just wanting to race ahead to get their things done, so that's come out as the main reason people don't like it. They think it's interrupting what they could be doing.

R: Any other metaphors there that could apply?

I: [Long pause] Probably lion tamer at the end of the day as well [laughs].

R: [Smiling] Why did you choose that one?

I: Because, huh, everybody's got competency goals that they've got to meet. So, yes, we have

Role
R = Expert - Provider

got to, in a sense, train them to meet those goals. Even though it might not necessarily be all that we're training them in, hopefully we train them a little bit extra as well as just the goals that they need to achieve for the certificates. The goal of getting the certificate hopefully isn't the aim of most people, it's actually to get the knowledge. The certificate is just a bonus I would say. And obviously for our funding and everything you have to hit the competency goals of passing the exams, so taming the lions, definitely. I suppose petrol pump attendant as well. The petrol pump attendant and the parent bird, those metaphors I'm not keen that you're the one filling them up with knowledge. They're the ones getting the knowledge, acquiring the knowledge for themselves, and you're helping them along the way.

Aims
Aims = Motivation

Influences

Role
R = Personal trainer

Knowledge
Learner
L = role

R: Okay. If you think about your perfect teacher is there a metaphor that you would use to describe that teacher?

I: [Laughs] I'm going to say I do like Professor Snape in Harry Potter [both laugh]. Mr sarcastic, but he's not probably the perfect one that you would have in mind! Umm, oh dear! There are a couple of people who I work with who I think are really good and I would aim to be like they are because they have lots of patience, lots of knowledge and are able to put across what they need to put across without being patronizing and without being too boring.

Professionality
P = Relationship - good

R: Can you think of a metaphor to describe that?

I: Out of these, I couldn't say just one. It would have to be a combination. [Pause] For one person I would say is really good I would say probably a Sherpa because they teach a lot of beginners who know nothing, so they are a knowledgeable guide in an unexplored terrain. But for people who are not teaching beginners an ideal one, I would hope, would be a gardener, because you are helping them to do the learning. You cannot just spew information out at people and hope that they'll absorb it, because they might pick up the information but they don't have the understanding that they need behind what you're telling them, so gardener.

Role
R = Multifaceted

R= Personal trainer

Knowledge
KD = Structural

R: Okay. If you thing back to perhaps the beginning of your training or perhaps when you were first teaching can you thing of and incident or perhaps somebody that you worked with that you felt was influential in how you developed as a teacher?

I: Yea, the tutor that I worked with when I was doing my voluntary, I worked as a second tutor with her, and she was just so good, so helpful. Not only with the students. She went through all the paperwork with me, all the necessary forms that have to be filled in - even stupid things like just registering people and how to fill in claim forms for your certificates and how to get round the system in the college itself, as well as being able to show the students. She had really good leadership for her class, I think. She got round everybody. Made sure she had time for everybody.

Professionality
P = Teacher - Good

R: Regarding your current situation what do you think are the kind of difficulties that your students encounter?

I: On the IT course it depends which course you're looking at. For people who are older just understanding all the terminology for a start off. Hopefully I've written the books in plain enough language to help them cope with that. One difficulty can be remembering from one week to the next if they don't do practice, because some people just won't and some people just cannot because they don't have the time or they cannot make the time. Also going into exam situations, I think a lot of my students are finding that the most difficult thing to overcome. They're fine in the class, but it's exam nerves, same as all of us.

Learners

R: And what do you do to help them overcome those problems?

I: For the people who won't practice in between sessions it's very hard. I tend to spend more time with them just going over and over things again and doing demos and asking them to make notes, if they haven't a computer at home and don't want to use drop-in here to read the notes. For people with exam nerves I tend not to tell them they are doing an exam. I take [laughs] I take all the headers and footers of the exams

Influences

Learners

and tell them, "We'll do this **like** and exam", and they do everything in exam conditions thinking their doing another exam practice. And once they've done that once and passed hopefully, touch wood, it gives them confidence and when it comes to the next exam they're not so frightened. I do an awful lot of work with them on proof reading and how the brain works and tell them it's to prepare them for the exams. So they know exactly why they are doing things and why they are not getting them right in the exams, because nine times out of ten it doesn't tend to be knowledge with my students. It's the nerves and reading the questions. And the brain working the way it does and picking out the key words in the questions and going, "Oh, I know how to do that" and not reading the rest of the question. So they're doing completely the wrong thing [laughs] or applying the right thing to the wrong piece of text. So I do quite a bit of work with them on how to get through those difficulties. I cannot remember what the third thing was that I said.

Teaching
Teaching method

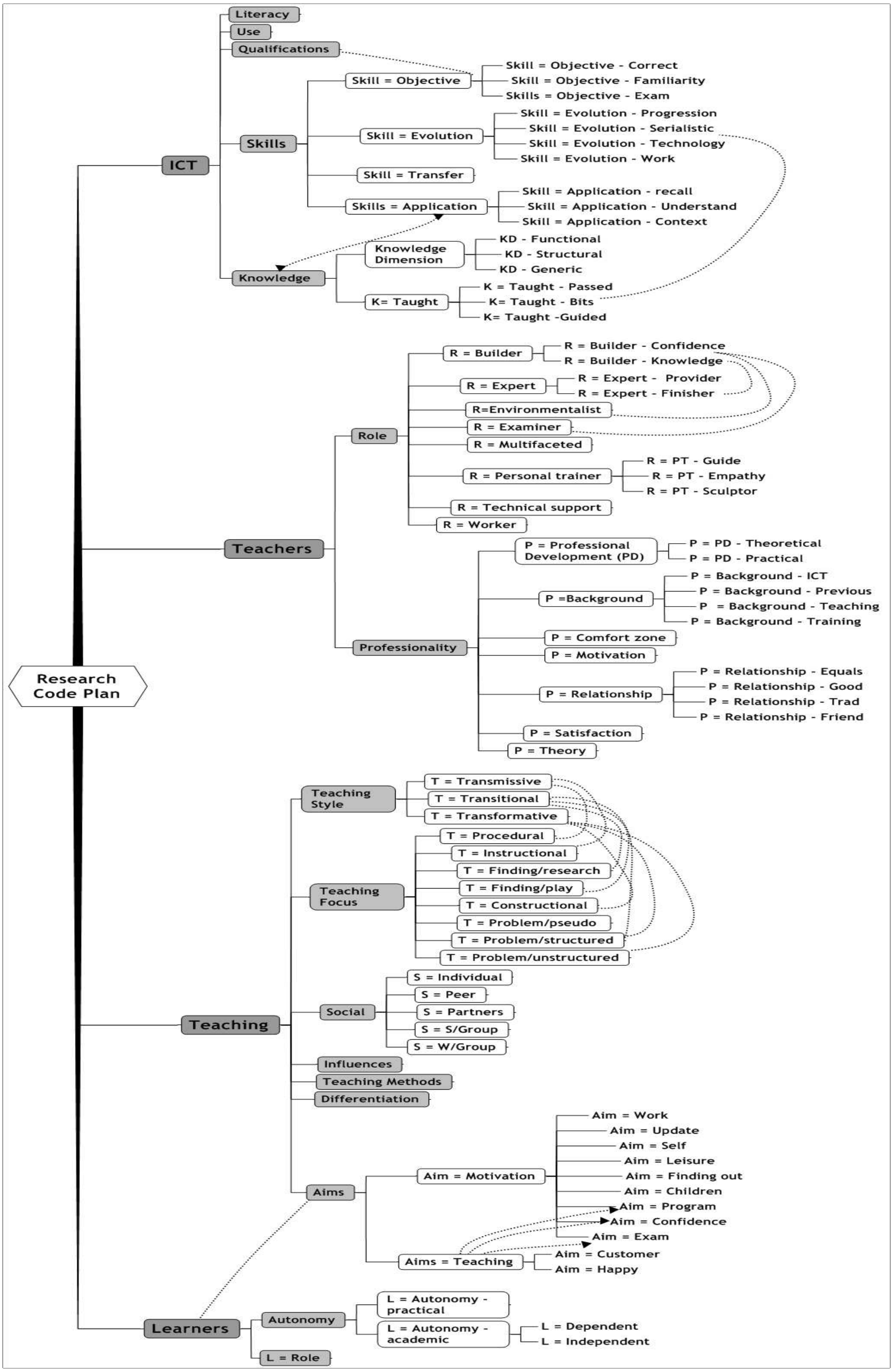
R: The terminology.

I: The terminology, yes. I've written the workbooks in plain English hopefully, and I talk to people using the terms and the meanings all the time. Anybody that needs extra I'll do extra help sheets for. I'm adding extra ones in quite regularly, popping them in a big file for all the staff to use.

Teaching method

I try to encourage people to use the drop-in here as well if they haven't got a computer or haven't got Internet at home. At the end of the day I cannot hammer the information in, it's got to be done by them, so the more practice they're getting the better. I **do** try to encourage them to do extra. Also the target setting as well, that gives us a change to go over what they've had difficulties with and to set further work to go over things that they are struggling with. That's helped some of them as well.

C3: Research Code Plan



Code	**Definition**
ICT	Teachers and learners understanding and perception of subject
Literacy	Definitions of computer literacy
Use	Ways that learners use their ICT skills outside the classroom
Qualifications	Teachers and learners views of ICT tests and syllabuses
Skills	
Skill = Objective	Teachers' or learners' objective for skills
Skill = Objective - Correct	Skills seen as 'correct' performance
Skill = Objective - Familiarity	Achievement seen as in terms of becoming familiar and confident with applications
Skills = Objective - exam	Skills and achievement seen in terms of exams success
Skill = Evolution	Skills seen as evolving over time
Skill = Evolution - Progression	Ways teachers perceive skills to progress or change as learners develop
Skill = Evolution - Serialistic	Skills seen as developed in a set progression
Skill = Evolution - Technology	Perceptions of ways skills needs have changed with changing technology
Skill = Evolution - Work	Ways teachers or learners perceive work practices
Skill = Transfer	Teacher and learner perceptions of the way skills are transferred from the classroom
Skills = Application	Ways that skills are applied to complete task
Skill = Application - recall	Emphasis of recall of procedures to apply to familiar problems
Skill = Application - Understand	Skills seen as requiring understanding to apply to problems
Skill = Application - Context	Skills applied in context
Knowledge	Views and understandings of the nature of knowledge
Knowledge Dimension	Underlying knowledge type
KD = Functional	Skills and knowledge as mastary of practical skills
KD = Structural	Skills and knowledge as understanding of application systems and structures

Code	Definition
KD = Generic	Skills and knowledge beyond the immediate computer skills and knowledge
K = Taught	Teacher and learner perceptions of how skills and knowledge are taught/learnt
K = Taught - Passed	Skills and knowledge seen as passed from one person to another
K = Taught - Bits	Skills and knowledge seen as broken down into parts and rebuilt
K = Taught - Guided	Skills and knowledge seen as developed by guidance

Teachers	Understandings and perceptions of teachers.
Role	Perceptions of the teacher's role in the teaching/learning experience
R = Builder	Images of teacher's role like a builder
R = Builder - Confidence	Teacher's role seen as building learner confidence
R = Builder - Knowledge	Teachers role seen as organizer of 'bricks' of knowledge, skills or curriculum
R=Environmentalist	Teacher as creator the right climate for learning
R = Examiner	Teacher as administrator, marker or interpreter of exam
R = Expert	Teacher as holder of knowledge
R = Provider	Teacher as provider of knowledge of computer use
R = Finisher	Learner has ICT skills, teacher seen as provider of exam know-how
R = Multifaceted	The teacher's role seen as complex and multifaceted
R = Personal trainer	Teacher's concern seen as for the learner
R = PT - Guide	Teacher as knowledgeable guide
R = PT - Empathy	Teachers' role seen in terms individual learner's emotional needs
R = PT - Sculptor	Teacher moulds learners' way of thinking
R = Technical support	Teacher as repairer and maintainer of equipment, or as 'help-desk' for ICT problems
R = Worker	Teacher seen as having an institutional role

Code	Definition
Professionality	Teachers' professional backgrounds, experience and understandings
P = Professional Development	Teachers' impressions of training and professional development experiences
P = PD - Theoretical	Understandings of and opportunities for theoretical PD experiences
P = PD - Practical	Understandings of and opportunities for practically based PD experiences
P= Background	
P = Background - ICT	Teachers' ICT background experience
P = Background - Previous	Teachers' professional experience before teaching
P = Background - Teaching	Teachers' teaching experiences
P = Background - Training	Teachers' training experiences
P = Comfort zone	Description of things that make teachers comfortable or uncomfortable in their teaching
P = Motivation	Descriptions of what motivated teachers to become ICT teachers
P = Relationship	Teachers perceptions of teacher/learner relationships
P = Relationship - Equals	Teachers or learners perceptions of the equality of perspective roles
P = Teachers - Friend	Teacher seen as learner's friend
P = Teachers - Good	Teacher or learners concepts of characteristic that make a 'good' teacher
P = Teachers - Trad	Teacher or learners perceptions of the 'typical' teacher
P = Satisfaction	Teachers' perceptions of professional (dis)satisfaction
P = Theory	Teachers' perceptions of educational theory

Teaching	Teaching practices and styles in the classroom and teachers underlying perceptions of practice
Teaching Style	The underlying teaching style
T = Transmissive	Teachers tells learner. Knowledge passed on form one to the other
T = Transitional	Teaching focuses on the learner, teacher as

Code	Definition
	supervisor
T = Transformative	Learning seen as socially constructed, teacher as facilitator. End object to change learners' behaviour
Teaching Focus	Types of teaching foci
T = Procedural	Teacher emphasizes practical skills and procedures to work computer
T = Instructional	Teacher provides detailed explanations of processes and systems
T = Finding/research	Learners find solutions to problems from material provided by the teacher
T = Finding/play	Teacher provides initial instruction then learners explore features for themselves
T = Constructional	Teacher uses questioning to encourage learners to recall and explain procedures, systems and structures for themselves
T = Problem/pseudo	Task problems predictable and standardized. Teachers seek one 'correct' solution
T = Problem/structured	Teachers posses problems and learners use the computer to work solutions
T = Problem/unstructured	Learners pose problems and teacher helps them find solutions
Social	Social interactions within observed classroom experience
S = Individual	Learner works on own with help from teacher as needed
S = Peer	Teacher initiates paired working activity
S = Partners	Learners initiate paired working activity
S = S/Group	Teachers initiate small group activity
S = W/Group	Teacher initiates whole class activity
Influences	Factors seen as influencing teaching practices and related activity
Teaching Methods	Descriptions of methods and tactics teachers used in the classroom
Differentiation	Teachers' and learners' perceptions on impact of and ways to deal with learner differentiation
Aims	The perceived aims of the classroom experience
Aim = Motivation	What teachers and learners perceive as the

Code	Definition
	motivation for or end aim of the learning process
Aim = Work	Aim to develop skills for work
Aim = Update	Aim to update existing skills
Aim = Self	Aim to develop self
Aim = Leisure	Aim to develop skills for leisure activities
Aim = Finding out	Aim to find out about computers
Aim = Children	Aim to help, 'keep up with', own children or grandchildren
*Aim = Program***	Aim to complete a program of study
*Aim = Confidence***	Aim to build confidence to use ICT
*Aim = Exam***	Aim to pass the exam
Aims = Teaching	Teachers' aims for the teaching/learning process
Aim = Customer	Aim to give the customer (learner) what he/she wants
Aim = Happy	Aim to provide learners with a happy, enjoyable learning experience
*** apply to both 'Aims' categories	As above
Learners	Understandings and perceptions of adults as learners.
Autonomy	
L = Autonomy - practical	Learners given flexibility in practical issues, e.g. when to work
L = Autonomy - academic	Learners given flexibility in tasks or way to learning
L = Dependent	Learners seen as dependent on teachers to provide solutions
L = Independent	Learners seen as capable of finding own solutions
L = Role	Understandings and perceptions of learners' role in the teaching/learning experience

C4: Grids to explore possible relationship between perceptions of ICT skill needs and

	i) Teachers' professional experiences			ii) Teachers' level of ICT qualification		
	Essential	Desirable	Less important	Essential	Desirable	Less important
A1	n^2 n^1 n^1 n^2 w^2 w^1 w^1 w^2 t^1 t^3 e^3 e^2	t^1 e^4		3 **3** 3 3 3 3 3 *4* 5 5 **6** *7*	**3** **4**	
A2	n^1 w^1 t^1 t^3 e^3 e^2	n^1 n^2 w^2 w^1 w^2 t^1 e^4	n^2	3 3 *4* 5 5 *7*	3 3 3 3 **3** **4** **6**	**3**
A3	n^2 n^1 n^1 n^2 w^2 w^1 w^1 t^1 t^3 e^3 e^4 e^2	w^2 t^1		**3** 3 3 3 3 **3** 3 *4* 5 5 **6** *7*	3 **4**	
A4		n^2 w^1 t^3 t^1 e^3 e^2	n^1 n^2 n^1 w^2 w^1 w^2 t^1 e^4		3 3 **4** *4* 5 *7*	3 **3** 3 3 3 **3** 5 **6**
T1		n^2 w^1 t^1 e^4	n^1 n^1 n^2 w^2 w^1 w^2 t^1 t^3 e^3 e^2		**3 3** **4** *4*	3 3 3 3 3 3 5 5 **6** *7*
T2		w^1 e^2	n^1 n^2 n^1 n^2 w^1 w^2 w^2 t^1 t^3 t^1 e^3 e^4		3 *4*	3 **3** 3 3 3 3 **3** **4** 5 5 **6** *7*

	i) Teachers' professional experiences			ii) Teachers' level of ICT qualification		
	Essential	**Desirable**	**Less important**	**Essential**	**Desirable**	**Less important**
T3		w^1	n^1 n^2 n^1 n^2 w^2 w^1 w^2 t^1 t^3 t^1 e^3 e^4 e^2		*4*	3 **3** 3 3 3 3 **3** 3 **4** 5 5 **6** *7*
V1		w^1 t^1	n^1 n^2 n^1 n^2 w^2 w^1 w^2 t^1 t^3 e^3 e^4 e^2	3 **4**	3 **3** 3 3 3 **3** 3 *4* 5 5 **6** *7*	
V2	n^1 n^1 n^2 w^1 w^2 t^1 t^3 t^1 e^3 e^2	n^2 w^2 w^1 e^4		3 3 3 3 3 **4** 5 5 *7*	**3** 3 **3** *4* **6**	
V3	n^2 n^1 n^2 w^1 w^1 t^1 t^3 t^1 e^3 e^4 e^2	w^2 w^2	n^1	**3** 3 3 3 **3** 3 **4** 5 5 *7*	3 *4* **6**	3
Q1	n^1 n^1 n^2 w^1 w^1 w^2 t^1 t^3 t^1 e^3 e^2	n^2 w^2 e^4		3 3 3 3 3 3 **4** 5 5 *7*	**3 3** *4* **6**	
Q2		n^1 n^2 w^1 w^1 w^2 t^3 t^1 e^3 e^2	n^2 n^1 w^2 t^1 e^4		3 3 3 3 3 **4** *4* 5 *7*	**3** 3 **3** 5 **6**
Q3	n^1 n^1 n^2 w^2 w^1 w^1 t^1 t^1 e^2	n^2 w^2 t^3 e^3 e^4		3 3 3 3 3 **4** *4* 5 **6**	3 **3 3** 5 *7*	

	i) Teachers' professional experiences			ii) Teachers' level of ICT qualification		
	Essential	Desirable	Less important	Essential	Desirable	Less important
S1	u^2 w^1 w^2 t^3 e^3 e^4 e^2	n^1 n^1 n^2 w^2 t^1 t^1	w^1	3 **3** **3** 3 *4* 5 *7*	3 3 3 **4** 5 **6**	3
S2	n^1 n^2 n^2 w^2 w^2 t^1 t^3 e^3 e^4 e^2	n^1 w^1 w^1 t^1		3 **3** 3 3 **3** 3 5 5 **6** *7*	3 3 **4** *4*	
S3	n^1 n^2 w^2 w^1 w^2 t^1 t^3 e^3 e^4 e^2	n^2 n^1 w^1 t^1		3 3 3 **3** 3 *4* 5 5 **6** *7*	**3** 3 3 **4**	
S4	n^1 n^2 n^2 w^2 w^2 t^1 t^3 e^3 e^4 e^2	n^1 w^1 w^1 t^1		3 **3** 3 3 **3** 3 5 5 **6** *7*	3 3 **4** *4*	
S5	n^1 n^1 n^2 w^2 w^2 t^1 t^3 t^1 e^3 e^4	n^2 w^1 w^1 e^2		3 3 3 3 **3** **4** 5 5 **6** *7*	**3** 3 3 *4*	
S6	n^2 w^2 w^1 t^3 e^3 e^4 e^2	n^1 n^2 n^1 w^1 w^2 t^1 t^1		3 **3** 3 *4* 5 **6** *7*	3 **3** 3 3 3 **4** 5	
S7	n^1 n^1 w^1 t^1 t^3 e^3 e^2	n^2 n^2 w^2 w^1 t^1 e^4	w^2	3 3 3 5 5 *7*	**3** 3 3 **3** **4** *4* **6**	3

Key:

Statements teachers requested to grade

Code	Statement
	Application Focus:
A1	To manipulate data within documents e.g. cut/copy/paste
A2	To be able to set up page properties e.g. headers and footers
A3	To understand and use file management systems
A4	To have a detailed knowledge of one particular package
	Technical Focus:
T1	To have a detailed knowledge of computer hardware
T2	To understand computer programming
T3	To have knowledge of the history of computing
	Vocational Focus
V1	To be able to touch type
V2	To become proficient at skills essential for current work situation
V3	To be able to use communication applications
	Test Focus
Q1	To be able to enter data accurately
Q2	To gain computer qualification skills
Q3	To be able to follow instructions
	Skill Transfer Focus
S1	To have an appreciation of how applications can be used
S2	To practice on tasks that are orientated to real life situations
S3	To have an over view of a variety of programs
S4	To be able to transfer skills to a variety of different situations
S5	To be comfortable with ICT
S6	To understand issues surrounding ICT e.g. data security
S7	To be familiar with help systems

Teacher Variables for Grid i

Variable	***Code***	***Label***	***Description***
Teacher background experience	**n**	novice	Teacher was a greenhorn teacher and inexperienced ICT user before attending ICT courses and deciding to become an ICT teacher
	w	work	Teacher used ICT skills at alternative work prior to teaching but had no previous teaching experience
	t	technical	Teacher worked as an ICT professional before prior to teaching but had no previous teaching experience
	e	experienced	Old hand teacher with experience of teaching other subject before becoming an ICT teacher
ICT teaching experience		<5	Teacher has less than five years experience of ICT teaching
		5-10	Teacher has between five and ten years experience of ICT teaching
		10-15	Teacher has between ten and fifteen years experience of ICT teaching
		15-20	Teacher has between fifteen and twenty years experience of ICT teaching
		>20	Teacher has more than twenty years experience of ICT teaching
Employment conditions	**bold font**	Full time	Teacher was employed full time by their institution
	normal font	Contracted	Teacher's only work was as a teacher but they worked contracted hours for their institution
	italic font	Part time	Teacher worked full time at alternative work and contracted hours as a teacher
Focus		test	Teacher delivered courses leading to qualification
		non-test	Teacher delivered non-test orientated courses

Variable	*Code*	*Label*	*Description*
Style	1	Transmissive	Teacher's style predominantly within Ramsen's Teaching Theory 1 (Transmissive) category
	2	Transitional/ transmissive	Teacher's style predominantly within Ramsen's Teaching Theory 2 (Transitional) category but inclined towards transmissive
	3	Transitional/ transformative	Teacher's style predominantly within Ramsen's Teaching Theory 2 (Transitional) category but inclined towards transformative
	4	Transformative	Teacher's style predominantly within Ramsen's Teaching Theory 3 (Transformative) category

Teacher Variables for Grid ii

Variable	*Code*	*Label*	*Description*
Qualification level	3-7		Level of qualification according to the National Qualification Framework
Qualification focus	normal text	User	ICT user qualifications e.g. ECDL, CLAIT
	<u>underlined text</u>	Professional	ICT qualifications associated with ICT professionals (i.e. people who work in the ICT industry) e.g. HND and BTEC
	bold text	Teaching	Qualifications which have a teaching and ICT element e.g. PGCE in ICT, RSA trainer certificate in IT
	italic text	Academic	Academically based awards e.g. Higher National Diploma in ICT, degree, MSc ICT

C5: Grid to explore relationship between teaching approach and teaching style or context

	Community	*FE*	*HE*	*Work-based*
Workshop	❶❶❶❶❷②	❶❷❷③		❷❷
Whole Group	②	❷	③③③	①

Key:
❶ Style = Theory 1 - Transmissive
❷ Style = Theory 2 - Transitional
❸ Style = Theory 3 - Transformative

● Test based
● Non-test based

C6: Grid to show learner motivation for attending courses (as identified in questionnaire)

	Work	Qualification	Leisure	ICT	Self
18-25	○●●●◆ ◆	●●◆◆	◆		
26-25	○◇●●● ●●●●● ◆●●●◆	●●●●● ●●	●	●	
36-45	○○○●● ●●●●● ●●●●● ●●◆●●	○●●●● ●●	●●●	◇●●●● ●●	◆●
46-55	○◇◇●● ●●●●● ◆●●	○●●◆◆	○◇●	○◇◇●● ●●●●● ◆	
56+	○●●●● ●	●●	○◇◇◆◆◆	○◇◇●● ◆	●◆◆◆

Key:
● female
◆ male

☐ beginner
■ intermediate
■ advanced

N.B. Learners could declare more than one aim the number of votes therefore exceed the number of learners

C7: Grid to explore teacher and learner aims

	Work	Qualification	Leisure	ICT	Self
C&G	●●●●●	●●●●● ♦♦♦	●●	●●●● ♦♦	
ECDL	●●●●● ●●●●● ●●●●● ●●●●	●●●●● ●●●● ♦♦♦♦♦	●●●	●●●●● ●●●● ♦♦♦♦♦ ♦	●●●●●
ECDL Ad	●●●●● ●●●●● ●●●	●●●●● ♦	●●	●●● ♦	● ♦♦
Internet	●●●●		●●●●	●●●	♦
MS office	●●●●● ●●●			● ♦	
OCR	●●●●● ♦	●●●●● ●●♦			
Photoshop	●●		●●	●●●●	♦
Web design	●●●●		●	● ♦	

Key:
● Learner ■ exam
♦ Teacher ■ non-exam

N.B. Participants could declare more than one aim the number of votes therefore exceed the number of participants

C8: Grid to record changes in response to skills task

	T1		T2		T3		T4		T5/6		T7		T8		T9/10		T14		T15		T16		T17	
A1	E	e	E	e	E	e	E	e	E	e	E	e	E	e	E	e	E	e	D	d	D	d	E	e
A2	D	e	D	e	L	e	D	e	E	d	D	e	D	e	E	e	E	e	D	d	D	d	E	e
A3	D	e	E	e	E	e	E	d	E	e	E/D	e	E	e	E	e	E	e	D	e	E	e	E	e
A4	L	e	L	l	L	e	L	e	L	l	L	d	D	e	D	d	D	d	D	d	L	e	D	d
T1	L	l	L	d	D	d	L	l	L	l	L	e	L	l	L	l	D	d	D	d	D	d	L	l
T2	L	l	L	l	L	l	L	l	L	l	L	l	L	l	L	l	D	d	L	l	L	l	D	d
T3	L	l	L	d	L	l	L	l	L	l	L	l	L	l	L	l	D	d	L	l	L	l	L	l
V1	L	l	L	l	L	d	D	d	L	l	L	l	L	l	L	l	L	l	D/L	d/l	L	l	L	l
V2	E	e	D	e	D	d	D	e	E	e	E	e	E	e	E	e	E	d	E	e	D	d	E	e
V3	D	d	D	e	E	e	E	e	E	d	L	l	E	e	E	e	E	e	E	e	E	e	E	e
Q1	E	e	D	e	D	e	E	e	E	e	E	e	E	e	E	e	E	e	E	e	D	d	D/E	d/e
Q2	D	e	L	l	L	e	D	e	L	e	D	e	D	e	D	d	D	e	D	d	L	e	D	d
Q3	D	e	E	e	D	e	E	e	E	e	E	e	E	e	D	d	E	e	E	e	D	d	E	e
S1	E	e	D	d	E	e	L	d	D	d	D	d	D	d	E	e	E	e	D	d	E	e	E	e
S2	E	l	E	e	E	d	D	d	E	e	D	e	E	d	E	e	D	d	D	d	E	e	E	e
S3	E	d	E	e	D	d	D	l	E	e	D	e	E	e	E	e	E	e	D	d	E	e	E	e
S4	E	e	E	e	E	l	D	d	E	e	D	d	E	e	E	e	D	d	D	d	E	e	E	e
S5	E	e	E	e	D	d	D	d	E	d	E	e	E	e	E	e	D	d	E	e	E	e	D	d
S6	D	d	E	e	D	e	D	l	D	d	D	e	E	e	E	e	E	d	D	d	E	e	E	e
S7	L	l	D	d	D	e	E	l	D/E*	d	E	d	D	d	E	e	D	e	D	d	D	d	D/E	d/e

* Disagree

Key:

E	Own = Essential
D	Own = Desirable
L	Own = Less important
e	Syllabus = Essential
d	Syllabus = Desirable
l	Syllabus = Less important

C9: Grid to explore changes from teachers' valued skills and perception of syllabus valued skills (in relation to syllabus, teaching approach and institutional type)

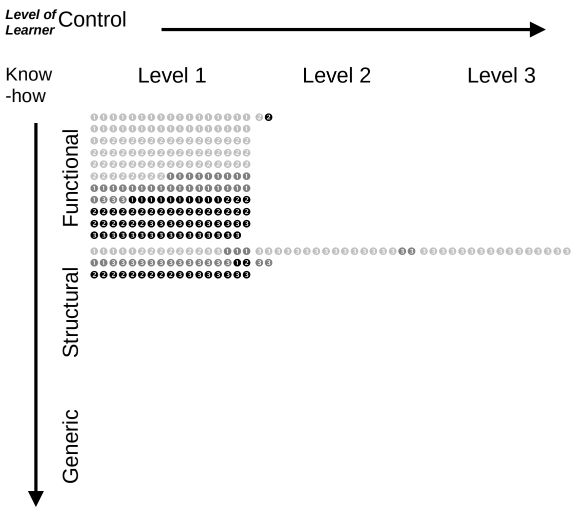
	Syllabus less priority ←			Agreement			Syllabus greater priority →		
	E-l	**E-d**	**D-l**	**L-l**	**D-d**	**E-e**	**D-e**	**L-d**	**L-e**
A1					*e c*	*m* ***n*** *m r g g e e m* ***e***			
A2		*g*			*e c*	*e m* ***e***	*m* ***n*** *r g e*		*m*
A3		r				***n*** *m g g e e m c* ***e***	*m e*		
A4				***n*** *g*	*e m e* ***e***		*e*	*g*	*m m r c*
T1				*m r g e e* ***e***	*m m e c*			***n***	*g*
T2				*m* ***n*** *m r g g e e e c*	*m* ***e***				
T3				*m m r g g e e e c* ***e***	*m*			***n***	
V1				*m* ***n*** *g g e e m c* ***e***	*r e*			*m*	
V2		*m*			*m c*	*m g g e e e* ***e***	***n*** *r*		
V3		*g*		*g*	*m*	*m r e e m e c* ***e***	***n***		
Q1					*c*	*m r g g e e m e* ***e***	***n*** *m*		
Q2				***n***	*e e* ***e***		*m r g e m*		*m g c*
Q3					*e c*	***n*** *r g g m e e* ***e***	*m m*		
S1					*n g g e e*	*m m e m c* ***e***		r	
S2	*e*	*m e*			*r m e*	***n*** *g e c* ***e***	*g*		
S3		*m*	r		*m e*	***n*** *g e e m c* ***e***	*g*		
S4	*m*				*r g m e*	*m* ***n*** *g e e c* ***e***			
S5		*g*			*m r m* ***e***	*m* ***n*** *g e e e c*			
S6		*m*	r		*m g e*	***n*** *e e c* ***e***	*m g*		
S7	r	*g g*		*m*	***n*** *g e e c*	*e* ***e***	*m m*		

Key:

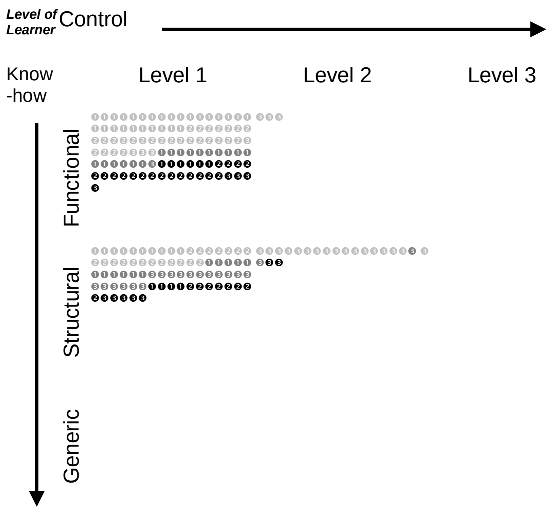
Variable	Code	Label	Description
Syllabus	c	CLAIT	Teacher's response related to working with CLAIT syllabus
	e	ECDL	Teacher's response related to working with ECDL syllabus
	g	City and Guilds	Teacher's response related to working with City and Guilds 7262 syllabus
	m	Mixed	Teacher's response related to working with mixed ECDL and CLAIT syllabuses
	n	National	Teacher's response related to working with national syllabuses such as skills for life
	r	RSA	Teacher's response related to working RSA text and word processing syllabuses
Teaching approach	regular font	Workshop	Teacher deployed a workshop classroom approach
	bold font	Group	Teacher deployed a whole group classroom approach
Institutional type	underlined font	Community	The institutions underlying background was community education
	italic font	FE	The institutions underlying background was further education

C10: Revised mapping to show nature of task and assessment for leading ICT User qualifications following e-Quals' syllabus changes

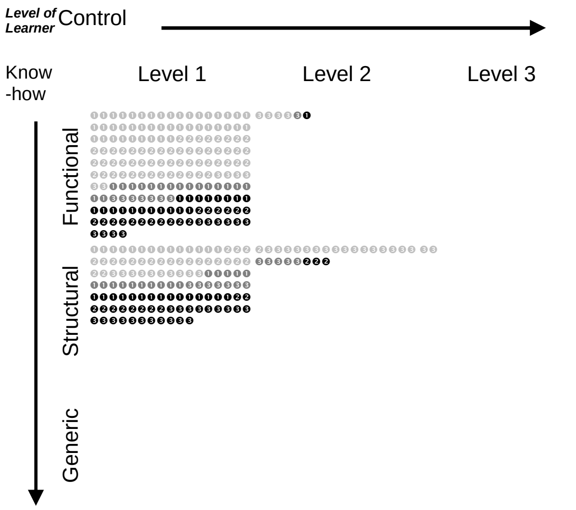
a) Word Processing



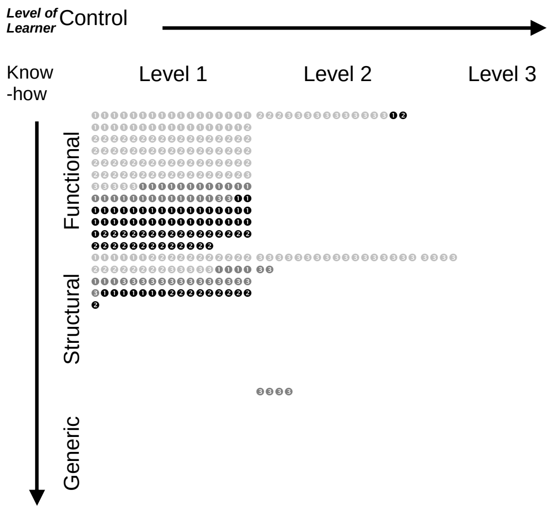
c) Database



b) Spreadsheet



d) Presentation



Key ❶ NQF Level 1* ❷ NQF Level 2 ❸ NQF Level 3 ● CLAIT ● ECDL ● e-Quals

* ECDL ❶ spans levels 1 and 2

D1: Teacher Profiles

T1		
Context:	***Observations:***	ECDL/CLAIT
	Approach: *	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	Work based
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	5
	Years teaching ICT:	5
	Employment: ***	Full time (as distance learning teacher) Contracted (as classroom teacher)
Qualifications:	***ICT Qualification: ******	User
	Teaching Qualification:	Degree in Education (working towards MA)
	Other Qualifications:	Unknown
Style:	***Predominant style observed:****	Procedural
	Sub-styles observed:*	Instructional + Constructional
	Overall style: ***	Transitional/Transmissive
	Main teaching tools:	Manuals, individual demonstrations

T2		
Context:	***Observations:***	Beginners Photoshop/PowerPoint
	Approach:*	Group
	Learner level:	Beginners/Intermediate (sessions 8+10/10)
	Context:	Community
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	2
	Years teaching ICT:	2
	Employment: ***	Contracted
Qualifications:	***ICT Qualification: ******	Teaching
	Teaching Qualification:	PGCE
	Other Qualifications:	BA (Fine arts)
Style:	***Predominant teaching style observed:****	Finding-out (play)
	Sub-styles observed:*	Procedural
	Overall style: ***	Transitional/transmissive
	Main teaching tools:	Whiteboard + individual demonstrations

* See Chapter 5   ** See Chapter 6   *** See key Appendix C4

T3		
Context:	***Observations:***	ECDL & CLAIT
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	Community
Background:	***ICT background:*****	Inexperienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	8
	Years teaching ICT:	8
	Employment: **	Contracted (predominantly as distance learning teacher)
Qualifications:	***ICT Qualification: *****	Teaching
	Teaching Qualification:	Certificate in Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Instructional
	Sub-styles observed:*	Procedural
	Overall style: **	Transitional/transmissive
	Teaching Tools:	Manuals, individual demonstrations

T4		
Context:	***Observations:***	RSA Text and Word processing
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	FE
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Old hand
Teaching:	***Years teaching:***	25
	Years teaching ICT:	15
	Employment: **	Part-time
Qualifications:	***ICT Qualification: *****	User
	Teaching Qualification:	Certificate of Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Procedural
	Sub-styles observed:*	Instructional
	Overall style: **	Transmissive
	Teaching Tools:	Practice exercises, individual demonstrations

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

T5		
Context:	***Observations:***	MS Office
	Approach:*	Group
	Learner level:	Mixed (one off session)
	Context:	Work based
Background:	***ICT background:*****	Inexperienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	10
	Years teaching ICT:	10
	Employment: *	Full time (Predominantly as centre manager)
Qualifications:	***ICT Qualification: ****	User
	Teaching Qualification:	Certificate of Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Procedural
	Sub-styles observed:*	Instructional + Finding-out (play)
	Overall style: *	Transmissive
	Teaching Tools:	Whiteboard demonstration, handout

T6		
Context:	***Observations:***	City and Guild 7262
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	Community
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	6
	Years teaching ICT:	6
	Employment: *	Full time
Qualifications:	***ICT Qualification: ****	Professional
	Teaching Qualification:	Certificate of Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Procedural
	Sub-styles observed:*	Instructional
	Overall style: *	Transmissive
	Teaching Tools:	Manuals

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

T7		
Context:	***Observations:***	City and Guilds 7262
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	Community
Background:	***ICT background:*****	Inexperienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	8
	Years teaching ICT:	8
	Employment: **	Full time
Qualifications:	***ICT Qualification: *****	User
	Teaching Qualification:	Certificate of Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Procedural
	Sub-styles observed:*	
	Overall style: **	Transmissive
	Teaching Tools:	Manuals

T8		
Context:	***Observations:***	ECDL/ECDL Advanced
	Approach:*	Workshop (with short group game activity)
	Learner level:	Mixed (rolling enrolment)
	Context:	Community
Background:	***ICT background:*****	Inexperienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	7
	Years teaching ICT:	7
	Employment: **	Full time
Qualifications:	***ICT Qualification: *****	User
	Teaching Qualification:	PGCE
	Other Qualifications:	Degree (subject unknown)
Style:	***Predominant teaching style observed:****	Instructional
	Sub-styles observed:*	Procedural
	Overall style: **	Transitional/transmissive
	Teaching Tools:	Manuals, individual demonstration, (whiteboard with group)

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

T9		
Context:	***Observations:***	ECDL/ECDL Advanced
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	FE
Background:	***ICT background:*****	Inexperienced
	Teaching Background:**	Old hand
Teaching:	***Years teaching:***	30
	Years teaching ICT:	15
	Employment: * ***	Full time
Qualifications:	***ICT Qualification: **** ***	Academic (MSc IT)
	Teaching Qualification:	PGCE
	Other Qualifications:	BA Business studies
Style:	***Predominant teaching style observed:****	Constructional
	Sub-styles observed:*	Finding-out (Research)
	Overall style: * ***	Transitional/transformative
	Teaching Tools:	Manuals, Intranet ‘Blackboard’

T10		
Context:	***Observations:***	ECDL/ECDL Advanced
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	FE
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	8
	Years teaching ICT:	8
	Employment: * ***	Full time
Qualifications:	***ICT Qualification: **** ***	Professional
	Teaching Qualification:	Certificate of Education
	Other Qualifications	Working towards BA in Education
Style:	***Predominant teaching style observed:****	Constructional
	Sub-styles observed:*	Finding-out (Research) + Procedural
	Overall style: * ***	Transitional/transformative
	Teaching Tools:	Manuals, Intranet ‘Blackboard’

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

T11		
Context:	***Observations:***	PEDAR-X by Novel
	Approach:*	Group
	Learner level:	Mixed (one off session)
	Context:	Work based
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Old hand
Teaching:	***Years teaching:***	Unknown
	Years teaching ICT:	Unknown
	Employment: **	Full time
Qualifications:	***ICT Qualification: *****	Unknown
	Teaching Qualification:	Unknown
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	'Structured' Problem solving
	Sub-styles observed:*	Procedural + Instructional + Constructional
	Overall style: **	Transformative
	Teaching Tools:	Worksheets, Whiteboard

T12		
Context:	***Observations:***	Golfing bespoke software
	Approach:*	Group
	Learner level:	Mixed (one off session)
	Context:	Work based
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Old hand
Teaching:	***Years teaching:***	Unknown
	Years teaching ICT:	Unknown
	Employment: **	Full time
Qualifications:	***ICT Qualification: *****	None
	Teaching Qualification:	Unknown
	Other Qualifications:	Doctorate
Style:	***Predominant teaching style observed:****	'Structured' Problem solving
	Sub-styles observed:*	Procedural + Constructional
	Overall style: **	Transformative
	Teaching Tools:	Golf equipment, Video, Whiteboard

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

T13		
Context:	***Observations:***	Datalogging Goniometry and EMG Data
	Approach:*	Group
	Learner level:	Mixed (one off session)
	Context:	Work based
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Old hand
Teaching:	***Years teaching:***	Unknown
	Years teaching ICT:	Unknown
	Employment: *	Full time
Qualifications:	***ICT Qualification: ****	Unknown
	Teaching Qualification:	Unknown
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	'Structured' Problem solving
	Sub-styles observed:*	Procedural + Instructional
	Overall style: *	Transitional/Transformative
	Teaching Tools:	Worksheet, Whiteboard

T14		
Context:	***Observations:***	ECDL
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	Community
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	5
	Years teaching ICT:	5
	Employment: *	Part-time
Qualifications:	***ICT Qualification: ****	User
	Teaching Qualification:	BA (Hons) Further Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Procedural
	Sub-styles observed:*	Instructional
	Overall style: *	Transmissive
	Teaching Tools:	Manuals, individual demonstrations

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

T15		
Context:	***Observations:***	ECDL
	Approach:*	Workshop
	Learner level:	Mixed (rolling enrolment)
	Context:	Community
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Greenhorn
Teaching:	***Years teaching:***	10
	Years teaching ICT:	10
	Employment: **	Contracted
Qualifications:	***ICT Qualification: *****	User
	Teaching Qualification:	Certificate of Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Procedural
	Sub-styles observed:*	Instructional
	Overall style: **	Transmissive
	Teaching Tools:	Manuals, individual demonstrations

T16		
Context:	***Observations:***	Beginners Webpage Design + Beginners Internet
	Approach:*	Workshop
	Learner level:	Webpage = Intermediate (rolling enrolment) Internet = Beginners (session 5/10)
	Context:	Webpage = FE , Internet = Community
Background:	***ICT background:*****	Experienced
	Teaching Background:**	Old hand
Teaching:	***Years teaching:***	30
	Years teaching ICT:	27
	Employment: **	Contracted
Qualifications:	***ICT Qualification: *****	User
	Teaching Qualification:	BA (Hons) Education
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Problem solving
	Sub-styles observed:*	Procedural + Instructional + Constructional
	Overall style: **	Transformative
	Teaching Tools:	Task sheets (Internet), Individual demonstrations

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

T17		
Context:	***Observations:***	ECDL
	Approach:*	Group
	Learner level:	Mixed (rolling enrolment)
	Context:	Community
Background:	***ICT background:*****	Inexperienced
	Teaching Background:**	Old hand
Teaching:	***Years teaching:***	20
	Years teaching ICT:	10
	Employment: **	Full time (Predominantly as course manager)
Qualifications:	***ICT Qualification: *****	User
	Teaching Qualification:	City and Guilds 7307
	Other Qualifications:	BA, BSc, PhD (in Environmental Science)
Style:	***Predominant teaching style observed:****	Instructional
	Sub-styles observed:*	Procedural
	Overall style: **	Transitional/transmissive
	Teaching Tools:	Whiteboard

T18		
Context:	***Observations:***	Not observed (Interview only)
	Approach:*	Workshop
	Learner level:	Advanced = CLAIT Advanced
	Context:	Community
Background:	***ICT background:*****	Unknown
	Teaching Background:**	Unknown
Teaching:	***Years teaching:***	Unknown
	Years teaching ICT:	20
	Employment: **	Full time (as distance learning teacher) Contracted (as classroom teacher)
Qualifications:	***ICT Qualification: *****	User
	Teaching Qualification:	Unknown
	Other Qualifications:	Unknown
Style:	***Predominant teaching style observed:****	Not observed
	Sub-styles observed:*	Not observed
	Overall style: **	Not observed
	Teaching Tools:	Manuals, Practice exercises

* See Chapter 5 ** See Chapter 6 *** See key Appendix C4

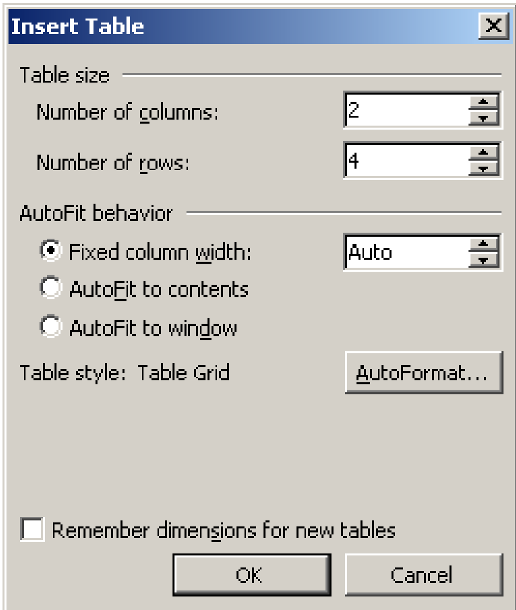
D2: Examples of training material used in workshop sessions

i) **Work manual (used by T8, T14 + T15 but typical of those used by other teachers)**

INSERTING A TABLE

A table needs to be inserted at the end of the document.

Insert a paragraph break and a clear line space at the end of the document (this means, click after the last word at the end of the last paragraph, and press Enter twice).



To create a table with 2 columns and 4 rows, click on **Table, Insert, Table** and select 2 columns and 4 rows.

The borders will be displayed automatically.

Enter the data below in the table.

*Note, you can alter the width of the columns by clicking on the line at the end of the column, and dragging it to the left or right.

Invention Year	Type of Equipment
1780	Paper copying press
1902	Electric fax machine
1937	Xerox photocopier

Format the heading **Invention Year** to be bold and centred.

The remaining text and numbers should stay left-aligned.

(NTALA, 2008a:28)

ii) Practice task (CLAIT) (used by T8, T14 + T15 but typical of those used by other teachers)

Task 3 - BUTTERFLIES

1. Open a new blank word processing file.

2. Set up the master page or template for the page as follows:

Page size:	**A4**
Orientation	**Landscape**
Top/Bottom margins:	**3cm Left/right**
margins:	**3 cm**

3. In the bottom margin area (the footer) key in your name, centre number and today's date.

4. Set up the page layout in newsletter format, to include a page wide heading above three columns of text.

   Column widths:
   equal Space between columns:
   1.6 cm

5. Key in the heading Wide World of Butterflies at the top of the page.

6. Format the heading in a sans serif font (eg Arial**),** and align it to the left.

7. Make sure the heading extends across the columns and fills most of the space across the top of the page. You may increase the character spacing or font size to achieve this (Select **Format, Font, Character Spacing**, and set the spacing to be Expanded, 2 or 3 pts to see the effect of increasing spacing between letters). An ideal size is 62 pt.

8. Import the prepared image Admiral and place it to the right of the heading. Format the text wrap of the image to be either Square or Tight. You may also have to reduce the size of the image.

9. Make sure the image remains in proportion, and the heading fits on one line.

10. Import the prepared text file **Butterflies** so that it begins at the top of the left column, below the heading. It should fill the first column and flow under the heading into the second and third columns.

(NTALA, 2008b: 8)

iii) Mock test (ECDL) (used and written by T17 but typical of practice tasks used by other ECDL teachers)

The following mock test is based on opening a database called ***Movies***. In the test you will create a small table and enter some data, establish a simple relationship between two tables, design queries that will extract data from the database and create simple forms and reports. **Remember to save any changes you make**.

32 Marks

1. Open the ***Answer file 5.5*** on your Candidate Disk and answer ***Question 1, 2, 3*** and ***4***. Save and close the ***Answer file 5.5***. **[4 Marks]**

2. Open the ***Movies*** database from your Candidate Disk. Create a new table with the 3 fields and their properties as shown below. **[2 Marks]**

Field Name	Data Type	Field Size or Format
Film ID	AutoNumber	Long Integer
Film Title	Text	60
Film Star	Text	45

3. Using your knowledge of databases apply a primary key to the most appropriate field. **[1Mark]**

4. Save the table as ***Vintage***. **[1 Mark]**

5. Add the following records to the ***Vintage*** table. **[1 Mark]**

Film ID	Film Title	Main Actor
1	Thunderball	Sean Conney
2	Zulu	Michael Caine

6. Open the ***Films*** table, add the field below so that it becomes the final field:

[1 Mark]

Field- Name	Type	Field Size or Format
Director	Text	40

7. There is an error in the data in the *Films* table. The film title ***Click*** should be ***Clockwork.*** Please make the appropriate change. **[1 Mark]**

8. Change the format of the ***Receipts*** field in the ***Films*** table to currency with no decimal places. **[1 Mark]**

iv) Practice tasks used in Internet lesson (written and used by T16)

a) Initial task

Internet Search Exercise 4

1. In which capital city is the Golestan Palace?

2. What is the highest mountain in Iran?

3. In what year was Saddam Hussein born, and in what year did he become `President' of Iraq?

4. How many British Prime Ministers have here been?

5. Find a definition of the word deontological?

---

b) Follow up task

A new Internet Web Search Activity

You are planning a short holiday to North Wales, and want to do most of the arrangements via the World Wide Web.

1. Find a detailed route plan by road from Whitley Bay to Porthmadog via Penrith and print it out.
2. How far is it in miles from Whitley Bay to Porthmadog?
3. You want to stay overnight B & B at Penrith. Find a Bed & Breakfast in Penrith town itself. Write the name of the B & B below:
4. You also want to eat at a restaurant in Penrith when you arrive. Find a pizzeria in Penrith and write its name below: 5. Find a hotel in Porthmadog town where you can book half-board for the week. What is the name of the hotel and how much will a week's half-board cost?
6. Where can you go by railway from Porthmadog?
7. For the second week of your holiday you want to stay at Portmeirion. Find the Portmeirion web site and print out the Main Page.
8. You and your wife want to stay at Portmeirion, self-catering, for one week. Find out the cheapest rental for two adults staying self-catering in May.

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