University of Strathclyde

School of Education

Ways of learning in later life: older adults' voices

An exploration into older adults' preferred learning and communication styles and how these fit with recent neuroscience insights into adult learning

Val Bissland

In part fulfilment of degree of Doctor of Education

2011

This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.

Signed

_____

Date

20th October 2011

Acknowledgements

This study would never have taken place had it not been for a fortuitous career change in the 1990s when I began to work with older adults at the University of Strathclyde within the Centre for Lifelong Learning (as it is known now). The Centre generously supported my continuing professional development over a number of years and provided opportunities for gaining experience and practical insights into the field of adult education and especially, learning in later life. I am very grateful to Lesley Hart, former Director of the Centre and previously Head of the Senior Studies Institute, for her steady encouragement. I am also indebted to the University for providing this opportunity.

Although the completion of the thesis has taken more time than I ever imagined, each supervisor has contributed to my understanding in different ways and I have been very fortunate indeed in having Dr Daniela Sime to help me finally to present my research in a coherent way. I also have to thank my husband for his patient endurance: for what must seem like an eternity, we have set off on holiday for years with the car stacked with my academic books and papers. Friends have also spurred me on to completion.

I am also grateful to all the students over the years in the Learning in Later Life programme whom I have had the pleasure to teach and from whom I have learned so much. They have enriched my understanding, especially those who took part so willingly in this study.

Abstract

This study explored older adults' preferred learning and communication styles to identify the types of classroom experiences which could best contribute to wellbeing and mental capital. Growing evidence from the brain sciences points to associations between learning and well-being, and between learning and protection from cognitive decline (Foresight Mental Capital and Wellbeing Project, 2008; Field, 2009; Frith, 2011).

The mixed method study has an equivalent status design (Creswell, 1995) which used Honey and Mumford's (1986) Learning Styles Questionnaire, followed by a supplementary questionnaire. Then, it moved to a social constructionist/interpretive framework (Gergen, 2004), which involved conversations to determine older adults' subjective understanding of learning now and in the past. The main framework for thematic analysis came from neuroscience which has uncovered knowledge about lifelong brain plasticity and the interconnectivity of emotions and memory. Also, of importance were the theoretical frameworks of Yang's (2003) holistic theory of knowledge and adult learning and, to a lesser extent, Gee's (2005) Discourse analysis.

The study found a range of learning styles, encompassing 14 combinations, from activists to theorists. Therefore, this indicates the need for a wide range of imaginative classroom practices. The participants conveyed a sense that they wished to build on their existing understanding in open and interactive modes, which contrasted strongly with early memories of learning. This also chimes with developments at the interface of neuroscience and adult learning, where constructing one's own knowledge in a social context has been shown to activate multiple brain networks and build stronger memory. In essence, the older adults were seeking enrichment, not acquisition.

While there is no single right way to learn, this study provides evidence that insights from neuroscience indicate that classrooms where social dimensions and active engagement are intertwined, create learning spaces attractive to older learners, and can offer opportunities to build cognitive reserve, wellbeing and mental capital, which is vital with the new timeframe of possibilities that longer lives afford.

Table of Contents

Figures

Tables

Chapter 1

1. 1 Introduction

As demographic trends in developed countries shift dramatically, with many people's lives expected to well exceed the biblical 'threescore and ten', later life now requires new personal and social redefinitions. There are implications which need to be examined as new cohorts enter a prolonged period of life following full-time employment, widely termed the 'Third Age' (Laslett, 1989). For many more people in the future this period is likely to constitute, virtually, one third of their lives (Fisher and Wolf, 1998). Sarah Harper (2006), Director of the Oxford Institute of Ageing, referred to ageing in Europe as "truly staggering" (p.1) and cited the prediction that by 2030 half the population of Western Europe will be aged over 50 with a life expectancy at 50 of another 40 years. She stated that this phenomenon is not solely the result of a 'baby boomer' bulge:

> "Rather, demographic maturing is a global trend that heralds long-term shifts in individual and societal behaviour - changes that are likely to restructure societies for much of the foreseeable future". (*op.cit*., p. 20)

Her view was confirmed in the *Future of Retirement Report* (HSBC Insurance, 2009) where the ageing population figures were set out worldwide:

> "In effect, what we are seeing is a population mega-trend; a global 'baby-boomer' generation spanning more than a hundred years." (p.11)

United Nations (2005) defined global ageing as the second great challenge facing the world after climate change. Therefore, how nations adjust to the new demographic structure will be critical for societies to flourish, and while governments are facing up to the implications as the first wave of 'boomers' reach retirement age, there is, as yet, no grand plan, although there are some developments. However, those connected to the field of educational gerontology have no doubt that learning has a crucial role to play in the lives of older adults. As a society, we need to take the learning later seriously.

> "The task of building support to address the needs of an increasingly diverse older adult student population is before us." (Fisher and Wolf, 1998, p. 87)

1.1.1 Data collection to final analysis

The data gathering element of this research project was carried out during the spring of 2002. The extended gap from initiation to completion arose through unforeseen circumstances[1] and during the intervening years there were important developments in leading thinking concerning advances in theory, methodology, research and policy. The inclusion of these developments entailed an additional literature review. In this introduction reference is made to both pre-2002 literature and more recent developments, so that the study is located within the contemporary social policy and research environment.

1.2 The age of ageing

In the advanced countries of the world a combination of falling fertility and rising life expectancy is producing 'mature' societies, where governments have concerns about labour shortages, diminishing youth and changes in old-age dependency, with many countries already having more people of pensionable age than there are children under 16 (Magnus, 2009). As numbers of older adults increase in proportion to younger people, the argument is frequently made that social services will be overwhelmed - regularly referred to in the media, as the 'demographic time-bomb'.

While the focus of much recent government policy throughout Europe has been on lifelong learning in terms of building the human capital of older workers (European Commission 2001, 2007, 2010; Longworth & Davis, 1996), policymakers are now being urged to reconsider the role of older adults in broader terms, as both providers and consumers (*European Foundation for the Improvement of Living and Working Conditions*, 2008). Educational gerontologists have been arguing this for some time (Phillipson, 2000) and therefore, in this context, it is timely to examine aspects of older adults' learning experiences.

However, some types of learning are likely to have more impact on 'ageing well' than others. As a practitioner in the field this investigation into preferred

[1] The demands on my time due to unexpected family-related responsibilities, together with a secondment from the university between 2003 and 2005 to the Scottish Leadership Foundation, resulted in the thesis writing being put on hold. In addition, my original academic supervisor left and departmental changes led to an inevitable delay in finding a replacement on my return, delaying progress towards analysis and completion.

learning and communication styles has emerged from my scholar–practitioner experience. There appears to be an unspoken assumption that older adults coming together to learn will automatically experience great benefits, regardless of the type of learning. Are there ways of learning which are particularly effective in refreshing and strengthening older adults' intellect and wellbeing?

1.2.1 The Scottish Situation

The Scottish Government has already established a lifelong learning strategy which has found expression in the creation of a series of initiatives under the umbrella of *Scotland's Futures Forum (SFF)*. It was launched in 2006 to help MSPs, policy makers, businesses, academics and the wider community explore future challenges and opportunities. In his essay to the *SFF* (2007), social gerontologist Brian Findsen adopted a critical stance and exhorted older adults to wake up to their rights:

> "It is incumbent on all Scottish citizens to exercise their rights to societal resources, such as education. That many older people do not currently assert their claims for formal education provision reflects their misguided belief that education is only for younger folk." (Findsen, cited in *SFF*, 2007, p.18)

A stated outcome of discussion at Forum *SFF* (2007) was that the onus was on policy makers to understand better how and why older adults might want to learn, then build "flexible, innovative and adaptable spaces and services" (*op.cit.*, p.7). One size is not going to fit all, with very different needs for different socioeconomic and cultural groupings. Therefore "spaces and services" will require to be distributed across communities in fair and equitable ways. Although statistics are constantly being gathered about participation in learning, the very definition of learning itself is not uniform and participation fluctuates (Withnall, 2010; Withnall & Thompson, 2003). Therefore statistical information on its own reveals little about why people are not participating. However statistics can show trends, as demonstrated below.

The key discussion paper to the *SFF* (2009) by Tom Schuller of the independent *Inquiry into the Future of Lifelong Learning* (Schuller & Watson, 2009) featured statistics prepared by the National Institute of Continuing Adult Education (NIACE). They revealed there was a drop in lifelong learning participation in Scotland from 38% in 1996 to 33% in 2009, compared with the UK drop of 40% to 39%. Schuller (*SFF,* 2009, p. 4) stated that the pattern of provision is not adjusting

itself in line with economic, social and demographic changes, and although Scotland's population is ageing faster than the UK as a whole, this is not reflected in the programme funding.

1.2.2 Different perspectives on learning later in life

Because there is no universal understanding of adult learning (Brookfield (1995) different organisations need to conduct research from their own perspectives. Here I draw on three UK-wide older adult studies which produced interesting sets of results:

- a government-sponsored study *(DfEE)* by Dench and Regan (2000) looked at motivation and the wider benefits of learning;
- an *Economic and Social Research Council (ESRC 2000-2003)* study by Withnall and Thompson (2003) examined learning choices and learning experiences over a lifetime;
- A *Universities UK* review by Phillipson and Ogg (2010) examined the engagement of older learners in education and training in higher education.

Dench and Regan (2000), using a sample aged 50 to 71 years, found that 80% of those whom they classified as learners, reported a range of positive spin-offs, from improved personal coping skills to greater social involvement. One of the most important reasons for learning was categorised as 'intellectual'. Withnall and Thompson (2003) also found a similar range of positive outcomes, but one of their most intriguing findings was "the simple acquisition of new knowledge being least important" (*op cit*., p.1). These results could be judged as contradictory concerning what learners classified as important, and are perhaps indicative of the methodological challenges in creating reliable data in educational research, where meanings and interpretations are often paramount.

If new knowledge is least important, this suggest that knowing more about something is not the main reason why many older adults become involved in learning, and therefore traditional classrooms may not be appealing. Dench and Regan (2000) found that about a quarter of the respondents said they had had enough of learning or perceived themselves to be too old to learn. This raises the critical issue of the way learning is defined in the first instance, narrowly, as something that happens in institutions or broadly, as a deep, personally-felt, actor-driven, dynamic process taking place in the context of one's life.

Phillipson and Ogg (2010) confirmed that very few of the 50-plus age group are involved in formal education, although thry looked beyond the formal HE sector and identified non-formal initiatives across Europe and America, such as *Senior Studies Institutes*, *Learning in Retirement* Institutes and the *University of the Third Age (U3A)*. In the UK, the 190,000 or so *U3A* members are scattered across the country and meet in self-help groups to learn informally, and at minimal cost. Lifelong Learning Centres (in some universities) also promote a multitude of adult education (AE) courses to the general public, as they have been doing traditionally for years. However some Departments of Continuing Education (as they were known before 'lifelong learning') have closed or have cut back, and others are facing future cuts. The report claims that the AE courses have yet to reflect:

> "the changing needs and aspirations of the new cohort entering what has been termed the 'third age'." (Phillipson & Ogg, 2010, p. 4)

Therefore, it can be seen that different reports piece together different pieces of the jigsaw. However this picture is never static, as more well-qualified people leave work with high expectations, others lose their jobs prematurely due to cutbacks and require training options, and there are the growing ranks of people 'ageing well' and entering late old age with changing needs. In addition, the economic and social environment in which people have to juggle priorities is also shifting. As Jamieson (2002, p. 11) stated:

> "The processes and dynamics of adulthood and ageing are complex and difficult to pin down in research."

1.2.3 Conceptualisation of later life

One of first academics to study later life (in the 1940s) was Chicago University sociologist Bernice Neugarten. In 1996, key selected papers from her body of work were published, which gave an account of the many stereotypical descriptions she encountered of older adults as poor, lonely people with enfeebled minds. However, she identified a growing trend among many older adults to pursue active lives, and posited that these individuals were challenging the socially constructed beliefs regarding age-appropriate behaviour.

In an effort to change perception of older adulthood as a single life stage, she introduced the concepts of young-old and old-old (Neugarten, 1996). Implicit in this re-categorisation is a reminder that ageing is not only an individual process, but also an interactive one, embedded in a shifting socio-cultural landscape, to which the newer terms 'baby boomer' and 'third ager' also attest. Neugarten's scholarship in ageing studies broke new ground and led historically to the definition of the academic field of human development, with her course on *Adult Development and Ageing* serving as a world class model. However, in general, the study of ageing sheered off from human development studies and, ironically, considering Neugarten's preference for an age-integrated society, a multitude of Institutes of Ageing or Gerontology have burgeoned worldwide.

1.3 Adult learning and policies for lifelong learning

The 'front-end' model of education, concerned with children (Williamson, 1997, p. 173), generally dominated the field until the publication in the 1970s of a series of policy and research documents by *United Nations Educational, Scientific and Cultural Organization* (*UNESCO*,1972), the *Organisation for Economic Co-operation and Development (OECD)* and the *Council of Europe (European Commission*). These were the major sponsoring bodies for the concept of lifelong learning (LLL), which was seen then as a social and humanitarian issue (Tennant, 1990). They set out the case for the expansion of educational opportunities for adults, as the world was fast developing into a place where initial compulsory education was an inadequate preparation for life and work.

1.3.1 Competing discourses

Concepts inevitably change their meaning over time, and policy documents themselves become the sites for discursive struggle with different ideological and social and political forces competing for dominance. As global markets expanded, the *European Commission* (2001) defined LLL as:

> "…all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective." (p. 9)

Many reports have followed, and as can be seen from the tenor of the 2007 extract, employment has moved to the top of the agenda, with older people mentioned after migrants:

> "Better adult learning can play a key role in vocational training in Europe and in the social inclusion of groups which are at a disadvantage on the labour market, such as migrants and older people."
>
> (*European Commission*, 2007, *Summary*, para. 2)

Commentators on LLL increasingly have expressed their frustrations concerning the gap between rhetoric and reality. Field (2006, p. 3) argued that LLL is little more than re-branding of post-16 education and training, rather than a new conceptual framework:

> "a kind of linguistic hyperinflation in which the term is constantly devalued."

Bengsston (2008) stated that the oft-cited definition of lifelong learning as learning from the cradle to the grave was 'far too vague' (p. 4) and not practical in terms of policy action. As there is no coherent and equitable system of financing LLL for everyone, the current system has failed to address the emergence of an ageing society (Schuller and Watson, 2009). And with the growing economic crisis in Europe, Nordin (2011) claims that the rhetoric is moving further away from the personal, civic and social, and closer to being solely an instrument for economic wealth. Thus, there is a danger of lifelong learning's broader purpose disappearing, even if this has not been done deliberately, but caused by policy changes in other areas (McNair, 2009).

1.3.2 Lifelong learning and learning in later life

The reality of how resources in the UK have been allocated recently is revealing. The statistics below were cited in the *IFLL Learning Through Life* Report:

> 'For every £55 spent on adult learning -
> £47 goes towards learning for people 18–24 years old
> £6 goes towards learning for people 25–49 years old
> £1 goes towards learning for people 50–74 years old
> 29p goes towards learning for people 75 years old and older.'
>
> (Schuller & Watson, 2009. p.10)

It is clear that unless there is an actual framework providing an appropriate range of opportunities, lifelong learning for older adults who have left mainstream work will

be left to market forces, and only those with the means and an inclination towards accredited courses will be able to buy into existing provision. Older adults in Scotland seem to be in a slightly better position due to Individual Learning Accounts, which, in general, provide a £200 (means tested) grant annually to an applicant for certain approved courses (ILA Scotland, 2011).

Historically, the first key UK document which held out the possibility of a sea-change in attitudes towards older learners was the *Carnegie Report of Learning in the Third Age* (Schuller & Bostyn, 1993). It made several broad statements to the effect that older learners should be included in a policy statement on lifelong learning and suggested that, although there was scope for separate provision, this should not allow general programmes to ignore the needs of older adults. However, the quasi-political sentiments of equality and justice, expressed in Carnegie, were judged as not sufficiently persuasive by Withnall and Percy (1994). They called for the focus to be on individual dignity, the realisation of potential, and fairness of opportunity.

1.3.3 Beneficial effects of learning

With a recent shift in policy papers toward appreciation of the wider benefits of learning, the UK discussion paper, *'The Learning Revolution'* (DIUS [Department of Industry, Universities and Skills], 2009) focused on informal learning, shifting the perspective from work-readiness to acknowledging the difference learning could make in maintaining mental and physical health. Such a conclusion should lead logically to the realisation that there are savings to be made in terms of medical and social work costs by supporting older adults in learning activities. A parallel situation at the opposite end of the age spectrum is nursery education (and *Sure Start Children's Centres* in England), which aims to create thriving children who will become independent citizens and achieve their personal best.

However, it calls for a leap of imagination for similar connections to be made between late adulthood, learning and productive lives. Government policy has tended to fixate on physical age-related decline and, without improved coherence at local level across health, social work, cultural and learning services, they will continue to operate in a fragmented way and learning later becomes a secondary issue (Soulsby, 2000). The influential Think Tank - the *Institute of Public Policy Research* (IPPR), in

its report *'Older People and Wellbeing'* (Allen, 2008), highlighted that there is "still no *'Sure Start'* for later life" (p. 5). Indeed, between 2004/5 and 2006/7, when adult educational funding in the UK dropped off significantly, the number of learners in publicly-funded provision fell by over a million, with those over 65 the largest proportion of learners lost (Anderson, 2008). However Anderson found that many of these lost learners did not give up, but found alternative activities within self-help groups, community projects and volunteering agencies.

1.3.4 Perceptions of learning

Anderson's findings (2008) resonate in many respects with the conclusions reached by Canadian researcher Allen Tough (1999, 2002) who provided the first comprehensive description of self-directed learning among adults. He suggested the *iceberg* as a metaphor because so much of it is invisible" (*ibid*., 1999, para.6) and estimated people spent around fifteen hours per week on their own individual projects which accounted for around 80 per cent of adult learning at any one time. However, people themselves did not seem to regard their own projects as learning, perhaps because 'real' learning is conceived as taking place within institutions. This may explain also why around a quarter of Dench & Regan's (2000) sample apparently expressed no interest in learning: their concept of learning may not have encompassed implicit learning that arises naturally from following one's own pursuits.

Even where classes for older adults exist, an assumption by funders is that these are not really serious and are part of the leisure market or a form of 'edutainment'. This neologism has been coined to convey activities that first seek to amuse, although they have some form of educational agenda. This perspective tends to strip learners of their complex social and psychological needs and reduces them to an audience. As Soulsby (2009) postulated in his response to *The Learning Revolution* (DIUS, 2009), this underlying attitude diminishes any sense of urgency, and importance concerning adequate funding, and downgrades learning activities not linked directly to economic prosperity.

Thus, we can see from the examples above, that there has been no shortage of policy papers, but at the same time, public provision for low cost adult learning is

dwindling and many people are looking for alternative outlets, through community involvement, charities and self-help groups, such as the U3A. Williamson (1997) makes the point that the marginalisation of older adults sends out a discouraging message:

> "Once out of the workforce, people are on their own in terms of having their learning needs valued and met" (p.176).

1.4 The value of learning in later life

The persistent search for learning by a significant proportion of older adults appears to confirm that Neugarten's (1996) findings still hold true: there are many older adults who have left their mainstream occupations with an appetite for learning. However, there are numerous barriers, not least that spending power is likely to drop. In addition, when apportioning limited personal resources, a class may be perceived as poor value if it embraces an ethos or value that does not match the person's purpose, perhaps because the learning is assessed or the class format does not suit preferred ways of learning. John Field, in his *IFLL* report, '*Well-being, Happiness and Lifelong Learning'* (2009c) pointed out to those interested in promoting adult learning that they have this powerful argument at their disposal:

> "…adult learning makes a small, but significant, measurable positive contribution to well-being." (p. 188)

It could be argued that if wellbeing is an outcome of learning for adults in general, then the difference learning makes may become even more significant in later life, with the cessation of ongoing workplace learning and the increased risk of age-related changes in the brain. Add the persuasive findings from neuroscience of the slowing of decline through effortful and challenging activities (see section 1.5), and the argument for engaging in learning later becomes even more powerful.

1.4.1 Learning, wellbeing and mental capital

The concept of well-being is one of growing significance in policy circles and in wider public debate, with the realisation that positive mental health and wellbeing are markers for a 'thriving' nation. The deliberations of economist Richard Layard

(2005) in his influential book *Happiness: Lessons from a New Science* brought together research findings from psychology, neuroscience, economics, sociology and philosophy and challenged the belief that, as a society become wealthier, its citizens become happier. By showing that happiness can be measured and explained, he presented an argument for a new kind of economics. He suggested that "we rededicate our society to the pursuit of happiness rather than the goal of dynamic efficiency" (p. 235). Adoption of this perspective would place lifelong learning on a different footing.

Learning has been shown to be important to a range of wellness indicators, if not exactly happiness indicators. The *Inquiry into the Future of Lifelong Learning* (Schuller & Watson, 2009), which detailed the need to restructure society along new lines, displays cohort-based data representing a systematic attempt to identify, not only the economic and social outcomes, but the personal outcomes of learning. The *IFLL* commissioner John Field commented:

> "Educationally, ageism begins at 25. …..Government's obsession with economic indicators for measuring success is failing to take happiness and wellbeing seriously." (Field, 2009a, para. 4)

The one-dimensional economic evaluation of learning is detrimental for adult learners in general, but it lets down older adults in particular, who are likely to have contributed over their working lives through taxation, to the huge expansion of education during the second half of the 20th century, and yet who have diminishing opportunities for learning at the very period of their lives when a new time frame is opening up. Also Field's reference to ageism is apposite. Recent research commissioned by Age UK (2010) reveals that ageism is the most widely experienced form of discrimination in Europe. Based on data from the *European Social Survey* (2010), it found that 64% of UK citizens said age discrimination was a problem.

1.4.2 Undervaluing potential

The government's recently launched consultation on the ban of age discrimination in provision of goods, facilities, services and public functions, an addition to the Equality Act (*Government Equalities Office*, 2010), indicates that there is awareness

that in employment, health, education and in other social spheres, ageist assumptions are rife. Ironically, age discrimination is not only about people's views of other generations, but also about the way people see themselves. Exposure to stereotypes and prejudicial attitudes can cause older adults to behave in ways which reinforce these stereotypical beliefs (Abrams, Eilola & Swift, 2009), and they become self-fulfilling prophecies.

The Foresight Mental Capital and Wellbeing Project (Kirkwood, Bond, May, McKeith & Teh, 2008) – a large scale study of international research study into mental capacity and wellbeing - drew attention to this general undervaluing of the older population. The authors made a plea for the greatest number of older adults maintaining the best possible 'mental capital', not only to preserve their independence and wellbeing, but also to maximise their active engagement and contributions to national life. Their conceptualisation of mental capital is of a human property emerging from the essence of one's biology, education, life experience, resilience and social life. Their definition was:

> "The extent of an individual's resources reflects his/her basic endowment (genes and early biological programming), and experiences and education, which take place throughout the life course." (Kirkwood *et al.*, 2008, p. 6)

The authors found that older adults, who tend to be persistently negatively stereotyped, are being denied learning opportunities, and are in effect missing out on building mental capital. Learning must continue throughout all of life as this can have a direct effect on mental health and well-being across all age groups, but holds out "particular promise in older people." (Beddington, Cooper, Field, Goswami, Huppert, Kirkwood & Thomas, 2008, p. 1057)

1.5 New insights from neuroscience

The final theme reflects my own professional bias as an adult educator. I have twenty years experience within the Learning in Later Life programme, University of Strathclyde, teaching and working with older adults in the areas of personal change and wellbeing, memory enhancement and boosting 'mind power'. With my academic

background in psychology and adult education I have an ongoing interest in the way insights from neuroscience have the potential to enrich teaching and learning.

It is not yet widely appreciated that a lifestyle characterised by engagement in activities of an intellectual and social nature is associated with slower cognitive decline in healthy older adults (Scarmeas & Stern, 2003; Stern, Habeck, Moeller, Scarmeas, Anderson, Hilton *et al.*, 2005; Whalley, 2001). Activities that involve effort and challenge contribute to resculpting and strengthening neural networks (Calvin, 1998; Cohen, 2005; Diamond, 1988, 2001; Goldberg, 2005; 2009; Greenfield, 1997; Lucas, 2001; Robertson, 2000) and compelling new evidence from biological research and functional neuroimaging by the above-cited researchers and others, is challenging the widely-held view that cognitive aging is a process of inevitable mental loss. The lifelong potential for neurocognitive reorganisation is one of the most important new areas of research in cognitive neuroscience, holding out the possibility of increased wellbeing:

> "transforming life in old age by preventing or even reversing the damage to cells implicated in mental decline." (Whalley, 2001, p.1)

Many lifestyle choices contribute to cognitive health, including learning. One of the key aims of this thesis is to draw attention to these insights, which have the potential to shift learning from a peripheral activity to a core one, every bit as important to wellbeing. This section gives a brief overview of some of these key areas which have the potential to transform older lives. These will be explored in more depth in the literature review in Chapter 2.

1.5.1 Neuroplasticity

Neuroanatomist Marian Diamond was an early pioneer of neuroplasticity research, and was one of the first scientists to challenge the received wisdom of the day that "loss of dendrites was an inevitable correlate of the aging process." (Diamond (2001, final para.). Her groundbreaking 7-year study (Diamond, Lindner & Raymond, 1967) provided statistically significant anatomical differences in animal models from birth to old age, dependent on environmental stimulation. In the 1990s an extensive body of research with the benefit of new technology and human subjects confirmed that

the human brain is plastic: this means it can physically change and rewire itself in response to stimulation and learning:

> "..the brain's ability to grow new neurons is one of the most exciting discoveries in neuroscience and a dramatic reason for optimism about the brain's potential in the second half of life." (Cohen, 2005, p.13)

Neurobiological studies have revealed that chemicals, such as dopamine and serotonin which raise mood, also produce higher levels of acetylcoline, a chemical required for learning. These brain chemicals are enmeshed in our neural networks, and far from obstructing clear thinking, the emotions they create are the vital rudders guiding human judgment and action (Cohen, 2005; Damasio, 1994; Damasio & Damasio, 2006; Davidson, 2003; Dirkx, 2008; Goldberg, 2001, 2009; Kotulak, 1997; Johnson & Taylor, 2006; Wolfe, 2001, 2006; Zull, 2002). The long-held belief that emotions interfere with learning has dominated education and western thought for 300 years and this has been shown not to be the case. Also, chemical messengers are not only in the brain, but distributed throughout the whole body by means of the endocrine system: biochemical change "at the receptor level is the molecular basis of memory" (Pert, 1997, p. 143).

1.5.2 Overlapping circuitry

Arguably, the researcher who has made the most significant contribution to knowledge concerning the entanglement of emotions and cognition is neurologist Antonio Damasio (1994). He is now collaborating with educational researchers, such as Mary Immordino-Yang (2007), a cognitive neuroscientist, educational psychologist and teacher, to study the emotion and social interaction during learning, motivation and creativity in classrooms. In a recent co-authored paper, they stated:

> "The aspects of cognition that are recruited most heavily in education, namely learning, attention, memory, decision making and social functioning, are both profoundly affected by emotion." (Immordino-Yang & Damasio, 2007, p. 7/8)

Learning as a source of generating positive emotions and improving quality of life was investigated by Jamieson (2007), which involved tapping into older adults' feelings about learning. However, learning as a source of pleasure is different from using emotions in the classroom to improve the learning process in the ways

suggested by Immordino-Yang and Damasio (*ibid*., 2007) - an issue as yet, not widely understood.

From their research results so far, they believe:

> "Simply having the knowledge, does not imply that a student will be able to use it advantageously outside of school" (*ibid*., 2007, p. 9).

Because older adults are likely to be familiar with ways of learning that underplay emotions, those who return to formal learning can end up in a double-bind. They may expect or feel more comfortable being taught in a formal way, and be less open to more participative methods which could make learning more memorable and enduring. However, even if older students are open to new ways of learning, and even desirous of learning differently from the past, many educators are not well informed about the nature of the entangled relationship between the constructs of emotion and cognition, or even if they are, they are unsure about how to go about leveraging this relationship within the classroom. The researchers' aim is to clarify this issue.

> "Our hope is that a better understanding of the neurobiological relationships between these constructs will provide a new basis for innovation in the design of learning environments." (*ibid*., p. 3)

1.5.3 Emotional intelligence

Emotional intelligence is also a relatively new concept which has filtered into the vocabulary of educators since the publication of the book with the same title by psychologist and science reporter Daniel Goleman (1995). It appeared during the *'Decade of the Brain'* - this was the designation given to the 1990s in the USA, to raise the profile of the brain research (Jones & Mendell, 1999), and led to a flurry of writing. Goleman drew on a broad range of findings from affective neuroscience and psychology, in which he described how emotions were regulated, and how human beings could express, develop and capitalise on their intellect, in modes other than the dominant logical-mathematical/verbal reasoning ways of thinking.

Traditionally, logical-mathematical and verbal reasoning were used, almost exclusively, to predict success and define 'intelligence' by psychometrics (IQ tests). Influencing Golman was the work of Harvard psychologist Howard Gardner (1983/1993) who had developed his Multiple Intelligences (MI) theory,

controversially redefining the concept of IQ. He made the case that human minds are highly differentiated entities and it is fundamentally misleading to think about "a single mind, a single intelligence, a single problem-solving capacity" (Gardner, 2003, p.13). Gardner's fresh perspective acknowledged that people have different cognitive strengths and contrasting cognitive styles, and this opened up the concept of intelligence to a new wave of thinking. His MI theory reflects one of the best known attempts to put cognitive research and constructivist philosophy into practice. Two of his named intelligences, which I regard as particularly important to older adults, are intrapersonal and interpersonal intelligence.

> "The capacity to know oneself [intrapersonal] and to know others [interpersonal] is an inalienable a part of the human condition and it deserves to be investigated." Gardner, 1983, p. 243)

Something similar is suggested by Gene Cohen (2000), former director of the Centre for Ageing, Health and Humanities at George Washington University, who wrote extensively on the awakening of creative potential in later life, in terms of an *"Inner Push"* (Cohen, 2005, p.31). He did not mean doing set things such as, writing, painting or music, but something more profound:

> "The point is that creativity is the process of bringing something new into existence - and novelty is everywhere you look." (p.169)

This would suggest that if the goal of developing students' intrapersonal and interpersonal intelligences permeated classrooms in later life, this would have a profound transforming effect on the experience of learning.

Developmental aspects of being human have interested researchers since studies of the mind began and good teachers have always known the power of empathy and have used this knowledge instinctively to teach in ways that engage and motivate learners. Yet this aspect has not been given much prominence in traditional teacher training, with the emphasis solidly on the rational mind. However Immordino-Yang and Damasio (2007) concluded:

> "When we educators fail to appreciate the importance of students' emotions, we fail to appreciate a critical force in students' learning. One could argue, in fact, that we fail to appreciate the very reason that students learn at all." (p. 9)

1.5.4 Summary

This introduction to neuroscience research has provided a brief overview of the impact of enriched environments, the entanglement of emotions and thinking, the concept of emotional intelligence and multiple intelligences which have relevance to the "Inner Push" in later life. These new insights are important to educators. Pat Wolfe (2005), an expert in translating current neuroscience into educational practice, stated succinctly:

> "There are many tenets we are learning from neuroscience that have direct application for the classroom and would make us a much more scientific profession." (Wolfe, 2007, video clip, final 15 seconds).

1.6 Learning in Later Life at University of Strathclyde

In this final section, I provide a brief resume of the background of the programme where the research took place. In 1987, a clutch of daytime classes targeted at older adults, was set up within the Department of Continuing Education (as it was then known) of the University of Strathclyde, and due to their success, the University agreed to a fund-raising campaign for the creation of a Senior Studies Institute (SSI). Through the efforts of a 'champion' professor and the programme's director Lesley Hart, the SSI was launched in 1993, with a remit to offer a range of learning opportunities to older adults, including volunteer projects, skills training for job-seekers, collaborative research, and links to other organisations in the field of ageing and education (Withnall & Percy, 1994).

Currently, the Learning in Later Life (3Ls) programme is the only one of its type in the UK (Phillipson & Ogg, 2010) with paid tutors and dedicated fully equipped classrooms. There are around 150 classes, seminars and workshops which attract over 3000 registrations each year. The programme aims to provide "quality, accessible and enjoyable learning" (Learning in Later Life, 2010-2011, p.1). Hart was strongly influenced by the views of John Dewey concerning "interactive learning, the accommodation of diverse learning styles and the value of experiential learning" (Hart, 2001, p. 21).

With over a hundred part-time tutors from a wide range of backgrounds, tutors are encouraged to attend on-going seminars to explore adult learning theory in relation to their own practice. I have been involved in this aspect of the Centre because of my teaching background, ongoing academic and professional development in adult learning, and my belief in the value of communities of practice (Wenger, 1998). I find this a useful practical approach to knowing and learning - engaging in joint activities and discussions, helping each other and sharing information.

1.7 Conclusion

Given the growing number of older adults and the drive toward ageing well, this chapter has sketched the background issues:

- the changing demographic profile
- national responses to the increase in the older population and identification of the wider benefits of learning;
- the lack of policies for learning in later life and persistence of ageism;
- awareness of older adults' untapped 'mental capital';
- recent neuroscience insights which are reshaping beliefs about later life and cognitive health;
- a brief profile of the research site.

Through investigating the preferred ways of learning of a sample of adults, there is the potential to gain a better understanding of types of fulfilling classroom experiences. Although this group is not representative of the general population, they are part of an established learning community and it is hoped the study will illuminate some of the issues concerning developing, improving and broadening learning opportunities.

The next chapter looks first, at studies on learning in later life examined prior to the collection of the empirical research and at gaps in the literature; second, gives an overview of relevant developments between 2002 and 2011, and finally, provides an overview of developments in the field of neuroscience and adult learning.

Chapter 2 Literature Review

2.1 Overview

This chapter has, in effect, two literature reviews. Section 2.2 fulfils the need to cover the literature search which informed the empirical study. The following questions guided the search:

- How does the literature portray older learners?
- How self aware are older adults of having a learning style?
- How flexible are older adults in their approach to learning?
- What kind of meaning do older adults place on learning in later life?

Section 2.3 revisits the literature because of the time lapse since the study was carried out. It was important to be able to refer to more recent publications and papers to provide an update where the debate had moved forward. Section 2.4 elaborates on the rich seam of neuroscience discoveries feeding into adult teaching and learning. Oxford neuroscientists Szucs and Goswami (2007, p. 122) suggest:

> "One of the most exciting aspects of educational neuroscience is the ways in which its new technologies can make unique contributions to old questions."

2.1.1 How the Literature review was conducted

The literature review on the field of adult development and learning, educational gerontology, learning styles and learning theory included the following resources:

Education Resources Information Centre (ERIC) database
Electronic Thesis Online Service (EthOS)
International Encyclopedia of Education online
Encyclopaedia of Informal Education online (INFED)
Questia Online Library.

The keywords used were: 'older adults', 'active ageing', 'learning in later life', 'lifespan development', 'adult education', 'learning styles'.

Key resources for the neuroscience search are shown separately in section 2.4.1.

Most referenced papers were accessed online, including journal articles and selected chapters of several books, available through Google Books.
I tapped into various key reports on older adults' learning at the Centre for Lifelong Learning and my own books on adult teaching and learning.

Also, use was made of the University's Faculty of Education Jordanhill Library for *Adults Learning* Journal (NIACE, Leicester).
Main international publications searched manually online:
Adult Education Quarterly, Adult Learning, Annual Review of Psychology, Educational Gerontology, Educational Psychology, International Journal of Lifelong Education, Journal of Educational Research, New Directions for Adult and Continuing Education, Research in Education and *The Psychologist*.
The initial search commenced in 2000 and was restricted to 1990 – 2001. However, some seminal studies in educational psychology and educational gerontology took the literature search further back. Until submitting the thesis, the search continued for newly published work, providing primary and secondary sources of information.

2.2 Literature review prior to empirical research

2.2.1 Conceptual aspects

First, I will briefly outline the concept of age itself and critically assess how older adults have been depicted in the literature to reveal underlying assumptions. How older adults have been portrayed has been closely allied to the state of scientific knowledge about the process of ageing, and to where older adults are positioned on the socio-economic and political spectrum. Examining these, past and present, provided a base for my own research because, whether acknowledged or not, the assumptions educators hold give structure and form to pedagogical activities (Roberts, 2000). The subject of ageing covers more than lifestyle and economics with a vast array of scholarly literature. Birren and Schroots (2001) stated:

> "Aging is one of the most complex subjects for humans to face and for science to analyze, and its subjective aspects have long been reflected upon and written about." (p. 3)

It is not within the scope of this thesis to go into lifespan development, although it is important, in the context of my study, to have an understanding of ways in which the age concept has evolved, as current societal beliefs influence older adults' own horizons and educators' beliefs. The classic developmental psychologists, Freud and Piaget, regarded development as completed in the formative childhood years, and adult developmental psychologist Erikson, (1968, cited in Sternberg, ed., 1995, p. 162) posited that 'mature age' - the final eighth stage of life, spanned the last 30-50 years. These great thinkers left impressions of limited possibilities for change which have lingered on in the "collective unconscious" (*op. cit*. p. 163): they were not wrong but their theories were incomplete (Sternberg , 1995).

The French existentialist philosopher Simone de Beauvoir (1984), best known as a feminist theorist, also set about challenging the negative inferences of later life and highlighted the influence of dominant societal groups in keeping these ideas alive. The tendency to dismiss the experiences and meanings associated with later life stubbornly persist in many spheres and this poses a potential danger because, while our gender and race are (virtually) fixed, we are going to become older persons unless we die prematurely, and how we think about ageing as our

younger selves and behave towards older people *now*, is likely to shape our *own* future. De Beauvoir put it this way:

> "Let us recognize ourselves in this old man or in that old woman. It must be done if we are to take upon ourselves the entirety of our human state."
>
> (*ibid*., p.73)

Cohen (2000) asserted that the current generation reaching retirement age are the first major population to grow up with positive images of ageing. They have probably seen their parents age reasonably well in terms of their physical, mental, social and financial circumstances and they have:

> " looked beyond stereotypes to glimpse what is possible in later life. If it can be good, people are more motivated to give it every chance to be so."
>
> (*op. cit*. p.6)

The extent to which the literature, since the 1930s, reflects this optimistic view will be examined in the next section by looking at representations of older adult learners.

2.2.2 Portrayal of older learners over time

The first empirical studies over 80 years ago were rooted in experimental work on 'trial and error' learning by the founder of educational psychology Edward Thorndike (*Encyclopædia Britannica Online, Edward L. Thorndike, 2009).* This was the era of strong behaviourist orientation when scientific objective methods separated the body and mind, with researchers aiming to establish 'laws' of learning. The basic question the early researchers asked was: could older adults learn at all? Many hundreds of studies were undertaken to examine intelligence and ageing, particularly using timed tests, which created a psychological 'deficit' model, which has been seered into the common consciousness. However, Thorndike left an important legacy of research, which continues with ongoing studies into the effects of ageing on cognition and memory.

Psychologists' investigations into this area (now with many joint studies with neuroscience) have produced a body of work, with data from large-scale, cross-sectional studies, now suggesting that cognitive skills do not "all go together when they go" (Rabbitt, 1993, p. 385). Patrick Rabbitt, former Director of the Age and Cognitive Research Performance Centre at the University of Manchester, and his team have contributed greatly to an understanding of the complexity of memory and learning:

> "….changes are confounded with the accumulation of a lifetime store of information, procedures, and skills, with changes in motivation and in physiological and mental well-being and with individual differences in the complex ways in which diverse genetic legacies play themselves out over very different life experiences."
>
> (Rabbitt, 1993, 19th Bartlett memorial lecture, p. 386)

In one of his studies (*op.cit*., cited in the lecture) 564 individuals aged between 20 and 79 years were compared on a self-paced, reaction time task and it was found that age only accounted for about 9% of the overall variation between individuals. The most interesting effect of age was not that it lowered average scores, but, rather, that variations in ability between the highest and lowest scoring individuals steadily increased with the ages of the groups sampled. The analysis showed a sensitivity to the heterogeneity of older adults and the complexity of how various cognitive abilities were affected differently by the passage of time. Although Rabbitt's research is in the positivist tradition and rooted in the scientific method, his approach demonstrated a different set of assumptions about older learners from Thorndike, as his subjects were portrayed as malleable, vulnerable human beings whose learning abilities were subject to a whole raft of other factors.

American social gerontologist and psychologist K. Warnen Schaie (1994, cited in Fisher, 1998), renowned for his work on the large Seattle Longitudinal Study (1956-2005), has cited a long list of variables that provide positive influences on cognition and reduce the risk of cognitive decline in old age. These include being free of cardiovascular and other chronic diseases; good environment; above average education; work activities involving complexity and challenge and ongoing educative activity. The above studies have the potential to influence practitioners' beliefs about older learners.

The first literature of a practical nature emerged in the USA in the early 1970s, with the establishment of the first graduate programme on the topic of educational gerontology by Howard McClusky [1900-1982], an innovative emeritus professor. Educational gerontology looks at older adults' further growth, learning capabilities, ability to change and improve, and discover new talents. McClusky's own passion for learning, as he grew older, drew him to this subject (Merriam & Caffarella, 1999). In 1973, he presented a keynote paper to the 1971 White House *Conference on Aging*:

> "Education is itself essentially an affirmative enterprise and…is based on the assumption that it will lead to something better in the lives of those participating." (McClusky, 1973b, cited in Hiemstra, 1981, p. 212)

McClusky presented a rationale for learning in later life based on four important needs – coping, expressive, contributive and influence (McClusky, 1971, cited in Hiemstra, 1998). This was a strong portrayal of older adults as proactive learners, seeking out courses in, for example, fitness, stress management (coping), Spanish, local history (expressive), doing volunteer work with a charity (contributive) and being an active member of a pressure group (influence). This was more than a rationale – it was a philosophy, a whole way of life. However, it might only be attainable by people of above-average educational and socioeconomic status (Fisher & Wolf, 1998). In many respects, this also reflects Cohen's (2000) hopes for the 'boomer' generation, of exciting opportunities for personal growth and profound satisfaction with advancing years.

McClusky also had a similar mindset to the influential Cambridge academic Peter Laslett (1987), who was to play a pivotal role in founding the United Kingdom's *University of the Third Age*. Both had great faith in the vitality of mind of older adults and firmly believed they were capable of "a constructive response to educational stimulation" (McClusky, 1973b, *op.cit*., Hiemstra, 1981). However, just how flexible are older adults? While McClusky's model conveys much optimism, action and energy and may fit a robust, retired professor at 70, would it be different for the same person at 85 or for a recently bereaved person at 60, or for a 60 year-old caring for a elderly parent? With circumstances in later life so variable and subject to change, how likely are ways of learning subject to change, to take on different meaning at different times and in different circumstances? Adult educator Fisher (1993) and others have emphasized the importance of viewing later life from the perspective of developmental periods, rather than as a single time frame or on the basis of chronological age.

The developmental model highlights the older adult as an adaptive or creative problem-solver, dealing with change and searching for practical solutions. With this model, the educator does not produce neat answers, but explores ideas, trusts people's integrity and helps learners find their own 'right' answers. This implies a constructivist perspective, with knowing an adaptive activity (von Glaserfeld, 1995):

it means thinking of knowledge as a kind of inventory of successful concepts and actions aimed towards precise purposes, and is analogous to the notion of the adaptation theory of survival (Darwin, 1859), expanded to include the goal of a

> "coherent conceptual organization of the world as we experience it."
>
> (von Glaserfeld, 1995, p. 7)

A final example of how ideas were developing in the UK was expressed through the writings of Withnall and Percy (1994), in their review of seven case studies. They found that the knowledge, skills, attitudes, memories and commonsense that older adults had already accumulated, formed the backdrop, if not the very core of successful participation. They also believed that, by locating learning in later life within the developing framework of lifelong learning, it would bring older adults into the system.

In summary, from the above models of older adult learners emanating from psychologists and educationalists, Thorndike's image (1928, *op.cit.*, Merriam & Caffarella, 1999) was of a person failing slowly, while Rabbitt's (1993) interest was on the widening gap in performance between individuals as they aged; Schaie (1994, *op.cit.*, Fisher, 1998) recognised untapped potential if people stayed fit and well, and McClusky (1973b, *op.cit.*, Hiemstra, 1981) held buoyant beliefs about older adults' capacity to learn, Fisher (1993) emphasised developmental needs at any age, while Withnall and Percy (1994) suggested using and building on past successes. One can detect from these examples an overall tendency for psychologists to look at what was failing and educators to focus on what was going well.

Therefore, when it comes to assessing older learners' portrayal, the current image appears to be driven by the momentum of longer healthier lives and the need to fill a new timeframe. There are some indications that ways of learning may change as life changes. However, little was revealed about how older adults felt about the learning process itself, being in a classroom again, and if they were looking for new types of learning experiences. Thus, older learners' voices were not much in evidence.

2.2.3 Recent Research studies into ways of learning

I will now explore how topics were defined and the assumptions and concepts employed, and in so doing, go some way towards providing a "methodological rationalisation" (Hart, 1998, p. 173) for my own research.

Below is a range of research topics published in *Educational Gerontology*, from its first edition in 1976 through to 1996, revealed by Hiemstra's (1998) analysis. The majority were aimed at policy makers and providers, such as health and fitness (10.7%), attitudes towards ageing (7.4%), international themes (6.7%), or specific themes such as women's issues (2.7%) and so on.

The categories which could be construed as dealing with ways of learning were:

Training and instruction	5.9%	
Memory issues	5.6%	
Cognitive issues	5.5%	
Educational Issues	4.4%	
Communication issues	1.9%	(Hiemstra, 1998, p. 12)

Therefore, only a small number of articles addressed issues involving the actual learning experiences of older adults.

2.2.4 University of Malta 3rd Age Study

The research I have chosen to critique is an interesting comparison to my own university's programme and was located at The *University of the Third Age* (U3A), Malta. The study was conducted by Formosa (2000), a social gerontology lecturer, employed within the University of Malta's European Centre of Gerontology. He adopted a critical Freirian perspective which highlights many of the contentious issues around the purposes of later learning. Unlike the UK's U3A, this programme is run by the University.

The *University of the Third Age* at Valletta, Malta, (known as the U3E) was established in 1993 and grew to around 900 members (2% of the Maltese older population). Formosa's study was a socio-political critique of the way the U3E functioned, with a top-down model of instruction and strong academic control. The research methods he used were non-participant observation, interviews and conversational probes. The data was analysed through conversation analysis, drawing heavily on Freirian philosophy and pedagogy. The study came to the

uncompromising conclusion that, as a result of the traditional mode of educational practice, the U3A failed to act as:

> "an archetype of transformative education, but is yet another euphemism for glorified occupational therapy that is both conservative and oppressive."
>
> (*ibid*.)

Formosa's claim, however, could be judged as an over-statement, although political language legitimately peppers critical theory. As discussed in section 1.4.1, age discrimination is widely experienced in Europe, and Malta will be subject to its share. However, it is debatable whether members of the Valletta U3E would agree they were oppressed, as Formosa earlier commented that many members expressed their gratitude to the U3E "for giving them a new lease of life" (*ibid*., p. 322).

However, he is not alone in advocating a critical stance and drew on the work of many respected critical educational gerontologists (including Battersby, 1990; Cussack, 1997; Gibson, 1986; Glendenning, 1992; Glendenning & Battersby, 1999; Moody, 1987; all cited in Formosa, pp. 319-320): they have asked the ultimate question - whose interests are being served by these older adult programmes? The University of Malta opted for a lecture programme - what Freire would have described as 'banking' education:

> "an act of depositing, in which the students are the depositories and the teacher the depositor."
>
> (Freire, 1972a, pp. 45-46, 49, cited in Formosa, 2000, p. 317).

Formosa's study was innovative in that it provided an alternative explanation of the U3E programme, revealing the university's lack of awareness of its role to encourage members to develop their own perspectives. This was despite the global U3A constitution, which stated that members should be helped to become "agents of change … in the field of ageing" (Formosa, 2000, p. 322). However, Formosa found that the predominantly well-educated members were unaware of the democratic aims, and seemed to identify membership with high-brow culture and the bestowing of a kind of 'university' status, replacing lost job identity. Formosa's critical stance fitted Glendenning and Battersby's critical educational gerontology:

> 'a critique of the dominant liberal tradition involving a negation that education for older persons is essentially a neutral uncontested enterprise."
>
> (Glendenning & Battersby, 1990, pp. 226–228, cited in Formosa, p. 320)

Formosa interpreted people's attendance at U3E as a symptom of the ongoing class struggle which involved people striving to maintain their place in the social hierarchy.

This is an interesting and plausible interpretation within critical theory, but what evidence did Formosa gather to substantiate his claims? He talked about "informal conversations" *(ibid,* p. 322) but it was not clear whether interviewees were selected randomly or purposefully, whether they were spoken to in groups and could have influenced each other's responses, and what conversational probes were used. Some phraseology in the analysis struck me as unusual. For example, he stated that most members were against "the idea of providing low standard education since it would demean the association's role" (*ibid*. p. 323). Was he talking here about a class on basic literacy which might attract people from lower educational backgrounds? Without knowing the questions, it was not possible to be sure.

Leaving aside the political rhetoric of Formosa's analysis, perhaps his most important critique, with universal resonance, is his condemnation of the attitude of lecturers:

> "…as if they were the only being in the room who possesses 'knowledge'….The experiences that older adults bring to the learning situation were neglected." (*ibid*., p. 329)

This approach does a great disservice to any student, but is particularly unfair to older adults who need to link new knowledge to what they already know, to assimilate it into their existing mental constructs. To quote Phil Race (1999), a veteran educational developer and 'senior fellow' of the *Higher Education Academy*:

> "If we simply concentrate on supplying them [students] with information, they are likely simply to try to store this. If we structure our teaching so that they are practising, applying, extending, comparing, contrasting, evaluating, and engaging in other higher-level processes, they are likely to see these processes as central to the ways they should be using their learning."
>
> (*op. cit*., p. 4)

Encouraging this type of classroom activity would go a long way to breaking down 'false consciousness' (*ibid.,* p.326), without discarding the existing programme. With widespread participation of diverse adult learners, it has become clear to learning theorists that there is no one way to learn. Adult learning is too complex, too personal, and too context-bound for one theory to explain everything (Merriam, 2001a). Enforcing one-size-fits-all is:

> "wilfully oppressive when applied to all kinds of people without regard for their unique life experiences… Knowledge is socially constructed and takes form in the eyes of the knower, rather than being acquired from an existing reality that resides 'out there'." (Kilgore, 2001, p. 53)

In a similar vein, writing from a social constructivist perspective, Candy (1991, cited in Merriam & Caffarella, 1999, p. 293) stated:

> "Teaching and learning, *especially for adults*, is a process of negotiation, involving the construction and exchange of personally relevant and viable meanings." (Italics in the original).

Constructivism, particularly social constructionism, suggests that learners are actively involved in a joint enterprise with teachers and other learners in "constructing" new meanings and understandings, which grow out of these social encounters. The implications of this perspective for classroom practice owes much to the writings of Vygotsky [1896-1934] (cited in Mezirow, 1996, p. 160), who argued that understanding is inherently a social rather than a biological act.

In the constructivist classroom, knowledge is not regarded as sound bytes of information, but as a dynamic, ever-changing view of the world. Given that so much is now understood about the importance of individuals connecting what is new to their existing knowledge, and the role of emotion and social interaction in learning (discussed in section 1.5.2), it does seem remarkable that lectures were conducted without "any possibility for free discussion" (Formosa, 2000, p. 324). Later, Formosa makes plain his view of the lecture experience:

> "The U3E's 'banking' character is especially evident when considering that the U3E fails to incorporate dialogue, problem-posing, and the unification of theory with praxis in its pedagogical work." (*ibid*., p. 329)

Formosa's perspective seemed to lean heavily in a postmodern direction, which focuses on the tension between the individual and the social to reveal the dynamics of power relations. A postmodern stance views knowledge as tentative, fragmented, multifaceted, and not necessarily rational, with one individual:

> "holding different and even contradictory understandings of a phenomenon at the same time." (Kilgore, 2001, p. 54)

As an employee of the university, Formosa was, of course, not a detached observer, but enmeshed in those same power relations.

The strength of this research was the way it made visible the context in which the U3E operated: for post-work, older adults in a class-conscious society, it appeared to fulfil a social, rather than an educational need. The University possessed high status, which reflected on the U3A members, and a critical theoretical lens identified the power relations that shaped their society and maintained the status quo. By looking at the socio-historic context through a postmodern prism, it revealed alternative possibilities.

Formosa condemned the lecturers for failing to properly engage, but his line of questioning did not pursue the issue of whether any learning actually took place, leaving some gaps in the data and some assumptions that may not be accurate. Perhaps the members used strategies to make the most of the lectures, through reading and searching the Internet. Were lecturers aware of constructivist approaches to learning (von Glaserfeld, 1995) and the convincing arguments for activation in the classroom (Race, 1999)? Formosa highlighted the shortcomings of the top-down method of teaching, but essentially his focus was the underlying power inequities through a critical lens. He referred to the possibility of older adults having their own learning styles, and to the apparent lack of interest of lecturers in sensing what these might be. However, this was not the direction his research was going and he admitted that the learning styles concept was, in any case, "an arena totally under-investigated" (*op. cit*. p. 330).

In what ways has this in-depth analysis provided me with a methodological rationale for my own research? A critical/postmodern perspective is appropriate where the aim is to expose unfairness, but this was not my intention. What was of particular interest to me about the Malta U3E study was the critique of the teaching method, along with the missing insight into the members' subjective experience of learning. The emphasis was largely on concerns around what was being provided and not about how learning was experienced - not just cognitive processes, but what it felt like as an older adult and a social being with:

> "…a mind, memories, conscious and subconscious worlds, emotions, imagination and a physical body, all of which interact with new learning."
>
> (Merriam, 2001b, p. 96)

Formosa's qualitative methodology (interviews, conversations and observation) allowed U3E members' views to be aired and his own observations to be recorded. In

seeking a better understanding of what the experience of learning is like for older adults, my emphasis will also be on hearing adults' voices, as social beings with the attributes which Merriam cited above, at individual and group level, involving interpretations of social situations, meaning frameworks, feelings, perceptions, understandings and imagining. This will require an interpretivist approach using direct engagement with learners, which will be discussed in full detail in the next chapter.

2.2.5 Ways of learning in U3A groups, England

This next study makes a useful contrast to the highly structured and controlled formal programme in Malta. Two years prior to Formosa's research, Walker (1998) reported on a NIACE *Older and Bolder* small scale investigation, using questionnaires which looked at learning within seven U3A groups located in England. Walker's main aim was not to critique the groups, but to find out what was happening in general, and if many were using the U3A to progress to more formal courses. This might seem quite uncontroversial, but Walker remarked on difficulties arising around the key 'progression' issue. Hidden in the concept was an unintentional subliminal message that the U3A was a stepping stone, and members should 'progress' to better things.

The adverse reaction to this question seemed to confirm to me that the U3A members were like their Malta counterparts - sensitive to the way they were being positioned in the social hierarchy. The report revealed that the deliberate distancing of the U3A movement from the trappings of formal provision - preset targets, outside evaluation and assessed learning outcomes:

"runs counter to current policy and social trends." (Walker, 1998, p. 16)

Walker warned of the danger of remaining totally unconnected and on the periphery, and reflected on whether the U3A, if it remained predominantly a leisure concern, and did not adapt, may turn into a 'fourth age' organisation, bypassed by the newly retired who may want something more structured. Perhaps a way of linking into society would be through intergenerational projects. Then, U3A membership might be perceived as less as a club, and more as a powerful community resource. A more radical U3A agenda would echo what Formosa (2000) was advocating for Malta's

U3E members - raised consciousness about how older adults can influence the world they inhabit.

However, Walker's (1998) article did not reveal anything about how the meetings were run in terms of learning scenarios, just that they "seemed broad enough to satisfy the requirement for mental stimulation" (*ibid.*, p. 16). There were no insights into the ways that produced stimulation. Brookfield (1992), warned there was a risk in responding to learners' felt needs as these were not always in people's best interests:

> "…you also confine people to ways of looking at the world and the habitual ways of behaving which are comfortable and familiar to them. That is not good education necessarily." (*op. cit*., p. 12)

Therefore, the U3A, by its humane nature, and emphasis on equality between teacher and taught, must run this risk. This reinforces my impression that actual ways of learning are often skirted around in investigations into 3rd Age learning, as if productive learning happens automatically just by the very fact of coming together with the desire to learn.

2.2.6 Learning styles and learning strategies

My literature search affirmed that Formosa was correct when he stated that older adults' learning styles were under-researched. After I have sketched a definition of learning styles and how they differ from strategies, I will critique the learning styles study I located.

Learning styles are often thought of as attributes like personality traits – preferring to see something written to listening; graphics and video to reading; hands-on experience before examining detail; time to absorb ideas before trying them out; learning alongside people than alone, and so on. These ways of thinking about learning have been developed by a number of researchers and educationalists since the end of the 1970s, working mainly independently, to create a plethora of LS models. Also, sometimes LS is used as a synonym for cognitive style. Sternberg and Zang (2001) posited that cognitive style "is closer to personality than other types of style" (p. vii), such as being impulsive or reflective. However, one enters the LS field without a guide at one's peril.

My guide was a review of research by Adey, Fairbrother Wiliam, Johnston and Jones (1999), commissioned by *Ofsted*. They made it plain that there were no clear-cut ways to categorise styles. Introducing the review, Adey *et al.* (1999, p.1) stated:

> "Research on learning styles and strategies is full of uncertainties and controversies, and therefore impossible to reach unequivocal conclusions."

As with so many psychological constructs, there is no agreement about a definition, although LS is roughly understood as a preferred way of processing and absorbing material to be learned. What is easier to define is a learning strategy, which is a deliberate action which can be applied in a situation to memorise, manage time or emotions (Adey *et al.*, 1999). These can include techniques such as: mind-mapping, mnemonics, keeping learning logs, taking study breaks, or even listening to background music. These kinds of strategies began to be promoted in the 1970s through books, tapes and videos, and now the field is highly developed with online *'Learning to Learn'* software.

At the forefront of this movement was educator Tony Buzan (1974, 2000). He was possibly the first person to realise the potential of the "cognitive revolution" (Semin and Gergen, 1990, as cited in Mezirow, 1996, p. 160), as the neurosciences began to impact on concepts of learning. Most educators accept that acquiring a clutch of useful strategies and applying these regularly when learning new things, will improve performance significantly for most people. Working in the United States, Twitchell, Cherry and Trott (1996) offered suggestions for teaching techniques and learning strategies, which they claimed were effective in reducing age-related deficits. They also provided general guidelines for learner-friendly classrooms, emphasising that these were good for all ages. However, the psychology studies on which the age-targeted suggestions were based took place in the 1980s and more recent cognitive ageing data is more sensitive to the confounding variables, acknowledging the wide variations within the older population, as discussed in section 2.2.2.

There is no shortage of books to help adult educators organise lessons in a way that is helpful (Caine & Caine, 1997; Race, 1999; Rogers, A., 1996; Rogers, J., 2001; Wolfe, 2001, and there are countless free online resources, such as Derek Bok

Centre for Teaching and Learning (Harvard University), Teachers Tool Box (Cambridge Regional College), Theory into Practice Database (G. Kearsley). Different people express the principles in different ways, but the main ideas include these suggestions:

- make the topic clear and memorable using auditory and visual cues;
- do not overtask working memory;
- introduce activities to aid processing of ideas and transfer to long-term memory.

Many adults will benefit by being encouraged to use mnemonics, imagery and concept mapping (Buzan, 1988, 1998; Buzan & Buzan, 1993, 2000) and to understand themselves as learners (metacognition), their styles, strengths and weaknesses (Lucas, 2001; Rose & Nicoll, 1998). This holistic approach seems to make more sense than trying to counter particular memory deficits, although Twitchell *et al.* (1996, p. 175) would appear to disagree:

> "It is essential that teachers consider older adults' declining abilities."

This gives the wrong message, as all adult classes will have people with differences on innumerable dimensions. Twitchell *et al.'s* view is also challenged by key ageing researcher K. Warner Schaie (1990, cited in Wolf, 1998, p.19), who posited:

> "It's possible that healthy individuals who maintain an active intellectual life will show little or no loss of intellectual abilities even into their eighties and beyond."

Given the heterogeneity of the older adult population and the vast range of subjects, it is incumbent on providers to adopt a philosophy that rejects traditional stereotypes, and the deficit model of ageing with its focus on physical and mental losses, and be adventurous and exploratory when delivering courses.

2.2.7 Learning Styles and the Learning Cycle

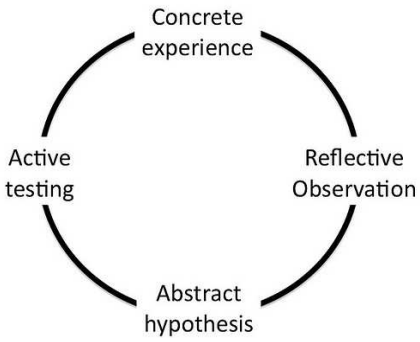
Of all the LS models, Kolb's (1984) has probably been the most influential in prompting new ways of thinking about learning (Brookfield, 1995). Before critiquing the study I located, which used Kolb's Learning Styles Inventory (LSI), it is necessary to explain his learning cycle concept, while avoiding becoming entangled

in his style concepts. Therefore, I will describe it through a research study by English adult learning theorist Peter Jarvis (1987), to reap the benefit of his observations.

Jarvis (1987) used the cycle to research the learning process from a social perspective, which was not totally new as Freire (section 2.2.4) and others had done this implicitly. Jarvis was interested in testing out the two learning processes which Kolb posited had to combine for learning to happen. The first was grasping an experience, and then the cognitive processes transformed the experience into knowledge.

His model had four elements:

concrete experience→ observation and reflection (reviewing)→
formation of abstract hypothesis (creating)→ active testing in new situations.



Jarvis posited that the strength of this model lay in the fact that Kolb started with purposeful human beings (not with animals, like the behaviourists). Kolb's interest lay in exploring the different ways adults responded to concrete experience. Most people recognise that there are different types of learning, but Jarvis emphasised the importance of distinguishing between the conceptual definitions of theorists and the way people talk about learning:

> "If they [people] were asked to explain what they meant by learning they would do so in terms of memorising information within the formal school. This is a social definition of learning, a process that has been labelled as learning." (Jarvis, 1987, p. 8)

Jarvis posited that learning always occurs within a social context and the descriptor - 'the learner' - is also, to some extent, a social construct, so that learning is not just an individualistic psychological process, but is a social phenomenon as well. He stated:

> "Learning is a rich social process and to restrict it to an individualistic process of some psychological research is to render it a disservice."
> (*op. cit*., p. 14)

However, Kolb's simple 4-stage cyclical model has an intuitive logic. His central idea is that learning and knowledge are intimately related and he combined these into a single definition of learning:

> "the process whereby knowledge is created through the transformation of experience." (Kolb, 1984, p. 41)

The experiential learning cycle (experiencing→, reviewing→, creating→ and testing→) can be started anywhere and is a continuous loop. He hypothesised that learning is both an experiential and a reflective process, and from this, he extrapolated that there are four forms of knowledge, each linking to the stages: each learner develops a preference for a certain stage (or combination) and this preference is their LS.

Kolb's LSI was a paper and pencil exercise and Kolb's four styles were named _'accommodator'_, _'assimilator'_, 'diverger'_ and _'converger'_. Armed with an understanding of their style, individuals would be able to comprehend better why they liked some learning processes better than others. For example, one person might enjoy the concrete experience, but not like reviewing; another might enjoy creating ideas, but not enjoy trying them out, and so on. LS raised awareness of adjustments to ways of learning to increase success. For the teacher, the challenge was to create lessons that moved through the cycle and did not miss a stage.

Jarvis (1987) went on to produce a more complex model of learning, with nine potential responses to concrete experience, which included social and emotional dimensions. However, it is not necessary to go into this here. It suffices to say, Jarvis posited that adult learning needed to be understood much more as a socially embedded and socially constructed phenomenon, than as pure cognitive processes. However, Kolb's learning cycle, because of its intuitive simplicity, has endured as a helpful way of enabling practitioners think about certain stages in processing information.

In the UK, Honey and Mumford, in 1986, developed their own version using Kolb's cycle (see Appendix 9), but with four simplified styles in everyday language, as opposed to Kolb's more convoluted conceptual categories (mentioned above):

activists (experiencing→),	reflectors (reviewing→),
theorists (creating→)	pragmatists (testing→)

For approximately 25 years, the H&M LSQ has been widely used in the UK in educational and training settings, to develop students' and professionals' LS awareness. Like many educational tools developed independently, little critical research has been done, apart from the major Coffield, Moseley, Hall and Ecclestone (2004) review. However, it has demonstrated high face validity, and H&M make no claims that the LSQ is a psychometric instrument, but simply a development tool. To that end, they have compiled norms and other statistics:

> "for a target population of trainers/helpers and not for statisticians… to help interpret questionnaire results" (H&M, 2000, p. 58-70).

2.2.8 Commonsense view of learning

As a counterpoint to Kolb's theoretical views of learning, it might be apposite to draw attention to a useful piece of research carried out some time ago by Säljö (1979, cited in Candy, 1990, pp. 35-36) who asked adult students: "What do you actually mean by learning?" Their commonsense responses fell into five main categories, summarised below:

1. Learning as acquiring information or 'knowing a lot'.
2. Learning as memorising - transferring information from outside into the brain to be able to reproduce.
3. Learning as acquiring facts, skills, and methods that are useful.
4. Learning as abstracting meaning. Here the reproductive concept (implied in 1-3) is replaced by a reconstructive one, and learning events and material are seen as the *raw materials* for learning.
5. Learning as interpreting aimed at understanding. Of the five definitions, this is the most complex and links with the learner's value system and the outside world.

Items 1 to 3 were relatively unsophisticated views of learning as something entering one's head from outside. Items 4 and 5 took into account the 'internal' or personalised aspects, which are seen as thinking one does in order to understand the real world. These working beliefs will make for useful comparisons with views of learning that arise in my own research.

2.2.9 Learning preferences among older adults

In Georgia (USA), Truluck and Courtenay (1999) set out to explore if they could detect a particular pattern of learning styles among older adults, with the aim of helping teachers work with older adults. This was largely unexplored territory, but two previous studies had led to conflicting results (Davenport, 1986; Delargy, 1991, *op. cit.)* Kolb's LSI was chosen and the sample consisted of 122 women and 50 men divided into three age-groups 55-65 (23%), 66-74 (46%) and 75+ (31%). They were recruited from community education and Learning in Retirement groups, church groups, *Elderhostel* and residential homes: they were predominantly well educated and economically advantaged, which is a familiar older learner profile (Merriam & Caffarella, 1999).

The results found no relationships between LS preference, gender or age. Nor was LS related to educational level. This confirms the basic premise of the LS construct, that it is not related to IQ score – high and low achievers can have identical LS profiles. They also found the respondents' styles were fairly evenly distributed across Kolb's four constructs, with slightly fewer in the Converger category. While the Kolb's learning cycle has an intuitive logic, his styles are complex combinations of concrete or abstract thinking and active or reflective processing. The Converger style is a mix of abstract conceptualisation and active experimentation. Working out exactly what this would mean in terms of teaching a particular subject is not clear. Similarly, claims made concerning common characteristics for a group as diverse as older adults can only be very tentative.

However, the authors recommended that no single teaching method is used, which is in line with Brookfield's (1992) exhortation, for adults in general, to use "a mix of different methods" (p. 13). With the constraints on working memory for all learners, and evidence that classroom activations are a powerful aid to learning (as discussed in section 2.2.6) teachers who ensure older learners are involved in the active part of the learning cycle are helping people learn. This, of course, is one of the key reasons behind discovering one's LS, to avoid remaining stuck at a particular stage in the cycle.

Missing detail in the study, as far as one can tell, was confirmation that the LS was accurate. If this was not done, then the face validity of the questionnaire

could not be affirmed. Also, there is no detail of how the LSI was administered, and how much discussion was done beforehand with the very diverse groups. This would have a bearing on how the questions were interpreted and answered. However, the authors, commenting on the application of LSI, wrote:

> "..it is a technique to get learners involved in the learning experience, to get them interested in their own learning, and it is method to guide educators in using a variety of approaches." (Truluck & Courtenay, *op. cit*. p. 234)

Thus, I can conclude tentatively from this limited LS research with older adults that it appears to generate a drive towards more imaginative teaching and learning. The lack of research may be because of the considerable effort required to understand the constructs, interpret results, and help a lay audience make sense of them, plus the questionnaire cost. Add to this, the "uncertainties and controversies" alluded to by Adey *et al.* (1999, p. 1), and researchers may have shied away.

In contrast, Peter Jarvis (1987) used Kolb's learning cycle for creative theory building and H&M (1986) embraced it as a stepping stone to developing their own simplified LS model. Using a questionnaire in the manner that Truluck and Courtenay (1999) suggest, requires further investigation and H&M's version may be a more practical instrument.

2.2.10 Summary of Key Findings in Section 2.2

The questions which guided the literature search were:

- How does the literature portray older learners?
- How self aware are older adults of having a learning style?
- How flexible are older adults in their approach to learning?
- What kind of meaning do older adults place on learning in later life?

As far as the first question is concerned, conceptions of older learners are changing with extended longevity and a new timeframe of possibilities. Science is also revealing a new perspective, highlighting the adaptability of older adults, (Cohen, 2000; von Glaserfeld, 1995). The emergence of educational gerontology (McClusky, 1973) with its positive philosophy, emphasised how learning can play a decisive role

in helping people adjust, find a means of self expression, contribute to the community and help shape society.

This vision of older adults as fully integrated and participative members of society has not been realised. They are not a homogeneous group and their lifetime of experiences conspires to influence cognitive, affective and motivational states differently, in ways unconnected to age (Brookfield, 1995; Rabbitt, 1993; Schaie (1994, cited in Fisher, 1998). Despite this, the literature has tended to portray older adults, as if everyone over 50 is at the same life-stage - whether male or female, highly educated or not, immigrant or not, able-bodied or not (Beatty and Wolf, 1996; Fisher, 1998; Glendenning, 2000; Jarvis, 2001).

Limited funding in the UK for research in this field means that current studies have concentrated on the concerns of policymakers and providers, with little attention paid to how people experience learning, and whether they have benefited from the 'cognitive revolution' and active teaching methods (Race, 1999). Also, little is known about older adults' learning styles and flexibility in learning. The Georgia research indicated that a LS questionnaire is a useful tool to help people think about how they learn.

There also appears to be an assumption that once a person enters a classroom, learning just happens. Formosa (2000) revealed that U3E members seemed happy to file into lecture halls, sit quietly and listen. Was this their preferred way of learning – patiently receiving 'deposits' from lecturers, as Freire (1970/2000) would have described it? Or was this really about mingling at the University and maintaining a feel-good factor, or a mixture of both? Similarly, the English U3A study demonstrated how feelings ran high when the feel-good factor was threatened.

Candy (1991) wrote that teaching and learning is about negotiation, building and exchanging useful meanings, while Jarvis (1987) described learning as a rich social process. Put these together and, as educators, we need to know more about ways of connecting, communicating and negotiating in the classroom, so older adults can maximise the gains from time spent together. In other words, we need to know more about the kinds of learning experiences which will generate the greatest satisfaction, intellectual stimulation, emotional fulfilment and focus on older adults' best interests.

2.2.11 Aims of the study and research questions

Based on the findings from the literature reviewed above, and the gaps identified in the existing literature at the time of planning my research (2001), the following aims were identified for my study:

- To explore preferred ways of learning and communicating in adults attending later life classes;
- To determine the learning style preferences of a sample of older adults and examine any emerging patterns;
- To explore the participants' understanding of learning and what it means to them
- To develop a clearer picture of changes in learning style over time, flexibility in learning, tolerance of a mismatch;
- To explore the links between emerging neurobiological research on adult learning and learning in later life.

Research Question

In line with the above aims, the main research question the study aimed to investigate was:

What kinds of learning styles and modes of communication do older adults prefer to use in later life classes and how do these fit with recent insights into neuroscience research and enhancing adult learning?

Based on this, the following sub-questions were developed:

What kinds of profiles would a sample of older adults produce using learning styles questionnaires?

How do older adults think about their own experience of learning and what it means to them?

Do learning styles and flexibility change over time?

What kind of actions are taken if there is a mismatch between preferred way of learning and teaching style?

What are the intersections between best practices in adult learning and current neurobiological discoveries and how might they impact on learning in later life?

2.2.12 Intended outcomes

I hoped that this study would shed light on forms of learning that are particularly apposite for older adults, bearing in mind that learning is a rich social and emotional process, and that a class offers a unique opportunity to bring people together, not only to learn from the tutor, but from each other. There is much agreement that learning has the capacity to shape and enhance people's lives beyond the classroom situation, supporting intellectual growth and contributing to a greater awareness of personal strengths and agency. **There is no one right way to learn**. All the same, learning may be enhanced if educators adjust their teaching to align with best practices in adult education and current neurobiological discoveries about how the brain functions and the type of learning scenarios where people thrive. Then, later-life learning would make a significant contribution to helping people manage life changes that can accompany the ageing process.

2.3 **Literature review: 2002 – 2011**

This section highlights more recent literature of relevance to this study. Various contemporary UK reports were introduced in Chapter 1 – the discussion documents of *Scotland's Futures Forum* (2007, 2009: section 1.2.1), the *Universities UK Study* (Phillipson & Ogg, 2010: section 1.2.2), *The Inquiry into the Future of Lifelong Learning* (*IFLL*) (Schuller & Watson, 2009: section 1.4.1), together with European Commission reports (2007, 2010: section 1.3.1) on active ageing. The documents reflected increasing awareness that the changing demographic profile requires, not only policies extending working life, but initiatives at all levels of governance, embracing active contributions to society by older adults, through volunteering; community and civic engagement; family caring and independent living.

2.3.1 Active Ageing and Lifelong Learning

Despite all the reports, the contribution learning can make to maintaining mental and physical wellbeing does not yet carry much weight, although *The Learning Revolution*, DIUS, 2009: section 1.3.3), the *IFLL* report *Wellbeing, Happiness and Lifelong Learning* (Field, 2009c: section 1.4) and the *Foresight Mental Capital and Wellbeing Project* (Kirkwood *et al.*, 2008: section 1.4.2), all made the case, in different ways, that society loses out if older adults are not strategically supported in maintaining active engagement with the outside world.

The European Commission has propose 2012 as the *"European Year for Active Ageing"*, but it remains to be seen if this makes a real difference and moves the lifelong learning agenda closer to centre stage for all older adults. The major recommendation of *The Inquiry into the Future of Lifelong Learning* (Schuller & Watson, 2009) of a new model of the life stages, with entitlement to learn at each stage, does not appear to have had an impact on practice yet. The need to reduce government debt in the wake of the global banking crisis of 2008, subsequent job losses and high youth unemployment are likely to have played a major part in this.

2.3.2 Recent overviews of the field of educational gerontology

As far as the studies into later-life learning are concerned, there have been two useful reviews – one from the United States (Chen, Kim, Moon & Merriam, 2008) and one commissioned by the UK-based Association for Education and Ageing [AEA] (Anderson, 2008). Chen *et al.* (2008) reviewed five mainstream adult education journals from 1980 to 2006 and identified only 26 empirical studies in the 93 articles, and found that most focused on academic discourses or policy issues. They concluded that article content lagged behind what we already know about the range of cognitive and physical capacities, developmental needs and interests of older adults, and suggested that much of what is actually happening is not being captured in studies or widely disseminated. They also suggested that the portrayal of older adults painted too rosy a picture of successful learning.

The authors eliminated gerontology-specific journals from the review, such as *Educational Gerontology*, so it was not a complete picture of published work. Perhaps this was the reason the critical writings of earlier scholars (Battersby, 1990; Gibson, 1986, Moody, 1987, cited in Formosa, 2000; Phillipson, 2000) were missing. However, it did single out Glendenning (2000) as a questioning voice who challenged the assumptions underlying later learning, including over-reliance on anecdotal evidence of its beneficial effects. They also added authors of books on later life, including the New Zealand educator, Brian Findsen (2005) who has spent time researching in the West of Scotland among underprivileged older adults, and when referring to participation in learning, stated:

> "It is not realistically attainable for the vast majority of seniors who live in a myriad of social and material conditions, some quite depressing." (p. 21)

Perhaps the article writers reviewed by Chen *et al.* (2008) can be forgiven for having a blind spot regarding diversity variables among older adults. Possibly, this was an unconscious attempt to make up for the former imbalance of negativity surrounding later life (De Beauvoir, 1984; Frieden, 1993) and the pervasive belief that "older adults cannot sharpen and broaden their minds" (Mehrotra, 2003, p. 645) . However, it is certainly right that educators move on from thinking in terms of the older adult population as a homogeneous group of eager learners and recognise that many older adults are marginalized, with marked inequalities of access for the least advantaged.

To digress slightly, at national level these inequalities are incompatible with the Scottish Government's goals, which emphasise the importance of lifelong learning, not only as a vital factor in economic prosperity, but also as a way to achieve, "social justice, stronger communities and more engaged citizens" (Scottish Government, 2007, p. 6). It is known that participation in learning in Scotland is slightly below the UK average in respect of age, which Field (2009d, p. 15) has pointed out should be a cause for:

> "significant policy concern given (a) what is known about learning as an inhibitor of cognitive decline and (b) future Scottish demographic trends".

So, for those individuals who have missed out earlier in life especially, ways need to be found to draw such people into learning without being made to feel patronised, on the one hand, or pressurised on the other.

To turn to the second review in question, the *AEA* review (Anderson, 2008) was useful in scoping the shifting landscape of later life from a European perspective. Among other things, it drew attention to the need to change attitudes and perceptions about ageing and the continuing capacity to learn. This highlighted that ageism still lingers, even in the academic and research community, where the field is not generally acknowledged. Anderson also pointed out that learning and teaching methodologies remain under-explored and not fully understood. It was also stated that, with the exception of NIACE and some European projects, there were few examples of learning practices, which was also my experience in my original literature search. However, there are two studies at different ends of the spectrum of later-learning research which highlight the diversity in the field.

2.3.3 New research directions on learning in later life

The first study addressed largely unexplored territory - the disadvantaged referred to in the previous section. Hodkinson, Ford, Hodkinson and Hawthorn (2008) forged an interesting way to explore this issue, with the creation of a new model of retirement. In a nutshell, the authors suggested:

> ".. retirement itself is a process of *becoming*, and learning is an integral part of that process - not something separate from it." (*op. cit*., p. 177)

This rejected the ubiquitous 'learning as acquisition' model for a 'learning as becoming' model. The research was part of a major qualitative empirical investigation called *Learning Lives: Learning, Identity and Agency in the Life-Course*, involving four UK universities and funded by the ERSC and part of their *Teaching and Learning Research Programme*. Over a three year period, 528 interviews with 117 people aged between 25 and 84 took place. Hodkinson's team in Leeds focused mainly on older learners.

They posited that voluntary organisations, leisure-oriented groups, religious groups, social welfare agencies and public helping agencies may be able to provide a better sense of fit for a considerable number of older adults in retirement. These contexts are what Hodkinson *et al.* (p. 181) have identified as "learning cultures", which should be encouraged to bring into their fold the less affluent and less privileged:

> "We need to work to increase the richness of learning cultures that disadvantaged retired people can and do participate in [and] improve the richness of retired peoples' social interactions." (*op. cit*.)

These sentiments reflected some of the ideas expressed more than a decade earlier by Withnall and Percy (1994), writing about an approach to good practice. Rather than adopt an equal opportunities approach (everyone with identical opportunities), their recommendations encompassed the ethical notions of human dignity, human potential and fairness, which recognised, as did Hodkinson *et al.* (2008), that the relationship between dispositions, personhood and learning is predictably complex, encompassing quite different personal and social circumstances, leading to different types of learning.

Recent intergenerational community projects in Scotland, created by the distribution of micro grants (McKechnie, 2009), have also been remarkably successful in this respect, managed independently by communities, local authorities and charities (Elvin, 2011). Illustrated local reports can be viewed at http://www.scotcip.org.uk/Local_Projects.html. Elvin (p.14) remarked on the contribution of older adults to such ventures:

> "the older adults involved have made genuine contributions to regeneration of their communities in partnership with young people."

Learning cultures of the type described by Hodkinson *et al.* (2008) and promoted currently in Scotland (Elvin, 2011) create a win-win situation for communities, children and retired people – and ultimately, for society, with greater social cohesion, less dislocation, and increased wellbeing and happiness. Although my research did not address the issue of disadvantaged adults, it is an important development in the field of later learning. Hodkinson *et al.'s* work is an acknowledgement of diversity, and of the humanity, personhood and learning needs in a little researched area, in which the older adults are often loosely (and wrongly) categorised as non-learners. However, this is a group at high risk of prolonged chronic mental and physical ill health and a dwindling quality of life (alluded to by Findsen, 2005), with accompanying high healthcare costs.

The other study at the opposite end of the learning continuum explored the contribution of studying to the elusive concept of 'quality of life' in retirement (Jamieson, 2007). The target group attended formal extra-mural classes at a London University college, with just over half possessing degree level qualifications. Questionnaires were followed up by in-depth interviews exploring links between quality of life and studying. The results illustrated that education at this level enhanced quality of life in different ways for different individuals. For some, it was the experiential benefits of attending classes, while for others there were personal, value-laden, affective and emotional reasons, but overall the processes and outcome made time spent learning seem like time "well-spent" (p. 22).

To summarise, I have highlighted ways practical policy on lifelong learning needs to be enacted in terms of wellbeing and mental capital, not just work. I highlighted the key observations of Chen *at al.'s* (2008) review which extolled researchers to open their eyes to heterogeneity and inequalities. From Anderson's review (2008) I selected two research studies which broke new ground - Hodkinson *et al.* (2008) and Jamieson (2007), which illustrated two ends of the spectrum within later learning, from community regeneration to studying at an advanced level.

In the next section, I will briefly outline the impact of the Coffield Report (2004) on the learning styles debate, followed by Yang's (2003) holistic theory of knowledge and adult learning, before the final section on the latest research encompassing neuroscience and adult learning.

2.3.4 Learning Styles developments

In sections 2.2.6 and 2.2.7, I provided an overview of the influence of Kolb's (1984) learning cycle and the stages of learning which greatly influenced theory building and learning styles in practice[2]. I also described how Kolb's ideas were successfully adapted by H&M (1986). However, for some time learning styles have been contentious and the debate came to a head when Coffield *et al.* (2004) were directed by the Learning Skills Development Agency (LSDA) to conduct a systematic review of the 13 dominant LS models in further education. The evaluations all encompassed the same aspects and the report claimed that most of the instruments were unreliable and invalid, which evoked a rigorous response among LS followers (Burnett, 2005, Cheminais, 2002, as cited in Raynor, 2006; Dunn, 2004; Evans, Cools & Charlesworth, 2010; Reid, 2005). Raynor (2006) defended the usefulness of learning styles by positing that, when used in well-considered ways, the concept was an essential feature of personalised learning.

Subsequently, Race (2010) has suggested that learning styles are best regarded as different ways that individuals respond to the main factors underpinning successful learning, thus freeing up learners from feeling trapped in a 'style' that predetermines how they go through learning processes. Race, in fact, has created his own model of learning (pp. 21-41) which eschews the idea of styles and a learning cycle, using instead a 'Ripples' metaphor, starting with wanting and needing to learn which starts the 'ripples' of learning in motion, leading to doing and so on. He sees the 'concrete experience' and 'active experimentation' aspects of the learning cycle as having so much in common in practice that they are, in fact, both learning by doing. It is also interesting that, reflecting on learning styles, Coffield's (2008) attitude appeared to have softened in connection with its usefulness as a tool for self awareness:

> "So a deep knowledge of individual learning styles could be used to increase the self-awareness of tutors and students about their strengths and weaknesses." (p. 23)

[2] Kolb is the most cited author in the vast Learning Styles literature or "jungle", as Desmedt & Valcke (2004, p. 445) emotively titled their roadmap of the field - *Mapping the Learning Styles 'Jungle'*.

Thus, while learning styles theorists were exhorted to put their house in order and generate a common language on styles instead of "endless dichotomies" (Coffield, 2008, p. 23), the value of a LSQ as an instrument to explore strengths and weaknesses was acknowledged.

2.3.5 Yang's holistic theory of knowledge and adult learning

The dynamic model of knowledge and adult learning (Appendices 5 & 6) proposed by Yang (2003) was described as "pivotal in presenting new conceptions of learning" (Batista-Taran, Cruz-Ledón & Coombs, 2008, p. 92). Its theoretical framework captures much of what is already hypothesised about adult learning and brings ideas together in an elegant way, drawing on a 'coin' metaphor with its three facets – head, tail and edge. A framework not only helps the researcher make sense of the data but provides a tool for structuring the investigation (Anfara & Mertz, 2006).

The model's epistemological roots are in a belief system that acknowledges the transformative nature of human existence and that learning is powerfully influenced by feelings and emotions, although Yang made no links to neuroscience.
Yang postulated that each facet needs the other facets to make sense of human learning. For example, conceptual knowledge is likely to consist only of sound bites of information without being connected to what we have learned through experience (perceptual knowledge) and to how motivated we are to know these facts (affectual knowledge). In Appendix 5 Yang's model of Dynamic Relationships between Individual, Organisation and Social/Cultural Contexts is displayed and in Appendix 6 there is a table which summarises his three-layered model.

Yang's theory encapsulates three prevailing approaches to knowledge in adult education - empirical/analytic, interpretive and critical (Mezirow, 1996, p.158):

> "Although the differences among the three facets of knowledge have long been recognized, few scholars have examined their unitary nature and their dynamic relationships." (Yang, 2003, p. 114)

Yang's view of knowledge - that learning can be viewed as both an individual and a social activity - recognises the complexity of the relationships that exist among the cognitive, behavioural and affective domains, how they interact with each other and how their combination influences the way people respond to particular situations.

The smaller outer circles in the diagram of the dynamic interactions (Appendix 5) embody the ideas enshrined in the three major learning paradigms (Mezirow, 1996). Technical knowledge resides in the positivist (or objectivist) paradigm, where rational decisions are made based on 'objective facts'. Theory in adult learning assumes to a large extent that the mind and body are split, thus leading to a strong emphasis on cognitive development, information processing, measuring intelligence, and so on. Because this domain is earnestly (even overly) promoted and valued in western culture, this knowledge is often privileged and knowledge gained in the other domains made light of or dismissed. This paradigm on its own now falls short because it denies that feeling and thinking are inexorably connected.

Practical knowledge resides in the interpretivist paradigm. This can be unconscious learning that occurs through practical experience, through living and being, through reflecting on past experiences and on new experiences that lead to new evolving understanding. Awareness of how we learn is a form of tacit, practical knowledge, and although we have naturally evolved ways of extracting meaning from life events, yet we are often unaware of the actual learning processes (Brookfield, 1990). Understanding can include knowledge gained collectively, shared understandings and practical expertise – in other words, the familiar actions and behaviours involved in being an effective and flexible member of a group. This is the domain:

> "where knowledge and information about persons and the world are embedded in the medium of language." (Mezirow, 1996, p. 161)

It is therefore subjective and fluid. However, Yang posits that this paradigm on its own falls short in not separating interpretation from reality, and that all theories, by their very nature, must have elements of conceptual knowledge.

Critical knowledge resides in the third paradigm. A classic example of the application of critical theory is Formosa's (2000) analysis of the U3A in Malta (section 2.2.4). This paradigm deals with liberation from the dominant ideology, deciding values to live by, and learning to live with the contradictions of democracy (Brookfield, 2005b, cited in Merriam *et al.*, 2007, p. 257). Yang's conceptualisation of critical knowledge relates it to feelings and emotions people have for the world around them.

This affectual dimension, holds out promise to illuminate the interactive nature of the three dimensions and this paradigm on its own is not one currently embedded in Western values and culture.

This section has given an overview of Yang's theory in which he synthesised and integrated existing learning theories. He claimed that this theory provides "a strong analytic tool to examine and re-examine common concepts and theories in adult learning and HRD fields" (Yang, 2004, p. 258). Its holistic approach should make it useful counterbalance to neuroscience theories.

2.4 Adult learning and neuroscience developments

> "The old phrase 'Use it or lose it' has gained a new meaning in the age of cellular neural plasticity and adult neurogenesis. Although the idea is extremely simplistic, it nevertheless reflects a correct impression."
>
> (Kempermann, 2006, p. 102)

In the past decade, the enormous growth in understanding brain plasticity has created an entirely new way to consider how learning and achievement take place (Bengtsson, 2009; *Dana Alliance for Brain Initiatives*, 2004, 2005, 2006; OECD 2007, 2008). Cognitive neuroscientists are also providing new insights into the brain's decision-making functions - the 'executive brain' (Goldberg, 2001, 2009). For example, more is now understood about the brain's capacity to retain new information in working memory until the tasks dependent on this information are completed. These executive functions play a crucial role in integrating many processes, including problem-solving and emotional control. As we saw from research discussed in sections 1.5.2 – 1.5.4, the effects of emotions on learning (Damasio, 1994, 1999; Immordino Yang & Damasio, 2007, and others) means teaching involves not only transmitting knowledge, but also nurturing attitudes, beliefs and a classroom which promotes positive engagement.

It is remarkable that neuroplasticity occurs, not only through our experience and actions, but also through our imagination, with Nobel prizewinner Eric Kandel (2006) the first scientist to demonstrate this phenomenon. Now scientists know, for example, that a single neuron, in the space of an hour during intensive learning, can

more than double its synaptic connections from 1300 to 2700. The rapid development of functional neuroimaging techniques has given researchers unprecedented access to working brains, although the cost of this type of research currently, at $600 per participant hour (Varma, McCandliss & Schwartz, 2008, p.143), is unlikely to lead to projects that test large populations. Cohen (2005) also drew attention to studies of mind and brain which showed actual improvements with age, such as left/right hemisphere co-ordination and emotional balance. He also claimed the more complexity, the more protection, which is in line with the concept of 'cognitive reserve', discussed in section 2.4.2.

> "The complex neural architecture of older brains, built over years of experience, practice and daily living is a fundamental strength of older adults. And the more complex the architecture, the more it resists degradation from injury and disease." (p. 8)

In this section, the aim is to provide an update on neurobiological research of relevance to later learning.

2.4.1 Bridge between neuroscience and education

In their book, Battro, Fischer & Léna (2008) provided an overview of major topics, but also gave a warning that public expectations were running ahead of the science. However, Howard-Jones & Pickering (2007) reported a high level of enthusiasm by teachers, and in the past 10 years there have been increasing examples of neuroscientists connecting with educators to produce articles, books and ways to foster creativity (Howard-Jones, 2009). Indeed, educational neuroscience has now become an established venture, with the following developments:

- Organisation for Economic Cooperation and Development (*OECD) Learning Sciences and Brain Research* Project (1999-2007).
- *ESRC* Teaching and Learning Research Programme *(TLRP*) Seminar Series (2007) *Neuroscience and Education, Issues and Opportunities.* involving 400 teachers, neuroscientists, psychologists and policymakers.
- NEnet (Neuroeducational Research Network). A recent initiative, coordinated from the Graduate School of Education, University of Bristol.
- NERVE: Neuroscience Educational Resources Virtual Encycloporta (2008). Access to over 300 educational resources from not-for-profit and other respected sources.

- *Mind, Brain and Education* (MBE) journal launched in 2007, bringing together education, biology and cognitive science, and the mouthpiece of the *International Mind, Brain and Education Society* (IMBES).

> "Research in educational settings will shape the great discoveries to come concerning basic biological and cognitive processes in learning and development." (Fischer, Daniel, Immordino-Yang, Stern, Battro & Koizumi, 2007, p. 2) [Editors of the *MBE*].

While resources for educational neuroscience are focused currently on early education, there is much of relevance that strikes a chord with mature learners. Many excellent websites have been established by scientific organisations with the aim of disseminating knowledge. These include *Dana Alliance for Brain Initiatives (DANA), Learning and the Brain, New York Academy of the Sciences, SharpBrains* and the *Society for Neuroscience*. *DANA*, for example, offers free an online PDF booklet - *Staying Sharp: successful aging of your brain* (2006).

Another example of important information concerns brain training programmes, as older adults are often tempted to buy, although there is a lack of standards (Sylvan & Christodoulou, 2010). *Sharpbrains* publishes consumer guides to inform decision-making. Two top-of-the-range programmes are *MindFit* (Mindweavers, 2008), and *Posit Science* (Merzenich, 2009). Merzenich, at the forefront of brain fitness development, believes scientifically validated programmes will become part of every well-organised older adult's life. *Posit Science* is unusual in having submitted its products to randomised, controlled trials (Mahncke, Connor, Appelman, Ahsanuddin *et al.*, 2006; Smith, Housen, Yaffe, Ruff *et al.*, 2009), but this makes them expensive. Obviously, there is heated debate in the scientific community about what software programmes can actually deliver, compared to less expensive forms of learning (Fernandez, 2009).

However, on the sociocultural aspect of learning, Baltes, Rösler and Reuter-Lorenz (2006) cautioned against a return to a reductionist approach to human behaviour, where people are regarded as mere highly-evolved biological organisms, with the influences of the environment and sociocultural contexts played down. They emphasised the modifiability and constructability, not only of the brain, but also of culture and the environment, to counter the strong focus on the remarkable discoveries around brain plasticity:

> "For humans, the cultural conditions of the environment are as important for brain development as the presence of oxygen." (p. 21)

There is a powerful message in the above statement for adult educators and practitioners, when considering the kind of cultural environments they wish to foster.

2.4.2 Research into cognitive ageing

Studies of cognitive ageing have continued to raise important questions about brain systems, variations among individuals and the lifelong potential for plasticity and reorganisation (Reuter-Lorenz, 2002). Usually a proportion of older adults who attend classes have concerns about cognitive deficiencies although, in conversation, it is usually couched in terms of forgetfulness. Identifying the factors involved in triggering problems could lead to delaying, ameliorating, or even reversing this, starting from the premise that this is not an inevitable part of normal ageing. In section 1.4.1, the concept of mental capital was discussed (*Foresight Mental Capital and Wellbeing Project*, 2008). Deary and Gow's (2008) contribution to this project was to review the substantial literature on the "cognitive ageing trajectories between individuals" (p. 2). Why do people of the same age show such differences in their age-related cognitive decline? The studies they reviewed have taken forward the work of Rabbitt (1993; section 2.2.2) and others, who had exposed a raft of confounding factors. Deary and Gow concluded from current research, involving collaboration amongst biomedical, physical and social scientists, that the most an individual can do to ensure cognitive vitality in later life, are likely to include:

> "adopting cognitively-protective lifestyles, consisting of concerted effort to reduce cardiovascular risk factors and disease and increased activity and engagement." (2008, p. 8)

Educators of older adults should know about the outcomes of such studies and incorporate this discourse into their classroom practice, to inform, educate and disseminate information, when appropriate. International research has shown health literacy is a greater predictor of health than a person's race or ethnicity, socioeconomic status, or level of education (Nielsen-Bohlman, Panzer & Kindig, 2004). This is counterintuitive as one would surmise that a good level of education would predict better health decisions. As far as efforts to learn are concerned, informing older learners that their endeavours (even if they forget details) are

contributing to their cognitive health, is motivating, energising and helping people maintain their best possible mental capital and sense of wellbeing. The role of practitioners in this area, to raise both morale and brain health awareness, should not be underestimated. In a recent article, Wright & Grabowsky (2011) make this point precisely, in highlighting how educators can help people access quality information on the Internet.

A related field of investigation is 'cognitive reserve' (Stern, 2002, 2006, 2007; Whalley, Deary, Appleton & Starr, 2004). This is defined as the tolerance by certain individuals of progressive brain pathology without it affecting day-to-day living. The authors suggested that cognitive reserve is linked to the extent to which one has nurtured one's brain throughout the whole of life, not only by learning but also through lifestyle factors:

> "The cognitive reserve hypothesis conforms with reported associations between early and mid-life lifestyle choices, early education, lifelong dietary habits, leisure pursuits and the retention of late life mental ability."
>
> (Whalley *et al.*, 2004, p. 369)

Therefore the resilience of the brain is a complex mix of environmental and developmental factors.

Neuroscientist Goldberg (2005) also challenged the beliefs and half-truths that our mental abilities are in steady decline. He cited studies showing new neurons in the adult hippocampus as a result of vigorous cognitive activity. He does not deny some mental abilities may decline but there are compensations, and he hypothesised that parts of the brain can grow stronger as we age, better at recognising patterns in complex situations, and as a result decision-making is more intuitive.

Cohen (2005, section 1.5.4) highlighted studies that suggest exercise boosts the neurotransmitters serotonin, dopamine and norepinephrine, all known to help people feel good and alert, as well as assist neural communication. Exercise increases BDNF (Brain-Derived Neurotrophic Factor) - a protein related to the Nerve Growth Factor (NFG), important for long-term memory. NFG also helps support existing neurons and encourages new neurons and synapses. It is active in the hippocampus, neocortex, and basal forebrain - areas vital to learning, memory, and higher thinking. (See Appendix 1 - Brain Maps). More recent studies show the positive effects of aerobic exercise on cognition and brain function (Hillman,

Erickson & Kramer, 2008). If people are to reap the benefits of longer lives, there is a powerful argument for making the brain-body connection one of the pillars of later-learning:

> "Adulthood is not a developmental destination or pinnacle, either psychologically or neurologically. It is the continuing evolution of our brains and our selves that constantly invite us to have a more active hand in our destiny." (Cohen, 2005, p. 41)

2.4.3 Brain-based teaching and the construction of knowledge

In the previous section, I relayed how neuro-imaging has provided a window into the brain at the neuron level. This section looks at what psychology and neurobiology can tell us about how the brain has evolved to process the rich flow of sensory information from the environment (or imagination).

A most important discovery has come through the work of world-renowned experimental psychologist and cognitive neuroscientist Endel Tulving (1972). He has differentiated episodic memory from other kinds of learning and memory systems. Episodic memory is a neurocognitive (brain/mind) system that enables human beings to remember personal experiences – 'first-hand' knowledge. Tulving labelled memories acquired through experience - *'episodic memory'*, because, in the main, we experience everyday life as a series of episodes, which involves the immersion of one's whole emotional and physical self. On the other hand, 'second-hand' knowledge, acquired through hearing or reading, has been known for many years to be more fragile, because it involves only words and thoughts. He called second-hand knowledge *semantic memory* – conceptual knowledge, yet to be applied or experienced. His theory has been extensively refined and elaborated upon and he suggested that episodic memory is:

> "a true, even if as yet generally unappreciated, marvel of nature."
>
> (Tulving, 2002, p.1)

As neuro-imaging has confirmed, learning through experience enriches the brain's connections by activating multiple sensory centres, the emotional centre, the frontal, integrative and motor cortices, ensuring a rich web of synaptic connections (*DANA*, 2004, 2005, 2006; Rose & Meyer, 2002; *Society for Neuroscience*, 2008; Zull, 2006). While numerous studies (as cited in Rogers, Berg, Boettcher & Howard,

2009) suggested slower processing speed, less concentration or overload of working memory in older learners, there are also current training studies looking for ways to enhance and maintain cognitive functioning of older adults through interventions targeting specific processes, like working memory (Borella, Carretti, Riboldi & De Beni, 2010) and research into scaffolding (Park & Lorenz, 2009).

Scaffolding (in neuroscience terms) is a normal process present across the lifespan, involving use and development of complementary, alternative brain circuits to achieve particular cognitive goals: scaffolding also seems to be protective of cognitive function in the ageing brain. Also, Hedden and Gabrieli's study (2004, cited in Rogers *et al*., 2009) indicated that implicit learning and memory (gained experientially) remain relatively stable across the lifespan. However, according to Cambridge researcher Goswami (2004), there are no studies showing that people can learn analytical skills implicitly – that is, the skills that enable educational achievement. He asserts: "These skills most likely require effortful learning and direct teaching." (p. 11)

The implications of different types of memory for teaching are many and varied. Because adults' working memory may be less robust, being inventive when designing a lesson, and building in multi-sensory experiences will maximise the activation of the brain's sensory centres. This implies using audio-visual material, building in activations (exercises, questioning, quizzes, debates, exchange of ideas, humour, stories) to increase good retention. This may sound not unlike Kolb's learning cycle and it is no coincidence that neurobiologist and educator James Zull (2002) has identified a relationship between Kolb's learning cycle (see section 2.2.7) and the way the brain processes information. Zull links neuroscience with learning processes in the brain and describes how areas of the neocortex are enmeshed in networks of other neurons that secrete chemicals of emotion:

> "These chemicals of emotion act by modifying the strength and contribution of each part of the learning cycle." (Zull, 2006, p. 7)

Indeed, he posits that emotions influence our thinking more than thinking influences our emotions. Long-term memory, in particular, is affected by emotions and these emotions, by being embodied in the original experience, are a powerful aid to recall

(Izard, 2009). A model of the experiential learning cycle superimposed on the regions of the cerebral cortex are shown and described in Appendix 3.

Zull's mapping of Kolb's four-stage cycle on to brain processes has elegantly helped to mesh neurological processes with thinking and learning. This is a powerful bridge to finding ways, "to teach with the brain in mind" (Taylor & Lamoreaux, 2006, p. 49). Science, of course, does not map directly on to teaching programmes (Willingham & Lloyd, 2007), therefore it needs the creativity of educators like Zull and others (for example, Caine, Caine, McClintic & Klimek, 2004 and Rose & Meyer, 2002; Wolfe, 2001) to turn the research insights into working models for practitioners to use. Currently, Zull's model appears closest to matching actual brain circuitry. He posited:

> "Learning experiences should be designed to use the four major areas of neocortex - sensory, back-integrative, front-integrative and motor."
>
> (2006, p. 5)

These areas equate with Kolb's familiar learning cycle and provide a useful way of conceptualising how information moves through the brain. This also resonates with Yang's theory that learning must be confirmed or 'tested' against previous knowledge:

> "…experience itself cannot automatically become valid implicit (perceptual) knowledge." (Yang, 2003, p. 109)

This process of making sense of experience happens by connecting with previous expertise, mental models, solutions and routines, either consciously or unconsciously in one's vast network of neurons, driven by what Cohen (2005, p. 31) called the "Inner Push", and what Yang called the affectual facet (Yang, 2003). Zull (2006) claimed:

> "This neurological complexity can be a component of wisdom. It is the biological form of knowledge, and the more complex our knowledge is, the more we are able separate the wheat from the chaff. The promise to adults is that the window to wisdom may actually begin to open." (p. 7)

2.4.4 Neuroscience and the art of the possible

Teaching, unlike science, is adaptive – it is the art of the possible. A number of practitioners and learning theorists have brought their experience and imaginations to bear on neuroscience research. In their publications, Caine and Caine (1997; 2001;

2006) have argued for thinking differently about teaching and learning. They believe that in order to properly understand, or acquire skills, individuals have to work it out for themselves, using their own brain processes. This, of course, has its roots in the constructivism of Dewey and Piaget, whose ideas about learning owed nothing to brain science, but to observation, reflection and analysis (Taylor, 2006). Although constructivism was initially a theoretical perspective, brain research seems to confirm its basic premise: that learning is constructed in the learner's mind. Caine and Caine (2006) suggested:

> "..people who 'get it' have acquired a new way of looking at the world. That means that they can see the problems that they could not see before." (p. 54)

Caine and Caine's solution for 'getting it' is an adequate amount of relevant experience - not more instruction or information, because the perceptual shift needs to be embodied in the whole psycho-physiological system, involving the chemicals of emotion which Damasio (1999), Pert (1997) and Zull (2006) described. This is the embodiment of meaning, which is the everyday experience, when you just know you have just grasped something. Caine & Caine (2006) highlighted the classic trap of teaching adults - aiming too high and trying to do too much. They suggested the remedy is mastering the art of 'scaffolding' – a concept developed by seminal psychologist Vygotsky (1978). The teacher plans experiences (exercises) at an appropriate degree of complexity and difficulty, demonstrates, questions, discusses as needed, and then allows the 'scaffolding' to fade as the learner 'gets it'. Experience is vital because it is only through relevant experiences that the entire intellectual system can be engaged.

> "Learning is more than the acquisition of the ability to think; it is the acquisition of many specialised abilities for thinking about a variety of things." (Lev Vygotsky, *Mind in Society*, 1978, p. 83)

In many respects, the above statement has shades of Gardner's Multiple Intelligence theory (1983/1993: see section 1.5.3) with its premise that within each person is a range of cognitive strengths and styles waiting to be developed.

I believe this constructivist experiential approach to teaching and learning is especially useful for a whole range of subjects attractive to older adults, such as, the expressive arts, learning a language or a musical instrument, using a computer, where

progress develops step by step to improvement. However, adults often feel self conscious about looking foolish in their early attempts. This whole scenario can be a real impediment to learning, so clever use of scaffolding by a skilful teacher is a great morale booster and leads steadily to the time when learners are not just receivers of knowledge, ideas and concepts, but become creators in their own right. There is no greater goal in teaching and nothing better for ageing brains!

Scaffolding (described above) requires trusting social relationships, as development does not happen in isolation. It is part of the core Vygotskian concept of the 'zone of proximal development', which means there is a zone or space where the capacity of the teacher matches the student's expanding capacities. As Caine *et al.* (2004, p. 166) stated:

> "This means that the amount and quality of learning that is possible for a student in any situation depends to a large extent on his or her relationship with an adult [tutor] or teacher."

Recent discoveries in social neuroscience have revealed how important it is to create an encouraging holding environment, where reflection and creative thinking can take place (Goleman, 2006). The teacher's interpersonal connection to the learner creates a biological state in the brain of cascading chemicals, stimulating and enhancing the growth and connectivity of neurons (Cozolino & Sprokay, 2006; Johnston, 2006; Ledoux, 1998, 2002). From Ledoux's (1998) neuroscientific perspective, emotions are not studied as psychological states, independent of underlying brain mechanisms, but as biological functions of the nervous system, which he considers is a more powerful approach (see section 1.5.1). This chemical brain-bath, triggered by social interaction - one form of which is dialogue, can keep the brain alert in a positive, receptive way and lead to greater brain plasticity. Our brains, in a state of relaxed alertness, search and make neuronal connections between the new ideas and what we already know:

> "Reflection, then, is a cognitive process whereby neuronal connections are made; when such connections are made, we have a restructured neuronal map or mental representation of that knowledge." (Johnston 2006, p. 65)

Thus, learning scenarios that are intent on covering a lot of material, may leave insufficient time for learners to make these connections. However, problems that are open-ended, have many possible solutions, that are more likely to occur in the real

world, require the part of the brain (the prefrontal cortex) that makes plans, decisions, and choices and creatively looks toward the future (Zull, 2002). Problem-based learning and case studies, when constructed to avoid clear right and wrong answers would seem to offer an excellent way, "to invoke adaptive pathways of the brain." (Taylor, 2006, p. 78)

2.5 Conclusion

Insights from neuroscience suggest that there are specific ways to create learning environments that maximise neuronal connections and improve retention. Of course, people are different, and research into cognitive ageing has raised important issues about variations and diversity. However, everyone can be helped to greater confidence in their learning ability by gaining a better understanding of different kinds of memory (episodic, semantic, working) which point to storing experiences to be central to human development, with emotion affecting what is remembered. This has encouraged researchers to create new models of learning, emphasising a constructionist approach and empathetic teaching. In line with these developments, excellent science websites have sprung up to inform, educate and advise on developments emerging from the neurosciences.

It would appear that the best developmental environments provide good support, but also challenge learners to leave their comfort zones, so they are at their "growing edge" (Daloz 1987, as cited in Taylor & Lamoreax, 2008, p. 57)**.** It is in this mental state where effort is required that new networks will form:

> "The growth and integration of neural networks is the biological mechanism of all successful learning….Challenges that force us to expand our awareness, learn new information, or push beyond assumed limits can all change our brains." (Cozolino, 2002, cited in Taylor, 2006. p. 84)

Chapter 3 Research Design Considerations

3.1 Overview

This chapter moves to a discussion of research design. It considers various research traditions and presents a theoretical justification for the methods employed. The sources cited include those consulted at the time of planning the research plus more recent commentary on methodological issues by the same authors and other writers.

Aims

In section 2.2.11 the aims of the study are stated in full. In summary, these are to explore preferred ways of learning and communicating in later life; older adults' own perspectives on learning; flexibility and tolerance of different ways of learning; and examine the data in the light of emerging neurobiological research.

Main Research Question

What kinds of learning styles and modes of communication do older adults prefer to use in learning in later life and how do these fit with recent insights from neurobiological research concerning enhancing adult learning? (Section 2.2.11)

3.2 The research pathway

> "The qualitative researcher begins with a research question, moving then to a paradigm or perspective and then to interpretive practices (or methods) that represent the empirical world." (Denzin & Lincoln, 2008, p. ix)

Denzin and Lincoln (2008) suggest a measured approach, a process that involves decision junctures which sets the researcher off down certain paths leading to particular methods. However, decision-making is never totally clear cut, but a process characterised by careful choices. The authors also made reference to the value-laden nature of social science research, research traditions and the researcher's personal biography, when they posited that every researcher:

> "…speaks from within a distinct interpretive community that configures, in its special way, the multicultural gendered components of the research act." (p. 28)

The researcher cannot escape from being of a particular class, gender, age, from a particular ethnic, cultural and educational background, from holding certain beliefs and theories about the world, and being in a relative position of authority. Thus, she or he does not start from some platform of neutrality, and consequently, there are no observations unaffected by personal feelings, interpretations, or prejudice, only observations socially situated in the worlds of the researcher and the researched.

However, despite qualitative research being able to produce only partial accounts, rather than precise explanations, this research process is an accepted form of inquiry, and researchers of virtually all persuasions appreciate its value. Also, because social phenomena are so complicated, different kinds of methods are often needed to unravel these and there is now general agreement that mixing different types of methods can strengthen a study (Creswell, 1995; Greene & Caracelli, 1997; Patton, 2002). Although there are always likely to be unresolved issues concerning mixed methods, with a few researchers adopting the position that quantitative and qualitative methods are "incommensurable opposites" (Niglas, 2000, [Discussion para.1], Patton (2002) posited that researchers:

> "…need to know and use a variety of methods to be responsive to the nuances of particular empirical questions and the idiosyncrasies of specific stakeholder needs." (p. 585)

Also, Green and Caracelli (1997) suggested that paradigms are best viewed as "descriptions of, not prescriptions for, research practice" (p. 8). There has certainly been a shift away from the preoccupation with the different assumptions among paradigms, known as the paradigm wars (Gage, 1989, cited in Burns, 2000) - fighting over the superiority of quantitative versus qualitative approaches. However, it still important to appreciate these different "worldviews" (discussed more fully in section 3.3) - "beliefs or assumptions that guide researchers' inquiries" (Creswell, 1998, p. 74). They lead in turn to the 'strategies of inquiry' (Denzin & Lincoln, 2008, p. 30) which comprise a group of skills, assumptions and practices "that the researcher employs as he or she moves from paradigm to the empirical world" (*op. cit.*, p. 34).

3.2.1 Choosing a strategy of enquiry

Using the research questions at the start makes clear how one arrives at the research methods, providing an opportunity to clarify the data gathering process (Creswell,

1998). The strategies of inquiry chosen should always match the type of knowledge that will answer the research questions. For many researchers this is the determining factor in deciding between qualitative and quantitative approaches (Burns, 2000) and my research question suggests the need for empirical data to be gathered using a mix of methods involving both product (Learning Styles Questionnaire and its questionnaire sequel) and process (discussion of meanings, changes and reactions from different perspectives). Datta (1994, cited in Tashakkori & Teddlie, 1998, p. 11) gave five convincing and practical reasons for 'coexistence' between the two methodologies and their paradigms;

- "Both paradigms have, in fact, been used for years.
- Many evaluators and researchers have urged using both paradigms.
- Funding agencies have supported both paradigms.
- Both paradigms have influenced policy.
- So much has been taught by both paradigms."

Also Denzin (1989) advised:

> "By combining multiple observers, theories, methods, and data sources, [researchers] can hope to overcome the intrinsic bias that comes from single-methods, single-observer, and single theory studies." (p. 307)

Mixed methods research, of course, means working with different types of data although Denzin and Lincoln (2008) posited that all research is interpretive, guided by the researcher's beliefs and that each of the practices that qualitative researchers recruit "makes the world visible in different ways" (p.5).

3.3 Qualitative and Quantitative Inquiry

In this section the differences and similarities between traditional quantitative and qualitative research will be examined, along with the topic of mixed methods.

3.3.1 The limitations of educational research

First, it is essential to accept that it is not in the nature of educational research that a 'gold-standard' methodology, similar to randomised controlled drug testing, is waiting to be discovered. Since human judgement is fundamental to every human

act, it is an impossibility that such judgements are not influenced by personal bias and emotion. As Burns (2000) stated, "the supposed objectivity of science is, in fact, a delusion", (p. 10). Good scientific practice is indeed:

> "a trial and error process, of looking at a problem through multiple lenses, a continual process of action and reflection." (Greenwood & Levin, 1998, cited in Greene, Benjamin & Goodyear, 2001)

It is interesting to learn that even randomised controlled testing, which had been the accepted norm for many years as the ultimate scientific method, has been challenged, with a groundswell of opinion advising doctors to think in terms of "contextual healing" (Brooks, 2008, p. 39) - the aspect of healing that is produced, activated or enhanced in the context of the doctor-patient encounter, rather than by the action of a drug alone.

Similarly, in the transaction between teacher and learner, connections are made between the personal and subjective world of the learner and the impersonal world of explicit knowledge. The teacher bridges both worlds and how well her students learn is not just a measure of what lodges in their brains but is contingent on the implicit 'know-how' and social practices of the teacher as a human being and member of a profession, which also changes as 'rules' and societal values change (Pring, 2000.) Given the complex transactions between teacher and learner, between researcher and researched, the range of contexts, the varying kinds of subject matter and how people characterise learning differently, it is unrealistic to expect educational research in complex settings to provide the kinds of definitive answers that the natural sciences can sometimes deliver confidently. To paraphrase American philosopher Richard Rorty (1931- 2007), the fact that the widespread success of science enables us to cope does not prove that scientific knowledge provides a view of the world that corresponds to some absolute reality (cited in Von Glaserfeld, 1989, p. 124).

3.3.2 What counts as valid research?

In the second half of the 20th century a number of scholars began to question some of the key assumptions of the 'positivist' camp against which their 'non-positivist' research efforts were being judged (Eisner, 1991, cited in Alexander, 2006, p. 207; Guba and Lincoln, 1985, *ibid*., 1989; Patton, *ibid*., 1990; Stake, 1995, *ibid*.).

Positivism assumes objective reality is an entity; it typically adopts a deductive approach and it establishes assumptions about relationships that are independent of experience (Fetterman, 2010). Non-positivist researchers have moved away from a view of validation and reliability characterised by the opposite extremes of objectivity-subjectivity and realism-relativism, towards an emerging lexicon which uses a different kind of language, such as, striving for trustworthiness and authenticity, which are defined as "balance", "fairness" and "completeness" (Patton, 1997a, in Patton, 2002, p. 51). Patton (2002) argued that this is achieved by the researcher's sincere commitment to understand the phenomenon as it is revealed, openly acknowledge intricacies and multiple viewpoints, and be fair in exposing both affirmative and dissenting voices with regard to conclusions reached.

Crotty (1998, p. 41) asked the question – "What store are we asking people to set by our research findings?" He asserted researchers need to clarify whether they are offering their findings as established facts (with some provisos) and likely to be able to be generalised or as interpretations that have been reached in a transparent way and can be judged in that light, as possibly useful (or even persuasive). Crotty takes the view that non-positivism is not automatically qualitative and self-professed qualitative researchers can be quite positivist in orientation, for example, when they talk about 'confirming' or 'validating' their findings by a follow-on quantitative study – "privileging the latter in a thoroughgoing positivist manner" (*op. cit.).*

Rowbottom and Aiston (2006) reflected the exasperation felt by many researchers concerning the so-called methodology wars, when they asserted quite stridently that the divide between the 'positivist' and 'interpretivist' approaches is "a perversely false dichotomy that has become enshrined in educational research " (p. 137) and has created "a dungeon of dogmatism" (p. 154). Without going into their detailed argument, they advocated methodological flexibility rather than rigid adherence to externally imposed standards, and stressed that researchers' concerns should be with the genuine 'fitness for purpose'. They closed by citing the unequivocal message of Sir Karl Popper (1902-1994):

> "Science has no authority. It is not the magical product of the given, the data, the observations. It is not a gospel of truth. It is you and I who make science, as well as we can. It is you and I who are responsible for it"
>
> (1983, cited in Rowbottom & Aiston, p. 154).

Popper's (1963) view, that it is easy to obtain verifications, for nearly every theory led him to posit that falsification should replace verification as the primary aim of science. This perspective which came to be known as post-positivism, has been influential. It is an intellectual attitude which acknowledges most of the criticisms leveled against traditional logical positivism and its underlying epistemologies. However, it also adopts a stance that is critical about what is seen as misunderstandings about positivism itself, namely, that many of the stereotypes about science come from a period when it was dominated by a form of absolutism, which tended to support a view of science as cut-and-dried, and of scientists as all-knowing, on a higher plain, and uninterested in the real dilemmas people face. A modern post-positivist critical scientist believes the goal of science is still to try and accurately portray 'reality', but acknowledges that this goal is virtually impossible.

3.3.3 Philosophical research issues

To bring Sir Karl Popper into the debate is to move to the realms of philosophy which some might argue is less relevant to adult education. The way adult education has developed, more as a field of practice than a profession, it may have been a little later than some in coming to terms with ethics (Sork, 2009). However, certain philosophical questions guide decision-making, such as,

- what do I believe - about human beings, the education of adults, ethics?
- how important are these beliefs to me?
- which basic values drive my practice?

These kinds of issues arise not only in teaching but in the research process. They impart a commitment to certain philosophical beliefs, which contain certain implicit assumptions, principles and values that underlie the process, even if these are not expressed openly. Philosopher of education Wilfred Carr (1995, cited in Bridges & Smith, 2006) suggested that researchers should not dodge philosophical issues and, indeed, have an obligation to grapple with them.

> [Researchers] cannot evade the responsibility for critically examining and justifying the philosophical ideas that their enquiries incorporate." (p. 131)

Educationalist Richard Pring (2000) also emphasised three aspects that researchers cannot avoid. First, there are the philosophical questions about the distinctiveness of

'educational practice', second, judgments about the relevance of the social sciences to such an inquiry, and third, how accessible the language used to describe the study is to practitioners in the field. His concerns are rooted in the widespread criticisms of much qualitative educational research, of its irrelevance to policy and practice, its lack of rigour, and that it is conducted in a piecemeal manner in a controversial biased way.

It is true that different researchers use concepts in different ways, especially when discussing the elements relating to methodological approaches with roots in different philosophical traditions. Denzin and Lincoln (2008) talked about *paradigms* (as discussed above in section 3.2), Patton (2002) referred to *theoretical traditions*, Merriam (2002) used *theoretical stances* and Crotty (1998) *theoretical perspectives*. So it is clear that there is endless debate about appropriate terminology and what is meant. It is a question of how one believes one can tap into social reality:

> "…and the criteria for judging the adequacy of knowledge and for distinguishing between scientific and non-scientific knowledge."
>
> (Blaikie, 2007, p. 5)

These complex debates and the major dilemmas that social researchers face are ongoing. My own epistemological awareness is based on constructing knowledge from relevant, contextual evidence. Therefore, knowledge is essentially provisional, personal and relative, in line with a stance that highlights the role of interactions, language and situatedness, sharing views and connecting one's perspectives with that of others. This subjectivist theoretical preference shaped my constructivist approach to the research process.

3.3.4 Planning a research strategy

Beliefs about the nature of knowledge

The philosophical debates are unlikely to disappear but what matters is an appreciation of our assumptions about the kind of knowledge we hope to generate. The labels 'qualitative' and 'quantitative' are still used as a kind of shorthand, with an understanding that, at the core of qualitative inquiry is the desire to make sense of the meanings and purposes - processes more than consequences. On the other hand, at the heart of quantitative research is data that can be evaluated statistically and

manipulated arithmetically, to yield a numerical indication of the significant of the result.

It is obvious from what was discussed in 3.2 that to design a piece of research is more than just randomly choosing methods from 'menus', but involves designing a strategy that has a logic and a set of steps that will lead from the questions to useful answers (Anfara & Mertz, 2006; Blaikie, 2007). Therefore, it is a matter of selecting the best elements from available strategies and drawing on past experience and accumulated insights from relevant literature. However, Blaikie (1993), also stressed, that researchers should "choose an approach which suits their purpose, prejudices and personality" (p. x). With these words, he is encouraging a choice of strategy that, in the final analysis, rests on personal judgement. The researcher is not neutral as Denzin and Lincoln (2008) affirm when they state: "Questions of inquiry always begin with a socially situated observer" (p. ix). For example, in the preamble to their report *Learning Through Life: Inquiry into the Future of Lifelong Learning* Schuller and Watson (2009) made clear their values:

> "We begin from the premise that the right to learn throughout life is a human right. Our vision is of a society in which learning plays its full role in personal growth and emancipation, prosperity, solidarity and local and global responsibility." (p. 2)

Koro-Ljungberg, Yendol-Hoppey, Smith and Hayes (2009, pp. 689-690) pointed out that a theoretical perspective and the epistemology embedded in the theoretical perspective can indicate the types of knowledge guiding a research project. They have built on Crotty's (1998) definition and have devised a useful table drawn from past and current qualitative research methodology literature. It gives examples of choices that are likely to be associated with particular epistemological and theoretical stances. They argue that transparency about decision junctures is a key element of good open qualitative research, along with instantiation of methods and methodological transparency. This is in alignment with the views of philosophers Carr (1995) and Pring (2000), as previously discussed.

Practitioner research

As a practitioner researcher, I interacted closely with the researched to create an environment of trust and openness for discussion and reflection. However, the issues arising from practitioner research relate to the results, as traditional notions of scientifically sound research demand that the researcher is an `objective outsider' meeting participants where there has been no previous relationship and no prior knowledge (Denzin & Lincoln, 1994). With insider research, the concept of validity becomes problematic because of the researcher's involvement (Rooney, 2005), with blurring of the boundaries. However, this view is based on the premise that there is an objective world where reality awaits inspection. The subjectivist epistemological stance (Rorty, 1979) adopted for this research, stands in opposition to this.

This aspect is designated an axiological issue (Creswell, 1998, p. 75) which means there will be inevitable biases as I bring my own preoccupations, concerns and worldview into play in the analysis and interpretation. I would argue that the flaws of insider research are applicable to almost all research. I was conscious of the socially situated character of this study and I have tried to make my position and the research process as transparent as possible. The task was to uncover other people's perspectives, which were equally valid as my own (Cohen *et al.*, 2000). Validity then attaches to the meaning that the participants gave to the data and the inferences drawn. Thus, from the authentic words of the participants and my interpretations, I believe readers have enough information to construct their own perspectives. These assumptions lead to a qualitative study within an interpretivist paradigm.

Methodological options

There are many variants of qualitative, naturalist approaches, but all have the central aim of understanding the subjective world of human experience. My own decision had to be based on the appraisal of available options. Denzin & Lincoln (1994, 2008) drew up four interpretive paradigms for qualitative research – positivist and postpositivist, constructivist-interpretive, critical. Formosa's (2000) study (section 2.2.4) was a clear example of rare critical research on third-age learning (with postmodernist overtones). However, my questions were not addressing issues of class, unfairness or power, although these issues underlie all opportunities. Withnall

and Thompson's (2003) study was a deliberate shift away from the more usual survey (Dench & Regan's [2000] government-sponsored study), to a qualitative approach aimed at understanding later learning from a life-course perspective. This biographical approach (Creswell, 1998, pp. 47-51) is one of the recognised qualitative traditions, which primarily uses interviews. Although participants in my study would be asked to think back and relate their current LS to earlier learning, the research questions were not related to life course stages. Therefore biography was not appropriate. Creswell (1998) designated the other four traditions as phenomenology, grounded theory, ethnography and case study, which I discuss briefly below and state where they sit regarding my own research.

A case study (Creswell, 1998, 61-64) is a familiar concept, as it is used in other well-publicised fields, such as medicine, business and journalism. Different researchers interpret a 'case' differently - for example, Stake (1995) described it as the research object, Merriam (1998) considered it a methodology and Yin (1994) viewed it as a research strategy. A case always involves a situation within clear boundaries. However, what was of interest in my research was not the situation within the Centre for Lifelong Learning (CLL), but how learning preferences were perceived. Had the research been aimed at building a better understanding of what went on within the CLL, reaching out to tutors, providers and so on, then a case study approach would have appropriate.

Ethnography (Creswell, 1998, pp. 58-61) is also a well-established naturalist form of inquiry which uses many data gathering methods, such as field notes, interviews and observation, to help understand a cultural phenomenon. There is an overlap with case study, but it differs in that it usually involves an extended period of involvement. The drawback is that the group may be altered by the prolonged presence of the researcher, thereby skewing the data. The CLL (see section 1.6) could lend itself to an ethnographic study as the programme is a well-established learning hub. However, neither the setting, nor the learners' characteristics, nor how well the programme fitted into the university culture, were aspects that were relevant to the research questions. Both case studies and ethnography have also been criticised for the volumes of data generated.

Moving on to phenomenology (Creswell, 1998, pp. 51-55), which is a search for the essence of a phenomenon, relies heavily on the intuition and imagination of the researcher. It involves a suspension of judgment about what is 'real', using approaches inspired by the transcendental philosophy of Husserl ("I live in my Acts", cited in Jarvis, 2005, p. 6). According to Burns (2000), it is a method which aims to describe "direct experience, taken at face value" (p. 23). Thus, phenomenology had the potential to address issues around learning preferences through a process of extended interviews and substantial periods of researcher reflection. However, in its purest form, the researcher is expected to adopt a role of total detachment. This runs counter to my position as an insider and also clashes with current neurobiological theory concerning the indivisibility of cognitive and affective domains (Damasio, 1994). However, aspects of phenomenology, such as analysing meanings, meaning themes and general descriptions of experience, I anticipated would be a central part of seeking out a deeper understanding. Therefore elements of phenomenology would be useful, but not in its purist form.

Although I did not plan to develop a theoretical model, features of grounded theory (Creswell, 1998, pp. 55-58) provide a system of coding data and generation of meaning themes which guide analysis. Creswell (1998, p. 56) traced the initial concepts of Glaser and Strauss (1967, *op. cit.)* to Strauss & Corbin's (1998) elaborations – in their own words, "cluster of very useful procedures, essentially guidelines, suggested techniques, but not commandments" (p. 4). An interview with Juliet Corbin (Meetoo, 2007) 40 years after the methodology was introduced, is illuminating:

> "The only criteria (sic) is that, if you call it grounded theory, you have a theory. Otherwise, call it grounded description. There's nothing wrong with grounded description - but we shouldn't confuse building theory with doing description. Both are valuable and make a contribution to knowledge and science." (p. 14)

In this statement, Corbin confirmed that grounded *theory* is not the only legitimate outcome. This runs counter to the way it has been presented generally. For many researchers, it has provided a template of explicit strategies, procedural rigour and seeming objectivity "stamped with positivist approval" (Charmaz, 2008, p. 205). For example, Creswell (1998) stated that the grounded theory process is systematic,

follows a standard format and the investigator "needs to recognize that the primary outcome is a theory with specific components" (p. 58). Patton (2002) believed the popularity of grounded theory (especially in doctoral theses) "may owe much to the fact that it unabashedly admonishing the researcher to strive for objectivity" (p. 127), thereby adding an aura of scientific rigour. Corbin would now appear to be more yielding concerning this formulaic description.

Charmaz (2000) has argued consistently for adopting grounded theory guidelines as tools, but dropping the positivist assumptions that "data simply wait discovery in an external world" (Charmaz, 2008, p. 206). She reinforces a constructivist approach, which emphasises that our conceptual categories arise through our interpretations of data rather than "emanating *from* them or from our methodological practices" (*op. cit.)* She believes that data needs to be informed by theory as what we know shapes what we 'discover', and that grounded theory's cloak of 'neutrality' is an illusion. Therefore Charmaz's version of grounded theory seeks answers to emerging theoretical questions allowing us to learn about the participants' worlds.

Mixed methods approach

In my research, I intend to use a number of different lenses to analysis the data - Yang's (2003) theory, neuroscience research and Gee's (2005) discourse model. Therefore, what emerges is a mixed methods study which does not fit neatly into any single research tradition. According to Creswell (1995, cited in Tashakkori & Teddlie, 1998, p. 18) an 'equivalent status design' probably best describes my approach, as there is approximately equal weight given to quantitative and qualitative data. At the time of planning my research, I did not have the benefit of Koro-Ljungberg *et al.'s* (2009) table of methodologies which included social constructionism (p. 690), which incorporated many of the above-mentioned aspects:

> "Social constructionism cannot be reduced to a fixed set of principles but is more properly considered a continuously unfolding conversation about the nature of knowledge and our understanding of the world - scientific or otherwise." (Gergen, 2004, p 183)

Social constructionism stems from a relativist epistemological position and aims to account for ways in which people are actively engaged in the construction of their

own subjective worlds (Burr, 2004). Therefore social worlds are "interpretative nets woven by individuals and groups" (1994, Marshal, as cited in Crotty, 1998, p. 54). Social constructionism emphasises the importance of culture and context in understanding and constructing knowledge, in the manner Charnaz (2000, 2008) implied. Social constructivism was also discussed in 2.2.4, in connection with learning being a joint enterprise between teachers and learners. My research was conducted in the same interactive spirit, with a potential pay-off for participants in terms of deepening their own self knowledge, not only through reflecting on the results of the LSQ, but also through learning from each other in focus group discussions.

Regarding the mixed methods aspect, there is, as yet, no agreed taxonomy. Niglas (2000) in her critical review of mixed methods, cited the work of Brymen (1988, *op. cit.)* who identified ten different ways of combining qualitative and quantitative research, Greene et al. (1989, *ibid*.) who developed a system consisting of five purposes, and also Patton (1980, *ibid.)* and Creswell (1995, *ibid.)* who included the topic in their textbooks. In one of the latest books on mixed methods by Plano, Clark & Creswell (2011, p. 2), they drew attention to the way this genre has gained momentum and cite other writers' confident language:

> "mixed methods has been called the 'third methodological movement' (Tashakkori & Teddle, 2003, p. 5), the 'third research paradigm' (Johnston & Onwuegbuzie, 2004, p. 15) and "'a new star in the social science sky' (Mayring, 2007, p. 1)."

The authors proposed that this upsurge may be due to the multiple ways of presenting information in everyday life through media communications (for example, scientific TV presentations with scenes of charts and graphs changing seamlessly to interviews on location). So, in this way, mixed methods have become a natural outlet for research.

To summarise, my own orientation matched a constructivist approach, which confirmed lining up my research with qualitative assumptions. I believe people actively construct or make meaning of their experience, they endeavour to make sense of what ensues, appraise it using their current belief system, and then sum up what the experiences means to them. Therefore, the research paradigm brought to bear falls within Denzin and Lincoln's (2000, 2008) constructivist/interpretive

framework, which looks for details about preferences, motivations and actions, which are not easily tested or identified in other cases, but nevertheless should provide insight into how learning has been experienced and possibly allow reflection on more widely applied features.

At the same time, completing a H&M LSQ (2000) and a post-LSQ began the process of helping participants tune into learning ideas. Both the quantitative and the qualitative data will be used equally to understand the phenomenon of learning preferences – an 'equivalent status design'. Therefore, it is accepted that conclusions must, by their nature, be tentative and it will be possible to conceive of alternative plausible explanations (Charnaz, 2000, 2008; Cohen, Manion & Morrison, 2001; Patton, 2002; Strauss & Corbin, 1998).

The next three sections look at the methodological issues concerning questionnaires and focus groups, including data collection methods for H&M's (2000) LSQ, the post-LSQ and focus group discussions.

3.4 Questionnaires

The underlying assumption behind any questionnaire is that the respondent will cooperate to provide truthful answers and everyone will extract comparable meanings to produce comparable data (Burns, 2000). If one is compiling a questionnaire, then the challenge lies in using language unambiguously. One way to do this is to have two or more fixed alternatives covering every possibility, making greater uniformity in measurement and creating greater reliability. The downside is that the answers can be superficial and can annoy respondents. However, if closed items are used judiciously at various places, the weakness can be overcome.

At the other end of the scale are open-ended questions which allow a "richness and intensity of response" (*op. cit.*, p. 572). There are no restrictions on either content or type of reply, but the way the question is formulated has to be thought through carefully. Then there is the challenge of coding the various replies. Complex questionnaires are usually tested to weed out misunderstood phrases or nuances that may strike a discordant note and affect responses to other questions, or even lead to refusals to continue. Scale items are another type which allows degrees

of agreement or disagreement on a scale of fixed alternatives – ranking in order of preference or just as a checklist. Some examples of problems over questions have been already discussed already, for example, Dench and Regan, 2000 (section 1.2.2); Withnall and Thompson, 2003 (section 1.2.2); Walker, 1998 (section 2.2.5).

3.4.1 Learning Style questionnaires

The normal method of investigating learning styles is to use a self-report instrument which allocates individuals into pre-ordained categories based upon the theorists' conceptualisations. Kolb's (1984) LSI and H&M's (1986) LSQ are based on the experiential learning cycle. I have provided (section 2.2.7) the background to the rationale behind this model. Kolb's four styles are 'accommodator' (activist), 'diverger' (reflector), 'assimilator' (theorist) and 'converger' (pragmatist) - the names in brackets are approximately the H&M equivalents (Sadler-Smith, 2001, cited in Cuthbert, 2005, p. 237). While these descriptors do not cover all the key components of a learning style, they provide an accessible view of one's "learning personality" (Lucas, 2001, p. 96). An important aspect is that learning styles are seen as stable aspects of personality and unlikely to change in the short-term (Cuthbert, 2005). Obviously, there would be little value in administering a styles questionnaire if a person's style were to fluctuate greatly over a few months. H&M (2000, p. 17) stated that learning style preferences "have probably developed quite unwittingly over a period of time".

I have given a brief overview (section 2.3.4) of the additional controversy that erupted around learning styles when Coffield *et al's* (2004) published their major report, positing that emphasis on learning styles was unwarranted. However, H&M have not modified their LSQ, and indeed it is now offered online. I have also pointed out that Coffield (2008) conceded that the H&M questionnaire could be a useful development tool, with one of its strengths its use "as a starting point for discussion and improvement with a knowledgeable tutor" (Coffield *et al.*, 2004, p. 77). Honey (2002), when asked to respond to Coffield's criticisms, defended the questionnaire as a development tool:

> "It is purely designed to stimulate people into thinking about the way they learn from experience which most people just take for granted."
>
> Honey (2002, as cited in Coffield *et al.*, 2004, p. 75).

3.4.2 Advantages of H&M's LSQ

An obvious advantage is that its language does not use pedagogic terminology, but asks everyday questions about everyday behaviour (see Appendix 10). Because so much learning happens at an unconscious level H&M (1986) chose, unlike Kolb, "to refrain from asking direct questions about how people learn" (p. 9). The creators posit that this gives it greater face validity: face validity is the quality of an indicator that makes it seem a reasonable measure. There are 80 statements (not actual questions) which all require a straight 'agree' or 'disagree' response, such as:

- *I actively seek new experiences*
- *On balance I talk more than listen*
- *I am careful not to jump to conclusions*

Second, the questionnaire was an incentive to people to participate in the research, and come perhaps "to realise, often for the first time, that learning is learnable" (Honey, 2002, as cited in Coffield *et al.,* 2004, p. 75). In other words, there was something in it for them, which was also in the spirit of the research as co-constructors of knowledge. Third, H&M's (2000) guide to introducing and administering the LSQ, and also the handouts on styles descriptions and scoring, allowed consistency across groups, with the process taking an hour and a half. Fourth, the H&M LSQ was licensed within the University, and also I was familiar with Honey's ideas. Therefore, it was a pragmatic choice.

3.4.3 Disadvantages of the LSQ

1. As with all questionnaires, while it is relatively easy to administer, it is time-consuming checking results (the results were self-scored) and collating the material.

2. Because it depends on self reports, answers could easily be faked. However, this is largely overcome when people are assured that it is an aid to development with no right and wrong answers.

3. With only a binary choice (tick or cross), some people feel uncomfortable having to respond in this way, but can be reassured that the questionnaire is designed to reveal general tendencies, not give a detailed personality analysis.

4. Because there are 20 statements on each style, many closely associated items make it appear repetitious. This apparent repetition needs to be explained.

5. Like any classification, a learning style is a simplification but people may begin to attach labels to themselves (and others), then begin to define themselves by LS.

Thus, to sum up, administering a LSQ needs more than superficial knowledge of the LS concept, to convey to respondents what they are being asked to do, what the questionnaire is measuring, and to be able to respond to questions. H&M also instruct anyone planning to administer the questionnaire to complete it personally to understand the scoring system. These procedures are outlined below.

3.4.4 Administration of the LSQ

General scene-setting remarks were important to put the process in the context of my research project and emphasise that the LSQ was a self-development tool, not a test. Nothing was said at that stage about the styles the LSQ is designed to probe. The participants were provided with a copy of the LSQ (Appendix 5) and also a few written instructions compiled from H&M's protocol. These reiterated the self-development aspect and emphasised the necessity not to miss any. People completed it at their own pace, and I circulated to ensure everyone was underway.

The guidelines in the LS Helper's Guide (H&M, 2000) were followed closely and, before scoring, the recommended procedure (*ibid*., p. 18) of explaining the learning cycle was done and the H&M handout of the four general style descriptions was distributed (Appendix 6). Participants were invited to underline any phrases typical of themselves. Then, the LSQ score key sheet was distributed with instructions to circle the numbers ticked and add them up on the four columns. This 'unscrambles' the items and provided four raw scores, which are then plotted on to the learning styles chart based on general population norms (*ibid,* p. 14). When joined up, the line indicates which of the five bands into which the score falls – from 'very strong preference' to 'very low preference' (see Appendix 12).

When this is complete, each person called out their LS which was recorded on a flipchart for 'Very Strong/Strong', Medium, and 'Low/Very Low'. A full table of raw scores and learning styles is available in Appendix 16. A discussion followed to allow people to reflect on the process and share impressions. This was not

recorded and was for the benefit of participants to help make sense of their profile and was done in the spirit of being a reflective partner in the research.

3.4.5 **Post Learning Style Questionnaire** (See Appendix 13)

Because a self-scoring sheet was used which I wished participants to retain, I had compiled a one page post-LSQ where the raw scores were recorded, together with answers to follow-on questions. At the foot, there was a section for permission to use data anonymously. The additional answers in this document helped to flesh out the LS profiles and provide further insights into styles. The results were sifted into categories and are represented in the form of tables and charts in Appendices 16 – 21.

3.5 Sampling

3.5.1 Background

I have given a bare outlined of the background to the 3Ls programme (see section 1.6.2). In 1995, Hart and McMellin undertook a survey of the student population which showed that approximately 71% were female with almost 95% aged between 50 and 70, 54% between 60-69 years, and 5% over 69. Almost 90% were not in employment, although 25% of this group expressed a desire for some kind of part-time work. 82% identified themselves as former skilled members of the workforce or professionals and it is likely that the 17% in the 'housewives' category were married to skilled or professional men. Only 0.5% of people were classified as unskilled manual.

This demographic profile is fairly typical of the clientele on university-based community programmes, with the 'learning-rich' coming back for more (Sargant, 2000). Reasons for being attracted to a dedicated 50+ programme was learning with people with shared interests and experience, and a supportive learning environment (Hart & McMellin, 1995).

3.5.2 Demographic profile in 1999- 2002

Below is Table 1 showing registrations for the 3 years leading up to my research.

Age Band	1999-2000	2000-2001	2001-2002
<50	13	5	27
50-59	445	533	646
60-69	1111	1083	1162
70-79	386	337	403
80-89	31	40	21
90-	3	0	3
n/a	402	671	453
Total	2391	2669	2715

n/a: Not available. Date of birth not supplied.

Table 1: Demographic profile of learners at the Centre.

The majority are aged between 60–69 which is reflected in my five groups. Also other demographic aspects are similar.

3.5.3 Opportunity sampling

"The key word in the sample population is representativeness" (Burns, 2000, p. 83.) There is no question of the 3Ls students being representative of the population in general, therefore no valid generalisations can be made to other populations as one could with a random sample (Cohen *et al.* 2000). As the 3Ls programme continues, the average age of the student population is increasing, as students return to classes into their seventies, eighties and even nineties.

Age Band	**2001-2002**	**2008-2009**
<50	27	150
50-59	646	211
60-69	1162	1620
70-79	403	901
80-89	21	132
90-	3	5
n/a	453	108
Total	2715	3127

n/a: Not available. Date of birth not supplied.

A comparison between 2001-2002 and 2008-2009 shows that the number of people in the under 50 bracket increased and those in the 50-59 bracket fell. This phenomenon may be the influence of age discrimination legislation admitting younger people, and more people in their 50s remaining in the workforce. Interestingly, the number in the 70-79 group more than doubled and in the 80-89 group increased about six-fold. This points to the ageing of the 3L student population in line with society in general.

Table 2: A comparison of learners' profiles at the Centre between 2001/2 and 2008/9

Research was carried out on accessible groups (Cohen *et al.*, 2000), which involved choosing those nearest individuals to serve as respondents. This is, of course, a limitation of the study. All the students volunteered, but "we never know whether volunteers differ in some way from those who do not" (Burns, 2000, p. 93). However, opportunity samples are valuable in exploratory studies and it is debatable whether one could attract older adults from the general population for this research. People participating in learning in later life have a bias towards valuing learning, which does not appear to exist in the general population, given the low numbers of older adults attending classes in general (Phillipson & Ogg, 2010; Schuller & Watson, 2009). However, although this is an accessible sample, it was hoped they could provide insights which would illuminate learning later.

3.5.4 Participants in the sample

In general, the participants were well educated or from economically advantaged backgrounds, although some had experienced further education through job training such as nursing, rather than attending colleges and universities. Some women married to professional men (classed as housewives in the past) had missed out on work-based opportunities to learn. This gender difference, as opposed to class difference, in the current ageing population is sometimes overlooked.

Being involved in educational research as a participant rarely has instant appeal and recruitment usually is done through gatekeepers. I attempted to widen recruitment by advertising for volunteers within Centre through posters and leaflets, but the response was minimal. I put this down to constant requests for research participants from other university departments. I recruited through face-to-face presentations about the questionnaire's usefulness in helping people understand how they learn. There was a novelty aspect to this, with only one person having completed one before.

Although the research involved focus group discussions and everyone had been invited to participate in this, there was a sharp drop in numbers, although attempts were made to negotiate different times. However, this turned out to be problematic, partly due to spring holidays. On the plus side, the smaller groups

provided opportunities for participants to contribute more fully to the discussion. In Appendix 14 there is an overview of each of the groups involved in completing the LSQ accompanied by a descriptive profile. For clarity, in Appendix 15, there is a separate list of focus group participants, with a descriptive profile of the signature themes of each group.

I accredit the success in recruiting from my own classes to the fact that I had built a relationship of trust, and there was camaraderie among students after ten weeks learning. The classes were over before the research process began. Therefore, everyone who volunteered did so because of their own interest in completing a LSQ. As far as the Computer Club is concerned, it was a self-managed group, although I co-ordinated the buddy project and had contact regularly with the six buddies who were also research participants. Indeed, it could be argued they felt more comfortable and freer to talk openly because they were familiar with the researcher and with each other. From this perspective, insider research has the potential, indeed, to increase validity due to the added richness, honesty, fidelity and authenticity of the information acquired.

There is always the issue of power relations between teacher and student, although I emphasised the voluntary nature of participation with the right to withdraw. Did my relationship with participants, as a former class teacher, mean that they responded in a different way? An implication of this question is that people might have told me what I wanted to hear, because perhaps I had already touched on the subject and unwittingly put ideas in their head. To my knowledge, the learning styles concept and ways of learning were never discussed and the concept was unfamiliar, except to one participant. My former students had certainly experienced interactive learning, but all 3Ls tutors are encouraged to conduct their classes in this way. Therefore, I am only one of many to adopt an open participative teaching style and I do not claim to be any different and thus attract especially active types of learners.

However, there is a particular question concerning volunteers who had also been in my classes. Was there something special about their interests which made the research particularly attractive to them? It is possible that the Mind Power class had a heightened interest, because in this class, key insights from neuroscience were

explored. However, the students appeared a normal cross-section of 3Ls students, many of whom regularly attended other general interest classes in the Centre such as art, languages and so on. Those who responded to my request were sent an invitation letter to let them know when the LSQ session would take place, with a return slip, email and telephone number for confirmation (Appendix 8).

3.6 Focus Group Method

The aim of the focus group discussions was to open up the research questions to discussion to discover participants' feelings, thoughts, understandings, perceptions and impressions (Krueger & Casey, 2009; Liamputtong, 2011) about their own experiences of learning. Below I examine why the focus group was the chosen method rather than interviews.

3.6.1 Focus group interviews

As a research method, the focus group interview has been gaining in popularity in the social sciences, but the first occasion of its recorded use was in psychology research as long ago as 1926 (Liamputtong, 2011). Focus groups went on to become a market research tool while, now, they are used widely in politics, communications and the public health sector. Field (2000) suggests that focus groups in educational research perhaps provide a concrete opportunity for both participants and researchers to learn from the process, as by the sheer weight of numbers, the participants can challenge the researcher's power to set the agenda for debate.

Focus groups are an iterative process in which "people's views and understandings are shared, debated, challenged and changed" (Field 2000, p. 324). He even goes as far as to say that the group itself can function as a small-scale learning community with a capacity for fostering learning, and may be well-suited to the study of lifelong learning. Johnson (1996, cited in Field, 2000) also posited that focus groups can promote a collective identity and be potentially empowering, and overcome the individualism of much interview-based research.

These views contrast with Krueger and Casey (2009) who believe focus groups ideally should be composed of strangers, so they have no concerns about self-

disclosure, although they must have a common concern on which to voice an opinion. Krueger and Casey also believe that the facilitator should not be in a position of power or influence, but this is not always the case in an educational setting. I am a tutor in the Centre and, although I have no real power, I could be seen as a University representative, who might not like to hear criticisms of teaching methods in the Centre, or who might relate critical comments back to directors. Also, it places one in the position, when publishing the findings, of perhaps making public criticisms of certain approaches taken by one's employers. However, one would hope that constructive criticism would always be welcome in academia and would also provide food for thought for 3L students. Maintaining one's intellectual integrity, being true to one's beliefs and portraying the situation through a reliable lens should be paramount to reveal new insights.

Carey (1995) draws attention to the issues of censoring and conformity in a group setting because members can modify what they say due to lack of trust in the moderator or in other group members. With conformity, comments can be fashioned to correspond with a member's understanding of the moderator's and other participants' expectations. So ensuring everyone is aware of anonymity and confidentiality is critical to build trust and counter any unease. Indeed, this data collection technique is dependent on establishing rapport and trust among the participants.

All in all, participants in a focus group normally feel safe and valued for their opinions. When discussing past learning, of course, there is always the possibility of evoking painful memories of miserable school experiences. Group discussions have the power to tap emotional and unconscious motivations (Morgan,1997), more difficult to reach in more formal interview set-ups, as participants get caught up in the discussion and draw each other out. Although none of my guiding questions specifically probed childhood, the issue came up. This touches on the difficult area of ethics and the principle to avoid causing anyone unnecessary stress which I address in 3.9.

Focus groups are now employed extensively in educational research. Chioncel, van der Veen, Wildemeersch & Jarvis (2003) have highlighted that three out of eleven major adult education projects in the UK 'Learning Society' research

programme used focus groups. Withnall and Thompson (2003) used ten focus groups in the ERSC *Growing Older* research (section 1.2.2) along with other methods. According to Vaughn, Schumm and Singabub (1996, p. 7) the following assumptions underlie the focus group interview:

- "People are a valuable source of information, particularly about themselves.
- People are capable of reporting about themselves and are articulate enough to put their opinions about their feelings and perceptions into words.
- The best procedure for obtaining people's feelings and opinions is through a structured group conversation
- There are effects of group dynamics that enhance the likelihood that people will speak frankly about a subject."

The first two points are inherent within all self-report measures, (including the LSQ). Also the first two apply to interviews. The distinguishing feature is their explicit use of group interaction to produce data and insights. Discussion can generate insights in a way that questionnaires and individual interviews cannot, through the dynamic process of spoken language and reactions to another's comments. The other side of the coin, of course, is that group dynamics can lead to irrelevant chatter. Morgan (1997) stated that the hallmark of focus groups is group interviews without:

> "an alternation between a researcher's questions and the research participants' responses….to produce data and insights that would be less accessible without the interaction found in the group." (p. 2)

While Morgan (1997) suggests the ideal number is six to ten people, Krueger and Casey (2009) warn that a group exceeding a dozen is liable to fragment. Chioncel *et al.* (2003) advise a smaller group for reliable results. Hearing others' thoughts can generate thinking along new lines, spark fresh avenues of investigation and fill in gaps, creating a unique discourse through collaborative meaning-making. Morgan (1997) found that focus groups are used in three different kinds of studies – first, self-contained studies; second, as a supplementary source of data; and third, in multi-method studies, like my own.

Focus groups have drawbacks, of course. They are more complex than one-to-one interviews, with data from multiple speakers difficult to compare across individuals (Bernard & Ryan, 2010). Chioncel *et al.* (2003) warn of the influence

of the phenomenon known as 'groupthink' – "group polarisation or dominance and passivity of some participants" (p. 503). Johnson and Johnson (2000, cited in Chioncel *et al.* 2003) suggested that 'groupthink' can affect the validity and reliability of the results if there is a collective striving for unanimity or harmony. In their evaluation of the use of expert focus groups in four European projects Chioncel *et al.* (2003) found other challenges which are summarised below:

- A high percentage of those invited did not show up.
- Organisation and moderation takes a lot of effort with less grip on some issues.
- Time is too compressed to get all questions answered effectively.
- There can be a high level of consensus rather than a spread of opinions.

I also found that only half of the original LSQ group signed up for the focus groups, but at least those who signed up came. The issue of changing times and rebooking rooms within the Centre is always difficult during the term, with limited flexibility. One hour was too compressed for the discussion, but trying to extend this might have been a further deterrent.

Focus groups certainly produce data which are qualitatively different from questionnaire or interview data, as the outcome is a product of group dynamics and the socio-cultural context. These issues are at the heart of a social constructionist perspective (Burr, 2003; Gergen, 2004, as discussed in section 3.3.4), with its emphasis on the communicative nature of dialogue and the assumption that language is not a transparent medium for delving into people's experiences and understanding their views. Events could be described differently by the same speakers in a different context and at a different time, and what the listeners hear could be interpreted differently. Therefore, knowledge creation can be seen as something shared, not as an intrinsically individual experience. This is in alignment with the interpretive paradigm's assumptions that realities are multiple, context-bound, and mutually shaped by the "interaction of the knower and the known" (Lincoln & Guba, 2000, cited in Baxter Magolda, 2004, p. 35).

Baxter Magolda's (2004) three key principles of educational practice, developed from her longitudinal work with college students, are first, to seek out students' opinions; second, build on this for continuing learning; and lastly,

construct knowledge together to arrive at more complex understandings than one could deduce on one's own. Creswell (1998) pointed out that: "human experience makes sense to those who live it, prior to all interpretations and theorising" (p. 86), but when people open up their minds to others' perspectives more complex ways of knowing become possible and understanding is enriched.

3.6.2 Focus group participants

In Appendix 15 is a table of the 26 people listed in their focus groups along with a brief mention of each group's dominant theme. The backgrounds and current shared experience of the respondents in each group influenced the direction of their opening discussion which addressed the issue of how aware they had been in their life of preferring certain ways of learning over others. Transcripts of each person's initial contribution(s) at the start (using discourse analysis), with a brief commentary follows in Appendix 23.

3.6.3 Transcriptions

The sessions were simple to set up with a view to tape recording, with permission to record the sessions secured. Six guiding questions were prepared, based on the research questions which were intended to flesh out previous results. The questions were:

- How aware have you been in your life of preferring certain ways of learning over others?
- In what ways has how you like to learn changed over time?
- What different styles of teaching have you experienced over the past ten years?
- Do you tend to select activities that reflect the way you like to learn or do you made adjustments when you experience a teaching style that does not suit you?
- Have you ever given up a class or activity because of a clash between your preferred way of learning and the teaching style?
- How do you judge how well you have learnt something?

Not everyone contributed to every question in the larger groups (Chionel *et al.*, 2003) and there was limited time to develop ideas (without becoming overly controlling and disrupting group dynamics), and the final question was dealt with only briefly. The original audio tapes were converted into Windows Media Files

before transcription. Transcribing was an excellent way to familiarise myself with the data, and not simply a mechanical process. On the occasions (in Group S), where the conversation veered away from the topic, this was not transcribed, but noted. When there was general laughter or general asides this was indicated and, as moderator of the discussions, any significant remarks/interjections I made were also transcribed. (Transcription of Focus Group C in Appendix 24).

3.6.4 Analysis of participants' voices

There are significant similarities between analysis of focus groups and other qualitative data. Commonly, researchers are interested in the themes which emerge so that similarities, differences and underlying truths can be discussed. Thematic analysis is perceived as a foundational method in qualitative research (Braun & Clarke, 2006) and techniques for analysing data in thematic analysis and grounded data are broadly similar (Liamputtong, 2011). Typically, data analysis begins during the process of collection (Cohen *et al*, 2001; Miles & Huberman, 1994) because of sheer volume, with early analysis reducing data overload. Miles and Huberman (1994) define qualitative analysis as consisting of the three simultaneous activities: data reduction, data display and conclusion drawing/verification.

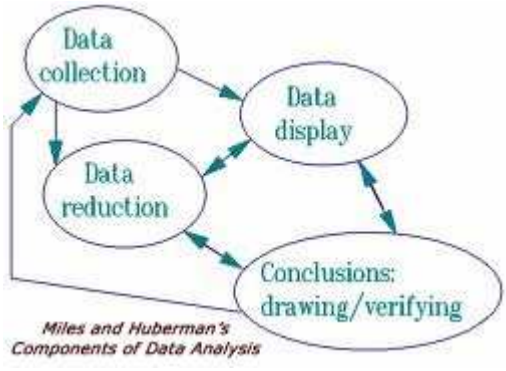


Figure 1: Miles and Huberman's components of data analysis

Data reduction is enacted in different ways, but essentially refers to the process of creating units of analysis as distinct as possible, while not distorting meaning. Essentially, this entails keeping the data with the context in which it occurred. By ascribing codes a process of selecting, focusing, simplifying, summarising and

transforming the written-up transcriptions gets underway. Tesch (1990, cited in Miles & Huberman, 1994, p. 11) referred to it as "data condensation". Burns (2000) believes that content analysis is more an art than a science:

> "The coding of qualitative research is important as it operates, as a labeling, retrieval and organizing device…The coding scheme is, in fact, the conceptual model." (p. 434)

Qualitative analytic methods can be split into two camps (Braun & Clarke, 2006), with some methods stemming from particular theoretical positions (such as, grounded theory (Strauss & Corbin, 1998); discourse analysis (Gee, 2005) and methods essentially free of theory and epistemology. A typical example of this is Aronson's (1994) article on a thematic analysis of a research-clinician's interview which reports on experiences, meanings and the reality of patients. Thematic analysis is compatible with both experiential and constructionist paradigms (Braun and Clarke, 2006). Therefore, it is a very flexible method for identifying, analysing and reporting themes within data, "both to reflect reality and unpick or unravel the surface of reality" (p. 81). Braun and Clarke argue that thematic analysis is often not named explicitly, unlike grounded theory, which has a high profile because of the valued goal of generating new theory. However, whatever one chooses to call it, thematic analysis involves searching across a data set for repeated patterns which are then coded.

3.6.5 Data Indexing

Since all analysis is essentially comparative, the first task is indexing to facilitate comparative analysis by gathering together data under one topic (Frankland & Bloor, 1999). Indexing is, of course, different from exclusive coding, as I did not assign pieces of transcript a single code contingent solely upon an initial hunch. Rather, each piece of transcript was assigned several, non-exclusive index-codes referring to several analytic topics. I postponed a final interpretation until all text items in the same categories could be compared systematically, with the emphasis on being inclusive, rather than exclusive. Frankland and Bloor (1999) describe the analyst as having a "pre-understanding of the transcript" (p. 147), presumably because the

researcher has experienced the event, transcribed the audiotapes and will have some ideas of interesting avenues of exploration.

However, it is only through deeply engaging with the material that analytic categories are generated in an intuitive way. Often researchers write about 'submersion' in the data and categories 'emerging', which make it sound like a mystical experience. From a working memory perspective, the brain is not good at holding on to lots of bits of information, therefore once the material is indexed in as inclusive a way as possible, and displayed, patterns can be deciphered which connect to existing theories, leading to greater elaboration of these categories and new categories – in other words, constructivism in action.

Codes at an early stage define categories which are mainly descriptive - for example, perspectives held by participants, ways of thinking about people or things, activity or process codes, or event codes. However, to be as true to the data as possible, they should arise from the participants' words and not be determined in advance, forcing data into some preordained framework and precluding alternative conceptualisations. However, if a theoretical approach is important, this requires engagement with the literature prior to analysis and this was my approach, although it can be a dilemma for the researcher. By coding up the data, the researcher is able to detect frequently occurring codes (regularities) and codes that occur together (patterns). Data display is a key element in Miles & Huberman's (1994) methodology to allow the researcher to see what is happening:

> "Generically, a display is an organised compressed assembly of information that permits conclusion-drawing and action." (p. 11)

The next stage is grouping the units into domains which according to Bernard and Ryan (2010) are a list of words in a language that 'belong together' (p. 38). Even with a fixed set of open-ended questions, it is impossible to forecast all the themes that come up before you analyse a set of texts (Dey, 1993, *op.cit.*, 2010). Grounded theorists call theme discovery 'open coding', classic content analysts simply call it qualitative analysis or 'latent coding' (Shapiro & Markoff, 1997, *ibid.).* As with all social science there are many variations on this theme depending on the type of study. Bernard & Ryan (2010) describe several observational techniques when scanning the data, which include repetitions, indigenous categories (local

terminology with specific meanings), metaphors and analogies. Lakoff and Johnston (1980) argue that:

> "most of our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature." (p. 3)

Analysis, then, can be a hunt for metaphors and working out the broad underlying themes that might underpin them (D'Andrade, 1995; Strauss & Quinn, 1997, cited in Bernard & Ryan, 2010) and I found this useful, because of the number of metaphors that arose in my study. Other techniques involve looking for similarities and differences, typical of grounded theorists like Strauss and Corbin (1990) who begin with a line-by-line analysis to keep the researcher focused on the data than indulging in "theoretical flights of fancy" (Bernard & Ryan, 2010, p. 58).

Bringing existing theories to bear on the data to explain it is a trade-off, as prior theorising can close one's mind to fresh ideas and new connections (Charmaz, 2000). Also, there is the danger of finding only what one is looking for, remembering Popper's (1963) warning, that it is easy to find confirmations, or verifications, for nearly every theory. An important stage is to establish relationships and linkages between the domains to ensure that "the data, their richness and 'context-groundedness' are retained" (Cohen *et al.*, 2000, p. 149). The move is then from description to the process of deriving logical conclusions from premises assumed to be true, while also seeking out, not only confirming cases, but examining the significance of disconfirming cases and minority opinions.

3.6.6 Coding interactive effects

Liamputtong (2011) highlights criticism directed at focus group research that researchers neglect social interaction within groups and manage the data, as if it is a series of individual interviews. The social constructionist framework (Burr, 2004) emphasises the co-construction of realities between participants and the negotiation of meaning. As this is my theoretical framework, I will be looking for themes produced within the group context, interactive effects and group dynamics which may reveal the strength of certain views and levels of agreement. In addition, there are opportunities to analyse the process of interactions between participants and myself, as moderator. According to Myers & Macnaghten (1999), the moderator

cannot be written out of the analysis. They drew attention to one of the best supported findings of conversational analysis:

> "Speakers orient to the immediately preceding turn, answers following questions, assessments following assessments, response following accusation. In many cases it is the immediately preceding turn that is important to the analyst - the moderator's question, or the participant's example". (p.184)

Therefore, because talk is sequenced, longer quotations from the transcripts will be included to support my interpretation where necessary and to consider an utterance in terms of what came before and after. What can be important is not only the topic but how it was talked about and linked to. The interaction may be important to fully understand what participants are really saying. Myers and Macnaghten (1999) pointed out certain dynamic forces at play: someone might be conveying solidarity, arguing for the sake of it, switching the topic, displaying special knowledge or experience.

Stephens (1996, cited in Liamputtong, 2011, p. 176) has developed a list of analytic questions for analyzing aspects of interaction, such as 'Did certain topics produce agreement?' and 'What common experiences were expressed?' This approach capitalises on the special opportunities focus groups afford. So utterances, in a sense, are artefacts of the specific research situation, rather than "attributes of the subjects" (*op.cit*. p. 185). Certainly, a conversation about learning would be unlikely to arise naturally in a group of older adults, unless linked, for example, to the topic of how children today learn in different ways.

In sections 3.6.3 - 3.6.5, the focus has been on the sociological tradition that uses text as a 'window into experience' as opposed to the linguistic tradition that describes how texts are developed and how their structure can reveal meaning. Next, I look briefly at this linguistic tradition of analysis and how it can contribute to understanding.

3.7 Discourse Analysis

As already mentioned, the first ten minutes of each focus group discussion were analysised separately using the integrated approach suggested by Gee (2005), applying certain tools of inquiry or "thinking devices" (p. 7). This fine-combed analysis helps to demonstrate, among other things, the influence of the early

responses in shaping the way people interpret the issues, the kind of memories they draw on to contribute and how the discourse that emerges is not in one person's head but distributed across different viewpoints. This underlines Carey's (1995) qualification that there is not one, stable exact reality to uncover in focus groups. It also reveals how the identities of the participants begin to emerge, to a greater of lesser degree, through significant memories of past learning experiences. Although discourse analysis was not the main method of analysis, my synopsis of each person's opening contribution provides a snapshot of the opening dialogue in each group (see Appendix 23).

3.7.1 **Gee's Discourse model** (2005, [1999])

I chose Gee's model because it did not require specialist knowledge of sociolinguistics. His approach involves analysis of language-in-use, but avoids the more complex aspects of linguistics and social theory. Indeed, Gee expressed the hope that his model can contribute "to important issues and problems in some 'applied' area' (p. 8). The two "thinking devices" described below are at the heart of Gee's approach which are the everyday storylines (or explanatory frameworks) that people use to make sense of their 'life-world':

> "…… 'everyday people's 'explanations', 'models' or 'theories' are very often largely unconscious, and often incomplete in some ways. This does not mean that they are not deep and rich in their own way." (p. 60)

Gee calls these storylines or unconscious models - *'Discourse models'* (with a capital 'D', pp 30-31). Just like explicit scientific theories, they are oversimplifications, to allow us to understand and take part in complex social worlds. We have hundreds we can assemble, from 'green issue' Discourses, to 'worthy citizen' Discourses, to 'classroom' Discourses. Discourses are not fixed entities but are revised and adapted depending on the situation, by bringing together what Gee calls *"situated meanings"* (Gee, 2005, pp. 53-70). 'Situated meanings' are words that have different meanings depending on the context. The meanings of words do not just reside in dictionaries, but are 'part and parcel of what the communication is about' (p. 174). Likewise meanings of words do not just reside in assemblies of neurons in our brains:

> "but are often shared across people, books, other media and various social practices……very often they are *negotiated* between people through communicative social interaction." (p. 67)

Therefore, they involve not only ways of thinking but also ways of believing, valuing and acting out a socially recognisable identity. Thus, the situated meanings people use can provide a window into their unconscious theories. Discourse analysis can involve asking questions about situated meanings, about particular activities going on, the identities of the participants, their relationships, the social good at stake, connections with other discourses and ways of privileging certain forms of knowledge - for example, using technical or professional language versus everyday language. Thus situated meanings and Discourse models are two useful tools of inquiry to illuminate "better, deeper and more humane interpretations." (Gee, 2005, p. xi)

3.7.2 The Opening Round

The texts selected specifically for discourse analysis are the first 10 minutes of each group which entailed everyone's initial contribution being given equal attention. This exposed how the discussions developed differently, although each group began with the same question. The analysis shows how various sub-topics or motifs emerged.

'Co-constructions' (my remarks that add to the discourse) have been retained. The text is printed in numbered lines and coded in the right-hand column. This will facilitate a comparison of the distribution of certain categories that reveal differences in the type of language used. Gee's coding system is described at the start of the transcripts in Appendix 23.

3.8 Limitations of current research

It must be remembered that this was a small sample which was not representative of older adults in general. They were also people who have, in the main, been successful learners in their lives and the social situatedness of learning within a campus setting is a place where they are comfortable. They were interested enough

in the process of learning to complete a LSQ and around half returned to the focus group discussions. The LSQ was interesting in itself, being a collaborative exercise done *with* the participants and not *to* them, as a 'reflective partner'. The post-LSQ expanded and explained more about the participants' learning preferences which added to the richness of the data by identifying other data patterns. Within the interpretivist paradigm, I presented a justification for selecting this mixed methods approach.

The issue of reliability and validity is always a challenge in qualitative research as the data collected during the sessions are partially affected by the session itself and magnification of particular aspects can be the result of group dynamics or 'groupthink' (section 3.6.1). Because participants are responding to each other, the information elicited is a function of each group interaction. Thus, focus groups are not replicable (Carey, 1995). However, assuming that censoring and conformity (as discussed in section 3.6.3) have not unduly influenced results:

> "the information can be considered as an accurate representation of the perceptions of reality for the group members and therefore valid."
>
> (Carey, 1995, p. 489)

However, Carey qualifies this statement by emphasising that there is not one, stable exact reality to be revealed when focus groups are used, especially with self perceptions, and the goal is to explore variations, not to reach agreement and generalisability. Ultimately however, the guideline questions set the agenda and the findings are, partially at least, a result of where the researcher looks (Miles and Huberman, 1994). My interest in neuroscience shaped the inferences drawn, and in thinking along these lines I may have missed other things or unconsciously distorted the data, and my insider knowledge could lead me to make assumptions or miss important information. The application of Yang's holistic theory of knowledge and learning, which is not neuroscience-based, was intended to act as a check against misinterpretation.

Finally, to complete this methodology chapter I will briefly relate the ethical issues relevant to this study.

3.9 Ethical issues

Although the guidelines now in place which govern all university research were not operational when I submitted my original research proposal, I was aware of *Ethical Principles of Conducting Research with Human Participants* (British Psychological Society, 1990), as a member of the BPS. Ethical codes are works in progress as standards are constantly changing, and the BPS has just produced an update. Also, the *ESRC Framework for Research Ethics* (2010) is online and updated as required. Ethical conduct is in essence "the application of informed moral reasoning, founded on a set of moral principles" BPS (2011, p.7). The main elements are valid consent, confidentiality, anonymity, fairness and processes consistent with these. These have not suddenly materialised, but were not necessarily applied so rigorously in the past but borne in mind. Miles and Huberman (1994) listed several ethical considerations for consideration before, during, and after the research had been conducted: these included informed consent; harm and risk; honesty and trust; privacy, confidentiality, and anonymity; intervention and advocacy. The difference now is regulation so participants are protected and researchers are in no doubt about their responsibilities.

Informed consent entails letting participants know what is involved and what they have to do. In early research, the researched were referred to as 'subjects' (placing then in a passive position) but this has largely gone, and terms such as 'respondents', 'discussants', and 'participants' convey cooperative roles with the right to withdraw. As a tutor in the Centre, I presented the research as a personal project and part of my continuing professional development. I initially addressed people in their classes with the intention of persuading them of the value of completing a LSQ, but I was not in a position to pressurise or coerce. I already had their trust and therefore it would have been dishonest to present it as 'official' research in an effort to encourage participation. Verbally, I told all groups that the process was totally confidential, the recordings were for transcription purposes only and names would be changed. Although the research was in two parts, they could choose to withdraw their participation.

I have already mentioned that focus groups can tap into people's emotions and unconscious feelings, so there is always a risk that some unhappy memory surfaces. However, I did not consider that the people who volunteered would not be able to

handle this because the students who attend the Centre tend be fairly robust learners. So the risk of harm was minimal. Had there been any need for intervention and advocacy, there is a counselling service within the Centre. Denzin and Lincoln (2008) wrote: "Today, many agree that all inquiry is moral and political" (p. viii). This sentiment is reiterated by Cohen *et al.* (2001) who stated: "[R]esearchers must make informed choices of research traditions, mindful of the political agendas that their research might serve" and that 'fitness for purpose' must be the guiding precept" (p.1). As McClusky stated almost forty years ago, education for older adults is based on the assumption that "it will lead to something better" (McClusky, 1973b, cited in Hiemstra, p. 212). Therefore, there is a moral imperative that research into later life contributes in some way to this agenda of improvement.

3.10 Conclusion

The goal of mixed methods research is to draw from the strengths and minimise the weaknesses of both in a single research study. In my case, the LSQ was a standard form of data collection with the results arrived at through a prescribed formula provided by H&M (2000), and the post-LSQ provided simple answers to a narrow band of follow-on questions. On the qualitative side the researcher is "the primary 'instrument' of data collection" (Johnson & Onwuegbuzie, 2004, p.18*)* with data based on the categories of meaning, which lend themselves to the exploration of personal experiences and participants' constructs. In the next chapter I will present and analyse the questionnaires and focus group material together and hope to demonstrate that quantitative and qualitative research techniques together are important, useful and complementary.

Chapter 4 Findings and Analysis

4.1 Introduction

This chapter presents the findings and analysis of the LSQ and post-LSQ, together with the perspectives of those who subsequently attended the focus groups. Direct excerpts are included throughout, with reference to specific Appendix documents. I will illuminate the complex interplay between perceptions of learning styles, interwoven with participants' narratives about learning strategies, motivation, attitudes, defining moments and feelings from former and recent learning. As one of the objectives of this mixed method study was to examine the learning styles (LS) profiles produced by older adults and look for any emerging patterns or differences, the LSQ results are examined first, interspersed with references to the follow-on questionnaire and focus group discussions where appropriate.

4.2 The Learning Styles Questionnaire (LSQ)

85% of respondents agreed their personal result was valid, with the profile consistent with their own view of themselves as learners. (See table of results in Appendix 16). For those who went on to discuss their learning preferences in their focus group this firm sense of having a particular 'learning identity' came across strongly, although this was expressed predominantly in their own words and not in H&M's terminology. In this section, I will examine the distribution of styles, participants' interpretations, the development aspects, rejection of designated LS and belief in authenticity of LS.

4.2.1 Distribution of styles

To help researchers with data analysis H&M (2000, p. 60) administered the LSQ to a random sample of 300 managers to allow comparisons to be made. Their results produced:

> 35% with one strong style; 24% with two; 20% with three; 2% with four and 19% with no strong preferences.

40% of my sample of 55 respondents was assigned two strong styles. See Appendix 17 (Fig. 1) for a graph showing how the strong styles per person were apportioned. The most common profile, by far, was Reflector-Theorist (n=13). See Appendix 17 (Fig. 2) for the six most common profiles. However, eight people rejected their styles and one person omitted to give any indication. Rejection was fairly even across the four styles. See also Appendix 17 (Fig. 3 and Fig. 4) for a comparison of all styles compared to accepted styles.

The R and T styles are closer to each other than to either A or P, and as Race (2010) argues, Activist and Pragmatist can at times seem interchangeable as 'learning by doing'. Analysing the language of H&M's General Description handout (Appendix 11), which puts flesh on to the abstract 'bones' of the styles, certainly shows strong parallels for R and T styles, and closeness between A and P, for example:

> Reflectors ponder experiences and observe them, while Theorists integrate observations into logically sound theories;
> Reflectors prefer to think long and hard about information before deciding, while Theorists think problems through in logical step-by-step ways;
> Reflectors prize caution, while Theorists prize logic.

Contrast this with:

> Activists prize giving things a go here and now, and Pragmatists like to act quickly and confidently to implement what they have learned.

The difference between 'giving things a go' and 'acting quickly and confidently' is quite subtle.

Of those who received a single style (and accepted it) there were seven Activists, five Reflectors, one Theorist and one Pragmatist. H&M's underlying hypothesis is that having one strong dominant style (and being unaware of this) is a potential barrier to becoming a "well-rounded learner". What was not discussed by H&M (2000) was whether having three to four strong styles makes for a more 'rounded' learner than having no strong preferences, or registering only in the moderate bands. So the LS concept becomes rather fuzzy when it presents as a combination of three or four styles, as opposed to its single 'purist' form or 'well-matched' pairs like Reflector-Theorist and Activist-Pragmatist.

Another contrast to the H&M's sample, where approximately one fifth had no strong style, compared to my research sample, was that only four people had no strong style, but moderate preferences. (This meant their scores registered in the medium bands.) They comprised two Activists (A), one Reflector-Activist (RA) and one with all four styles (ARTP). The fact that almost all participants had at least one strong style suggests that, although most people said they had changed, the new styles were not less pronounced, as Kolb (1984, cited in Truluck & Courtney, 1999) suggested tended to happen in mid-life, as people explored alternatives. New ways of learning are equally subject to becoming fixed with repeated use, which is in line with current thinking from neuroscience about neuroplasticity being a double-edged sword (Doidge, 2007). Our brains are indeed plastic, but once we tread a new path, we tend to adhere to it and it can become just as habitual as the 'old style'.

The controversy surrounding learning styles suggests it would be wrong when analysing the results, to place too great an emphasis on small differences, especially from the limited sample here. Looking at the spread of styles in Truluck and Courtney's (1999, see section 2.2.9) sample of 172 participants, it was fairly even, but the least preferred LS was Converger, which they stated involved active participation. However, it is worth reiterating that Kolb's categories do not match exactly to H&M styles (H&M, 2000). The Converger style is matched to Pragmatist by Sadler-Smith (2001, cited in Cuthbert, 2005) as its H&M equivalent. However, I have already drawn attention to Race's (2010) critique of the overlap of Pragmatist and Activist styles. The range of views would tend to confirm the criticism by Coffield *et al.* (2004) about lack of clarity around definitions. Given these fuzzy boundaries, comparing the spread of styles with Truluck & Courtney's study would not be particularly illuminating, but exploring the different reactions of the participants to their results should provide insights into their ways of thinking about learning.

4.2.2 Participants' interpretations of their learning styles

The first extract below illustrates several aspects of how the learning style concept was perceived. My opening question in the focus groups concerned awareness of preferring certain ways of learning over others. (After each name is an individual

identifier code and LS code.) Linda (M5, ART) followed Maureen (M16 – LS: not known), who had been a mature Open University student for a number of years, and accordingly, had done most of her course work in a solitary style. She expressed her desire to continue to learn, but only with face-to-face learning, so she could share her ideas and contribute to the class. As discussed in section 3.6.6, I will display linking fragments of the preceding contribution where appropriate, as the participants and myself as facilitator (notated as VB) built the conversation in social constructionist fashion:

VB	*'[So] given a choice, you would certainly like face-to-face.'*
Maureen	*I would. That's the way I would like to learn.*
Linda	*'I think I've always been aware that I prefer hands-on. I like face-to-face tuition and if I use anything at home, I tend to use video and I like CDROMs because of the interaction.'*
VB	*'So, you are quite happy learning with a computer?'*
Linda	*'Eh (pause) No. (Laughter from the group and quick interjection from another participant: 'The CDROMs speak back to you, is that right?') Yes. If it works very fast, I like it, but if it's slow…'*(Grimaces).
VB	*'The technology gets in the way.'*
Linda	*'It does, yes. But I was surprised at the results. I thought I really was a pragmatist, but I realise I have these other things as well, which was interesting.'*

These *'other things'* Linda referred to were unexpected aspects of her LS - a very strong Activist (A) and Reflector (R), and a strong Theorist (T), with her Pragmatist (P) profile only moderate. Therefore, the hands-on, pragmatic aspects, which she claimed as her dominant preference, would seem to have been elicited through the Activist statements of the questionnaire. Concrete experience (the domain of Activists) and active experimentation (the domain of Pragmatists) are often difficult to distinguish (Race, 2010). ART is certainly an uncommon profile, as H&M's Activist and Reflector general descriptors have contradictory qualities when comparing their opening statements:

> 'Activists involve themselves fully and without bias in new experiences.'
>
> 'Reflectors like to stand back to ponder experiences and observe them from many different perspectives.'

It is difficult to see how one can strongly do both, unless the differences in the demands of the learning situation dictate which style comes to the fore. It is not explained in H&M's (2000) manual how contradictory styles assigned to the same person are reconciled and translated into behaviour.

One other point which the excerpt above demonstrates, concerns interactive effects. Myers and Macnaghten (1999, see section 3.6.6) drew attention to the well-documented fact that, in conversation, speakers orient to the immediately preceding turn. Maureen had explained why face-to-face was her preference. Linda began by declaring her preference for hands-on learning, followed immediately by mention of face-to-face tuition. Arguably, this would not have been said if Maureen had not focused on it previously, but this does not mean Linda just copied it automatically. It is the nature of conversations that we consider others' ideas and include or reject them, as the dialogue flows. However, awareness of this phenomenon, which is in evidence throughout all four focus groups, means that a simple count of the number of times certain topics appear in each group would not be particularly meaningful.

In general, there was not significant disagreement between participants, but it did occur when two former teachers with diametrically opposite styles – a Reflector Theorist and an Activist Pragmatist – were discussing language learning. Although their styles differed, their sensory modalities were identical with Kinaesthetic, Visual, Auditory (KVA) profiles. Mhairi (A2, RT, science teacher) and Norma (A5, AP, English teacher) are discussing the way languages used to be taught with a strong bias towards written grammatically-correct forms:

Mhairi	*'There is a lot of criticism about how we were taught in schools. Take languages – we were taught to read and write it but not speak it very well. But it is surprising how it comes back.'*
Norma	*'I think I was taught very well.'*
Mhairi	*'But we criticise that way of teaching now.'*
Norma	*'I wouldn't –I think I just struck it lucky.'*
Mhairi	*'Yes, but is it not generally accepted now that it was the wrong way to teach languages?'*
Norma	*'I think there has to be a whole variety.'*

Mhairi *'A friend's daughter had a penpal over in France and she said – 'When I was forced to, it was surprising how much came back from what I had been taught'. Her grammar was probably better than her daughter's (laughing), but her daughter was more fluent.'*

VB *'Yes, it is a different skill – a different bit of the brain.'*

Norma *'Ideally, you should have a balance.'*

Mhairi *'Which we didn't have. While I say I had a good grounding in the grammar, I was very reticent in speaking.'*

In the above extract, Mhairi did not concede Norma's point about balance. In her judgement there was a wrong balance. This is an example of multiple realities with two equally valid, co-existing worldviews. Norma was one of the 20% whose style had remained unchanged, therefore, as an Activist-Pragmatist she would not need to be told to practise speaking the language, as this would have come naturally, although she described this as being lucky. Mhairi stated that she had changed to become more practical of late, but she had accepted, as a young scholar, the grammatical approach to language learning with her logical, scientific mind.

The above dialogue also has echoes of Gardner's (2003) Multiple Intelligences perspective, which posits that it is fundamentally wrong to think that human beings have only one correct way to think, reason and problem-solve. People have an array of skills upon which to draw, some of which will be drawn from genetic inheritance and others which will be encouraged or discouraged by the culture and environment (Baltes *et al.*, 2006). Nothing in biology, psychology and one's life is static, with multidirectional influences between genes, brain, thinking, behaviour and environment. Therefore, what seems as glaringly self evident to one person is hotly disputed by another, as our experiences are filtered by the types of analysis we use and our cultural, social and educational vantage points.

As Brookfield (1995) stated, we construct our experience, not only through our senses but through our perceptual filters. These are so deeply embedded in our psyche that they are virtually unconscious. This is the facet of knowledge that Yang (2003) described as the foundation layer, where our beliefs, social norms and values unconsciously shape how we draw meaning from our experiences. Therefore, Mhairi and Norma are unlikely to agree on the right language balance between grammar and

spoken language learning however long they discuss it, because experiences are never free from the cultural contradictions that inform them and the different ways our brains process information, whether it is called a learning style (H&M, 1992), a cognitive style (Sternberg & Zang, 2001) or an intelligence (Gardner, (1983/1993).

4.2.3 The LSQ as a development tool

Although Linda (M5, ART: in the extract in 4.2.2) had thought of herself as a pragmatist, she confirmed that her ART style seemed right, saying that she realised she 'had' these other styles as well. This illustrates the power of a test result to convey a kind of authority and 'scientific' validity – a point made by two others in the post LSQ although, ironically, Ernest did not agree with his assigned style:

Ernest (C8, ATP)	*'Takes the subjectivity out of the subject and carried out in an interesting way.'*
Bridget (S8, A)	*'To get objective assessment of one's learning style.'*

Bridget judged that the type of LS being measured would not apply to meetings, discussions and reading reports which had taken up much of her working life, challenging the idea that one's LS is a typical strategy that one adopts in *any* learning situation. This is one of the criticisms of learning styles, highlighted in Cuthbert (2005), where attention was drawn to the positivistic and individualistic nature of styles, which can lead to labelling and stereotyping by ignoring the context and the learner's personal history and circumstances.

Nevertheless, the idea of 'objective' assessment powerfully influences credibility and the degree to which individuals are open to developmental aspects, so that they can start to think of themselves differently. In a parallel therapeutic context, this is what cognitive therapy attempts to achieve – a change in the way people see themselves or see a particular issue. It would be fair to say that Linda appeared to accept the array of unexpected styles as attributes she had not realised she possessed, but which she could now see as undeveloped parts of her persona. In a sense, this demonstrates H&M's LSQ in action as a development tool, to help people reflect on new learning possibilities. So, whether the result is verifiably accurate, is not the point. It had set a train of thought in motion which intrigued Linda and opened up

more complex ways of thinking about herself as a learner. This has shades of Baxter Magolda's (2004) ways of knowing (discussed at the end of section 3.6.1) which suggested building on students' opinions for continuing learning and construct knowledge together to arrive at more complex understandings. It also appears to confirm what Cohen (2005, cited at the close of section 2.4.2) believed about adulthood - it is not the end of a process, but the evolution our brains and our selves, spurring us on to be more proactive.

In response to question 3 in the post LSQ (see Appendix 18), concerning useful or interesting aspects of the LSQ, approximately half the sample commented on specific LS aspects such as need for balancing styles, the value of raising awareness of styles, or remarks about their own results, for example:

Magda (M8, RT)	*'Interesting to consider different styles. It gave more insights into my own preferences.'*
Adele (R3, A)	*'Discovering the different types of learner.'*
Nan (S7, A)	*'I found it surprising I had such an even spread.'*
Claire (S1, A)	*'Discovering I was a strong activist.'*

Thinking about their own learning style captured their imaginations and no one dismissed the idea as meaningless, even the 15% who did not agree with their result. Nan, for example, who commented on the even spread, was given an Activist profile, despite her raw scores for the four styles being A=8, R=8, T=9 and P=9. With a maximum for each style of 20 points, Activist was the only score not registering in the low bands, just making it into the medium band, sufficient to give an Activist profile. As I will discuss later, fairly even low scores seemed to indicate more flexibility in ways of learning. As already indicated, only four people did not register a strong style, making Nan's profile unusual.

However, a number of respondents alluded, indirectly in the main, to the LSQ providing more than cognitive insights into styles. The comments below indicate a shift from focusing only on how information is processed, to appreciating we are affective beings with diverse personalities and a clear sense of self, with the capacity for change, and with attitudes that affect our interactions with the world:

Linda (M5, ART)	*'Self knowledge.'*
Una (M7, TRP)	*'Questions were well thought out and responses should reflect personality, learning and communication.''*
Gordon (M12, TRP)	'*Seemed to be aimed at establishing the kind of person, not just learning preferences.'*
Julia (A3, R)	*'Can either confirm or negate one's self concepts and can be used as a basis for further development.'*
Joseph (R2: RT)	'*Made me think about my attitudes.'*
Wynn (R6, AP)	*'The breadth of it.'*
Eddy (C16, ATPR)	*'Covered a broad range of behaviour.'*

These comments reflect concepts of personality, self concept, attitudes and behaviour, which bundled together, are elements of self reflection. It is interesting that all but one have a Reflector style in their profile. The notion of reflective learning touches on the domain of affective knowledge (Yang, 2003) which specifies a foundation of values, vision and aspiration underpinning all learning and assumes that experience is at the root of learning. This approach implies that the many issues that instigate our learning come, in fact, from experience and observation.

The next five comments also support H&M's (2000) contention that people take how to learn for granted, and by the time they are adults they think they know this. These participants show an awakening of reflection on ways of learning after completing the LSQ:

Harriet (A1, A)	*'A new experience in considering an unfamiliar area of self assessment and self knowledge.'*
Norma (A5, AP)	'*Useful in showing where more care could be taken by me.'*
Ida (R8, TP)	'*Self examination – aspects of myself I had not considered before.'*
Muriel (M4, RTP)	'*Encouragement to consider how to learn.'*
Lena (S6, ART)	*'Reflects adaptable to new learning.'*

In respect of Harriet and Norma, they had been teachers most of their lives, but the LSQ had provided some new insights. Norma, who had been a strong Activist –

Pragmatist all her life, although she said it was possible to adapt, was at her most comfortable in an active mode, and her comment indicated that she will more carefully select her classes in future. Ida had rejected her LS profile, but expressed her openness to new possibilities. Muriel, who had completed several LSQs, believed it could offer encouragement, and Lena also thought it would help towards future learning. Although H&M believed that adults are generally unaware of their learning preferences, everyone seemed to have a sense of their preferred mode of learning, although not expressed in H&M's terms. Therefore, the LSQ was useful in making preferences more explicit. This was affirmed by these participants and appears to support its use as a developmental tool.

The next quotes from the post-LSQ relate to aspects of learning over time. It is well-known that learning spaced over time is better remembered than the same amount of learning crammed into a short period, which quickly becomes forgotten. If we can link new learning to past experience, which is well embedded, then the chance of remembering and understanding new material is greatly enhanced:

Graham (S5, PRT)	'*Relating it [LS] to past experiences.*'
Jill (R10, R)	'*[The LSQ] highlighted changes influenced by age. Showed up contradictions.*'
Adam (M14, R)	'*Thinking about how I have changed over the years.*'

How Graham (who rejected his assigned profile) related his learning style to past experiences is not clear, as he could simply be referring to how his way of learning had changed from rote (a point he made later). Jill was one of the few participants who mentioned age influencing change and "contradictions", and also the LSQ started Adam thinking about changes over time. Some of these changes could be to do with remembering and forgetting, as rote learning from childhood, which came up frequently in the focus groups, tends to be well remembered, but we are not motivated to learn by rote as adults or particularly good at learning this way. New knowledge has to be used and refreshed or it tends to fade. However, implicit learning through experience, remains relatively stable across the lifespan (Rogers *et al.*, 2009). Many people are unaware of the different types of memory and think that

when certain memories escape us, all memory is failing, which Rabbitt (1993) and others have demonstrated not to be the case.

The final three quotes on the usefulness of the LSQ highlight needs and awareness of diversity:

Laura (C13, A)	*'[The LSQ provided] insight into [my learning] needs.'*
Rhea (R7, T)	*'Everyone is different in their learning procedures.'*
Diana (S9, R)	*'[The LSQ gives] insight into one's own and others' preferences and the theory behind Kolb's work.'*

Laura's comment about 'needs' indicates going beyond cognitive strategies. Modern biology has confirmed that we are emotional and social creatures, who owe our very survival over millennia to learning and social functioning (Goleman, 1995, 2006; Immordino-Yang & Damasio, 2007). The biological connections between the emotional, cognitive, and social have highlighted the critical role of emotion in education, which runs much deeper than most people realise. However, this aspect is not one that the learning cycle includes and thus, it is largely absent in comments about the LSQ. However, Rhea's and Diana's remarks relate not just to themselves but other people and how one way of learning does not fit all.

4.2.4 Rejection of designated learning style

Although around 85% agreed with their LSQ profile, it is interesting to look at six of the dissenting voices in more detail, as it is possible to find plausible explanations as to why there were mismatches in these cases. First, there were four participants who recorded that they had changed, but this was not reflected in assigned learning style. Martin (C1, R) had expected to be more Activist and wrote in the post-LSQ:

> *'It [the LSQ] will help me to understand the construction of training courses I occasionally still attend.'*

Therefore, Martin's response to the questionnaire may have been influenced by a lifetime as a professional, with the need to be a reflective practitioner and undergo continuous training. However, he was quite clear that he was "moving on to the 'doing' rather than learning by rote". Angela (C12, RTP) was the opposite of Martin and thought she should be a very strong Reflector, and did not agree with the very

strong Theorist-Pragmatist styles which she had also been assigned. This is a case of additional styles being confusing to the participant, especially as Angela reckoned she had changed because she "has more patience now." This chimes with her self perception of being a more reflective person.

Bridget (S8, A), the third example of a 'style rejecter', had scored as a moderate straight Activist, but on examination of her scores for Reflector, Theorist and Pragmatist, they were all in the *very low* bracket. She wrote in the post-LSQ:

> *'Circumstances alter. When working I was involved in meetings, teamwork etcetera – pragmatic tasks. My preference has become more a Theorist.'*

In Bridget's case, many years of interactive working with meetings and discussions have meant developing an active style of learning, although she did not think her type of work would affect her learning style, as mentioned previously. However, this aspect seemed to have come through in the questionnaire and appears to be in line with H&M's assertion that learning preferences are associated with everyday behaviour. Perhaps, when more time has elapsed, the Bridget's Activist style will fade. However, her scores in the very low bands possibly indicate that she is a flexible learner who can adapt without much difficulty, although now the discipline of work was over she felt drawn toward her natural Theorist self.

Then, there was Brenda (C4, PR) who thought her Activist score was wrong:

> *'I thought my Activist score would be higher and Pragmatist lower. I have become more inclined to 'have a go' and learn by trial and error.'*

This appears like another case of the Activist and Pragmatist styles overlapping (Race, 2010), to the extent that they are interchangeable. Therefore, Brenda's 'having a go', came through in her responses to the Pragmatist statements.

Finally, two participants, who claimed their ways of learning had not changed over time, also rejected their profiles. Charles (C5, T), thought he had always been an Activist:

> *'The result is surprising. I thought the Theorist would be the lowest.'*

However, although his Activist score was categorised as moderate, it was only two points below his Theorist score, with his Reflector and Pragmatist scores down in the low bands. Inevitably, where there is a small difference tipping the score into a

particular band, discrepancies are going to arise. The other participant who thought he had not changed since youth and who rejected his very strong styles was former electrical engineer, Ernest (C8, ATP):

'I am surprised. I thought I would have been strong Reflector and low Activist.'

It is interesting that Ernest now thought of himself as a strong Reflector. He had been an engineer all his working life, which is a practical, problem-solving type of job, which would tend to be reflected in an ATP (or similar) profile. However, as suggested in the case of Bridget (S8, A), given a longer time lapse, the ATP style might change to reflect how he consciously feels now. The things we do in our working lives mould our brains into certain patterns, whether we are conscious of this or not. Many things (and some argue, most things) go on in our heads at a subconscious level. In Yang's (2003) model this is the implicit foundational layer, where the habits and routines embedded in our everyday lives, operate outside our awareness. As H&M's LSQ statements which elicited responses focused on these everyday activities, and not on actual aspects of learning to create the profiles, this may account for the mismatch in Ernest's case.

Therefore, it is possible to find plausible explanations why the styles of these six students were not in tune with their perceptions. However, as Diana (S9, R) suggested, simple human error when completing a questionnaire is always a possibility in mismatched results.

4.2.5 Belief in the authenticity of the LSQ

An extract from the focus group discussion involving Muriel (M4, RTP) illustrates how influential the LS concept has been for someone exposed to it several times. She was the only person in the sample who had ever completed one before:

Muriel *'I'm fascinated by this result, because generally I can make the connection between what I am doing, and who I am, and the results. When I did it first many years ago I was a very strong pragmatist – the rest were away down here. When I started off in education – the theorist [was] grovelling down at the bottom. As I went through my career, it changed. The last time [I completed the test] I was most strong a reflector, which is curious for a pragmatist, because I feel that is predominantly me. I had over the previous two years been doing developmental work, so it made sense. This time it does not make a lot of sense. I'm not working, have not done for 3 months, and that obviously has made a difference. Why or how I have no idea.'*

Intriguingly, although Muriel stated that her result was surprising, she accepted it as an accurate portrayal of her LS. From this, one could deduce that she believed in the power of the LSQ to deliver an accurate profile, which had been borne out by her previous experience and rationalising the results as they changed with the shifting nature of her work.

Our first work experiences tend to be remembered well in our episodic memory, because of their emotional resonance (the 'reminiscence bump' as it is called), as our self understanding and values develop as young adults. When she referred metaphorically to the Theorist, *'grovelling at the bottom'*, this implied that she placed the Theorist style as out of reach, reflecting a high value often assigned to abstract thought. However, this is certainly not a LS value, as LS concepts are not hierarchical. Yang (2003) posited that metaphors are manifestations of hidden implicit (perceptual) facets of knowledge and therefore, using metaphor as a lens, provides a view of the unspoken values behind verbal statements. This also highlights the way labels such as Theorist and Activist become inappropriately associated with 'good' and 'bad' styles.

The unfortunate 'labelling' effect of individual testing manifested itself also with Kim's (M9, A). She thought that the LSQ showed up her "shortcomings" as a straight Activist. This highlights the human tendency not only to label categories, but also to evaluate them, and for Kim, being a straight Activist, was perceived as an inadequacy, with her other three styles in very low bands. Compare this to the first extract I displayed in 4.2.2, where I discussed Linda's (M5) delight in finding that she had these *'other styles'*, when she thought she was only a straight Pragmatist. Thus, the measuring instrument can become endowed by participants with the power to generate a hierarchy of attributes, with more styles and stronger styles being perceived as desirable, and only one strong style or low-scoring styles perceived as undesirable.

The LSQ, and other instruments of this genre, have as their rationale the raising of LS awareness, which can then be used to adjust one's approach and increase learning success. However, even although this aspect had been explained to the participants, there was a tendency for people, especially those whose formative years have been spent being tested continually for performance, to think of any

results as some type of grade, endowed with far more discriminating power than it has in reality, especially if this "personality" type test (as opposed to an intelligence test) has not been encountered before.

Everyone seemed to know what type of learner they were now, whether it was a critical reflector, a face-to face learner, hands-on or one of H&M's designated styles. The range of styles and the different strength of styles in this relatively small group of older adults would seem to point to the need for a range of methods and imaginative ways of learning to keep everyone engaged, as recommended by an array of educators, including Brookfield (1995); Caine *et al.* (2005) and Race (2010).

4.3 Ways of learning

Adult learning does not occur in a vacuum. What one needs or wants to learn, what opportunities are available, the manner in which one learns—all are to some extent determined by the shape of society (Jarvis, 1987, 2009), and two forces affecting everyone in recent times are societal change and information technology, so it is not altogether surprising that approximately 80% reported changes (See Appendix 19). Analysing the data revealed five interrelated themes which were catalysts for change. These are not in order of importance and are not equally weighted:

- working life;
- life and living;
- information technology;
- intrapersonal change;
- healthy learning environments.

I will take each of these themes in turn and present examples of supporting data from the post-LSQ, together with data from the discussions. Because the themes are interrelated, there are no hard and fast boundaries. Responding to these five catalysts depends on having access to learning opportunities and there are reasons why certain adults have more access to opportunities than others. Those adults who have been socialised into valuing and acquiring middle class attitudes and skills will be most able

to take advantage. Also, those who worked in professions have a head start. The first three excerpts below highlight this aspect.

4.3.1 Working Life

What one does for a living contributes considerably to patterns of participation in adult learning, with the result that some people have greater choices. It is interesting that the first three cases below have an Activist style, possibly through the need to deal with change and adapt to professional demands:

Adele (R3, A) *'Having taught primary pupils I have learned from my own mistakes in presenting classes.'*

Kim (M9, A) *'As a teacher, I have adapted to very interactive styles of teaching.'*

Both Adele and Kim were thoughtful primary teachers who had learned experientially from feedback from their own teaching.

Kim *'In my job I had to keep up to date. Probably, I enjoyed doing drawings on the board to make things more interesting, but I didn't really think of it in that way. Then I thought rote learning was the best way for the bulk of the children.'*

It is interesting that the meaning of Kim's statement in the post-LSQ was only fully revealed when she discussed her teaching work. Rote learning was what she had enjoyed as a child, and teaching by rote was what she stated she continued to practise as a teacher. So interactive styles were not consciously her way, but they had become so since her retirement, particularly through the art class:

> *'I enjoy hands-on now. I love the Art class. There was a tutor there, she demonstrated first, then you did, and she would come and look and make suggestions. I loved that. And I found I learned so much more in that way of learning, than just sitting listening to somebody talking. But I don't think I would have learned like that when I was young. I might have – I don't know'.*

This seems to indicate that awareness of ways of learning is a form of tacit knowledge: we have evolved ways of rationalising our actions and experiences, yet we are often unaware of the underlying processes. This is modelled by Yang (2003) as the perceptual facet of knowledge that denotes learning absorbed unconsciously and not openly articulated. Kim expresses this uncertainty about interactive learning in the last line quoted above. However, she was aware she was trying to improve learning by using graphics, although she did not have a conceptual model at that time. She was

teaching instinctively as teachers do – 'rote' might have been the label, but she was teaching in more complex ways. And now, as an older learner, she had converted to hands-on experiential learning, although this may have happened unconsciously.

The next case is Rowena who did not have a strong learning history, but her education took off when she trained as a nurse. She forcefully expressed that she had no time for the written word. She may indeed have been dyslexic from the strength of her conviction, and from other remarks:

> *'I am not a reader. The way I read a book every week is to go to the cinema. If I see a film – that's my story.'*

She seemed to have a poor opinion of her ability, rooted in childhood:

Rowena *'I remember my father had big encyclopedias, but my older sister was the only one to use them. I was two years younger, so I was not allowed to even open them.'*

VB *'But you were getting older as time went on. (Laughter) Or were you always 'too young'?'*

Rowena *'Don't touch!' I use that for the density [slowness in thinking] I am now, but eh, …I never really read much as a kid – any books were for my sister.'*

When Rowena was growing up, dyslexia would be virtually unknown and children with reading difficulties would be labelled as 'less intelligent'. Sadly, this negative view of herself has not been expelled. Yet, she trained as a nurse, and when I pressed her as to how she learned the theory, the following dialogue ensued:

VB *'So, when you were doing your nursing, did you not have a certain amount of theory though?'*

Rowena *'Oh, there was a lot of theory which was fine. I'm OK doing things.'*

VB *'So, how did you learn that?'*

Rowena *'Just by copying other folk doing it. I would memorise it. Then, when you were doing your compositions I would remember. I didn't really read.'*

VB *'So, you remembered other people speaking about what they had done?'*

Rowena *'If I was handed a piece of paper to read - I'd say: 'I'll do that later'.'*

VB *'Maybe, like Claire, you like to communicate about what you are learning.'*

Rowena *'I am not an opinionated person but I do like other folks' opinions.'*

Claire *'You like to discuss though, don't you?'*

Rowena *'Oh, yes.'*

Note the empathetic input from Claire at the end of this dialogue, after I had mentioned her name. Through a process of observation, memorising, talking with others and doing it, Rowena completed her training. According to the opening statement in H&M's descriptor 'Theorists adapt and integrate observations into complex but logically sound theories' (Appendix 11). Therefore, her profile of Activist-Theorist fits well and the experience of training, qualifying and then working had given her the confidence to come to classes despite her early discouragement, and despite doubts about her ability. Without that successful training, it would be unlikely she would be sitting there as a participant. It also suggests that early memories of bad experiences tend to linger and although people can move on, negative imprinting is rarely totally forgotten, and such people are more vulnerable to failure.

Work is a powerful catalyst for change as new methods of management training or professional development introduce many people to more interactive, experiential and cooperative methods. Julia (A3, R) talked about the *'culture shock'* of learning in this way:

Julia *'I went back to do a post-grad qualification and that was a culture shock because it was a completely different way of learning. You were being taught to work with each other.'*

The type of learning mentioned by Julia was so different because the issues were open-ended, had many possible solutions, and were more likely to occur in real life. They require the part of the brain (the prefrontal cortex) which makes plans, decisions, and choices and creatively looks to the future (Zull, 2002). They are messy problems, but they provide the kind of meaningful scenarios that adults have to deal with. This kind of learning encourages increased cognitive complexity—namely, learning that changes not just *what* people understand but *how* they understand it (Taylor, 2006). The ability to reflect consciously on one's learning activities is a key element in developing self knowledge about one's critical thinking.

This kind of collaborative learning was also experienced by Harriet (A1, A) and a group of colleagues when they undertook a project to improve their promotional prospects:

> *'So we got together and we introduced a reviewing system whereby we could get a deeper understanding, not only of what we were being asked, but of what was being asked of us. We all did very, very well from that and gained tremendous confidence, from being helped by others.'*

This type of constructivist learning has shades of epistemological transformation (Baxter Magolda, 2004), questioning existing assumptions and crafting new ones to see the world from a more complex perspective. This process is also described succinctly by Andy (M15), who talked about changes over time and the transformation he experienced when he began training as an arbitrator in his 50s, as career development. He had not been particularly successful at school but, nevertheless, had qualified as a civil engineer, although he spoke with humour about his LS as a student, being '*crisis learning – the day before the exam'*. Below, he gives his reaction to a new type of learning he experienced for the first time:

> *'It was totally different – groups of like-minded professionals discussing case situations, discussing laws in relation to the construction industry. There was not a lot of structured learning and there was no test till the end. But, obviously, this was working for me – lectures, discussions, case-studies, and even discussions within the office. I'd like to think it worked both ways – they learned from my experiences…. you are learning from people you respect and whose values you respect. They have proven their ability to you.'*

Although constructivism was initially a fairly abstract idea, brain research has confirmed the basic premise that understanding is constructed in the learner's mind and you will learn well from people you respect. Different types of learning contributed to Andy's success, and there were also a powerful socio-cultural environment of respected peers which affected how the learning was constructed (Vygotsky, 1978). These were, in effect, self-directed 'communities of practice' (Wenger, 1999). Therefore, although they read and absorbed new information, if this had not clicked with existing knowledge and experience, it would not have been transforming. We have to make meaning out of knowledge before it becomes our own. As Taylor (2006, p.74) stated, "We are inevitably meaning-making, not meaning-taking, organisms": our pattern-seeking brains have to find their own meaningful connections.

Learning can also happen at work through exposure to real life scenarios, when the formal professional knowledge learned from books does not provide

answers. Greta (A4) described such a situation she experienced which transformed the way she thought about her teaching:

> *'I had lots and lots of theory but I didn't really have the practical stuff. And when I had to teach it to adults, I had to understand it myself and in doing that it was they who taught me the bits that I thought in theory – 'Oh yes, this does happen – it didn't. No, because they were unique'.*

Because Greta encountered parents with different ideas from educators, her theories were challenged. She wrote the word *'Holidays'* on the board and asked parents to tell her what the word meant to them. The *'wealth of information'* they came up with amazed her and she found her ideas were *'miles off the track'*:

> *'And that was an eye-opener to me [*laughing*]. I'm talking about maturity by that time [*still laughing*]. It wasn't the children I'd been teaching for years – it was their parents that were teaching me and asking me -What did I mean by that word?'*

When Greta's expert knowledge let her down, a different mode of learning was triggered that involved learning experientially. This was a thoroughly social and democratic process (reversing normal power relations in the classroom), through which the teacher's attitudes to previous experience or academic study, were developed, challenged or changed.

However, not everyone has to be a professional to become a more flexible learner. It is intriguing that Jo (C11, ARTP), who agreed with her moderate/low strength profiles across all styles, wrote: *"[I] grasp the present"* in response to the post-LSQ question on how she had changed. This comment could be interpreted as conveying the flexible attitude of someone able to adapt to whatever is required of her and make the most of opportunities. From her record as a lifelong learner (in her 70s), Open University student, regular project volunteer (including a computer buddy) and computer tutor at the Centre, she fits well into the profile of an adaptable older adult (with no particularly strong style), who has learned to go with the flow and change her ways of learning to meet any situation. This links to the next section which moves from the world of work to the more general theme of life and living.

4.3.2 Life and Living

> "[We] live from birth to death in a world of persons and things, which is what it is because of what has been transmitted from previous human activities. When this fact is ignored, experience is treated as if it were something which goes on exclusively inside an individual's body and mind ……experience does not occur in a vacuum."
>
> (Dewey, 1938/1963, cited in Cole & Wertsch, 1996, p. 39)

As Dewey stated insightfully, we actively construct our understanding from experiences, often not of our own making. It became apparent that it was mainly in terms of deeply-felt past experience that the discussants made sense of their learning styles, whether it was school (Jonathan, C15, RT), university (Martin, C1, R) or work (Katherine, C14, RT) and from these embedded memories they were able to construct the stories of their learning journeys and how their learning preferences had changed over time, or not, as the case may be:

Jonathan	*'Initially it is very much a childhood thing. You sat there and the teacher put out the material without any interaction on your part. Then, later on in life you realise that was not the best way for you.'*
Martin	*'My experience of academic education was very much tutor to large class … very formal and very one-way traffic. Since I have retired, moving on to doing, rather than learning by rote, certainly has become much more attractive to me.'*
Katherine	*'We all started off with the 'chalk and talk' and 'sit up straight'. But, when I came to the actual teaching bit, obviously I was interested in learning how people were going to assimilate things'*

Jonathan's theme was the contrast of the *'childhood thing'* with his current preferred interactive way; Martin picked up on the theme and selected the metaphor - *'one-way traffic'* at university, and Katherine talked about *'chalk and talk'* and wondering how her students would assimilate knowledge. This progression of the dialogue, focusing on different experiential periods, arose naturally as the conversation developed around awareness of learning, through stories that illuminated their life circumstances. They were feeling their way towards revealing truths which cannot be reached easily any other way, as they probably had not thought much about this before. This is a good example of a focus group, through conversation and metaphor, constructing an understanding together. Angela (C12, PTR) followed on and mentioned Katherine's

idea of assimilation, Martin's large-scale lectures, and then added her own part concerning the fear of challenging a lecturer:

> *'You were being lectured to and you tended to drift off, at least I did, because you thought, 'I disagree with what he said there'. But I wasn't bold enough to get up.'* [Laughter]

Paul (C10,TR) came next with his own idea about his need for visuals (discussed later in this section), and then Aiden (C7, ARTP) spoke and returned to Katherine's *'chalk and talk'* metaphor, picked up on Angela's *'drifting off'*, Paul's visuals and added his own *'practical aspects'*:

> *'I think the block method, as Katherine said, the chalk and teaching method is very good. I find with the block teaching, you drift off more. Whereas if you are getting the visuals and the practical aspects, I find it is more conducive to my way of working.'*

And so on it went – an example of social constructionism, with the sum greater than the parts.

Metaphors were also used in the post-LSQ and Martha (M11, RT), in reference to her general life experience mentioned a *'huge learning curve'*, and appeared to focus on the curve's positive meaning, namely the potential for quick progress, rather than the pattern's negative aspect, namely the difficulty of keeping going after the basics:

> *'I feel I have been constantly learning all my life as general life experience, both in private and in business. It has been a huge learning curve.'*

This statement underscores the reality that learning does not just take place in classrooms. Dealing with the vast complexity of modern life, means absorbing volumes of information, learning from experience and knowing when to apply it. Patrick (M6, RTP) also made the point about being selective and using one's experience to assess the value of information:

> *'As you become older, you tend to draw on experience to blend with information received, to produce a more balance viewpoint.'*

Like Andy, he is moving towards a constructivist learner-centred viewpoint. This placed him at the heart of generating knowledge and making meaning, with interaction between his experiences and new learning. Diana (S9, R), whose formal learning trajectory started in a Montessori primary school and finished in teacher training college, expressed this straightforwardly:

'I have been in very many learning situations and have adapted greatly.'

Diana expanded on her learning flexibility which allowed her to switch from her normal style to a more effective way for language learning:

> *'I had to learn a couple of languages, partly in work, and I find that very difficult. So I have used 'Accelerated Learning'– doing actions, looking at visual things, drawing pictures, sticking bits of paper on the settee …. It is not my natural way, but I find that helpful. I also use a lot of mind maps. I draw pictures and do snakes coming out. I like that.'*

Diana was alluding to the influential 'Accelerated Learning' (AL) movement (Rose & Nicholl, 1998), widely applied to language learning. AL is the name coined for ways of learning designed to help learners by using activity methods, allowing everyone to learn faster. The AL movement is influenced by Gardner's (1983/1993) Multiple Intelligences theory, but also includes aspects involving the physical body and brain, such as ensuring adequate hydration, fresh air, nutrition and movement and music to prime the brain. AL and other brain-based learning approaches came under critical scrutiny in the 1990s and were accused of taking brain science 'a bridge too far' (Bruar, 1997).

Although it was not Diana's trained way as a lecturer, she found adding more visual imagery to her language learning helpful and enjoyable, through drawings, mind maps and labelling. She also had a strong Visual-Kinaesthetic profile (VK), which helps to explain why it worked so well for her. However, the critical success factor of 'accelerated learning' may be the cascade of brain chemicals, which enhance the growth and connectivity of neurons and is triggered by enjoyment from learning in an active experiential way. This, indeed, had been her initial experience of learning, in a Montessori school where mainly activity methods are used:

> *'Right from the beginning I learned to do a lot of touching, feeling, making connections with different shapes – and that continued through primary school with project work, long before they were doing much project work in Scotland.'*

Such an active learning environment left an indelible impression, and shortly after she began her career as an education lecturer, she abandoned formality:

> *'I was convinced that lecturing was not the way. I switched after about three years into short lecture, discussion, lots of feedback, so that it was much more interactive. So I have always been keen on immediacy and interactive things.'*

This illustrates the interplay of socio-historical context (Merriam *et al.,* 2007) and learning style, and contrasts with Molly (S3, RT) in her group, who had a professional training as a psychologist, but had been at the receiving end of quite a different type of education. Molly responded spontaneously to Diana's remarks about her Montessori school and mentioned how different her early education had been, in a classroom with about 50 other children – and, one can conjecture (knowing it was in Glasgow), in an austere building, sitting in serried rows, with little in the way of light relief. Thus, it is not surprising that this early environment would have influenced ways of learning.

Molly	*'When I was a teenager I was very prone to try and learn by rote. I've dropped that the years. Em, I wonder - trial and error is the way I learn.'*
VB	*'Is that in almost any task?'*
Molly	*'No, it is more to do with things I am having to learn because I am on a steep learning curve since my husband died. He always did the' do-it-yourself' and now I am having to poke my head in (laughing) under the bonnet to figure out what needs to be done.'*
VB	*'Seeing what works.'*
Molly	*'Yes, seeing what works.'*

Unlike Diana, rote was probably the only type of learning Molly knew at school. Her childhood experience was personal, context-specific and perhaps only partially articulated, but still influencing other aspects. Yang's (2003) theory posits that the perceptual facet is where habits, routines, social norms and traditions 'hide', but they still influence the conceptual facet (the consciousness mind) and the affectual facet (current feelings). The interacting and indivisible facets are locked in a kind of dynamic 'dance' through time and it is impossible to separate the dancer from the dance. Such a view is at the heart of a social constructionist perspective. Major change in our social and emotional lives highlights human frailty: we may be competent in our professional lives, but can be exposed and vulnerable in other areas when our psychosocial-personal environment suddenly alters (Baltes *et al.,* 2006), as is prone to happen in later life. Like Martha, Molly drew on the 'learning curve' metaphor, in her case to indicate a sense of urgency.

Still under the heading of 'Life and Living', there were a number of people who drew attention (in the post-LSQ) to changes that came about through opportunities to experience new methods:

Maria (R9, A)	*'I have gone from rote 'sponge' learning to proactive learning.'* (Similar ideas expressed by Gordon: M12, TRP; Rhea: R7, T)
Jill (R10, R)	*'Early life – rote; later life – interaction/discussion.'*
Julian (R4, AP)	*'More student participation – less formality.'*
Dee (M13, RT)	*'Opportunities to learn by doing/discussion/ are far greater than in the 'old days' and lead to better learning and a more enjoyable experience.'*
Aiden (C7, ARTP)	*'More input with audio-visual aids and IT.'* (Similar ideas about IT expressed by Beryl: C3, RTP; Aileen: M1, RT; Una: M7, TRP; Chrissie: M10, ATRP)

It is encouraging that these older adults have had opportunities to experience types of learning other than traditional teaching and that they have happily adapted to this. How widely available such opportunities are is difficult to tell, but with general cutbacks in adult provision one can imagine this is not the norm.

The next extracts highlight how people change as they began to experience new methods other than the traditional talking teacher. One could argue that 'chalk and talk' had its place in providing the acquisition of certain basic building blocks. However, older adults rarely need (or are motivated) to learn in this way, as they have spent their lives dealing with increasing complexity and value deep-level thinking. Beryl (C3, RTP) marvelled at the way her granddaughter learned so quickly, although as children we all probably just soaked up knowledge, but the process is not at a conscious level. Beryl highlights how important visual aids are to her now:

> *'I have always required to have a visual aid as a support, especially now, if people are talking. And as Paul said, doing it practically afterwards, if it is appropriate.'*

Almost everyone benefits from visual aids as the visual cortex in the occipital lobe takes up about a third of the brain and is designed for pattern recognition (Caine *et al.*, 2004). It codes visual images, which trigger connections to other associated memories. Sensory input is, of course, only the beginning of the brain processing information. However, if these sensory signals are weak – if one cannot hear the

words, cannot read a display, or information arrives through a weak sensory channel, then processing problems can arise (Merzenich, 2008). So, it is not surprising that Beryl found visual aids a support - most people do, and the hands-on side of this can be making one's own visual representations (Buzan, 1993), as Muriel (M4, RTP) did, by inventing blue petal concept maps to remember material. When asked if she had been taught this technique, she replied:

> *'Isn't that interesting! Human beings can come up with their own answer. I had to pass the exam, and in these days it was rote learning. I had to use the visual and I've always been a practical person – the pragmatist in me has always been very strong.'*

Right across the groups, there were examples of participants expressing their need for visual input. Interestingly, Gordon (M12, TRP) stated he was not sure about all the "visual stuff":

> *'There is more use of technology now – videos, computerised material and handouts in advance – perhaps the thing I find most useful. I'm not sure all the visual stuff is particularly helpful for me. I tend to prefer written material. If you go to a lecture with only talking, you will take in a certain amount, but an hour later a lot has gone.'*

Handouts, of course, are visual material which can be customised by adding notes or sketches, and then used as a memory aid. Therefore, in a sense, one can think of a handout as a personal visual aid, without the richness and colour of images. Paul (C10, TR) explained the importance to him of being able to visually represent knowledge in some way to understand it:

> *'I've always been conscious of wanting some sort of visual explanation of what's happening. If I get an instruction how to go somewhere, I can normally draw a map. Whereas my wife is the opposite. She wants it all verbally. However, practical subjects – you just can't do on paper.'*

Paul stated forcefully that his need for visual clues differed totally from his wife's need for auditory cues. This underscores the diversity of older adults' different preferences, although failing sight and hearing can develop which may mean ways that worked well before, may not always work well. For instance, Molly (S3, RT) admitted that, as she gets older, the visual modality is increasingly important:

> *'I have begun to appreciate as I get older, that I am very much into visual perception rather than auditory perception. It means when I want to learn anything I read about it, rather than listening. In fact, I do French here, but I have had to work so hard at it, because I really don't have the auditory ability I need. I like to see the words.'*

Educators should be tuned in to the importance of presenting material in different modalities, but sometimes this is overlooked. The results in the post-LSQ on sensory modalities (VAK styles) show visual or kinaesthetic (hands-on) modes had almost identical weighting, with auditory as first choice for only 18% of participants (Appendix 20). What form this 'hands-on" activity takes will depend on the subject and context, but if the learner is not actively engaged in the learning experience, the learning remains 'second-hand' knowledge or semantic knowledge (Tulving, 2002, section 2.4.3), and is highly vulnerable to decay unless reinforced by repetition or practice.

Julia (A3, R), in the next extract, describes a module she attended which included lots of hands-on experiential learning, but also had report writing, exams and projects, so it appeared to be designed around Kolb's learning cycle:

> *'A bit of biology, chemistry, physics, engineering, where we 'deconstructed' a washing machine* [laughter] *and that was fun.* [Approving comments]. *We made soap - a pendulum. It was hard work for 14 weeks. One night a week we did two subjects - we did the experiment and then wrote it up. We did something like nine reports, two exams, two projects and two presentations.'*

The intensity of this science class, albeit hands-on, is a type of learning with limited appeal to all but a small minority of mainly well-educated older adults, who find intellectual challenge, involving private study and exams, adding to quality of life (Jamieson, 2007). However, the majority of older adults, generally speaking, prefer the learning process to happen mainly in an interactive classroom, with minimal 'homework' and direct feedback from class exercises. Laura (C13, TR) underscores the value of this at a language class:

> '*You are learning lesson by lesson. I prefer to have an exercise and get it corrected and discuss afterwards the mistakes other people have made. You learn quite a lot from feedback.'*

Discussing mistakes, of course, is an excellent way to learn and other people's mistakes are even more interesting! Discussion is central to adult learning and will be looked at in more detail later. Next, Mhairi (A2, RT) draws attention to the fact that our brains pick up on different things, and taking time to share our different interpretations allows time for *'fine tuning'*, which is good metaphor for making better sense of new content:

> *'I would agree that being able to discuss what we have maybe just 'learned' (in quotes) is quite illuminating, because you then realise that you don't all hear the*

same thing, we don't all take the same thing from what we hear, and it allows you to fine-tune the information you have received.'

The same sort of idea of discussion helping to clarify what is in one's mind was also stated by Diana (S9, R):

'In the past…I read masses of things, I did lots of things and somehow it was only when people talked to me that I realised what I had been doing.'

Encouraging students to connect to course content in a variety of ways, some of which are mentioned above, allows for a myriad of techniques, from constructing a learning log, where course content can be personalised with drawings, mind-maps, poetry or reflections, to presenting one's own follow-up activities or plans to the class.

While connecting with the material in some way is a universal necessity, the other universal drive is to connect to others. Therefore, if it was just knowledge older adults wanted, there are many ways of acquiring this nowadays without joining a class. The social dimension of learning (Jarvis, 1987) cannot be underestimated, although it was almost below the radar in Group C as the conversation was driven by discussion of learning strategies. However, there was general agreement from the computer buddies that teaching someone was a great way to learn, as this sequence of dialogue shows:

Paul (C10, TR)	*'I would say the whole buddy programme - if you regard the buddies as learners - we tend to learn an awful lot when asked a question we cannot answer. I go and seek help from him [pointing at a colleague] or him…I've been learning!'*
Katherine (C14, TR)	*'I learn more from other people than they learn from me.'*
Jonathan (C14, TR)	*'That's part of the interactive side.'* (Chorus of voices – Yes, yes, yes!)
Angela (C12, PTR)	*'Sometimes you are asked questions you really couldn't answer. One person asked a technical question about how email traveled. I thought I should be concentrating on how to send email, not the mechanics of it.'*
Jonathan C15, TR)	*'I think that is a good example of how different people require different explanations. Some people accept it is done like this, press these key, and others will say – why?'*(All start talking at once!)

Group C had six volunteer computer buddies present (interestingly, five out of the six students in this group had Theorist-Reflector profiles). They were unanimous in

the firmly-held belief that their knowledge continued to grow as they mentored. Being faced with novices with different styles and different starting points, the computer buddies have to connect interpersonally, find out where people are at, and take them round the 'learning cycle', providing hands-on computer instruction, time to reflect, offer explanations and allow plenty of practice.

For both learner and buddy the one-to-one experience is deeply engaging. As Tulving (2002) postulates, learning through experience involves not just words, thoughts and practice, but immersion of the whole emotional and physical self. Adult student and teacher/mentor join together in a process that "changes both their brains" (Cozolino & Sprokay, 2006, p. 11). Teaching computer skills to novices is what could be defined as 'high challenge', but because of its one-to-one nature, it is 'low threat'. Motivation to succeed is high in such an environment (*OECD*, 2007). Motivation arises from the affective facet of knowledge (Yang, 2003), with feelings now acknowledged as inseparable to thinking and optimal brain functioning. Such projects, in which older adults teach their peers, offer powerful opportunities for enriching learning experiences.

Advancing one's computer knowledge can continue through following manuals, online courses or enrolling for a class, and often this latter experience can miss out on all the social elements that enrich learning. Jonathan, both a computer tutor and a volunteer buddy, expressed his concern regarding the lack of this social dimension in a class where he had assisted.

> *'One of the disappointing things I have found, as an assistant computer tutor, is that we get a class of students and the tutor just goes straight into the learning without any introduction.'*

Jonathan brings a welcome mature perspective to the computer courses, as it is often young lecturers who run IT courses who have grown up with computers and perhaps have less awareness of the psychological barriers older learners may face:

Jonathan	*'Another method of learning which I have experienced here - they give you the manual and the first few pages explain the topic. And then the next few pages ask you to do examples. All the class moves at different levels - not tutor-led but tutor er…'*
VB	*'Moderated?'*
Jonathan	*'Yes, moderated.'*

VB	*'So the tutor is floating about.'*
Jonathan	*'Yes, floating around and I find that is very good.'*
Paul	*'I agree completely. I did a computer course like that and I found it much better than other courses, where I am trying to keep up and you miss something.'*

A method that is conducive to accommodating different styles and different starting levels will be far more successful than a course where everyone is unrealistically expected to cover the same ground at the same rate, which inevitably is de-motivating and even distressful.

This leads neatly into the next section which covers information technology, as there were participants for whom computers have made a difference to their ways of learning. It is short because the technological revolution is a subject in its own right and the focus of this study is on personal styles, not technology.

4.3.3 Information Technology

With the accelerated rate of technological change, the urgency of dealing with this is felt acutely by many older adults, who perhaps reached the end of their working lives without having to dip into digital technology, although the numbers in this position are decreasing rapidly. Even a mobile phone demands a level of technical know-how that was unimaginable 20 years ago, hence the high demand for classes with names like *Computing for the Terrified* and the launch of *Computer Buddy* schemes, in an attempt to overcome the fear barrier. The following comments were made in the post-LSQ:

Joyce (C17, RP)	*'I've adapted to new technologies in all aspects of life'*
Aiden (C7, ARTP)	*'I'm more computer-oriented now that IT has taken off.'*
Nan (S7, A)	*'More input with AV aids, including IT; more computer-oriented now.'*

Some older adults embrace computer technology wholeheartedly, but just how comfortable they are will depend on a whole raft of factors, not least former or current job, and possibly contact with the younger generation. Angela (C12, PTR), for example, said:

'The children nowadays - they come in and say they have done such and such. And you think - I've never tried that. You've got to keep going with them.'

Teaching people to use the Internet is one thing, but using it for learning is quite another. It would be difficult to overestimate the impact of the Internet as a source of knowledge, but there is great debate about how effective a computer is as a learning tool, compared to face-to-face classroom encounters. Angela and Martin are enthusiastic computer users and Angela explained how she used it as an adjunct to her class learning:

Angela *'Take the Egyptology class. The guy gave us websites and you could go and learn more than he could tell you in the two hours. You could go through the temples and burial chambers on a virtual tour.'*

Martin *'That's the advantage of modern technology. All that is accessible to you at home. It is one of the marvellous changes.'*

Angela *'You can look through the gallery – the Salvador Dali museum, for example, on the Internet, and know exactly which part to go to see particular pictures'.*

Although she may seem to be endorsing the Internet wholeheartedly for learning, she is referring in reality to blended learning – a combination of a class and related websites, where more can be discovered in a hands-on way. It is a method that more and more tutors are using independently, through directing learners to websites or through creating a class website to add value to their teaching, allowing learners to explore links to their particular interests.

The potential for more types of blended learning is largely uncharted territory, but features strongly in U3A programmes in Australia, for example, where distance precludes face-to-face learning for many rurally-based people (Swindell, 1995). Blended learning in Scotland will be a major growth area in the future, as broadband becomes the norm, and net meetings and user-friendly platforms create ways of interacting and social networking. This field is wide open for development. More classes are going online, making it critical in each discipline to study the advantages and disadvantages of learning this way. Much research has been done and many books written about e-learning and learning styles, especially in the higher education field. However, I am not touching on this aspect here, except to say that the need to design courses that help students capitalise on their learning style,

appears critical to improve the success and retention rates of online learning (West, Rosser & Monani, 2006).

Brain research suggests that exploring meaning is something that is best done through shared experiences and best achieved, as Cozolino & Sprokay (2006) suggested, face-to-face and heart-to-heart. So the type of courses older adults enjoy, which usually involve interaction, present a challenge to e-providers. However, there may be a whole raft of courses in the future, which will involve a delivery component online and a tutorial component in a classroom, but the cost of programme development in the current economic climate is not working in its favour.

4.3.4 Intrapersonal change

So far, I have selected examples from the data which illustrate change driven by work, by life, by new interactive teaching methods and by new technology. Next, there is change that comes when people's conception of learning itself shifts, from a view of knowledge as primarily a matter of reproducing aspects of some outside reality, to finding personal meaning in what is seen and heard. New knowledge then becomes the clay that shapes new ways of understanding. Several participants (below) expressed this in the post-LSQ and others elaborated on this theme.

Harriet (A1, R)	*'I have become increasingly reflective and less inclined to have preconceived ideas and make assumptions. I listen more and keep an open mind.'*
Grace (A4, TR)	*'Much more reflective.'*
Linda (M5, ART)	*'I think things through.'*
Miriam (C9, PART)	*'I look at things from more than one viewpoint.'*
Christine (C6, P)	*'I am more patient and go into things in more depth.'*

Approaches that move learners along a continuum from memorising towards increasing depth of understanding are usually embedded within the learning situation. It can be done by helping people understand how learning takes place through explaining the learning cycle, or by strengthening understanding of how knowledge itself is created (Candy, 1990). Baxter Magolda (2004), Brownlee (2004) and others,

have researched this more complex ways of knowing, and Cohen (2005) has traced the development of wisdom in older adults. Below are examples of various transformative experiences among the participants.

Norma (A5, AP), whose style had not changed, although she said she could learn in different ways if required, described how she left school to escape the tedium. She decided to go to university years later, experienced communicative methods, and learning at last became meaningful to her:

> *'I realise that very much of the teaching long ago, was lacking in dialogue. And that's possibly one of the reasons that I was turned off going further.* [Laughs]. *I couldn't bear the thought of going on to university. And that is quite interesting to me now.'*

This extract highlights how little importance was once attached to cultivating communicative skills. Talk was seen as interfering with learning in much the same way as emotions are thought to get in the way of thinking. People with a strong communicative dimension to their personality (like Norma), felt stifled, and *'couldn't bear the thought'* of spending more time in an environment where this was not valued. Later, she found a university where her experience of learning was transformed:

> *'One of tutors said you've no idea how wonderful it is to have people like you in a group because you are going to stimulate discussion…. We had tutorials and were able to discuss things in depth.'*

She went on to become a successful English teacher and found that now discussion was officially on the curriculum for her senior pupils!

Harriet (A1, R), who stated in the post-LSQ that she was becoming a more open-minded person, challenges the stereotype of people becoming more rigid thinkers as they age. She articulated eloquently that being able to explore ideas through dialogue deepens understanding and growth. In effect, it helps people overcome fear of admitting they do not understand and builds up confidence. Harriet stated:

> *'When you have this continuing dialogue it is one way of overcoming the fear people have of admitting they don't understand something. Because, by developing the whole issue, you are picking up just a wee bit more information and in among that will be the vital clue, to not only your understanding, but having a depth of understanding. It gives you the confidence to say – 'Yes, I know about this'.'*

Fear in adult education may be a legacy from negative school experiences, combined with the way intelligence continues to be perceived as a display of cleverness by producing 'right' answers. Dweck (2006) has identified that some people carry around beliefs that they will be judged as not 'smart' if they cannot produce the 'right' answer. Therefore, it becomes a risk not worth taking. Harriet highlights that having opportunities to discuss gives time for deeper thought processes to be activated, relevant information to be absorbed, connections made to previous knowledge and new understanding to form. She is articulating what neuroscience has confirmed about time being needed for ideas one hears to connect up in the associative cortex and go on to higher level processing in the frontal cortex (Zull, 2006). Then, people are able to make a perceptual shift and will "get it" (Caine *et al*, 2004).. As Harriet states, discussion facilitates *"a depth of understanding."*

She elaborates on this point when she uses the metaphor "watching the penny drop" towards the end of the group discussion:

> *'I have actually watched children - visibly watching the penny drop, not from something I've said, but something another child has said - because they understand the language of a peer. So I think without those opportunities [to engage in discussion] you are really, in a sense, short-changing the learner.'*

There is no reason to believe (from the tenor of her previous contributions) that the metaphor –'*short-changing the learner'* - would not equally apply to adult learners being denied opportunities to find their own voice and construct their own meaning. (This was also the point of Formosa's [2000] U3A critique). She also recognises, perhaps in an intuitive way, through her use of the metaphor *'short-changing'*, that a 'social good' (Gee, 2005) is at stake here – denying learners of opportunities to develop their potential, and build their own understanding and intelligence. Using Yang's (2003) model, Harriet's words can be identified as an example of perceptual knowledge gained by the teacher through her own practice, activated as conceptual knowledge (in terms of a new explicit framework for using dialogue in her teaching) and expressed as affectual knowledge at orientation level (freedom and justice) with concern for learners' needs and rights, expressed in the metaphor 'short-changing'. This is powerful insight and poses the question, also asked by Glendenning (2000) and Findsen (2005) about older learners – Whose interests are being served by

certain educational practices if personal development is not a priority? Claire (S1, A), who claimed her LS had not changed, reinforces the value of this approach:

Claire *'I find when I try to learn I like to either discuss it with somebody or read up about it. Sometimes there is a little element which I have touched on before. I sometimes have a bit of doubt, so I like to have a bit of a discussion.'*

VB *'Bounce ideas around.'*

Claire *'Yes, bounce them around. I think, like yourself, Molly, you learn by experience.'*

VB *'Has that been a thread running through your life?'*

Claire *'I think so. I think I feel slightly insecure and I like to discuss things.'*

VB *'Human contact – reassurance that you are doing the right thing.'*

Claire *'Yes, human contact - But it's that - 'Yeah, that's right, that's right – go ahead'* [Laughs]. *Pat on the back and that sort of thing. That's the way I like it.'*

Claire's desire for reassurance highlights a point Zull (2006) made succinctly. He described how the cortical networks are bathed in chemicals secreted from an older part of the brain (the limbic system –Appendix 1, Evolution of the brain and Figure 3) which still profoundly influences the 'thinking brain'. Neuro-chemicals impact on the signalling system and "act by modifying the strength and contribution of each part of the learning cycle" (p.7). Fear reduces concentration and increases anxiety, while optimal learning depends on a positive cycle of engagement, discovery, reflection and practice, leading to enjoyment, fulfilment and confidence (Ledoux, 1998, Johnston, 2006). Discussion with empathetic peers, as a way of overcoming uncertainty, as Harriet suggests, is one of the most effective classroom strategies to boost understanding.

The purpose of education shifts when human happiness and social, emotional, spiritual and intellectual development merge. Carl Rogers [1902-1987] the influential humanist psychologist, who advocated a student-centred approach, described learning as one of the defining characteristics of the human race as we strive to make sense of the world and our lives, and later life is a time when learning can take on a new significance. Martin (C1, R) conveyed this fundamental shift in his thinking in retirement:

> *'Now the world's your oyster. You can choose whatever you want to do in whatever order you want to do it, and at this stage it can be much less structured, and more*

individually suited. I think this is the big difference. Now it is intrinsic- what I am motivated to do is what I enjoy doing.'

The knowledge that adult learning can be a leisure activity quite different from a sport, for example, is something of which educators are not always aware. The value of taking an integrated approach embraces the belief in the interconnection between mind, body, spirit, and sociocultural factors (Baumgarten, 2001) and where the focus is in promoting holistic growth. This may mean taking people out of the classroom. The stimulation of new places is very attractive to older adults - hence the popularity of Elderhostel (now Exploritas) and other thriving summer schools. Martin reflects this enthusiasm describing an architectural site visit:

'The best part of that course was when we did the site visit to Durham – and that was really very interesting. The course came to life seeing the actual buildings.'

Cozolino and Sprokay (2006) have described the brain as a 'social organ' (p. 11) designed to learn through shared experience. The course would not have 'come to life' in such a memorable way without the social dimension of learners together sharing the whole site visit experience. Martin also throws out a challenge to providers for more innovations of this nature:

'I think you (the University) need to be looking at courses to see if they can be developed in new ways.'

Andy (M15), who had already undergone transformation in his learning approach to become an arbitrator, had changed again:

'I've moved away from structured learning. I'm now getting into 'comfort'learning. I'm doing a class on metalwork. There is not a lot of thought involved but I am finding it very interesting and very exciting. Someone with a skill is showing me how to use that skill and you have got something at the end. It is like comfort foods – it is comfort - learning as you want to do it.'

Andy's metaphor conveyed learning for pure enjoyment, using his hands to make things which human beings have been doing since the dawn of civilisation, with the satisfaction of a finished product. This idea of positive feelings, invoked by success, driving one on to the next stage was expressed by a number of participants. In the next extract Kim (M9, A) responded to the question on how she judged she had learned something well:

'I tend to enjoy something if it gives me pleasure afterwards. After the art class I think – 'I really enjoyed that'. So I remember because of the enjoyment and it motivated me to return.'

Reflection on learning, not necessarily at the time, but afterwards is a powerful driver. Kim found that just thinking about the class later created good reinforcing feelings. Her Activist LS and strong visual and kinaesthetic profile also meant she was well-suited to a practical class. Similarly, Claire (S1, A) and Rowena (S4, AT), both with Activist profiles, responded to same question, with the focus also on an art class. I pressed Claire about feedback:

Claire	*'I think if you have been at art and done quite well at it you would then want to take it a bit further on to the next stage.'*
VB	*'But how do you know you have done well at it?*
Claire	'*You are enthusiastic and you remember - it does not get shoved away back and you want to take it further.'*
VB	'*You want to use it in some way?'*
Claire	*'That's right. You know so much more, therefore it is more interesting because you have learned more and go on to the next stage. That's how I judge how well I have learned.'*
Rowena	*'If it gives me a buzz. It is like me going to bake a cake – if it turns out I'll make a fruit loaf next time.'*
VB	*'So some internal feeling of achievement drives you on.'*
Rowena	*'If it turns out, you are delighted – if not, cover it in custard.'* [Laughter].

Claire (also with a strong visual and kinaesthetic profile) was spot on when she stated that her feeling of enthusiasm anchored the new knowledge and made her want to go on – or as she put it - *'it does not get shoved away back'*. In effect, this is the creation of a virtuous cycle reinforcing success. Rowena expresses it metaphorically in terms of *'a buzz'*, which is none other than a cascade of chemicals flooding the brain's pleasure centre. Brain chemistry underpins responses to substances such as alcohol, chocolate, prescription drugs, and addictions to practices such as gambling, shopping and smoking (Pert, 1997). These pleasure pathways, stemming from more primitive parts of the brain, have an unconscious influence on all behaviour involving our emotions, and as cognition and emotions are inexorably linked

(Damasio, 1994), our motivation to learn is affected positively or negatively depending on the neurotransmitters released. Although we cannot control this chemical release which signals attraction or danger, we can consciously decide how we will respond to those signals (Taylor, 2006). This is where mindset (Dweck, 2006) towards success and failure plays a critical role. Rowena's remark - *'covering it in custard'*- could be interpreted as evidence of a 'growth' mindset, as it is still good for something, even is it failed!

Rowena's friend at the art class was of a different ilk, as she experienced negative reinforcement:

> *'Gemma did not come back. There is art in her family, so she thought she was going to become an 'artiste'* [Laughter]. *I tend to plod on and on. It was interesting and the people in the class were great - really good.'*

Success eluded her friend who had misguided expectations that she had a genetic predisposition for art, and when this did not manifest itself early on, she left. Despite her unfortunate childhood experiences, Rowena appeared to have the growth mindset that most people have to persevere to succeed. She *'plods on and on',* bolstered by the social dimension of others' encouragement.

However, different people have different thresholds of disappointment, just as with pain, and a teacher who believes that individuals must work everything out for themselves (Caine & Caine, 1991) also takes the risk, that if the penny does not drop quickly enough, the learner feels overwhelmed and walks away. Such people can come to define themselves as lacking in ability and will bring this mind-set and self image to bear in new situations, which may further reinforce a sense of inadequacy. This is where the art of scaffolding is so important (Vygotsky, 1978, cited in Caine *et al,* 2004), but no teacher will judge the situation correctly every time, given the spread of expectations and spread of learning styles within an adult class.

An upbeat approach, rather than a cautious approach, will usually work, as most people who enrol have overcome previous knock-backs and have a certain confidence in themselves. Chrissie (M10, ARTP) exemplifies this spirit:

> *'I learn better now that ever I have before because I now have the confidence to ask questions. When I first went to school when I had finished I remember her [the teacher] telling me, 'Go and sit with your hands on your head'. So I never finished anything first again. Because I was so shy I used to get shouted at, so I just became more and more withdrawn. It was not till, in fact, my children had*

grown up that I went out into education and I enjoyed it, because the people that taught me were very interactive and interested in adult students. That is what I really enjoyed. That is why I come here now.'

VB *'You could have been put off learning for life.'*

Chrissie *'Of course, I learned things myself– I do a lot of practical things, but as far as education is concerned it really put me off from the very beginning.'*

VB *'You are probably one of thousands switched off by early experiences.'*

Chrissie's remarks, like Rowena's, illustrate how painful emotional experiences can have a devastating effect, but in the hands of a good adult educator trust and self belief can be restored. Her profile produced four strong styles, which probably means that she is, in fact, a good all-round learner. Maureen (M16) has never experienced Chrissie's treatment and has a completely different perspective on her early education, with her enthusiasm for learning never wavering:

'I think teaching when I was young was very good because of the quality of the teachers. I have always had a curiosity to learn more. I think now the difficulty is retaining what I have learned.'

Maureen raised an issue here that came up frequently in the respondents' narratives – how to make learning stick. Norma (A5, AP), as a mature student with a young family, reflected on how much of her University learning went *'in and out'*:

'I think there are an awful lot I learned in the University that went in and out. I got through the exams but I cannot remember a single thing. They were learned for that purpose, and that is not real learning. I think real learning is something you use later in your everyday life or in your leisure.'

This type of learning – what Andy called *'crisis learning'* – transferring information from outside into the brain to be able to reproduce for exams, is in fact short-term memorising and not really learning at all (Saljo's, 1979, category 2 learning, cited in Candy, 1990 – section 2.2.8). This commonsense definition is often used for learning, which is conceived as the straight rote transfer, with little or no interpretation. Norma recognised that this was a travesty and *'real learning'* was something that you could make your own and apply in your life. Katherine (C14, TR), however, still had a lingering admiration for *'chalk and talk'*:

'I find the old chalk and talk really had its merits, because an awful lot of stuff dinned into you is still there. Whereas if you are learning practically – I found anyway – unless you are going to be using it regularly, it fades. It's not so easy to recall if you have not done it for a couple of years.'

Having stuff *'dinned into you'* is not what adult learning is about and is probably a reason many adults never set foot in a classroom. Why some types of learning are retained better than others is explained by the work of Tulving (1972, 2002) and others who distinguished between second-hand knowledge (conceptual knowledge) and learning from experience (perceptual knowledge). As neuro-imaging has confirmed, learning from experience stimulates the visual, auditory and motor cortices, the emotional networks and prefrontal lobes, creating a rich web of synaptic connections (see section 2.4.3). Also, critical to the process of learning is a relationship of mutual trust and respect between teacher and taught which, sadly, seemed not to materialise in some people's young lives, but at least, can be experienced later in adult education. Caine *et al.* (2004, see section 2.4.4) have highlighted the paramount importance of quality relationships between learners and adult educators, as has psychologist Carl Rogers (1969) on the value of positive regard and neuroscientist Marion Diamond (2001) on the effect of loving attention.

Finding her own meaning in life and developing her own reflectivity is uppermost now in Diana's (S9, R) thinking, which is not surprising in someone with a strong Reflector style and a background of different jobs, different careers and different interests:

> *'I have become much more involved in later years in making connections between different things I have read and studied. I keep now drawing them together. I'm less prepared now to get absorbed in what I am learning – I am much more interested in how I see it – how it fits with what I think about life. I'd like to do more of that.'*

Before commenting on the above, here also are Mhairi's (A2, RT) thoughts on reflexivity. For her, the LSQ has played a part in highlighting a growing awareness of different ways of learning as she reflects on her broadening perspective:

VB *'In your questionnaire, Mhairi, you have shown that you have become more reflective.'*

Mhairi *'I think I am now more aware of the circle [the learning cycle]. Just because something is done in a certain way, it is not necessarily the best way. I like looking back at how things were done, what improvements could be made. Maybe that is more a reflective attitude. I also like hands-on. I like to understand why things work.'*

VB *'As a scientist?'*

Mhairi *'I don't know which came first – the chicken or the egg. Was I like that before, because I liked it or was it because I was good at it? I think I have*

> *become more aware of having more interests than I thought and perhaps I ignored these. I don't know whether I should take an art class or something.'* [Laughter]

Earlier, Mhairi also indicated that she had not given much thought to how she learned before, while now she enjoys learning more interactively and queries whether this might be linked to maturity. The more people develop and educate themselves, the more they refine their behavioural and cognitive options (Baxter-Magolda, 2004). In fact, one could argue that the chief purpose of education is to cultivate repertoires of cognitive and behavioural styles and strategies, helping adults recognise the complexity of situations and the possibility to respond in flexible and creative ways. Although LS constructs and their measurement instruments have been found to be flawed (Coffield *et al.*, 2004), the process of reflecting on learning and discussing different approaches with peers and teachers, offer mind-changing possibilities.

In the case of Diana and Mhairi, it could be said, that they are contemplating their emotional development (Goleman, 1995), as Mhairi toys with the idea of an art class and Diana philosophises about how her learning fits together. These aspects deepen one's intuitive and spiritual self. In terms of Gardner's (1983/1993) Multiple Intelligence theory the women's growing awareness of new possibilities is burgeoning intrapersonal intelligence (self-monitoring and reflection), which may have remained dormant during busy working lives. Although their interpersonal skills as teachers will have found expression in efforts to facilitate improvements in others, later life provides opportunities as never before for developing one's latent potential.

4.3.5 Healthy learning environments

Wolfe (2006) claimed that educators who understand the biological underpinnings of emotion can use it to affect learning and retention in a positive way by building "emotionally healthy and exciting learning environments" (p.40). It was interesting that this 'healthy' metaphor was also used by Harriet (A1, A). As she concluded her opening contribution:

> *'I think it is always beneficial to have an ongoing dialogue because sometimes you don't know what you know until you talk about it, until you actually speak. And you find that part of the learning process is transforming thought into dialogue. And so*

> *that process of learning is a mixture of being given information, seeing it visually and then, not only saying what you think yourself, but learning, sometimes, with great surprise, what other people's perceptions are. I think is a very healthy way of, not only learning, but retaining and understanding, understanding and retaining.'*

Harriet was referring to the process of articulating one's own thoughts and reciprocating by actively listening to another person. Zull described how talking activates the motor cortex and all the brain musculature involved in speech. To use the words 'healthy' to describe this way of learning she was drawing on a discourse of health, although perhaps not consciously, as people's metaphors are often not fully expressed (Gee, 2005; Yang, 2003). Health is one of the most powerful discourses in our culture. To use it to describe learning in this context is unusual and Harriet bestows on the dialogic process a metaphorical "health" value.

We are all familiar with exhortations to bodily health - healthy living, healthy eating and healthy exercise. However, there is now awareness that one's mental state is key to health and I drew attention in Chapter 1 to a number of reports (Allen, IPPR, 2008; Beddington *et al.*, 2008; Field, 2009b, 2009c) which all acknowledged this link. Remaining well and maintaining mental capital are inextricably connected and are seen as vital for preserving independence and wellbeing in later life - "A new mindset is needed" (*Foresight*, 2008, p. 33). Perhaps, part of this could be more opportunities for various forms of 'healthy' learning, some of which have been suggested by participants in this research through more collaborative practices which create supportive cultural spaces, which would also include the 'learning cultures' envisaged by Hodkinson *et al.*, (2008). Classroom cultures are changing and Beryl (C3: RTP), as she expressed her enthusiasm for the LLL programme, drew attention to this:

> *'At one time tutors were held in awe and no one dared ask a question never mind challenge them. That has gone to a great extent. That's great because it makes for a good atmosphere in the class. You are all working and learning together.'*

Healthy learning environments have an atmosphere of open exploration, with the search for meaning at it core. Meanings do not sit in a brain compartment but are an emergent property of many brains. They are socially constructed - subject to all the varying influences in our lives on a moment to moment basis. Articulating what you mean begins to change half-formed or half forgotten existing knowledge into

coherent thoughts to be matched against others' ideas. Greta (A4, TR) expressed this idea well:

> *'You cannot tell what is in your head till you say it out loud to someone else. I don't mean we can't tell. Like going back to what you said, Harriet. In discussion, you are actually hearing yourself going over what you have been thinking and all the interpersonal skills about your reaction, whenever I say something – 'Oh, That's not what I got out of it'.'*

In negotiating meaning, one needs to bring into play the affectual facet – the feelings and emotions that suffuse human transactions, requiring genuine respect, tolerance, patience and interest in the speaker or listener. Without these, words might be spoken and heard, but communication rarely takes place. Educators need to embrace and cultivate these human values. Dialogue engages both intellectual and interpersonal skills and connects people in way now known to promote wellbeing and, by default, is a contributory factor to mental capital.

Discussion, of course, is not without its dangers, as groups or dyads set the task of discussing an issue, need some ground rules so there is an equitable sharing of views and no one-sided conversations, as Greta (A4, TR) pointed out:

> *'We needed to have of ourselves - control - when to keep talking and when to finish off and when to pull the topic back. Because there was one particular person who tended to dominate and the tutor did not handle him well.'*

This is a whole subject on its own, as adults come to classes for many different reasons. A few people can be particularly needy and can appear to dominate discussion and use it as a vehicle for their particular obsession, usually not intentionally, but because of an underlying problem, and this puts a strain on the group. It is an issue not adequately addressed in the literature, but a situation most teachers have to deal with at some point in their professional lives, which ultimately may need counselling intervention.

Dialogue enhances recall and this is welcomed by adult learners for a variety of reasons. Therefore, a teacher/tutor who can make the classroom experience more vivid will improve the memories of what takes place there. Diana (S9, R) made the point that the lively, engaging, and dynamic exchanges of views with her university students left her with vivid memory traces to this day:

> *'I can even see myself, for example, saying certain sociological things and someone in the class saying - 'That's a load of rubbish?' 'Well, let's see if we all think that.' I*

can see the person and I can see the point they were making and what we doing. And that is very vivid still.'

Neuroscientists all say, "Neurons that fire together, wire together", so we know that the brain links assemblies of neurons together and the richer the sensory experience the more joined-up connections. Diana's vivid recollections of the people, the dialogue, the discussion points, were established through the rich multi-sensory experience of an animated debate, which engaged all of the brain in dynamic interaction. Consciousness experience is at the core of cognitive functions and connects memories - trigger one memory, others follow. Memory is sometimes talked about as if it is a thing, but it is a process influenced by the emotion chemicals from the limbic system.

Greta gives a graphic description of one type of experiential learning which evoked the right conditions for encoding:

'At the memory class, we learned from getting up off our seats and putting physically into our memory patterns visual things, such as a shopping list to memorise, on our body parts – eggs on the top of my toes. All these exercises are still there because we took part, talked about it and laughed about it, and feeling we had achieved something.'

This learning space contrasts with the class Laura (C13, A) describes where the sort of stimulation required to make the experience memorable was totally lacking:

'If you find you are not gaining anything, work at home and try and contribute to the class. This never really works awfully well though. The class never seems to join together. It is only now and again one experiences this and I think it is the tutor's fault. No, because sometimes you can get a class that just wants to be passive and that lends itself to a very uninteresting class.'

Laura was very forgiving in her statement, as the class teacher has the key task of injecting energy and enthusiasm to what should be an already motivated group of people. Wolfe (2006) has drawn attention to the key responsibility of the teacher to create a 'healthy' environment.

If there are 'healthy' environments, then there must be 'unhealthy' environments, where there are incongruities and conditions less conducive to learning, some of which will lie within the tutor's control, and others on the situation, expectations and individual reactions. In the focus groups, the participants were asked how they responded if they experienced a clash. This can create a feeling of dissonance, which can trigger uncomfortable emotions that have to be dealt with

there and then. The first type of dissonance is a mismatch of starting level described by Paul (C10, TR):

> *'I attended one language course where the course did not follow the syllabus promised, as almost everyone had been on it the year before, so they just carried on. That was not good for me as a newcomer.'*

It is only fair that a class adheres to the published agenda, unless there is a very good reason for change, so Paul was justified in feeling cheated and somewhat aggrieved. Andy's (M15) grievance also involved language learning, which turned out to be a complete waste of time:

> *'Two years ago I took a quantum leap and went to Alliance Francaise. They put me into a class where they do nothing but talk French. I was most uncomfortable. I stuck it for a couple of weeks but I was at the wrong level. That has put me off.'*

This student's "quantum leap" was a leap too far and demonstrates that effort taken before or at the start of a class, to establish individual levels and student's expectations, would pay dividends in the long run. Andy's departure after a couple of weeks, never to return, was a loss to the organisation, and at a personal level he might never try another language class. This would be a great pity, as learning a foreign language is one of the best ways to create new neural networks and contributing to building cognitive reserve (Stern, 2006). The next example reinforces the frustration generated when Muriel (M4, RTP) feels she is wasting her time because the course has been advertised incorrectly:

> *'I am attending International Cookery. I feel it should have been advertised as a basic class – as it is too basic for me. I'd have been better to buy myself a cookery book and just get on with it.'*

Katherine (C14, TR) makes the point that when a course turns out to be a disappointment, it is not only money that is wasted:

> *'You are also paying with your time, which is not going to be repeated, so you do want to make the best use of it.'*

Although our life span is extending, how one spends one's remaining years is an important issue, as we are all aware of a finite lifespan and time is precious and not to be squandered. The next extract is from Rowena (S4, AT), who believed many students in her beginners art class had drawing experience and made her feel inadequate:

> *'What did upset me was there were a few there with qualifications from the art college. So drawing a bottle - I had every shape, whereas those ladies were drawing*

> *it - perfect. I thought – I shouldn't be here. I felt really incompetent. When she* [the tutor] *came near I'd flick over my paper and say I'm still measuring up.* [Laughter]. *Whereas, if we are all in the same boat, we can have more fun with it.'*

This is a case not dissimilar to Muriel in her cookery class, except the positions are reversed. This time it is not though lack of progress, but too many people producing material better than beginners' level. Rowena's metaphor – *'All in the same boat'* – conveys that she felt an 'outsider'. This is a case where scaffolding (Vygotsky, 1978) was required and perhaps also, more sifting at the start to confirm the different levels in the class. It is one of the major challenges in all adult education classes to ensure everyone's needs are met and no one should feel in an inferior position.

Another type of practical class where frustrations can boil over is Information Technology, as illustrated by Paul (C10, TR):

> *'I recall in A's class – tutor-led rather than paper-led. And he wanted to move onto the next stage and I had to say - Hold on! I realised there were other people who were less vociferous, but they also wanted further explanations. So the student has to shout!'*

Perhaps, every class needs a confident student like Paul who is prepared to challenge the 'galloping' tutor. Often, the flagging individual thinks he is the only one and keeps quiet. Jonathan (C15, RT) also makes the point about the tutor having his own agenda:

> *'I certainly experienced the tutor-led teaching (IT) which can be excellent for 20/30% of the class. But always some fall behind, while the tutor seems to have this course set that they have got to do this, got to do that.'*

This problem is surmounted by individual workbooks, already discussed by Jonathan, and should be the norm for IT unless it is a very small group which allows one-to-one help.

In the post-LSQ the final question asked about the type of classroom situation that would be completely unappealing – a 'switch-off' (see Appendix 21) Verbal presentation with little or no engagement was the key culprit. The presenter's personal style was also a critical factor - particularly non-participative lectures, few visual aids, monologues from notes or rambling style. Content also came under scrutiny, with too much detail or theory, complicated models and long descriptions. Many of these elements will have been experienced by regular attendees at adult education. There were also comments that arose in the focus groups concerning the

teacher's style of presentation. Norma (A5, AP) made the point that signposts of where a lecture is leading can make all the difference:

> *'I don't mind a long spell of someone talking at me if it is well structured. You can then mind-map it – as I did often. Other people just stand up and blether. I find that very, very frustrating and I want to get up and walk out.'*

Later, Norma commented on a 'taster' session, advertised as a practical subject, where she made her voice heard when the presenter failed to deliver:

> *'I came to a taster class....a practical subject and no practical thing was appearing. He just rabbitted on. Eventually he said – 'We'll now get on to the practical bit'. I shouted – I could not stop myself – 'And about time too!' I thought – 'Was that me?' I had reached such a stage of frustration that I did challenge him at the end.'*

Tutors who do not deliver what is expected of them deserve to be admonished, but often students just depart, never to return. Aiden (C7, ARTP) revealed that his style was to speak quietly to the tutor:

> *'If I have a lot of problems I speak to the tutor - one-to-one - to see if he can come round to my way of learning. I would not intend to upset the whole class.'*

Molly (S3, RT) endorsed the idea that the crux, whatever the subject, is to connect to the class and keep people engaged. This perhaps underlines the reality that older adults are often not in search of plain facts, but want to be taken out of themselves and entertained, as much as educated. She said:

> *'I think it is most important to have an interactive approach between the tutor and the class. There is a lady whose classes I go to who is absolutely marvellous. She has a tremendous depth of knowledge, but she gets sidetracked. We get lots of stories and I admit I go to the class for this - it's amusing and fascinating sometimes – but it is certainly not the subject.'*

Rowena (S4, AT) also endorsed the importance of an encouraging teacher and learning for pleasure:

> '*[The tutor] was very good, very good for boosting your ego. I think if things are light-hearted – especially for our age-group - because we don't want any pressure. We are at the stage now to relax.'*

Also Katherine (C14, TR) drew attention to freedom of choice, Laura (C13, A) to choice and freedom from exams, and Joyce (C17, RP) to a light touch and variety:

Katherine *'There is nothing we need to know really in that sense. So we can concentrate on things we like to know.'*

Laura *'I think this over 50s is a great opportunity for everyone to choose what they want and enlarge on it without having the stress of exams, and the rest of it.'*

Joyce *'I find if I want to learn I need someone with a sense of humour. But I like variety. I can't stick with anything for too long.'*

These reflections on motivation - and other references to motivation by respondents, for example, Martin -*'the world is your oyster'*, Kim, Claire and Chrissie (section 4.3.4) - reveal that in later life, for many people, intrinsic motivation is the driving force – bribes and extrinsic rewards are no longer required – no need for promises of grades, gold stars and promotion. If educators find out what is motivating an older learner, then they can concentrate on delivering the appropriate content. However, sometimes educators can get it completely wrong and a different kind of scenario plays out when too much information is crammed into a session and it becomes anything but motivating (Caine et al, 2004), as Linda (M5, ART) found at one lecture she attended:

> *'We heard eight tapes about types of people but no one could keep up so I don't think we learned much. There are some forms of learning experiences that are less than helpful.'*

In the next extract, Claire (S1, A) found that the atmosphere was so formal, that even questions at the end were not welcome, which sounds not unlike the U3A in Malta (Formosa, 2000):

> *'This person just stood and said what they had to say and we[the students] did not say anything. At the very end of the class some people dared to put their hands up, but it was not encouraged. It did not suit me at all. The person knew the subject inside out but the presentation was terrible and there were no handouts.'*

So, knowing the subject well did not compensate for restricting communication. Controlling adults in this way creates uncomfortable feelings: instinctively we want something to happen, some reaction to a question or a counter argument, or some connection with the other listeners. Most of us have a natural desire to speak with others (Goleman, 2006) and will happily discuss anything we are asked, if given a chance. As Palmer (1998, p 156) wrote: '…the human soul simply wants to be seen and heard'. In complete contrast to the previous extract, Harriet (A1, A) described the features of a good lecture she experienced at a conference:

Harriet *'The person who spoke longest - 45 minutes- I heard every word. I listened with great satisfaction because I knew I was retaining it because of the manner she used. It was because of the hard work she had put in. One sentence slides – I found that helped me as I got older. She spoke to that with dramatic interventions*

humour, and speaking to the audience – have any of you ever thought…? Put up your hand if you have..?'

VB *'She engaged the audience.'*

Harriet *'Exactly. We moved from one part of the presentation to the next with, just what you were talking about, Julia – with a brief summary. As a result this was the theme that everyone was speaking about. Whereas the other stuff had fallen into a black hole. She was lively, she was performing the way teachers do, but she was wonderful at it. You could see at the end of it she had achieved great satisfaction.*'

Harriet's metaphor - a *'black hole'* - aptly describes what happens with a surfeit of information. However, a lecture delivered by someone skilled in the art who uses interaction, with some well-prepared slides, can be an effective and useful platform for future discussion. Harriet finished by drawing attention to the speaker's own satisfaction. That inner satisfaction is something experienced by both teacher and taught when learning has taken place. This feeling of satisfaction came over when the participants below were asked when they knew they had really learned something: Learning naturally was the key for Martin, which meant in the way that came easiest to him and gave him the greatest satisfaction:

Martin (C1) *'Apply what you learn naturally without giving it too much thought. And build from there and feel a sense of satisfaction and enjoyment.'*

For Linda (M5), it was not necessarily applying the knowledge but making one's store of knowledge one's own. This involved selectively linking acquired knowledge to one's own life and interests:

'Application is good but I don't think it is always application. It is building up your store of knowledge and recognition, and making it your own.'

Katherine (C14) reckoned it was taking a step beyond what you have learned, or a side step, to develop your own variation on a theme:

'I think if you start to build on what you have learned, and it leads you to do other things, not necessarily exactly what you have learned.'

Similarly, Gordon (M12) saw it as making spontaneous connections to the wider world, adding to one's pleasure and quality of life:

'I did an art appreciation class last year. I don't think there is any application as such, but I do recognise things in TV programmes and art galleries, and it adds to the quality of life.'

For Andy (M15), it was learning a new skill from a craftsman and the pleasure of producing something with his own hands:

> *'Something practical, useful and tangible - perhaps to put into practice in my life, tangible - something I have made with my hands.'*

Rowena (S4) – a people person – focused on the social aspects of learning and thought that, perhaps just keeping learning with one's friends, supporting and encouraging each other and keeping thinking *'on the same wavelength'*, so no one gives up and no one loses out, is all the reason needed for learning:

> *'You keep in with your friends to make sure you are all on the same wavelength. It saves you from slipping…When someone tells you something you want to hear, it makes your day.'*

Her final comment is perhaps the reason many older adults engage in learning to *"make their day"*, to experience an environment where they learn something interesting, do something interesting, or meet someone interesting: they require to leave a class feeling uplifted, and sustained by the experience, whatever it is. To pararphrase McClusky (1973, cited in Hiemstra, 1981) education is an affirmative enterprise and should enrich the lives of those engaging in it. The voices above suggest this means different things to different people but one thing it is not about, is acquiring knowledge for its own sake – learning fulfils a deeper purpose in their lives.

To summarise this section, extracts identified a range of learning environments, some 'emotionally unhealthy' with classes at the wrong level or too many levels. There were mismatches between what has been promoted and what transpired - leading to annoyance, outbursts and challenges. There was one-way communication (mainly lecture format). Discussion could be dominated by one person, with the outcome, in general, that people became annoyed, overwhelmed, bored or frustrated. The opposite of this were healthy learning environments, where different styles and levels were catered for, where the class descriptor accurately portrayed the nature of the learning and met people's expectations, the atmosphere was encouraging, communicative and inclusive, and everyone felt motivated and eager to contribute to a common learning purpose.

4.4 Discourse analysis of early contributions

The first ten minutes of each focus group which was analysed using Gee's (2005) discourse analysis identified various motifs/metaphors and topics that emerged and the socially-situated identity of the speakers. (See section 3.7 and Appendix 23) This was my first attempt to analyse the material in depth. Julia (A3), for example, spent her first contribution in 'state and action' mode, describing what she had done, using fact-giving language which is often used by 'authority figures'. In a way, this detached her from normal social interaction and placed her in the domain of her personal biography pathway through what Gee calls an "achievement space" (2005, p.141). There were no affective statements conveying how she felt or ability-constraint expressions conveying any uncertainty, which was different from the others in her group. However, she had arrived a little late and had missed the general tone set by the others. Her first contribution served to illustrate the varied course of a focus group discussion, which can move off in any number of directions.

With a contrasting style, Diana (S9), in her group, talked using more ability-constraint terms and affective statements, such as, *'that helps', 'but I never did enough of that', 'I found that very difficult', 'I like that'* - which are used primarily in social bonding conversations which address emotional needs and minimize differences. In this small group, two others had presented themselves as less confident learners. One can surmise that Diana, with her background of academic accomplishments, and with the sensitivity of a teacher, was deliberately playing down her achievements to minimize differences. It was an eye-opener to be so close to people's words and meanings through the discourse analysis process. It was useful to have scrutinised these first contributions as a primer to a thematic view of the transcripts, and it sensitised me to look beneath the surface of words for possible unspoken implications.

It also illustrated that the language we use will vary, not only with different social groups, but also with what we believe about the vulnerability and weaknesses of our listeners at the time of speaking. It also became clear that understanding is not completely stored away in any one person's head, but distributed across different

viewpoints in the groups and develops as dialogue builds, and I have supplied some examples of this. The experience of conducting the discourse analysis on the early responses was insightful, assisted with the holistic analysis of the complete texts and made the production of the thematic analysis more grounded.

4.5 Summary of findings and analysis

This chapter began by examining the results of H&M LSQ, drawing on the results from the post-LSQ and relevant discussions in the focus groups. Reference has been made throughout to the display of additional data in the Appendices, in addition to the many extracts to illustrate my analysis, including those illuminating the five interrelated themes identified as catalysts for change. The early discussions for all groups, analysed using Gee's (2005) Discourse analysis, are in Appendix 23 and the transcript of Focus Group C is displayed in Appendix 24. In the next chapter there is a fuller discussion of the results.

Chapter 5 Discussion

5.1 Introduction

In the previous chapter I analysed the participants' H&M LSQ results, the written responses to the post-LSQ questionnaire and the texts of the focus group discussions, using the processes described in Chapter 3. Many examples were presented which illustrated differences in terms of learning styles, differences in terms of changes in perception of learning styles and differences in preferred ways of learning in later life. These will be discussed in the relation to the research questions.

Although the findings of this study are limited by its small scale and the fact that participants were drawn from a few classes within a single institution, they suggest, if only in a tentative way, that older adults benefit from being active participants in the learning process, and from collaborating with each another and the teacher, in making meaning. This involves educators adopting an integrated approach to learning in later life which is grounded in ways of knowing which engage the whole person - intellectually, physically, psychologically, socially and emotionally – leading to enhanced wellbeing and more complex ways of understanding the world.

As presented earlier, the main research question was:

What kinds of learning styles and modes of communication do older adults prefer to use in later life classes and how do these fit with recent insights into neuroscience research and enhancing adult learning?

Based on this, a series of sub-questions were developed:

What kinds of profiles would a sample of older adults produce using learning styles questionnaires?
How do older adults think about their own experience of learning and what it means to them?
Do learning styles and flexibility change over time?
What kind of action is taken if there is a mismatch between preferred way of learning and teaching style?
What are the intersections between best practices in adult learning and current neuroscience discoveries and how might they impact on learning in later life?

I will begin with the quantitative part of the research which was H&M's LSQ which first opened up the subject to the participants and produced a LS profile for each participant.

5.2 Summary of Learning Styles results

85% agreed with their result and found it interesting to think about learning as a cycle of four different processes – active experiences (Activists), reflecting or reviewing through observation (Reflectors), coming to a conclusion through intellectual examination (Theorists), and planning practical exercises (Pragmatists). Almost all learning situations require elements of all four styles, but preferences for some parts of the cycle over others, provides the LS labels. The majority of the participants had a combined style, with the most popular being Reflector-Theorist – almost one quarter of the sample. There were approximately one third more Reflector and Theorist styles assigned than Activist and Pragmatist styles. These results indicate that there may be a predominance of older adult learners comfortable to adopt a more passive reflective role in the classroom. However, there are likely to be a fair number who are quite the opposite, and many in between. Therefore, the challenge for the teacher is to ensure the approach taken is inclusive, so everyone's learning experience over a period includes all aspects of the learning cycle.

5.2.1 The experience of completing the Honey and Mumford's LSQ

Despite H&M's LSQ being in existence since 1982, I found no evidence of it being used before in research with older adults. However, it was completed with ease by all participants, who appeared to enjoy examining different aspects of the learning process, which they had not thought about in these terms before. In recent times, children have been involved in *'Learning to Learn'* programmes (as they are often called), so they can begin to think like lifelong learners and become aware of their own styles of learning. Older adults also appear to be interested in gaining similar insights into their own learning. However, *learning to learn* for adults involves raising awareness at a deeper level than simply knowing one's scores on a LSQ or

understanding a preferred pattern of learning. Rather, it would mean developing an awareness of how one knows something and of the rationale, assumptions, evidence and explanations which underpin beliefs that something is true (Baxter Magolda, 2004.)

Although the LSQ is used in business and professional settings to help employees become better all-round learners or team players, it benefited from being free of technical terminology, which is more than can be said for many learning style models. Research on styles has been largely confined to the post-compulsory sector, and to Kolb's widely-cited and practically employed experiential learning cycle as presented in *Experiential Learning* (1984). Kolb offers the LSI as a psychometric tool designed to "assess individual orientations towards learning" (p. 67). H&M's LSQ (1986; 1992), which is a derivative model (but not a psychometric tool), was selected in this case as an accessible instrument, licensed through the university and used widely in the UK since its inception.

While my results are interesting, "uncertainties and controversies" (Adey *et al.* 1999, p. 1) still swirl around the LS approach to individual differences, especially since the extensive review by Coffield *et al.* (2004). However, learning styles questionnaires continue to be found helpful, but recent guidance in teacher education (Hillier, 2005; Tummons, 2007) suggest a cautious approach, taking great care not to reify learning styles. Then the danger lies in labelling people and expecting them to behave that way consistently: styles cannot be divorced from the learning context, so should be used carefully and critically to avoid stereotyping. As Tummons stated:

> "People do learn differently but different subjects, curricula, or technical skills require different kinds of practice or work or aptitude: the tutor's role therefore, should be to bring them together." (p. 100)

Writing in 2008, Coffield acknowledged that, using H&M's LSQ to understand personal learning styles, could be useful to raise self-awareness of both tutors and students concerning their own learning strengths and weaknesses. As discussed (section 2.2.9), one of the few attempts at researching learning styles in older adults was undertaken by Truluck and Courtenay (1999), in the USA. They found the questionnaire (Kolb's LSI) raised interest in thinking about the process of learning in personal terms and differences between people, and could also guide teachers to use

a variety of approaches. It was in this spirit, that H&M's LSQ was administered to the sample in the Centre for Lifelong Learning (CLL) to trigger thoughts about preferred ways of learning and then explore whether these ways had been fairly constant through life or had changed.

5.2.2 Aspects to consider when using H&M's LSQ

To administer the self-report, the self-scoring LSQ took a considerable amount of time compared to an ordinary questionnaire because, after completing it, participants needed to have a short presentation on the learning cycle; time to read through the four descriptors - Activist, Reflector, Theorist and Pragmatist - and to search for aspects which applied personally; tally the results using H&M's scoring sheet and plot the results into the banded chart from 'very high preference' to 'very low preference', then read off their LS and reflect on its accuracy. Finally, each result was entered on a flipchart to provide a visual representation of the group's profile, followed by discussion of the results and individual questions and assimilation.

For participants to properly benefit from the exercise, which is important ethically, these steps cannot be rushed. Therefore, anyone administering H&M's LSQ should be aware of the investment in time required to understand the learning cycle behind the questionnaire. The sequence of completing the LSQ needs to be followed closely and takes around an hour and a half. H&M (2000) provide a helpful guide (70 pages, including implications of the LS and how to build up an underdeveloped style). The LSQ can now be done online although the respondents still need feedback and time to interpret the results, discuss what it is supposed to be measuring, what the learning cycle is and what the LS means in terms of their learning activities.

With 85% of participants agreeing with their results this seems to confirm the face validity of the LSQ. In Chapter 4, I analysed in detail six out of the eight rejected profiles and found plausible explanations as to why this came about (section 4.2.4). However I am conscious of Popper's (1963) view that it is easy to find confirmations for almost anything, if we search for them. H&M (2000) claim that this consistent high face validity is due to the fact that the prompts do not refer directly to how people learn, which "most people have never consciously

considered" (p. 20) and therefore, to which they could not respond accurately. The statements were associated with everyday behaviour such as:

Q. 79 I enjoy the drama and excitement of a crisis situation – Activist;
Q. 13 I take pride in doing a thorough job – Reflector;
Q. 54 In discussions I get impatient with irrelevancies and digressions – Pragmatist;
Q. 43 I tend to have distant, rather formal relationships with people at work – Theorist.

I have selected the above statements from the LSQ because they have strong emotional aspects – enjoyment, pride, impatience, relationships, and it is interesting that the LSQ is peppered with many such statements, incorporating feelings. According to H&M (*op.cit*) the items in the LSQ:

> "admirably illustrate how learning preferences underpin and are associated with everyday behavioural tendencies."

From the above statement, one can deduce that H&M's underlying assumption is that the way we live our lives, which includes our habitual emotional reactions to people and events, infuses the way we learn.

H&M have succeeded in making the LSQ user-friendly by the use of everyday statements, which made it relatively easy for people to decide whether a condition applied or not. In discussion afterwards, some people said, when faced with no option but to put a tick or a cross, there was a bit of uncertainty, because missing a response was not allowed. It is likely that the use of everyday statements led 50 respondents to comment favourably on its useful or interesting aspects, with one person commenting directly on its efficacy as a measuring instrument:

> '*Questions were well-thought out and responses should reflect personality, learning and communication.*'

There were favourable comments even from those who did not agree with their style. For example, Martin (C1, R) reckoned he was more Activist than Reflector, but wrote that he now had some insight into the structure of his occasional training courses, and Bridget (S8, A) hypothesised that her job had turned her into an Activist, although, now away from that environment, her preference was towards '*being more of a Theorist'*. Therefore, H&M's LSQ made some sort of intuitive sense to people and they were receptive to its developmental aspects. This was indicated by the expression of a considerable lexicon of growth vocabulary such as '*insights', 'self-knowledge', 'communication', 'self-concepts', 'attitudes', 'self-*

examination', 'encouragement', 'needs' and *'reflection'*. No one gave any indication that it was irrelevant, so the instrument fulfilled the research purpose of triggering reflection on learning.

5.2.3 Accepted profiles

When looking solely at the profiles (Appendix 17, Fig.4) which met with the respondents' agreement (46 out of 55 participants) 31 Reflector and 28 Theorists styles were allocated, almost one third more than Activist (19) and Pragmatist (17) styles. The number of participants allocated a Reflector-Theorist (RT) profile was 13. RT has been found to be consistently the most common combination by H&M. The next most commonly agreed style in the sample was 6 Reflector-Theorist-Pragmatists (RTP), followed by 5 straight Reflectors (R). Looking at a Reflector's strengths according to H&M (2000. p. 44):

> "they are careful, thorough and methodical, good at listening and assimilating information, and rarely jump to conclusions."

The downside is:

> "a tendency to hold back from direct participation, be slow to reach decisions, lack risk-taking, and be not particularly forthcoming or good at small talk."

These characteristics seem closer to personality traits than ways of learning and therefore, one might assume, they would be resistant to change. It is interesting to compare the Reflector to the Theorist profile (H&M, *ibid*. p.45) because the number of Theorist styles allocated was almost the same (28) and this style is closest to Reflector. Theorists strengths are:

> "logical thinking, rationality and objectivity, good at asking probing questions, disciplined and able to grasp the big picture."

The downside is:

> "restricted lateral thinkers, low tolerance for ambiguity, distrustful of anything subjective or intuitive, full of *shoulds*, *oughts* and *musts*."

Putting these two together one would anticipate Reflector-Theorists would be quite traditional thinkers, perhaps a bit set in their ways, but this does not seem to ring true for all six participating in the focus groups with Reflector Theorist profiles, discussed below.

They all possessed the common feature of being graduates, with Molly (S3) the only one to state that her learning style had not changed. However, widowhood seemed, in fact, to be driving change, as she was, in her own words, *'on a steep learning curve'* after her husband's death and had changed to *'trial and error'* learning. One is reminded of McClusky's categories of needs (1971, cited in Hiemstra, 1998) as Molly's coping needs "must be satisfied in order for adequate social adjustment, psychological health, and physical well-being to continue" (p.10). American education pioneer McClusky hypothesised that the philosophy of older adult education was based on needs – coping, expressive, contributive and influence (section 2.2.2), and certainly, the coping and expressive needs are the ones that providers target (Findsen, 2007). Molly attended a language class for her expressive needs and a music class to meet her coping needs, following an accident which had altered her auditory function – *'to see if I might actually acquire an ability, as compensation'*. So Molly was a very proactive learner and also meeting her contributive needs as a volunteer in my research! I will endeavour to probe the apparent contradictions over what the participants meant, when they talked about having changed or not changed ways of learning.

Some of the changes in learning preferences, which the Reflector-Theorists in the focus groups mentioned, were: *'discussing things and exchanging ideas'* (Mhairi, A2) and an awareness that theories do not always shape up in the real world (Greta, A4). Probably Paul (C10) and Katherine (C14) are closest to H&M's classic Reflector-Theorists, but the question remains – they said they had changed their learning preferences, but was it more a change of learning strategies (Adey *et al.*, 1999) or did it run deeper? Jarvis (1987) provided a clue when he stressed the importance of differentiating between the conceptual definitions of theorists and the everyday way people talk about learning. He posited that people tend to think of learning in terms of memorising within formal school settings, because memorising is the social definition of learning.

Certainly, mention of rote learning arose in every group, except for Group A, because, with five teachers involved, discussion was on a more abstract level, and the reproductive concept of memorising was replaced by reconstructive and interpretive ones. Saljo (1979, cited in Candy, 1990) found that there were five commonsense

responses when people were asked what they meant by learning (section 2.2.8). His second category was learning as memorising (same as Jarvis, 1987) and his fourth and fifth were learning as abstracting meaning and understanding (applicable to Group A). It seems a reasonable assumption, that when participants were asked about changes to their ways of learning, their first thoughts were their memories of conventional teaching, when rote dominated. I will explore this further over the next sub-sections.

5.2.4 Missing links in Kolb's learning cycle

A particular difficulty with Kolb's concept is that he does not explore the nature of knowledge in depth. Compare his four stage cycle to Yang's (2003) three-layered model of knowledge with its three facets (section 2.3.5). Kolb's model omits the critical dimension of how the person feels about learning, while Yang's affectual facet embraces values, aspirations and visions which arise from the person's emotional drives. Learning later is a voluntary activity, and most participants have paid for classes and are emotionally committed, as well: it is important to them and to their wellbeing. Katherine (C14) reminded one of this when she stated *'you are paying with your time which is not going to be repeated.'*

Kolb's cycle, in a sense, is going round and round, but the motivational aspects are obscured. Veteran adult educator Phil Race (2010) rejected the learning cycle, and invented his *'Ripples'* model, starting with feelings of wanting and needing, setting the 'ripples' of learning in motion. However, perhaps for some older adults, even wanting and needing are not that important, a view expressed by Katherine with her remark –'*There is nothing we need to know really.'* Not everyone might agree with this sentiment, but released from the constraints of family commitments and work, to some extent at least, one cannot expect anything other than older adults will opt to do what they like to do. Martin (C1) expressed this another way when he stated *'the world is your oyster'*. Therefore, education for older adults can sometimes be a search to fulfil the basic need for human happiness, and all the benefits that accrue when social, emotional and human development come together (Baumgarten, 2001).

The growing understanding of the importance of feelings in a learning situation was researched by Immordino-Yang and Damasio (2007). They posit that the aspects of cognition vital to education and social interaction are both profoundly affected by emotions. They have found that there are two main problems with a model of learning that ignores them. Firstly, a better understanding of the neural architecture of the brain has revealed that we do not learn and remember in a purely rationalist way, for example, by doggedly going through each stage of the learning cycle. The frontal cortex, where goal-oriented activity and ideas about action take place, is intimately linked to the older (in evolutionary terms) parts of the brain, located deep and low beneath it. These are often referred to as the basal structures or the limbic system, and the channels of communication are called the orbitofrontal-limbic connections (Cozolino, 2002). When our frontal cortex receives pleasure chemicals from the basal region, the learner gets a reward which motivates her or him to continue to move along this developmental path.

This was what was happening when Rowena claimed: '*When someone tells you something you want to hear, it makes your day*.' And also when she affirmed how she knew she had learned something: '*It gives you a buzz!'* Streams of neurotransmitters from the basal forebrain, flood the neural networks and assist in moving the emotions from the limbic area to these higher regions, where we can begin to see "through the eyes of another" (Daloz, 1986, cited in Johnston, p. 66). Daloz, who was particularly interested in mentoring and the interplay between education and development, realised that students were often going through various crises or turning points in their lives, and looked to education to help in the process of changing things. But whether going through changing times or not, when our brains are flooded with pleasure chemicals, these are supreme teaching moments: positive emotions release acetylcholine (ACh) which has a variety of effects as a neuromodulator upon neuroplasticity, arousal and reward, and which has also an important role in sustaining attention.

Therefore emotions, far from being a barrier to learning, create the perfect conditions in the brain for remembering what has been learned, giving it relevance and making us want more, and it is part of our evolutionary inheritance. Martin (C1) expressed this neatly in a few words in terms of '*learn naturally'* - being able to

apply learning with ease and letting the good feelings flow and carry him forward. Kim (M9) voiced similar sentiments in terms of a warm afterglow, simply through recalling '*because of the enjoyment'* and motivating her to return.

This leads to Immordino-Yang and Damasio's *(op.cit)* second point, which was that, by teaching in a way that reduces the emotional impact of a subject, educators may be creating a kind of 'sanitised' knowledge, devoid of values, passion, and significance, which does not connect up well to people's real worlds where things do matters, and therefore this knowledge never becomes anything learners can feel is theirs. This is reflected in Linda's (M5) comment, when she was asked when she knew she had really learned something – when "*you have made it your own.'* It also chimes with a constructivist perspective, and 'knowing' as an adaptive activity (von Glaserfield, 1995), with one's knowledge "a kind of compendium of concepts and actions" (p.7), tried and tested by the individual and which she knows works for her. Effective motivation to continue learning can be fostered only by leading learners to experience the pleasure inherent in understanding something chosen as their own.

Immordino-Yang and Damasio's *(op.cit)* believe that if educators do not appreciate the role that students' emotion plays they are completely missing out on optimum teaching opportunities. During the times when these good feelings are flowing, pleasure chemicals from the basal forebrain are producing acetylcholine (ACh), which, as already mentioned, improves the ability of brain cells to transmit information between cells, and also encourages plasticity and learning (Zull, 2002), and as Cohen (2005) pointed out, plasticity is "a dramatic reason for optimism about the brain's potential in second half of life."

How the brain, mind and body act interdependently to create learning styles is not known (Given, 1997-98). Therefore, as yet, there is no coherent neurobiological explanation, despite the continuing strides in understanding brain processes: learning is so complex because neural tissue is so complex. Seminal research on neuroplasticity (Diamond, 1967, 2001, section 1.5.1) and subsequent studies have shown that the brain and body are one system and the brain's optimum functioning depends on physical states, including good nutrition; increased neurotransmitter production through exercise (Cohen, 2005; Hillman *et al.*, 2008, section 2.4.2); the

motivation of newness; the excitement of challenge; and nurturing relationships (Diamond, 2001; Johnston, 2006).

It is just possible, that when learning styles are better understood some time in the future, a more comprehensive LS model will emerge with coherent constructs including emotional, social, physiological, environmental domains, as well as the dominant cognitive ones. Already, educational developers have been creating learning systems which include many of the above factors, such as Accelerated Learning (Rose & Nicholl (1998), used by Diana (S9) to improve her language learning, and mind mapping (Buzan & Buzan, 1993, 2000) chosen by Norma (A5) to capture lecture content. The Dunn and Dunn model (1998), a detailed account of which is portrayed by Given (1997-98), is strong on the physiological domain of learning through the senses. In the next section I examine these preferences for certain sensory modalities which were probed in the post-LSQ.

5.2.5 Learning through different sensory modalities

Of the three modalities, visual and kinaesthetic (hands-on) preferences had almost equal weighting, which accounted for 82%, approximately (see Appendix 20). Doing it practically (hands-on) came across as an essential form of reinforcing learning – '*Both doing examples and interactive with the teacher*' (Jonathan, C15), and exploring mistakes – '*You are learning quite a lot from feedback*' (Laura, C13). Writing down ideas, or discussing them, are forms of active testing: simply putting an idea on paper or talking to someone are physical acts, engaging respectively, the muscles of the arm, hand and fingers, and the tongue, lips, mouth and airways. They produce signals from the motor cortex, which are regions of the brain involved in the planning, control, and execution of voluntary movement. The body senses these movements, and so a mental idea is changed to a physical event or a form of concrete experience. Concrete experience, is of course, one of four pillars of the learning cycle (Appendix 3) which follows on from testing, and is where new sensory information is gathered, before setting off again around the learning cycle - reviewing, creating and testing (Zull, 2006, see section 2.4.3).

Many participants, as they thought their way through learning episodes, using their own words, and their own interpretations and constructs, enriched my

understanding of the significance of particular sensory aspects, especially in the visual sphere. For example, Molly (S3) realised '*reading and writing are the [only] two means I have of capturing the thing'*; Paul (C10) always wanted '*some visual explanation of what's happening'*; if the teacher was talking '*visual aids are always an advantage'* to Beryl (C3); and Claire (S1) knew herself to be '*a visual person and get bored* [with reading].' As infants, initially learning develops through our senses, but modality preferences may be the result of environmental experiences as much as genetic ones, as intense exposure or deprivation to certain senses (during critical periods) cause "learning-induced changes in neural networks" (Alkon, 1992, cited in Given, 1997-98, p. 13). So, the brain is an ever-changing landscape where some sensory aspects are subject to the vagaries of life, rather than deliberate choices, and because of neuroplasticity, the brain rewires to adapt.

However, whether preferences are genetic or changed by experience, accident illness or ageing, the participants were quite clear about what worked for them now in the sensory domain. Each sense has its specific role, but vision is arguably the most powerful, giving us "precise spatial input on objects in the world, and mapping those objects on the neo-cortex" (Zull, 2006, p. 6). Images, along with language (auditory input), underpin thinking, and create the metaphors we use in speech: it is difficult (as a sighted person) to think without imagery, and the language of the participants was peppered with metaphors. Sfard (1998, p. 5), on writing about the patchwork of metaphors for learning, said:

> "Different metaphors may lead to different ways of thinking and to different activities. We may say, therefore, that we live by the metaphors we use."

Imagery evokes emotion which we then interpret as feelings. These in turn, become linked to the visuals, and embellish them, engendering emotional responses (Zull, 2002). Diana (S9), who was a strong visual person, illustrated this perfectly when she recalled, as a lecturer, various lively classroom discussions involving young male students, and as she spoke, one could hear the excitement welling up in her voice as her thoughts reactivated the feelings at the time and she spoke about their '*outrageous ideas that really caught fire!'* Conversations catching fire are not necessarily every teacher's natural style, but by intensifying the students' emotional state, both meaning and memory are likely to be enhanced (Wolfe, 2006).

For some people, it was not a question of selecting visual, auditory or kinaesthetic strategies, but the nature of the subject itself which dictated the modality of learning. For example, Kim (M9) and Rowena (S4) waxed eloquent about their art classes, and for Andy (M15), it was his metalwork, his *'comfort learning'*, providing him with both the excitement of creating his own work and a deep sense of satisfaction. This type of hands-on class seems to offer a kind of balm for the spirit, which is often dismissed as not 'real' learning, but these types of craft activities tap into the ancient parts of the brain (limbic system), where emotions and physical feelings of wellbeing and comfort reside – what Golman (1995) might call emotional intelligence, Gardner (1983/1993) might describe as intrapersonal intelligence and Damasio (1994) has shown to be critical for regulating the flow of our lives.

Therefore a class, which is totally relaxing and fosters our 'inner child', makes us feel good, and has a role to play in the scheme of things. Many people have perhaps neglected this side of their nature due to busy working or family lives, and early education often had little time for such activities. Indeed, this type of learning in the past was looked down upon, quite wrongly, as inferior, and only for simple minds. This is a great fallacy, as it is impossible to live a fully functioning human life without being able to tap into the wellspring of our being (Gardner, 1983). Cohen (2005) wrote about the awakening of creative potential in later life, in terms of the "Inner Push" (p. 31), and he did not mean just doing set things such as writing, painting or music, but being aware of "the process of bringing something new into existence - and novelty is everywhere you look." (p. 169)

Practical classes lend themselves to inspiring untapped creativity, but they often have a gender divide. For men, it is more likely to involve hard materials like wood, metal, or slate, but the social dimension is also strong and competitive elements are largely absent. Crafts such as ceramics, calligraphy, and jewellery-making, have no particular gender bias, but for women, patchwork, quilting, lace-making, macramé, weaving, indeed any form of creative stitching or handcraft, can be creativity plus "comfort learning", as classes usually take place within nurturing environments, conducive to companionable conversation.

This is, however, a far cry from empowerment and emancipation (Glendenning & Battersby, 1990). One is reminded of Formosa's (2000) critique of

the U3A in Malta as "glorified occupational therapy" (p. 315). I tend to agree with Withnall (2010), that currently, there does not appear to be any desire among older adults for political approaches through the learning process. Interestingly, despite Formosa'a critique and continuing efforts to embed the field of older adult education within a critical perspective (Formosa, 2002, 2005, 2007), the UTA in Malta is not significantly different and he is calling for:

> "the UTA movement to go through a cultural revolution to remain relevant to contemporary ageing lifestyles." (Formosa, 2009, p. 171)

The U3A in general, has remained independent of mainstream lifelong learning structures. Thus, learning in later life, in general, appears to be more of a personalised quest for fulfilment, but not a solitary individualised quest. In the next section I discuss whether learning styles and flexibility change over time.

5.3 Summary of perception of change and flexibility

80% of the sample said they had changed their way of learning and most people defined change socio-historically, comparing learning now to the 'old days'. Those who entered school in the 1940s and 1950s were immersed in a culture of rote learning - learning as acquisition, with the outcome - 'knowing a lot'. This was Saljo's (1979, cited in Candy, 1990) first category of commonsense understanding of learning. Then, people experienced other forms of learning through broadening life experience, working life, tackling information technology, experiencing new teaching methods and becoming more aware of personal strengths. In other words, they changed the way they thought about learning, and effectively, developed more complex mental models, although this was not articulated as such.

New preferences included, finding their own voice, making meaning, integrating new knowledge with their own experience, being open to different perspectives through interactions with others, and awareness of personal growth. This demonstrated that learning was adaptive to circumstances and opportunity, and was reshaped by a combination of extrinsic and intrinsic factors. Therefore, the

participants displayed considerable adaptability as learners to the changing environment and to inner drives as they developed.

5.3.1 Learning styles perceived as constant

Those who denied their LS had changed, appeared to be using an enduring aspect of their personality as a reference point, such as a strong communicative style or a need for reassurance, rather the socio-historic context. Models of learning styles based on personality traits exist, although it is not an overt aspect of the H&M model. Nevertheless, personality traits are embedded in the probes, as discussed, so they are implied. This was something that was not explored in any depth in my study and could be further investigated, because it appeared, from their contributions to the focus groups, as if those who said their LS had not changed, were equally adaptable as the others when the need arose. (In total, four out of the 26 believed they had not changed.)

According to Kolb, a LS is not a fixed trait, but "a differential preference for learning, which changes slightly from situation to situation" (Kolb, 2000, cited in Coffield *et al.* 2004, p. 60). However, he has also stated that scores derived from the LSI are stable over very long periods with the learning styles of 60 year old graduates unlikely to have changed much since their student days. However, this has not been researched, and several graduates in my study contradicted this assertion and, as illustrated below, spoke with feeling about how their ways of learning had changed dramatically. Of course, the LS concept was not developed in the 1950s and 1960s, when the emphasis was almost all on teaching, not learning. The culture was then one of 'acquisition' (and still is to a large extent).

5.3.2 The 'acquisition' metaphor

The 'acquisition' metaphor, as described by (Coffield, 2008, p. 8), is seen as "gaining possession of knowledge, skills and qualifications, just as people acquire cars, watches and houses" and carries an assumption that learning is individual and therefore, 'knowing a lot' is the goal. It conveys knowledge in the lecturers' heads transferring to the students' heads, as a result of listening carefully, taking notes, studying and memorising for exams. It is largely perceived as a technical

undertaking, but the graduates in this study had clear memories of this type of learning, which is quite alien to them now, and their early experiences were expressed in heart-felt ways.

Martin (C1) talked about '*very formal and one-way traffic'* and Angela (C12) expressed her fear of asking questions when she was '*being lectured to'*. It stopped Norma (A5) from going straight from school into higher education because she '*couldn't bear the thought of going to university*.' It led Andy (M15) to resort to '*crisis learning'* to pass exams, and advice to Kim (M9) from her lecturer, when faced with a re-sit, was to '*rewrite all your [lecture] notes …and reread every time from the beginning.'* No emphasis here on depth of understanding, but firmly on reproduction. A feeling that something was wrong with this type of mechanical learning was also expressed in the discussion about language teaching, where Mhairi (A2) asked Norma (A5) – '*Is it not generally accepted now that it was the wrong way?'*

Apart from Norma who felt she had always had a very strong Activist Pragmatist style, those mentioned above, all held the view that they had changed. Strictly speaking, this is not quite true, as far as Angela is concerned. Although she said that she was now '*learning in her own way and no one is talking at me'* (indicating change), she also checked the box to say her way of learning had not changed, and she professed to being a Reflector, rejecting the additional Theorist and Pragmatist styles assigned by the LSQ (giving her a RTP profile).

I explain this in terms of these two participants having different ways of interpreting change. Norma, who could not face going through a system so alien to her preferred LS, opted out and stayed true to herself. Angela, who was able to adapt to the 'acquisition' system sufficiently to pass her exams and collect her qualification, did not perceive the experience as changing her LS. Is it possible to be immersed in a particular system of learning in one's formative years and not be moulded by it? Was it through her university experience and subsequent work experience that Anna, in fact, developed Theorist and Pragmatist attributes, without being aware of subtle changes in her approach to learning?

Yang (2003) posited that, while we learn through our conscious, rational mind which makes intentional efforts to understand things, on its own it cannot

capture the complexity of real social and cultural contexts and their ambiguities. It is through direct experience and personal involvement in particular situations, when our emotions trigger and when we are involved with other people or social groups or organisations, that we experience a different way of understanding (Yang, 2003, section 2.3.5, Appendix 5). Yang calls knowledge gained through this personal active engagement, perceptual knowledge, which is not openly expressed or stated, and therefore it is hard to formalise and communicate.

This may help to explain why the LS concept is so elusive, and why there is such a plethora of models claiming to identify learning styles. It is part of a complex holistic approach to learning, which involves us intellectually, emotionally and physically, so it is difficult to articulate. At a conscious level, it is obvious whether we are learning by memorising (rote), or doing, or face to face. However, communication about ways of learning in this study at a deeper level, has been glimpsed mainly through the metaphors people have used.

5.3.3 Links from past to present

It is not possible to know, if the respondents' LS profiles when young (if the LSQ had existed then), would bear any resemblance to their profiles as older adults. The only person in my study (Muriel, M4) who had completed the questionnaire over a period, found that it had changed from Pragmatist to Reflector, then to Reflector-Theorist-Pragmatist (RTP), with the Theorist style initially very low. She rationalised that the first change was due to the nature of her work, when she was reading copiously and planning development. She felt a Pragmatist at heart because she was a practical person, and did not understand how she had acquired a Theorist style as she had been retired for three months. An interesting aspect is that she did not reject this new RTP style, presumably because she had faith in the LSQ, as it had been right for her before. Perhaps, this illustrates how easy it is, in all kinds of testing, to accept a label as if it has been predetermined (Hillier, 2007).

However, to understand someone's approach to learning later, it is useful to know of the connections to learning in childhood, adolescence and later, and to the formation during these periods of interpretive filters, cognitive frameworks and the cultural climate (Brookfield, 1995). I posit that the learning culture of the

participants' younger days would shape their brains and their thinking, and their learning style would continue to change as they moved through life and were exposed to other experiences and methods. Of course, for someone with a very strong activist-pragmatist style in a learning culture where knowledge was acquired through transmission, there would be a clash (as in Norma's case). Whereas, someone with reflector-theorist characteristics would be more likely to fit into the educational system, which primarily values analytic learners in the Western rationalist tradition.

5.3.4 Cultural influences

Baltes *et al.,* (2006) have drawn attention to the power of culture, which they stated in uncompromising terms, is as important "for brain development as the presence of oxygen" (p. 21). In essence, 'developmental biocultural co-constructivism', as Baltes *et al. (op.cit.)* grandly called their meta-theory, holds that throughout life, culture/environment and the brain, influence and modify each other – it is not '*one-way traffic'* (to use Martin's metaphor) - the human mind changes the culture, and the cultural environment also shapes the mind, and the two continue to influence each other throughout the lifespan. It is difficult to imagine LS being exempt from this shaping process. Neuroscientist Gazzaniga (1992, cited in Given, 1997-98, p.13) posited:

> "environmental influences could change the basic neural architecture to create more than 50% difference in how we learn".

Therefore, when people experience a changed learning environment over a period, their LS will almost inevitably be modified to a greater or lesser degree.

Baltes *et al.'s* (*ibid.)* meta-theory was developed to counter the phenomenal upsurge of neuroscience, and in particular, the implications of neuroplasticity, which have profoundly shifted scientists' views of human potential. To a lifespan researcher, like Baltes (1939 – 2006), who coined the term 'successful aging', and who was one of the world's most influential developmental psychologists, the buzz of neuroscience was in danger of drowning out lifespan developmental perspectives. Baltes *et al.* (*ibid.)* supported the notion that human behaviour is inherently the outcome of the dynamic interactions of genes, brain and culture which, at one and

the same time, is open and constrained. 'Developmental biocultural co-constructivism' is obviously a highly complex concept, which cannot be explored in depth here, but analysing the circumstances discussed by the respondents, which they perceived as creating a shift in their perspective and a change in LS, the change appeared to occur because of a combination of alterations to their inner life, social or work life and the changing culture.

For Andy (M15) and Kim (M9), it was learning to belong to what could be called 'communities of practice' (Wenger, 1999) – *'groups of like-minded professionals discussing case situations'* and learning *'from other members of staff'*. According to Wenger (1999), we all belong to communities of practice – at home, at work and in our hobbies, usually several at one time, and they are everywhere - in families, communities and organisations, where people are in informal networks through shared expertise or enthusiasm for a joint project. The computer buddy scheme is a prime example, and Paul (C10) spontaneously expressed the nature of the learning that takes place as the computer buddies respond to novice users' questions, by tapping into each others' knowledge or working out answers together.

The concept of 'communities of practice' comes from the 'participation' metaphor, which Coffield, 2008, p. 8) described as, simultaneously:

> "learning to belong to different 'communities of practice';
> learning to recognise changes in our identity;
> learning to create meaning out of our experiences and ;
> learning what it means to know in practice."

Thus, learning is located in social processes where we experience personal change and make sense of real-life experiences. It follows, that it may have been an identity change to which participants referred when they spoke of change, as much as change in ways of learning. Julia (A3) experienced a *'culture shock'* when she became involved in management training. For Harriet (A1), it was in a self-directed group of colleagues where they *'gained tremendous confidence…watching the penny drop*'. For Greta (A4), it was an *'eye-opener'* when her pupils' parents caused a shift in her perspective, by challenging her *'miles off the track'* assumptions. For Norma (A5), her learning discovery was finding that there were ways of learning at university which accommodated her activist-pragmatic style, and allowed for some *'real learning.'*

However, it does not need career development to cause a shift. All it took for some was to become involved in classes and experience a new type of learning. For example, Maria (R9) described making the leap direct from *'rote sponge learning to proactive learning'*. And the extract (section 4.3.4), concerning Chrissie's (M10), showed that, through her own success as a self-directed learner and despite a particularly wretched school experience, she acquired the courage to enrol in adult education and encountered good adult educators who restored her confidence. She said that she is *'learning better now than ever I have before'*. One can speculate that if she had not had a good experience on her return, she would not have given it a second chance. Our vulnerability does not diminish with age, but increases in an ageist culture, which is quick to deride older adults' endeavours to learn.

If one accepts Baltes *et al.'s* (2006) meta-theory of 'developmental biocultural co-constructivism' – that, through life, the brain and culture/environment modify each other, and also Gazzaniga's (1992, ibid.) premise that the environment can create more than 50% difference in how we learn, then it is not surprising that 80% of this active group of learners perceived a change in LS. However, it may be that release from the confines of an acquisition culture of learning has allowed a LS to flourish which accommodates emotions as well as thought, and meanings as well as matters of fact. The next section moves to the question of how older adults think about their experience of learning and what it means to them?

5. 4 Summary of the meaning of learning

Alexander (2006) posited in his philosophical treatise on educational paradigms, that a priority in educational research is understanding the purposes and meanings humans attribute to educational practices. I found the participants in my study were greatly influenced by the changing world, which had altered immeasurably since childhood, when learning was done by rote. However, unlike the majority of older adults in the UK, who have not entered a classroom since school, most had gone on to higher education, job training, computer courses or other opportunities and were

also attendees at classes in the 3Ls programme. Therefore, they were experienced learners.

Most, however, were looking for a different quality of experience. That did not mean everyone wanted the same thing, but the way they preferred to learn had a different resonance. Although social aspects were not overtly mentioned, a positive social experience is a necessary classroom condition if other benefits are to accrue. Their search was for enrichment, with this being expressed in a variety of ways - as learning without pressure, learning what they liked to learn, open to more points of view, feeling satisfaction and enjoyment, 'comfort learning', making something of use, and keeping on the same wavelength with friends. Perhaps this can be summed up by two affirmations: *'Life is good'* and *'I am good'*.

5.4.1 Enrichment in later life

Let us assume that the teacher has fostered a classroom climate which promotes positive engagement (Immordino-Yang & Damasio, 2007); she/he has made good interpersonal connection to the learners (Cozolino & Sprokay, 2006) and the scene is set for exploratory thinking (Goleman, 2006). What is then the best way to set the process of enriched learning in motion? Teachers usually wrestle with this issue, because no two classes are the same and no two students are the same. The distinguished American psychologist David Ausubel (1918–2008), who was strongly influenced by the constructivist teachings of Piaget, wrote:

> "If I had to reduce all of educational psychology to just one principle, I would say this: the most important single factor influencing learning is what the learner already knows." (Ausubel, 1968, cited in Race, p. 56)

The difference between teaching children and adults is that adults are likely to know a great deal more about a subject or around a subject, but often they don't realise it. It is the teacher's task to find out the things that learners bring to the table. Race (2010) calls these "learning incomes" (p. 55). However, often older adults are reluctant to speak up for a number of reasons. They may be uncertain about their understanding in the presence of an 'expert'; they may be fearful of appearing foolish in front of other people; they may be more familiar with the 'banking method' of education (Freire, 1970/2000) which emphasises passive listening and acceptance of facts; they

may be used to asymmetrical power relations and see teachers as authority figures, and so are unable or unwilling to question their values. As Beryl (C3) remarked:

> '*At one time, tutors were held in awe and no one dared ask a question, never mind challenge them'.*

Thankfully, tutors working with older adults have relinquished their authority or 'power position' in the classroom to a great extent, which Beryl affirmed - at least in her experience. She welcomed this because of the transformation to the atmosphere when teacher and learners were *'working and learning together.'*

5.4.2 An experiential approach

The respondents also had their own thoughts about how to improve self confidence. Harriet (A1) voiced her belief in the value of exploring understanding through dialogue, as it allowed time for people to tap into their previous knowledge and realise they had a deeper understanding than they first thought, and then be able to say to themselves '*Yes, I know about this.'* Claire (S1) was someone who bore this out as she was quite explicit that she had always been a little unsure of herself, and '*That is my main way of learning – I love discussing things.'* Talking about new ideas is a powerful way to connect the new with the old. It is now understood that our ability to do this is based on assembling images in the back association cortex which "are remembered and used as tools in thought" (Zull, 2006, p. 6, see also section 2.4.3). To remember takes time to reflect and reflecting time is often missing in classrooms, and is certainly missing at most lectures where covering too much ground is too often the norm, as the participants expressed in their comments in the post LSQ.

The other aspect of the "talking teacher" is that there is often the assumption she/he has the 'right' answer, rather than encouraging people to find their own meaning. The importance of discussion and dialogue was expressed in the two participants above, but it came through to a greater or lesser degree in all the focus groups, depending on the way each conversation flowed. It is now understood that the best way to help people understand - and remember - is to engage the frontal cortex - the higher level thinking part of the brain (sometimes called the 'executive brain', Goldberg, 2005), where new information connects to memory and the

meaning-making process begins. This is the heart of a constructivist approach to learning and understanding (Caine & Caine, 2006).

5.4.3 Episodic memory

With so much attention on mental decline in later life, remembering what is learned often worries older learners, as Maureen (M16) confirmed when she expressed she had *'difficulty is retaining'* what she had learned. Trying to remembering things absorbed through one modality (through hearing a lecture or reading a book, for example) without further engagement, has been known for many years to make recall difficult. Learning through a more rounded experience is known to involve a powerful memory process, identified by Tulving (1972, 2002) as 'episodic memory' – experiential episodes which have engaged the whole person, physically, cognitively and emotionally. Greta (A4) gave a wonderfully graphic account of an episode in a memory class in which the right conditions for encoding the material were created. They acted out a little scenario of memorising a shopping list using a well tried 'location' method (used by memory champions) and it had stayed with her because they *'took part, talked about it and laughed about it.'*

Tulving, who is one of the most influential contributors to modern psychology, differentiates episodic memory from other kinds of neurocognitive (brain/mind) systems. Tulving's theory of 'encoding specificity' emphasises the importance of retrieval cues in accessing memories of past experiences. In the situation remembered by Greta, a message list was being recalled by attaching, in her imagination, each item to a different body part. So, the retrieval clue was the mental picture of *'eggs on her toes'*, and the whole scenario for all shopping items had been acted out. Thus, forgetting may be caused by the lack of retrieval cues, as opposed to decay of the memory trace over time or interference from other memories – both of which are often blamed for forgetting. This was a fun exercise to demonstrate a principle, but it had another very important effect which she mentioned. It engaged the class to think more constructively about ways they might improve memory, and not give up because they discovered *'memory was failing, not because we were old, but because we were not applying all of our possible skills.'*

5.4.4 Sense making for better memory

Cognitive and biological ageing is a fast-growing area of funded research (Deary & Gow, 2008) as the world faces up to ageing populations, and if researchers can point to practices which may prevent or reduce cognitive decline and boost mental capital to minimise years of dependency, then now is the time. There is evidence of processing speed slowing down as we age, concentration sometimes being stretched and less working memory capacity (Rogers *et al.*, 2009), although there are wide variations among older adults, as already discussed (Rabbitt, 1993, section 2.2.2). Also, it is not all about decline: Goldberg (2005) hypothesised that older adults' brains are capable of better pattern recognition in complex situations and of more intuitive decision-making. Also Cohen (2005) believed that older adults can become experts in 'higher level reasoning' which is the foundation for what he called "developmental wisdom" (pp. 36 - 38).

However at classroom level, activities which are conducive to remembering, are very helpful and encouraging to older adults, and as information gained experientially appears to remain fairly stable across the lifespan (Hedden & Gabrieli, 2004, cited in Rogers *et al.*, 2009), the more imaginative activities the tutor can dream up, the better. Neuroimaging has confirmed that learning which activates multiple sensory sites, emotions, the frontal, integrative and motor cortices, ensures a neural web of rich connections (Zull, 2002).

Lectures are not normally very helpful in this way, even if they are well illustrated, because lecturers often fall into the classic trap of aiming at too high and covering too much (Caine *et al.*, 2004). However, Norma (A5, AP) stated she did not mind '*a spell of someone talking at her'*, if she can see the structure of the lecture and draw a mind-map. What she is doing, of course, by mind-mapping the words, is bringing her 'executive brain' (Goldberg, 2009) into play through making decisions about what she wants to remember, then visually representing this using key words on paper. This affords her the opportunity to revisit the experience later, using the retrieval cues on the mind-map to trigger the content. However, without a certain level of deep processing most of the things we hear are lost quickly, and listening and mind-mapping simultaneously is putting quite a load on the brain's working capacity. As

Gordon (M12) said about the lecture format in general – '*an hour later, a lot has gone'*.

Race (2010) suggests that there are three factors that underpin successful learning. There is learning by doing, which means activating all different parts of the brain, as discussed above in neurobiological terms (Zull, 2002); learning through feedback, which involves learning from other people's reactions or mistakes, or simply seeing the results of what you are making or fixing (trial and error learning); and then, there is making sense of things, which is arguably the most important aspect of much classroom learning. This is about '*the penny dropping'* (Harriet, A1), finding a '*wealth of information'* and '*eye-openers'* (Greta, A4), completing '*the full circle'* (Martin, C1), being '*on a steep learning curve'* (Molly, S3), receiving '*a pat on the back'* (Claire, S1), '*cottoning on'* and '*on the same wavelength'* (Rowena, S4).
As Race (2010) concluded:

"We can't make sense of things for our learners. Only they can do it".

The formidable task of the educator is to create the kind of 'scaffolding' (Vygotsky, 1978) where whatever is to be learned becomes achievable, in ways that meet the diverse learning styles and purposes of older adult learners. However, sometimes things go badly wrong, which leads to the next question concerning mismatches of learning styles and responses to such occurrences.

5.5 Summary of mismatches

Inevitably, there are times when the unforeseen occurs and a class is less than satisfying - technology failures, cold classrooms, or interruptions. However, here I was looking for frustrating aspects that can be avoided: many examples were given in the second half of section 4.3.5. First, clear class descriptions should indicate starting level of knowledge, especially in a practical course (art, languages or computers) and the class format should be stated: sometimes there is an assumption that learning will occur automatically for everyone, regardless of the method. Some may be able to adapt to whatever is on offer, but others, with a strong style, are likely to be frustrated,

as comments in Appendix 21 show. Second, a most distressing experience was feeling foolish, because others appeared to be progressing well. This happens with a lack of screening or exploration at the start to establish previous experience. And there was also anger, if students felt misled by the class descriptor and their time had been wasted. Not everyone felt able to articulate their annoyance, and some sadly, even blamed themselves and just departed, leaving no winners in that situation. Therefore, clarity about how classes are to be conducted, the appropriate level of entry and ways of learning to be applied, are of the essence.

5.5.1 Allowing for diversity

I found a serious cause of tension was being 'talked at', so learners felt they had either heard it all before or they were overwhelmed with information. Of course, it is normal to have older adults with different levels of knowledge because of the wide range of life experience and previous learning. Therefore, adopting an approach which taps into the learners' knowledge and world view, allows topics to be explored through discussion of real or hypothetical situations, through paired or group exercises. This builds self confidence and involves everyone in meaning making: those who think they know little, then discover they know a bit more, as they pick up on different aspects, and those who start off with a firm view, perhaps find others challenging their perspectives. So everyone is fully engaged. This is a social constructivist approach, which adopts the stance that knowledge does not exist in one person's head waiting to be transferred, but is created through dynamic social interaction in pursuing new understanding.

The participants in this study have provided interesting insights on what helps and hinders learning, their preferred ways of learning and preferred modes of communication. Throughout the analysis and discussion I have drawn on explanations from neuroscience research which intersect with best practices in adult education. In this final section, I will pull together these new perspectives linked to the emerging themes in this study.

5.6 Adult learning and current neurobiological discoveries

In Chapter 4, in reporting on the data, where appropriate I used neuroscience insights in the analysis, which had not been attempted before in educational gerontology. Below, I present a summary of the key findings using this approach, and I discuss the importance of this new perspective. I was helped greatly in this endeavour by the publication of 110th edition of New Directions for Adult and Continuing Education (Johnson & Taylor, 2006), which was dedicated to exploring neuroscience's growing relevance, with contributions from neurobiologists, psychologists and educationalists, who provided food for thought and many leads for further study. Continuing high hopes for progress in this field are reflected in the quote below from the 2011 report from *The Royal Society's* working group on *Neuroscience and Lifelong Learning*, chaired by Uta Frith of the Institute of Cognitive Neuroscience, London:

> "Growing understanding of the neurological basis of learning could help most individuals to become fulfilled and productive members of society who can respond with resilience to changing circumstances in their lives."
>
> (Frith, 2011, p. 9)

Evidence shows that learning organises, shapes and strengthens the brain's connections: it fine-tunes the brain, preparing us better for whatever life has in store. Actively engaging our brains in learning throughout life can have a significant impact on how well we age, by increasing our capacity for flexible responses to external stressors. This means learning builds more robust mental resources to deal with life-changing events, and with normal ageing process (DANA, 2006). In section 5.4 I discussed a key message which was expressed in various forms in every focus group: people were looking for a different quality of experience from previous learning. Lives had been spent building knowledge, but there was a sense that knowledge *per se* was no longer the focus – it was how learning could enrich life. This chimes with the one of the key findings of Withnall and Thompson (2003):

> "Learning in later life was perceived to have a range of positive outcomes with the simple acquisition of knowledge the least important." (p. 1)

5.6.1 Summary of key neuroscience findings

The main research question concerned what kinds of learning styles and modes of communication older adults preferred and how these fit with recent neurobiological research and enhancing adult learning.

I have dealt with the learning style aspect in section 5.2. Here I address the fit between the key findings around communication styles and neuroscience.

These were:

- Whatever a person's learning style, a satisfying learning experience will engender feelings of wellbeing and pleasure, and be motivating;
- Older learners are curious about many things, but want new knowledge to connect to existing knowledge, or the learning to have practical applications for the enrichment of their own lives;
- Learners want to connect with others, know what others think, exchange views and contribute to a common purpose of deeper understanding;
- Learning through doing has a strong appeal, whether it is learning a practical skill, doing examples and receiving feedback, or experiential learning beyond the classroom.

5.6.2 Promoting development

If knowledge acquisition is no longer the most important factor, then this is a key piece of information for tutors to grasp, because traditionally, this is perceived by tutors as their raison d'être. In what ways does the tutor need to shift her/his perspective, from primarily helping people master content to promoting development, and what can neuroscience contribute to tutors' understanding? The first step in students' developmental journeys is to establish "an emotionally healthy and exciting learning environment that promotes optimal learning" (Wolfe, 2006, p. 40). Making class members feel they are welcome, wanted, and in a friendly place, is achieved by being explicit about a class ethos of supportive and encouraging social interaction. This positive emotional environment is one of the most important things a tutor can do to prepare for successful learning. How students view themselves, how they perceive the environment, and how they interact with others, can have profound effects on the

brain. These factors have been shown by social cognitive science to be the kind of conditions which alter brain chemistry, through the process described in detail in section 5.2.4.

Pleasure chemicals flood the neural networks, stimulating and enhancing activity in the frontal cortex where reflective activity takes place, and connections are made to existing knowledge networks. They create what Rowena (S4) called "a buzz", as dopamine, serotonin and norepinephrine encourage growth and reorganisation of networks (Zull, 2002). A classroom culture where warmth and empathy is established quickly involves everyone in a flying start and several participants drew attention to this requirement for a good atmosphere. Therefore, tutors need to think of appropriate ways for people to connect to each other, and how to organise their classroom to facilitate this. Tutors already know the importance of establishing rapport: what they may not know is the scientific explanation for what is happening in their students' brains, and the difference to the level of satisfying learning, through the establishment of a "safe holding environment" Johnston, 2006, p. 64).

This leads to the next important insight from social cognitive neuroscience. Over countless years of evolution our brains have developed mechanisms for survival which allow us to learn through social interaction (Goleman, 2006). We are wired to connect with others and are drawn into a brain-to-brain linkup whenever we engage in dialogue. This was expressed by several participants in their own way, for example – *'a very healthy way of learning'* (Harriet, A1) and *"all the interpersonal skills"* (Greta, A4). This type of encounter is so deep and direct, that it primes the emotions which link into other bodily systems, affecting hormones, heart rate, circulation, breathing and even the immune system. In other words, we are powerfully reactive to other people.

In sections 4.3.5 (Healthy learning environments), 5.4.1 (Enrichment in later life) and 5.5 (Mismatches), I drew attention to the immeasurable value of discussion and collaboration in the classroom to allow meaning-making to take place. These brain mechanisms enable us to engage in empathetic interaction, consider the intention of the other person, try and understand what someone means and think about how we want to interact (Stern, 2004). Stern distils his perspective from psychology, neuroscience, philosophy and the arts, to shed light on everyday "in the

moment" experiences when we can gain insight into our own understanding. This sort of experience was expressed succinctly in Harriet's (A1) opening statement in section 4.3.5.

The teacher, as well as enabling these 'now' experiences in the classroom, also needs to gauge what is going on in the minds of the learners. This is not something new, as Dewey wrote about the importance of teachers reading minds. What is new, is that social cognitive neuroscience seems to indicate, that people need to feel this "affective attunement" (Johnston, 2006, p. 65), if learning is to take place. This close alignment with the teacher came across in several conversations. Not only does this boost learning, but it also boosts resilience and makes setbacks in learning more bearable, as certain individuals discovered, when it came to trying to master something difficult. We all fear rejection, letting ourselves or others down, or feeling stupid. Affective attunement cultivates a growth mindset (Dweck, 2006), which means we are able to take risks, learn from feedback, and manage failure. And, in the process, we are discovering a little bit more about ourselves, our strengths and weaknesses.

The other critical facet of learning is linked to the work by Tulving (1972, 2002) on the centrality of experience to learning and the construction of knowledge (see section 2.4.3). Constructivism is also a philosophical viewpoint about teaching and learning, in that it values the idea that only genuine learning takes place when learners are able to process new information in ways that make sense to them (Caine & Caine, 2006). This is more likely to happen if there are concrete examples, analogies, exercises and activities that, through reflection, trigger connections to existing networks of knowledge. These then produce new solutions (or theories) in the frontal cortex – Goldberg's (2001) 'executive brain', which moves thinking to the next stage of the learning cycle leading to action (Zull, 2006).

For the participants in the research, a recurring theme was a clear preference for this process of actively creating their own knowledge. When teachers establish a protocol in their classrooms where learners are challenged to make meaning, a different type of stimulation takes place in the brain. Although at an early stage of research, brains grow best in this context of interactive discovery with others, to

create enduring neuronal patterns, which lay down lasting memories and build cognitive reserve.

5.6.3 The linkages between education and neuroscience

Discoveries from neuroscience research with implications for educational practice, have been accumulating for almost thirty years, resulting now in the emergence of educational neuroscience. There is a new determination that neuroscientists and educators must collaborate and find a common language. This is quite a challenge when one considers the gulf between studies using brain scanners and classrooms full of people. Unfortunately, years without formal interdisciplinary communication allowed many 'brain-based' ideas to filter through to education without proper scrutiny (Howard-Jones, 2008), creating a negative backlash. However, partnerships are now developing apace, with many areas of practical educational concern being informed by neuroscience, including adolescent development, mathematics and reading, and the contribution of sleep, exercise and nutrition to learning (Goswami, 2004; Howard-Jones, 2008). For example, sleep deprivation can explain some highly specific effects on memory and other mental functions.

The linkages between neuroscience and adult learning are essentially different from children's education, with some of the most interesting research focusing on improving the resilience of the 'ageing mind' (Cohen, 2005). The discovery of the processes of neuroplasticity (constant reshaping of neural networks) and neurogenesis (generation of new brain cells), have overturned the received wisdom of years, of steady mental decline from the age of 30 onwards (see sections 1.5 and 2.4). One of the most hopeful findings is that the more interconnected our neural networks, through years of complex living, learning and working, the more likely it is that we are building our 'cognitive reserve' (Stern, 2002, 2006, 2007; Whalley *et al.*, 2004), and contributing to maintaining our mental capital and wellbeing. Research on cognitive reserve has found:

> "an inverse relationship between educational attainment and risk of dementia, which means that keeping the mind active slows cognitive decline and improves cognitive abilities in older adults" (Frith, 2011, p. 4).

And cognitive reserve and resilience can be built up at any point during life. Add to this the vital importance of a healthy cardio-vascular system, not just for the heart's benefit, but for the brain's performance.

5.7 Conclusion

In summary, an emotionally healthy and exciting learning environment, with many opportunities to support each other in meaning-making and to learn actively through practical experience, appears to be supported by the latest neuroscience research and will provide older learners with optimum learning opportunities well suited to the continuing growth of mental capital and wellbeing.

In conducting this research, it has been possible to respond to the debate on active ageing and the value of learning in later life. With unprecedented numbers of older adults now entering 'the third age' as they leave the workforce, their learning needs matter, with mounting evidence that learning makes a significant positive contribution to wellbeing and 'mental capital' (*Foresight Mental Capital and Wellbeing Project*, 2008).

Mental capital includes a range of human capacities, but not least cognitive capability, flexibility and efficiency of learning. Insights from neuroscience suggest strongly that we need to keep using our cognitive capabilities or they will steadily decline. Learning in an affirmative social environment is one way, of not only maintaining sharpness, but also attaining other considerable psychological, emotional and physical benefits, which will enable continuing enjoyment of life and contribution to society.

In the final chapter, I will conclude by restating the importance of this study, along with its limitations, an appraisal of the methods, possible future research and make recommendations for practice.

Chapter 6 Conclusions and Recommendations

6.1 Overview

This chapter begins with a very brief overview of the context of the study when the empirical material was gathered in 2002, and key societal and knowledge developments since. Then, I present the conclusions and the importance of the present study, with a consideration of its limitations and the potential for further research. This is followed by an appraisal of the methods and their implementation. It closes with recommendations and personal reflections.

6.2 Context in 2002

The study was conceived at a time when there was much debate about the possibilities and opportunities for learning in later life within the context of demographic change. With recognition of the increasing significance in the policy arena of reshaping society's view of ageing, and capitalising on older adults as a societal resource, my research set out to explore older adults' perspectives on preferred learning and communication styles in ongoing educative activity. Previous research had tended to focus on policymakers' or providers' concerns, such as the *Carnegie Inquiry into the Third Age* (1993) and academic writing (Glendenning, 2000; Laslett, 1987), which scoped the territory of 'Third Age' learning including the cultural dimensions of ageing. Also Withnall and Percy (1994) had reviewed a range of existing provision, including the *Learning in Later Life Programme* at University of Strathclyde where my research was conducted; they found that older adults' accumulated life experience and skills were at the heart of participation, together with an extended lifespan. The hope was that learning in later life would gain a legitimate place (and adequate funding) within the lifelong learning policy framework.

6.3 Developments from 2002 to the present

In a world which has become increasingly financially unstable, lifelong learning is almost exclusively focused on the employability skills of the working population, and increasingly, for older adults, this means prolonging working life in alignment with a longer lifespan. Thus, funded provision for those who have left the workforce has sharply declined. An independent inquiry into lifelong learning (Schuller & Watson, 2009) attempted to alert government to the folly of focusing only on economic indicators, and ignoring the personal outcomes of learning in terms of happiness and wellbeing. In parallel, Beddington *et al.* (2008), in their major report, looked at mental capital which encompasses both cognitive and emotional resources, and mental well-being, and found evidence that learning can help promote wellbeing, and protect against normal cognitive decline with age. In 2010, Phillipson and Ogg (2010) examined the engagement of older learners in the HE sector and found there were a few isolated courses, but virtually nothing geared for the cohorts of older adults leaving the workforce. And finally, *The Royal Society*'s working group on *Neuroscience and Lifelong Learning* confirmed the cognitive benefits of learning, and that findings from neuroscience, which characterise different learning processes, can enhance teachers' own experiences of how individuals learn (Frith, 2011).

Given the predicted costs of supporting the aging population, it is in society's long-term interests to attend to recommendations from the above-mentioned research to capitalise on older adults' cognitive resources if society is to prosper, both economically and socially. Therefore, it is important to understand better what type of experience is going to attract this population group, on the basis that in due course, the strategic error of sidelining this sector will become clear. The major investigations, mentioned above, point to the relevance of my small-scale exploratory study which is concerned with classroom experiences.

In the 1990s, in parallel with the increased awareness of the demographic 'time-bomb', a neuroscientific explosion was underway through the use of new techniques, such as functional neuroimaging. These developments have provided insights into the complexity of how we learn and how learning is a lifelong process. The unplanned delay in writing up the study has in some respects been opportune,

because recent years have led to literature (books, journals, magazines) bringing neuroscience within the grasp of the educational sector. In the light of the importance of this emerging field, although much has yet to be uncovered, I decided that neuroscience advances warranted their use as a lens through which to examine older adults' preferences for learning and communication in the classroom, which, to my knowledge, has not been done before.

6.4 The research conclusions

The Learning Styles Questionnaire

In this mixed methods investigation, H&M's self-report LSQ was used to establish a LS profile for each respondent which conveyed their learning preferences in terms of activist, reflector, theorist and pragmatist profiles, giving a view of each "learning personality". 85% of the sample (n=55) accepted their profile as accurate (with between one and four preferences assigned per person), affirming a good level of face validity. I suggested plausible reasons (see section 4.2.4) as to why some were rejected, due to residual work influences or an artifact in the way the questionnaire was structured. There were approximately 60% reflector and theorist preferences compared to 40% activist and pragmatist preferences.

These findings suggest: (i) there may be a preponderance of older adults with a cautious philosophy (reflectors), only able to accept anything after extensive scrutiny, and those who like rational, logical arguments (theorists) and are uncomfortable with subjective judgments and (ii) there will be a lesser proportion who thrive on the challenge of new experiences (activists) and become bored with methodical implementation, and those who like to press on with new ideas (pragmatists) and become impatient with prolonged deliberation.

If this is a reasonably accurate reflection of older adults' preferences, then subjects such as philosophy, ethics, religion, literature and poetry would appeal to reflector-theorists, and subjects such as photography, creative arts, computing, languages, family history and guided walks would attract activist-pragmatists with their desire for direct involvement. However, this is an overly simplistic way to look at learning and why older adults opt to learn. If one accepts the social constructivist

view, that learning is a joint enterprise between teachers and learners, many older adults join a ten-week class out of *"curiosity to learn more"* Maureen (M16), and need to be drawn gently into the subject. From the focus group discussions, people were not seeking to cram more information into their heads, but were looking for a different quality of experience – learning for enrichment, not acquisition. With the range of styles in this small research sample of 55 encompassing 14 different combinations, from a single preference to four preferences (plus a variation of strengths), I conclude that this points to the need for a range of methods and imaginative ways of engaging everyone, which avoids the assumption that a single method of delivery will suit all students who chose to attend a particular class.

Changes, flexibility, VAK profiles and mismatches

The post-LSQ probed changes over time, flexibility in ways of learning, different sensory modalities (VAK profiles) and mismatches, which together with input from the focus groups, generated some interesting findings. Four out of five felt they had changed their LS. However, it appeared to be the way they thought about learning itself that had changed, not their LS in H&M's terms. This was not how participants conceptualised learning, with one exception - the person exposed to H&M's LSQ on two other occasions was comfortable using her H&M 'labels'. The majority linked back to *methods of learning* in the past, when they were expected to memorise information, a process that appeared to be anathema to them now.

One could conclude that, although the LSQ was a useful tool to stimulate discussion about styles now, self-knowledge about how one learned in the distant past is limited. Not many people are able to sense the way previous learning shaped their thinking. Later in life we create fictions and theorise about what our styles might have been. Change was seen to happen through work training, living one's life, an inner desire to change and experiencing new successful methods in the classroom. Those participants, who felt their style had not changed, appeared to be recalling enduring personality traits, which ran like a thread through their lives. These findings (see section 4.2.4) perhaps underline the difficulty in precisely pinning down the LS concept, as our brains are subtly reconfiguring all the time in response to what is happening in our lives and our culture/environment. However,

evidence is building that the more learning one does, the more adaptive and resilient one becomes.

When it came to identifying sensory modalities (VAK profile), these appeared to be more clear cut, with the sample split evenly between visual and hands-on learning, and only 13% citing the auditory mode. It is no coincidence that the visual cortex is one of the most studied parts of the brain, although it is still not understood in its entirety because of its complexity. The saying, 'A picture is worth a thousand words', is true in many respects, with images underpinning thinking. This is the reason that teachers use analogies, stories and metaphors to convey ideas, which learners conjure up in their own imaginations and remember more readily than the actual spoken words. There is an anomaly here, as students hear auditory input, but it is turned into mental imagery almost instantaneously: it is virtually impossible not to picture something that is being talked about, unless it is abstruse theories of which one has no knowledge.

However, in a classroom, it is not just carefully-chosen metaphors and stories that are powerful, but social interaction, gestures, body language, eye contact, attitude, the emotional tone in the classroom and a sense of common purpose. These elements are intangible and absorbed unconsciously, but are known to influence the alertness of the frontal cortex through the production of brain chemicals that 'light up' the brain, as demonstrated in functional neuroimaging. As discussed in the previous chapter, social neuroscience has discovered that our brains are wired for rapport with other human beings, and the spoken word is just one of several powerful forms of human communication. Thus, one can conclude that VAK profiles are: (i) a simplification that captures certain preferential elements of initial sensory processing and (ii) only stepping stones to an immensely complex meaning-making process that links to what the learner already knows.

Sometimes, what learners already know or do not know can cause a problem, as I discovered when I probed instances when older adults had found their learning experiences frustrating or disappointing. Grievances ranged from practical courses where the level was too basic or too advanced, or the teacher talking too much instead of involving the class, to lectures where there was no interaction or discussion. The mismatches of level were prevalent in art, language and computer

classes and can occur in any class where there is progression to higher levels. It is a challenge to educators to create the type of learning environment where people become socially integrated, but can progress comfortably at different rates. The idea that a class of older adults all start from the same place is ludicrous, given the range of life experience and previous education. Therefore, it would appear that mismatches occur through failure to establish: (i) previous experience and common ground and (ii) an ethos of drawing on the mental capital of the learners as a resource. Older adults have low tolerance of the above failures and one can expect disappointed students to withdraw rapidly from such 'unhealthy' environments.

Neuroscience research

Finally, looking at the neurobiological research of relevance to adult learning, there have been key developments which challenge common-sense views about inevitable decline in later life. There has been the discovery of: (i) neuroplasticity, which is the brain's lifelong capacity to change by a remarkable amount, depending on how it is used and (ii) neurogenesis, which is the regular production of new brain cells in certain parts of the brain, and (iii) implicit learning, which are complex skills which are learned unconsciously through experience. Then, there have been discoveries about brain architecture and the inseparable nature of social, emotional and cognitive networks which mean: (i) learning is enhanced through social interaction, with emotion affecting what is learned and the endurance of memories, (ii) the teacher's enthusiasm and belief in the student's potential can alter the receptiveness of the learner's brain to new material and, conversely (iii) presenting material in decontextualised, conceptual and undemonstrative ways makes new knowledge less likely to link to existing networks or seem related to real life.

In addition, the theoretical idea of constructivism, reflected in Vygotskian thinking (building step-by-step understanding through experience), which appears to shape the private processes of the mind, is the way neural networks physically take shape in the brain, as incoming sensory information connects up in the back associative cortex and reaches out to the adaptive meaning networks in the frontal cortex (fired up by the emotion), which then link to prior knowledge networks and the motor cortex. This is a completely different process from rote learning which

involves endless mechanical repetition and reproduction, with no real requirement for making meaning and understanding. Active meaning-making entails the learners doing the work and the teacher creating the best supportive circumstances under which the learning is done, often in collaboration with others. These processes encourage older adults towards ways of knowing which are more complex and profound and, according to the cognitive reserve hypothesis, will also build compensatory networks to maintain function in the face of age-related physiological changes.

6.5 Contribution to the field

This study attempted to come to a better understanding about how people in later life defined, explained and interpreted their learning preferences in the context of their everyday lives in an ever-changing world, which has shaped and reshaped their ideas of learning. The uniqueness of this mixed method study was the use of a LSQ which produced comparable profiles of everyone in the sample and provided a stepping stone to discussion aimed at meaning making, using a social constructivist approach. This highlighted the role of interactions, language and context, and the social construction of knowledge. Research into educational gerontology has hinged largely on researchers' and practitioners' assumptions about learning in later life, rather than how older adults have experienced it. Consequently, the face-to-face encounters in the focus group were central to connecting perspectives and sharing views, especially as reflecting on the process of learning is not something people of this generation were taught to do. In contrast, there is greater awareness of the value of teaching young people about learning how to learn, as learning is expected to be a regular, if not constant, feature of their adult lives in the future.

A very important aspect of this research was to shine the lens of neuroscience on the findings. With powerful evidence that the ‘Use it or lose it’ mantra has never been more true than when it comes to retaining one’s existing cognitive resources, it is vital that teachers know the type of learning experiences which will maximise gains, and also link in to what people enjoy to keep them coming back. The broad range of learning styles suggests that Race (2010) is close to the mark when he

recommends teachers structure lessons so that students are practising, applying, comparing and contrasting, and in general using higher-level processes, as this is in line with what many of the participants' stated preferences for immediacy and interaction. As discussed in the previous section on neuroscience, constructing one's understanding, fires multiple brain networks, and this process is enhanced in the context of discovery with others.

Neuroscience confirms what Jarvis (1987) has hypothesised about learning – that it is not just a psychological process taking place in an individual's head, but a social phenomenon. The participants were seeking first enjoyment, pleasure and enrichment, not acquisition. And although not often mentioned explicitly, the social aspects of learning underpin learning in later life classes, because knowledge *per se* can be accessed through other sources.

In addition, I drew attention to Johnston's (2006) writings about the power of "affective attunement" – positive interpersonal contact essential to human relationships, that teachers know creates a good atmosphere in their classrooms. Social cognitive science has confirmed that how we view ourselves, perceive the environment and interact with others, alter brain chemistry for better or for ill. When the pleasure chemicals start flowing, the growth and reorganization of other neural networks follows, thereby increasing flexibility and resilience. The reverse is true when stress hormones flood the brain and block higher level thinking: no older person is going to persist with mismatches, because they have the option to walk away. Therefore, it follows that it is incumbent on teachers and tutors to ensure learning in later life is, without exception, an affirmative experience which helps neural networks flourish in the best possible conditions.

6.6 The limitations of the study

The participants in the study were all drawn from the same 3Ls programme attached to the University of Strathclyde, with most (but not all) having a history of successful learning throughout their early schooling and working lives. Therefore, the findings cannot be generalised to the wider population of older adults, as statistics show that most do not attend classes and also, may never have had opportunities in their

workplace for training and development. Indeed, the sample is evidence of the yawning gulf between the learning-rich and learning-poor, as described by Sargant (2000). Also, it was an availability sample, as I drew from a small group of students, many of whom had attended classes I had taught, and whom I was able to invite face-to-face to participate in the research. As explained in Chapter 3, I believe these students are fairly typical of the 3L students in general, as they had attended classes other than mine but, of course, one can never be completely sure that those who volunteer are more positive and highly motivated than those who do not volunteer.

Most participants were Scottish and had progressed through the Scottish educational system which placed a high value on education, as opportunities for further education expanded in the 1940s, 1950s and 1960s. There was a culture of rote learning in their early years, although one participant had gone to a Montessori school in Glasgow and this experience appeared to have left an indelible desire for interactive learning. However, the majority shared a broadly similar cultural history and displayed a wide range of positive attitudes and expectations toward learning in later life. Consequently, this could imply that the findings are specific to the context of the Glasgow 3Ls programme and might therefore seem alien to older adults in a different cultural and social context.

The study did not aim to investigate the broader reality of later life in Glasgow, where forms of learning take place in local community settings, although not in the shape of classes as such, but through intergenerational projects and community regeneration, as discussed in section 2.3.3. The learning in these less affluent and less privileged settings are more along the lines of Hodkinson *et al's* (2008) 'learning cultures' which reject the 'acquisition model' of learning. Yet, the 3Ls participants also rejected the 'learning as acquisition' model, and work needs to be done to compare the views expressed in a privileged group with ones held by older adults engaged in community 'learning cultures', to find out if indeed they share a common purpose, despite quite different learning trajectories shaped by different structural and cultural forces. It might then be possible to explore how these different experiences may be alternative ways of activating the higher mental processes, which support the continuing growth of mental capital and wellbeing. As resilience is an adaptive response to stress and adversity, and can be built up through

education, it would be immensely valuable for less fortunate individuals and for society, to be able to attract more people from poorer communities to join learning projects.

6.7 Potential for further research

It would be useful to know what kind of views tutors had of their students' learning preferences. Although newer tutors may be sensitised to more varied ways of learning, many experienced tutors may be tempted to play safe with the lecture format of traditional adult liberal education, where the lecturer controls the flow of information and dispenses words of wisdom (Freire's, 1970/2000, 'banking education'). As research continues to provide a deeper understanding of the workings of the human brain, it would be interesting to assess to what extent tutors are aware of the developments at the interface of neuroscience and adult learning. Although educators need to be cautious about how they apply these findings to practice, it is one of the aims of The Royal Society working group (2011) on *Neuroscience and Lifelong Learning* to disseminate knowledge about neuroscience to enhance teachers' own experiences of how individuals learn.

There is a need for action research to test out in classes of older learners concepts such as "emotionally healthy learning environments" (Wolfe, 2006) and "affective attunement" (Johnston , 2006) and how emotions affect learning, memory and recall (Immordino-Yang & Damasio, 2007). Tutors working with older adults are well-placed to create pilot projects and share findings with colleagues through online or local networks. There is little to lose and much to be gained from perhaps devising a LSQ specifically aimed at older adults, to be used as a development tool to raise awareness of ways of learning, in the same way that young people are encouraged to become self-aware learners, to help them succeed in environments with a diverse mix of people. Willing tutors could put videos of interesting classroom activities online (password protected) to show ideas in action with real classes and different subjects. Using media clips to share good practice is virtually an untapped resource, which could dramatically encourage innovation and meaning-making in the education domain.

6.8 The research methods

As sole researcher, I carry total responsibility for the way the research was gathered, analysed and interpreted. By creating an environment of trust and ensuring it was understood that participation was entirely voluntary, I believe the respondents talked in an open and revealing way, and were honest and willing collaborators in this joint enterprise. The 26 who attended the focus groups devoted serious thought to exploring an area which, at first, may have appeared rather esoteric and not of great interest. The focus group method was helpful in building up a better understanding of learning preferences as conversations progressed.

Most participants had probably not talked about such things at any great length before, and by sitting around a table and actively engaging in the construction of their own subjective worlds, meanings emerged through a continuously unfolding conversation. I believe this social construction of knowledge yielded results that might not have been so illuminating using individual interviews, given the nature of this topic. I have provided illustrations of how participants built on each others' ideas as they reflected on what was said before. Therefore, the focus groups appeared to be a good illustration of "interpretative nets woven by individuals and groups" (Marshall, 1994, cited in Crotty, 1998).

The other side of the coin was that discussions could go off at a tangent, especially in the smaller groups, where there was a more intimate atmosphere and individual contributions tended to be longer. One hopes that by not allowing the conversations to veer too far from the research themes, and steering discussion back to the probe, that this did not cause any participant to feel their contribution was undervalued, and most importantly for the research, that intervening did not prejudice the authenticity of the data.

To transcribe and analyse around four hours of talk is very heavy on time. Therefore, the use of NVivo software to organise this material initially was helpful to instantly pull together all of one person's contributions or all the conversations on one probe, and then print out and use the more conventional method of colour pens for coding and recoding data to pick out emerging themes - what Juliet Corbin (2007) called 'grounded description'. No doubt with more experience, better use could have been made of the software to do this kind of operation. I fully appreciate

that my conceptual categories arise from my interpretations of the data, and agree with the position which Charmas (2008) adopts, concerning the need for data to be informed by theory, as what we know shapes what we 'discover'.

I found Yang's (2003) theory of knowledge and learning a useful lens to counterbalance theories from neuroscience and examine my categorisations. References to Yang's three-layered model are used throughout the analysis to this end. As the questionnaires and narrative data have equivalent status and answer, in effect, similar questions, I decided to combine all findings and analysis in one chapter within this constructivist/interpretive framework. I also accept that the conclusions by their nature are tentative and a different researcher could have found alternative plausible explanations for what was said and written. I have concentrated in this section on the focus group aspect of data collection because it is perhaps most contentious, and I have previously addressed the issues around the questionnaires throughout the thesis (see sections 3.4, 4.2.3, 5.4 and in 6.4).

6.9 Recommendations

On the basis of the findings from the present study, the primary recommendation is that the new insights from neuroscience, which are related to adult development, become part of the continuing professional development of adult educators (see Appendix 25), with discussion about how this knowledge can be applied in classrooms. Unlike children's education, where educational neuroscience is tackling the more contentious cognitive processes of reading and arithmetic teaching, all adult educators should be aware of certain developments, in particular:

Neurogenesis and *neuroplasticity*

Knowledge of adaptability of the brain through life, given the right stimulation, can help change ageist attitudes embedded in society.

The effect of emotions on learning

To fully appreciate that transmitting knowledge, which has been the traditional teacher's role in our culture, is only part of the picture. Nurturing positive beliefs and

a classroom climate, which promotes interpersonal and social connection, practice and action through a variety of means, creates energising emotional states for lasting neural connections and stable memories, because of basic changes in brain chemistry.

The effects of learning on wellbeing

Many studies show the connections between wellbeing and learning. This gives the tutor an important role and responsibility to contribute to the general health of her students through creating "emotionally healthy learning environments" (Johnston, 2006) when optimum learning can take place. This entails fully comprehending that learning is a social and cultural enterprise, thus it follows that an inclusive atmosphere in the classroom is as important for learning as good material and presentation skills.

The effects of other factors on cognitive vitality

The *Foresight and Wellbeing Project*, 2008 and other studies have found that cognitively-protective lifestyles are assisted, not only by engagement with life and learning, but by reducing cardiovascular risk factors, which involve physical exercise, weight control and diet. Disseminating this kind of brain health information when appropriate, as well as informing older learners that their efforts to learn are actively contributing to maintaining their cognitive health, is motivating, encouraging and adds to a sense of wellbeing, and also adds value to learning. This thesis has identified a significant number of websites where information is available for the lay person, such as the *Staying Sharp* downloadable booklet (Dana, 2006). Such dialogue could be embedded in introductory sessions to new students. Also, seminars about some of these important neuroscience discoveries could be incorporated into programmes to inform older adults about the positive news from neuroscience, generally only available in books (Cohen, 2005; Goldberg, 2005), or on brain science websites (Dana Alliance for the Brain; Society for Neuroscience). See Appendix 25 for matrix of possible dissemination pathways.

New ways of learning

Learning experientially has been shown to be very attractive to older adults. Therefore, incorporating activities away from classrooms, to bring learning 'to life' in memorable ways, would pay dividends for students and providers alike. With free transport for the older population in Scotland, this resource could be used imaginatively by programme providers and perhaps broaden the appeal of learning to new learners who are not moved to participate in conventional learning activities, but would be willing to come together to discuss their experiences.

This raises the issue of types of blended learning, using online material together with some classroom meetings. This is largely uncharted territory, but is a way of tapping into free technology (when broadband becomes universal) with the potential for adding social dimensions and shared learning through networks. Another new way of learning is to use older learners as 'teachers' as has been demonstrated very successfully in computer buddy projects, introducing people to computers on a one-to-one basis. There are other ways that older adults could be mentors/buddies yet to be explored – perhaps to assist in using particular software, such as genealogy, photo albums online, video editing.

6.10 Personal reflections

My own learning journey in the course of this study has been challenging, as life events such as my secondment between 2003-2005, serious illness of my daughter, the difficult last year of my mother's life, and the departure of two supervisors, made it seem as if concluding this project successfully was mission impossible. Having submitted rather hastily in 2010, I am glad to have had a concentrated period to look at the data again in a more detailed and measured way, not only to do it justice, but also to not let down those who participated in good faith. I have also gained a better understanding of the research process through taking time and reflecting more deeply.

The study originated in an interest in the learning styles of older adults and the extent to which classroom practices accommodated diversity. Before 2002, the neuroscience of interest to adult educators was articulated by a limited number of

writers, but this has opened out since then in exciting ways and many discoveries are increasingly compelling. Through engaging with this significant body of literature, as well as the areas of particular relevance to learning in later life, I have deepened my knowledge and have a greater understanding of neuroscience than I ever thought possible. This has enriched my own teaching on brain boosting, better memory and wellbeing. Also, if the cognitive reserve hypothesis is to be believed, I should have added significantly to my own resilience and my own reserve of neurons.

References

Abrams, D., Eilola, T. & Swift, H. (2009). *Attitudes to age in Britain, 2004-2008* (Research Report No 599), Norwich: Department for Work and Pensions

Adey, P. Fairbrother, R. & Wiliam, D. (1999). *Learning Styles and Strategies - A review of research*. London: King's College.

Age UK (2010). *A Snapshot of Ageism in the UK and across Europe*. Retrieved from http://www.ageuk.org.uk/latest-press/age-uk-research-shows-age-discrimination-is-rife-in-europe/

Alexander, H. A. (2006). Philosophy, Methodology and Educational Research: Introduction. *Journal of Philosophy of Education*, 40:2, 131-135.

Allen, J. (2008). *Older People and Wellbeing*. London: Institute of Public Policy Research. (IPPR)

Anfara, V. A., Jr., & Mertz, N. T. (Eds.). (2006). *Theoretical frameworks in Qualitative Research*. Thousand Oaks, CA: Sage

Anderson, S. (2008). *Later Life Learning: A Review of the Literature.* Association for Education and Ageing.

Aronson, J. 1994: A pragmatic view of thematic analysis. *The Qualitative Report*, 2, 1. Retrieved from http://www.nova.edu/ssss/QR/BackIssues/QR2-1/aronson.html

Baltes, P. B., Rösler, F., & Reuter-Lorenz, P.A. (2006). Prologue: biocultural co-constructivism as a theoretical metascript. In P. B. Baltes, P.A Reuter-Lorenz & F. Rösler (Eds.) *Lifespan development and the brain: the perspective of biocultural co-constructivism* (pp. 3-34). Cambridge: Cambridge University Press.

Batista-Taran, L., Cruz-Ledón, A. M., & Coombs, C. (2008). Book Review: Merriam, S.B., & Brockett, R. (2007). *The Profession and Practice of Adult Education: An Introduction.* San Francisco: Jossey-Bass, in *Adult Education Quarterly*, 59, 90-93.

Battro, A., Fischer, K.W. & Léna, P. J. (Eds.) (2008). *The educated brain: essays in neuroeducation*. Cambridge, UK: Cambridge University Press.

Baumgartner, L. M. (2001). Four adult development theories and their implications for practice. Focus on Basics, National Centre for the Study of Adult Learning and Literacy. 5: B (1-7)

Baxter-Magolda, M. (2004). Evolution of a Constructivist Conceptualization of Epistemological Reflection. *Educational Psychologist*. 39, 1, 31-42.

Beatty, P. T. & Wolf, M. A. *Connecting with Older Adults: Educational Responses and Approaches*. Malabar, FL: Krieger, 1996.

Beddington, J., Cooper, C., Field, J., Goswami, U., Huppert, F., Kirkwood, B. & Thomas, S. (2008). The mental wealth of nations. *Nature*, 455, 1057-1060.

Bengtsson, J. (2009). *Education, learning and brain research: An international perspective*. Powerpoint Presentation (Glasgow University CRADALL 2009 Seminar Series).

Bernard, H. R. & Ryan G. W. (2010). *Analaysing qualitative data: systematic approaches*. London: Sage.

Birren J. & Schroots, J. (2001). The history of geropsychology. In J. Birren, J., & W. Schaie, W. (Eds.) *Handbook of the Psychology of Aging* (Fifth Edition), Chapter 1, 3-26. London: Academic Press.

Blaikie, N. (1993). *Approaches to social enquiry*. Cambridge: Polity Press.

Blaikie, N. (2007) (2nd Edition). *Approaches to social enquiry*. Cambridge: Polity Press.

Borella, E., Carretti, B., Riboldi, F. & De Beni, R. (2010). Working Memory Training in Older Adults: Evidence of Transfer and Maintenance Effects. Psychology and Aging, 25, 4, 767–778.

Braun, V. & Clarke, V.(2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 2, 77-101.

Bridges. D., & Smith, R. (2006). Philosophy, Methodology and Educational research: Introduction. *Journal of Philosophy of Education*, 40, 2, 131-135.

British Psychological Society. (2011). *Code of Human Research Ethics*. Leicester, BPS.

Brooks, M. (2008). The Power of Belief. *New Scientist*. 199, 2670, 36, 38-39.

Brookfield, S. (1990). Expanding knowledge about how we learn. In R.M. Smith (Ed.). *Learning to learn across the life span*, pp. 327-345. San Francisco: Jossey Bass.

Brookfield, S. (1992). Why Can't I Get This Right? Myths and Realities in Facilitating Adult Learning. *Adult Learning*, 3, 6, 12-15.

Brookfield, S. (1995). Adult Learning: An Overview. In A.Tuinjman (Ed.). *The International Encyclopaedia of Education*. Oxford: Pergamon Press. Retrieved from

http://www3.nl.edu/academics/cas/ace/facultypapers/StephenBrookfield_AdultLearning.cfm

Brownlee, J. (2004). Teacher education students' epistemological beliefs: Developing a relational model of teaching. *Research in Education*, 72, 1, 1-17

Bruar, J.T. (1997). Education and the brain: A bridge too far. *Educational Researcher*, 26, 8, 4-12.

Burns, R. (2000). *Introduction to Research Methods* (4th edition). London: Sage.

Burr, V. (2003). *Social Constructionism.* (2nd edition). Hove: Routledge.

Burr, V. (2004). Constructionism. In M.L.Lewis-Beck, A. Bryman & T. Futing Liao (Eds.). *The Sage encyclopedia of social science research methods,* Vol. 1, p. 185. London, Sage.

Buzan, T. (1974, 2000). *Use Your Head*. London: BBC Worldwide Ltd.

Buzan, T. (1988, 1998). *Master Your Memory*. London: BBC Worldwide Ltd.

Buzan, T. & Buzan, B. (1993, 2000). *The Mind Map Book*. London: BBC Worldwide Ltd.

Caine, N.C. & Caine, G. (1997). *Unleashing the power of perceptual change: The potential of brain-based teaching.* Alexandria, Virginia: ASCD

Caine, G. & Caine, R. (2001). *The Brain, Education and the Competitive Edge*. Maryland: Scarecrow Press.

Caine, R. N. & Caine, G. (2006). Meaningful Learning and the Executive Functions of the Brain. *New Directions for Adult and Continuing Education*, 110, 53-61.

Caine, R. N., Caine, G., McClintic, C. and Klimek, K. (2004). *12 Brain/Mind Learning Principles in Action: The Fieldbook for Making Connections, Teaching, and the Human Brain*. Thousand Oaks, California: Corwin Press.

Calvin, W. H. (1998). *How Brains Think: Evolving intelligence, then and now.* London: Phoenix.

Candy, P. C. (1990). How people learn to learn. In R.M. Smith (Ed.). *Learning to learn across the life span*, pp. 30-63. San Francisco: Jossey Bass.

Carey, M.A. (1995). Analysis of Focus Group Data. *Qualitative Health Research*, 5, 4, 487-495.

Carnegie Inquiry into the Third Age (1993). Final Report, Dunfermline: Carnegie UK Trust.

Centre for Lifelong Learning (2011). *Certificate of Professional Development in Adult Teaching and Learning*. Glasgow: University of Strathclyde. Available at http://www.strath.ac.uk/cll/cpd/adultteachingandlearning/

Charmaz, K. (2000). Constructivist and objectivist grounded theory. In N. K.Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd edition, pp. 509-535 Thousand Oaks, CA: Sage.

Charmaz, K. (2008). Grounded Theory in the 21st Century. In N. K.Denzin & Y. S. Lincoln (Eds.), Strategies of Qualitative Inquiry, pp. 203-242. Thousand Oaks, CA: Sage.

Chen, L-K, Kim, Y.S, Moon, P. & Merriam, S. B. (2008). Review and Critique of the Portrayal of Older Adult Learners in Adult Education Journals, 1980-2006. *Adult Education Quarterly*, 59, 1, 3-21.

Chioncel, N. E., van der Veen, R., Wildemeersch, D. & Jarvis, P. (2003). The validity and reliability of focus groups as a research method in adult education. *International Journal of Lifelong Education*, 22, 5, 495-517.

Coffield, F. (2008). *Just Suppose Teaching and Learning Became the First Priority*. London: Learning and Skills Network.

Coffield, F., Mosely, D, Hall, E. & Ecclestone, K. (2004). *Learning Styles and Pedagogy in Post-16 Learning: Findings of a Systematic and Critical Review of Learning Styles Models*. London: Learning and Skills Research Centre.

Cohen, G. D. (2000). *The Creative Age: Awakening Human Potential in the Second Half of Life.* New York: Avon Books.

Cohen, G.D. (2005). *The Mature Mind: The Positive Power of the Ageing Brain*. New York: Basic Book.

Cohen, L. Manion, L. & Morrison, K. (2001). *Research Methods in Education. (*Fifth edition.) New York: Routledge.

Cole, M. & Wertsch, J. V. (1996). *Beyond the Individual-Social Antimony in Discussions of Piaget and Vygotsky.* Retrieved from http://www.massey.ac.nz/~alock/virtual/colevyg.htm

Cozolino, L. (2002). *The Neuroscience of Psychotherapy: Building and Rebuilding the Human Brain*. New York: Norton, 2002.

Cozolino, L. & Sprokay, S. (2006). Neuroscience and adult learning, New *Directions for Adult and Continuing Education*, 110, 11-19.

Creswell, J. W. (1995). Combined quantitative and qualitative designs. In J.W. Creswell, *Research design: Qualitative and quantitative approaches* (Chapter 10), Thousand Oaks, CA: Sage.

Creswell. J. W. (1998). *Qualitative Inquiry and Research Design*. London: Sage.

Crotty, M. (1998). *The foundations of social research*. London: Sage.

Cuthbert, P. F. (2004).The student learning process: Learning styles or learning approaches? *Teaching in Higher Education*, 10, 2, 235-249.

Daloz, L. *Effective Teaching and Mentoring*. San Francisco: Jossey-Bass, 1987.

Damasio, A. (1994). *Descartes' Error: Emotion, Reason and the Human Brain*. New York: Putnam. (Reprinted in Quill 2000).

Damasio, A. (1999). *The Feeling of What Happens: Body, Emotion and the Making of Consciousness*. London: Heinemann.

Damasio, A.& Damasio H. (2006). Minding the body. Daedalus, *Journal of American Academy of Arts & Sciences*. Vol. 135, No. 3, 15-2

Dana Alliance for Brain Initiatives [DANA] at www.dana.org. *The Dana Foundation*. International Brain Awareness Week campaign.

Dana Alliance for Brain Initiatives [DANA] (2004, 2005, 2006). *Learning Throughout Life, Staying Sharp: Current advances in brain research*. New York: Dana Alliance for Brain Initiatives. Retrieved from http://www.dana.org/WorkArea/showcontent.aspx?id=14214

Darwin, C. (1859). *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. The Online Literature Library at http://www.literature.org

Davidson, R. J. (2003). Seven sins in the study of emotion: Correctives from affective neuroscience. *Brain and Cognition*, 52, 129–132

De Beauvoir, S. (1984). Introduction from *'The Coming of Age'*. In M. Rainbolt & J. Fleetwood, J. (Eds.), *On the Contrary: Essays by Men and Women*, (Chapter 6, pp. 70-76). New York: State New York Press.

Deary, I. & Gow, A. (2008). *Determinants of Normal Cognitive Ageing: Implications for Mental Capital*. London: Government Office for Science: *Foresight Project*.

Dench, S. & Regan, J. (2000). *Learning in Later Life: Motivation and Impact*. *Research Brief 183*. London: Department for Education and Employment.

Denzin, N. K. (1989). The research act: A theoretical introduction to sociological methods (3rd Edition). Englewood Cliffs, NJ: Prentice Hall.

Denzin. N. & Lincoln, Y. S. (1994). *Handbook of Qualitative Research* (2nd Edition). London: Sage.

Denzin. N. & Lincoln, Y. S. (2008). *Strategies of Qualitative Inquiry*. London: Sage.

Derek Bok Center for Teaching and Learning, Harvard University. Available at http://isites.harvard.edu/fs/html/icb.topic58474/TFTlectures.html

Desmedt, E. & Valcke, M. (2004). Mapping the Learning Styles Jungle: An overview of the literature based on citation analysis. *Educational Psychology*, 24, 4, 445-464.

Dewey, J. (1916/1997). *Democracy and Education: an introduction to the philosophy of education*. New York: Free Press.

Diamond, M.C. (1988). *Enriching Heredity*. New York: The Free Press/Simon and Schuster. Extract available at http://education.jhu.edu/newhorizons/Neurosciences/articles/Significance%20of%20Enrichment/index.html

Diamond, M. C. (2001). Successful Aging of the Healthy Brain. *American Society on Aging and the National Council on the Aging*. Retrieved from http://education.jhu.edu/newhorizons/Neurosciences/articles/Successful%20Aging/index.html

Diamond, M.C., Lindner, B., & Raymond, A. (1967). Extensive cortical depth measurements and neuron size increases in the cortex of environmentally enriched rats. *Journal of Comparative Neurology*, 131:3, 357–364. Abstract retrieved from http://onlinelibrary.wiley.com/doi/10.1002/cne.901310305/abstract

Dirkx, J. M. (2008). The Meaning and Role of Emotions in Adult Learning. *New Directions for Adult and Continuing Education*, 120, 7-18.

DIUS, 2009. *The Learning Revolution*. Department of Innovation, Universities and Skills, Norwich: TSO.

Doidge, N. (2007). *The Brain That Changes Itself: Stories of Personal Triumph from the frontiers of brain science*. New York: Penguin Books.

Dunn, R. (2004). Professor Rita Dunn's Response to Coffield Report. *The International Learning Style Network* (ILSN).

Dweck, C. S. (2006). *Mindset: The New Psychology of Success*. New York: Ballantine Books.

Economic and Social Research Council (2003). *Growing Older programme*: *Research Findings 13*. Sheffield: University of Sheffield. Retrieved from http://www.growingolder.group.shef.ac.uk/AlexWithnall_F13.pdf

Economic and Social Research Council (2007) – Teaching and Learning Research Programme (TLRP) Seminar Series. *Neuroscience and Education, Issues and Opportunities*. Retrieved from www.tlrp.org/pub/commentaries.html

Economic and Social Research Council (2010). *Framework for Research Ethics* (FRE). Swindon: ESRC. Retrieved from http://www.esrc.ac.uk/_images/Framework_for_Research_Ethics_tcm8-4586.pdf

Elderhostel: *Adventures in Lifelong Learning*. Retrieved from http://www.exploritas.org

Elvin, E. (2011). Intergenerational Practice Micro Grants: small projects making a difference. Glasgow: Scottish Centre for Intergenerational Practice

Encyclopædia Britannica. *Edward L. Thorndike*. Retrieved from *Encyclopædia Britannica Online*: http://www.britannica.com/EBchecked/topic/593342/Edward-L-Thorndike

European Commission (2001) *Communication from the Commission. Making a European Area of Lifelong Learning a Reality*. COM (2001) 678 final. Retrieved from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2001:0678:FIN:EN:PDF

European Commission, (2007). *Action plan of adult learning: It is never too late to learn*. COM (2006) 614 final. Brussels: European Commission. Retrieved from http://europa.eu/legislation_summaries/education_training_youth/lifelong_learning/c11097_en.htm

European Commission, (2010). *Decision of the European Parliament and of the Council on the European Year for Active Ageing 2012*. SEC (2010) 1002 final. Brussels: European Commission. Retrieved from http://europa.eu/eucalendar/event/id/204075-conference-towards-the-european-year-for-active-ageing/mode/standalone

European Foundation for the Improvement of Living and Working Conditions – *Active Ageing*. Eurofound (2008). Dublin: Publications Office. Retrieved from www.eurofound.europa.eu/pubdocs/2008/11/en/1/ef0811en.pdf

European Social Survey *(2010). ESS User Bulletin 13*. Available at www.europeansocialsurvey.org

Evans, C., Cools, E., & Charlesworth, Z., M. (2010). Learning in higher education - how cognitive and learning styles matter. *Teaching In Higher Education*, 15, 4, 467-47.

Fernandez, A. (2009). Preparing Society for the Cognitive Age. *Frontiers in Neuroscience*, 3:1.

Fetterman, D. (2010). *Ethnography: Step-by-Step* (Applied Social Research Methods) (3rd edition). Thousand Oaks: Sage.

Field, J. (2000). Researching Lifelong Learning Through Focus Groups. *Journal of Further and Higher Education*, 24, 3, 323-335.

Field, J. (2006). *Lifelong Learning and the New Educational Order*. Trowbridge: Trentham Books.

Field, J. (2009a). Adult learning is Ageist. *NewStart*. Retrieved from http://www.cles.org.uk/newstart/

Field, J. (2009b). Good for your soul? Adult learning and mental well-being. *International Journal of Lifelong Education*, 28, 2,175-191.

Field, J. (2009c). Well-being, Happiness and Lifelong Learning. *Inquiry into the Benefits of Lifelong Learning*. Leicester: NIACE.

Field, J. (2009d). The Future of Adult Learning in Scotland: A demand-led skills strategy? Holyrood Conference: *The Future of Adult Learning and Social Cohesion in Scotland*. Stirling: Stirling University. Available at http://www.ioe.stir.ac.uk/staff/documents/Field2009TheFutureofAdultLearningandSocialCohesioninScotland.pdf

Findsen, B. (2005). *Learning Later*. Malabar, FL: Krieger.

Findsen, B. (2007). Freirean Philosophy and Pedagogy in the Adult Education Context: The Case of Older Adults' Learning. *Studies in Philosophy and Education*, 26, 6, 545-59.

Fischer, K., Daniel, D., Immordino-Yang, M., Stern, E., Battro, A., & Koizumi. H. (2007). Why Mind, Brain, and Education? Why Now? *Mind, Brain, and Education*, 1, 1, 1-2.

Fisher, J. C. (1993). A framework for describing developmental change among older adults. *Adult Education Quarterly*, 43, 2, 76-89.

Fisher, J. C. (1998). Major streams of research probing older adult learning. *New Directions for Adult and Continuing Education*. 77, Spring, 27-39.

Fisher, J. C. & Wolf, M. A. (1998) Epilogue. In J.C.Fisher & M.A.Wolf (Eds.), Using learning to meet the challenges of older adulthood. *New Directions for Adult and Continuing Education*, 77. San Francisco: Jossey-Bass.

Formosa, M. (2000). Older adult education in a Maltese University of the Third Age: A critical perspective, *Education and Ageing*, 15 ,3), 315-339.

Formosa, M. (2002). Critical Gerogogy: Developing practical possibilities for critical educational gerontology. *Education and Ageing*, 17, 3, 73-86.

Formosa, M. (2005). Feminism and critical educational gerontology: An agenda for good practice. *Ageing International*, 30, 4, 396-411.

Formosa, M. (2007). A Bourdieusian interpretation of the University of the Third Age in Malta, *Journal of Maltese Education Research*, 4, 2, 1-16.

Formosa, M. (2009). Renewing universities of the third age: challenges and visions for the future. *Recerca: Revista de pensament i analisi*, 9, 171-196.

Foresight Mental Capital and Wellbeing Project (2008). Final Project report – *Executive summary*. London: The Government Office for Science.

Frankland, J & Bloor, M. (1999). Some issues arising in the systematic analysis of focus group material. In J. Kitzinger & R. S. Barbour (Eds.) *Developing focus group research: politics, theory and practice* (pp. 144-155). London: Sage.

Freire, P. (1970/2000). *Pedagogy of the oppressed*. (30th anniversary edition). New York: The Continuum Publishing Corporation. .

Frith, U. (2011). *Brain Waves Module 2: Neuroscience: implications for education and lifelong learning*. RS Policy document 02/11. London: The Royal Society.

Gardner, H. (1983/1993). *Frames of Mind: The theory of multiple intelligences*. New York: Basic Books.

Gardner, H. (2003). Multiple Intelligences after Twenty Years. Paper to the *American Educational Research Association*, Chicago, Illinois. Available at http://pzweb.harvard.edu/PIs/HG_MI_after_20_years.pdf

Gardner, H. (2006). *Multiple intelligences: New horizons in theory and practice*. New York: Basic Books.

Gee, J. P. (2005). *Discourse Analysis: theory and method*. (2nd Edition). Abingdon: Routledge.

Gergen, G. J. (2004). Constructionism, Social. In M.L.Lewis-Beck, A. Bryman & T. Futing Liao (Eds.). *The Sage encyclopedia of social science research methods*, Vol. 1, pp. 183-185. London: Sage.

Given, B. K. (1997-1998). Psychological and neurobiological support for learning-style instruction: why it works. *National Forum of Applied Educational Research Journal*, 11, 1, 10-15.

von Glaserfeld, E. (1989). Cognition, construction of knowledge, and teaching. *Synthese*, 80, 1, 121-140.

Glendenning, F. (2000). *Teaching and Learning in Later Life*. Aldershot: Ashgate Publishing.

Glendenning, F. & Battersby, D, (1990). Why we need educational gerontology and education for older adults: a statement of first principles. In F. Glendenning & K. Percy (Eds.), *Ageing, Education and Society: readings in educational gerontology*. Keele: University of Keele.

Goldberg, E. (2001). *The Executive Brain: frontal lobes and the civilized mind*. New York: Oxford University Press.

Goldberg, E. (2005). *The Wisdom Paradox: How your mind can grow stronger as your brain grows older*. London: Simon and Schuster UK.

Goldberg, E. (2009). *The New Executive Brain: Frontal Lobes in a Complex World*. New York: Oxford University Press.

Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ*. New York: Bantam Books.

Goleman, D. (2006). *Social Intelligence. The new science of human relationships*. New York: Bantam Books.

Goswami, U. (2004). Neuroscience and education. *Journal of Educational Psychology*, 74, 1–14.

Government Equalities Office (2010). *Equality Act*. London: Stationery Office. Retrieved from http://www.equalities.gov.uk/equality_bill.aspx

Greene, J. C. & Caracelli, V. J. (1997). Defining and describing the paradigm issue in mixed-method evaluation. In J. C. Greene & V. J. Caracelli (Eds.), *Advances in mixed-method evaluation: The challenges and benefits of integrating diverse paradigms* (pp. 5-17). New Directions for Evaluation, No. 74. San Francisco: Jossey-Bass.

Greene, J. C., Benjamin, L. & Goodyear, L. (2001). The Merits of Mixing Methods in Evaluation. *Evaluation*, 7, 1, 25-44.

Greenfield, S. (1997). *The Human Brain*. London: Weidenfeld & Nicolson.

Harper. S. (2006). Mature Societies: Planning for Our Future Selves. *Daedalus,* 135:1, 20-31. Retrieved from http://www.mitpressjournals.org/doi/abs/10.1162/001152606775321040

Hart, C. (2000). *Doing a literature review.* London: Sage.

Hart, L. A. (2001*). The SSI Odyssey 1991 - 2001*: *A Decade of Achievement*. Glasgow: Strathclyde University.

Hart, L.A., & McMellin, I. (1995). *It makes you think: the impact of participation in the Learning in Later Life programme*. Glasgow: Strathclyde University.

Hiemstra, R. (1981). The contributions of Howard Yale McClusky to an evolving discipline of educational gerontology. *Educational Gerontology*, 6, 2&3, 209 - 226.

Hiemstra, R. (1998). From Whence Have We Come? The First Twenty-Five Years of Educational Gerontology. *New Directions for Adult and Continuing Education*. 77, Spring, 5-14.

Hillier, Y. (2005) Reflective teaching in further and adult education (2nd edition). London: Continuum.

Hillman, C. H., Erickson, K. I. & Kramer, A. F. (2008). Be smart, exercise your heart: exercise effects on brain and cognition. *Nature Reviews Neuroscience*, 9, 58-65.

Hodkinson, P., Ford, G., Hodkinson, H. & Hawthorn, R. (2008). Retirement as a Learning Process. *Educational Gerontology*, 34, 3, 167–184.

Honey, P. & Mumford A.(1986). Using your Learning Styles. Maidenhead, Honey.

Honey, P., & Mumford A. (1992). *The Manual of Learning Styles*. Berkshire: Honey.

Honey, P., & Mumford A., (2000). *The Learning Styles Questionnaire 80-item*. Maidenhead: Peter Honey.

Howard-Jones, P. A. (2007). Neuroscience at the school gates: Are we ready? (Powerpoint slides). *Neuro-Educational Research Network (NEnet),* University of Bristol. Retrieved from http://education.exeter.ac.uk/download.php?id=8853

Howard-Jones, P.A. (2008). Scepticism is not enough. *Cortex*, 45, 4, 550-551.

Howard-Jones, P.A. (2009). Neuroscience, Learning and Technology, (14-19 years). Report for Deep Learning Project, BECTA.

Howard-Jones, P. A. (2011). From brain scan to lesson plan. *The Psychologist*, 24, 2, 110-113.

Howard-Jones, P. & Pickering, S. (2007). Educators' views on the role of neuroscience in education: Findings from a study of UK and international perspectives. *Mind, Brain and Education*, 1, 3, 109-113.

HSBC Insurance (2009). *The Future of Retirement - It's time to prepare*. Cicero Consulting, Oxford Institute of Ageing. Oxford: University of Oxford.

ILA Scotland *(Individual Learning Account*), Scottish Government. Retrieved from http://www.ilascotland.org.uk/

Immordino-Yang, M.H. & Damasio, A. (2007). We Feel, Therefore We Learn: The Relevance of Affective and Social Neuroscience to Education. *Mind, Brain, and Education*, 1, 1, 3-10.

Izard, C. (2009). Emotion Theory and Research: Highlights, Unanswered Questions, and Emerging Issues. *Annual Review of Psychology*, 60, 1-25.

Jamieson, A. (2002). Theory and Practice in Social Gerontology. In A. Jamieson & C. Victor (Eds.), *Researching ageing and later life: the practice of social gerontology*. Buckingham: Open University Press: 7-20.

Jamieson, A. (2007). Education and the quality of life in later years. *Quality in Ageing - Policy, practice and research*, 8, 3, 15-24.

Jarvis, P. 1987. *Adult learning in the social context*. Beckenham: Croom Helm

Jarvis, P. (2001). Universities as Institutions of Lifelong Learning: Epistemological Dilemmas. *Journal of Higher Education Outreach and Engagement*, 6, 3, 23-40.

Jarvis, P. (2005). *Towards a Comprehensive Theory of Adult Learning*. London : Routledge.

Jarvis, P. (2009). *Learning to be a person in society*. Routledge: London.

Johnson, R. B. & Onwuegbuzie, A.J. (2004). Mixed Methods Research: A Research Paradigm whose time has come. *Educational Researcher*, 33, 7, 14–26.

Johnson, S. (2006). The neuroscience of the mentor-learner relationship. *New Directions in Adult and Continuing Education*, 110, 63-69.

Johnson, S. & Taylor, K. (Eds.), 2006. The Neuroscience of Adult Learning: *JB ACE* Single Issue, Adult & Continuing Education. *New Directions in Adult and Continuing Education*. San Francisco: Jossey-Bass.

Jones, E. G. & Mendell, L. M. (1999). Assessing the Decade of the Brain. *Science.* (American Association for the Advancement of Science), 284, 5415, 739.

Kandel, E., R. (2006). *In Search of Memory: The Emergence of a New Science of Mind*. New York: Norton.

Kearsley, G. [Copyright 1994-2011] *Explorations in learning and instruction: the theory into practice database*. Retrieved from http://tip.psychology.org/knowles.html

Kempermann G. (2006). Adult neurogenesis. In P. B. Baltes, P.A. Reuter-Lorenz & F. Rösler (Eds.) *Lifespan development and the brain: The perspective of biocultural co-constructivism* (pp. 83-105). Cambridge: Cambridge University Press.

Kilgore, D.W. (2001). Critical and Postmodern Perspectives on Adult Learning. *New Directions for Adult and Continuing Education,* 89: 53–62.

Kirkwood, T., Bond, J., May, C., McKeith, I. & Teh, M. (2008). *Foresight mental capital and wellbeing project: making the most of ourselves in the 21st century*. London: The Government Office for Science.

Kolb, D.A. (1976). Learning Style Inventory:Technical manual. Boston: McBer.

Kolb, David A. 1984. *Experiential Learning: Experience as the Source of Learning and Development*. Prentice-Hall, Inc., Englewood Cliffs, N.J.

Koro-Ljungberg, M., Yendol-Hoppey, D., Smith J. J. & Hayes, S. B. (2009). (E)pistemological Awareness, Instantiation of Methods, and Uninformed Methodological Ambiguity in Qualitative Research Projects. *Educational Researcher*, 38, 687-699.

Kotulak, R. (1997). *Inside the brain: revolutionary discoveries of how the mind works*. Kansas City: Andrews McMeel Publishing.

Krueger, R. A. & Casey, M. A. (2009). *Focus Groups: a practical guide to applied research* (4th Edition). London: Sage.

Lakoff, G. & Johnston, M. (1980). *Metaphors We Live By*. Chicago: University of Chicago Press.

Liamputtong, P. (2011). *Focus Group Methodology: Principle and Practice.* London: Sage.

Laslett, P. (1989). *A Fresh map of Life: the emergence of the third age*. London: Weidenfield and Nicholson.

Layard, R. (2005). *Happiness: lessons from a new science*. St. Ives: Penguin Books.

Learningandthebrain.com/ *Learning and the Brain* (2011). Public Information Resources, Inc. Retrieved from http://www.learningandthebrain.com/

Learning in Later Life Programme (2010-2011). Centre for Lifelong Learning, University of Strathclyde: Glasgow. Retrieved from http://www.strath.ac.uk/media/ps/cll/ssi/docs/LLLP10.pdf

Ledoux, J. E. (1999). *The Emotional Brain: the mysterious underpinnings of emotional life*. London: Phoenix.

Ledoux, J. E. (2002). *The Synaptic Self: how our brains become who we are*. London: Viking..

Longworth N. & Davies W. K. (1996). *Lifelong Learning*, London: Kogan Page.

Lucas, W. (2001). *Power Up Your Mind*. London: Nicholas Brealey Publishing.

Magnus, G.A. (2009). *The Age of Ageing: How Demographics are Changing the Global Economy and Our World*. Oxford: Wiley.

Mahncke, H. W., Connor, B. B., Appelman, J., Ahsanuddin, O.N., Hardy, J.L., Wood, R.A., Joyce, N.M., Boniske, T., Atkins, S.M. & Merzenich, M.M., (2006). Memory enhancement in healthy older adults using a brain plasticity-based training program: a randomized, controlled study. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*,103, 33, 12523-12528.

McKechnie, B. (2009). *Connecting Generations – A Guide to Best Practice*. Glasgow: Scottish Centre for Intergenerational Practice, University of Strathclyde. http://www.scotcip.org.uk/files/documents/Connecting_Generations_Web_version.pdf

McMaster University Teaching Tips. Retrieved from http://cll.mcmaster.ca/resources/teaching_tips.php

McNair, S. (2009). *Older People's Learning: an action plan*. Leicester: NIACE.

Meetoo, D. D. (2007). Interview with Juliet M. Corbin. Salford, University of Manchester, UK. Retrieved from http://www.journalofadvancednursing.com/docs/JulietCorbinInterview.pdf

Mehrotra, C.M. (2003). In defence of offering educational programs for older adults. *Educational Gerontology*, 29, 8, 645-6.

Merriam, S. B. (1998). (2nd Edition). *Qualitative Research and Case Study Applications in Education*. San Francisco: Jossey-Bass.

Merriam, S. (2001a). Editor's Notes. *New Directions for Adult and Continuing Education*, 89, Spring, 1-2.

Merriam, S.B. (2001b). Something Old, Something New: Adult Learning Theory for the Twenty-First Century. *New Directions for Adult and Continuing Education*, 89, 93–96.

Merriam, S. (Ed.). (2002). *Qualitative research in practice: examples for discussion and analysis*. San Francisco: Jossey-Bass

Merriam, S. & Caffarella, R. (1999). *Learning in Adulthood: a comprehensive guide,* 2nd edition. San Francisco: Jossey-Bass.

Merriam, S. B., Caffarella, R. S. & Baumgartner, L. (2007). *Learning in Adulthood: a comprehensive guide,* 3rd Edition. San Francisco: Jossey-Bass.

Merzenich, M. (2008). On the Brain: about brain plasticity. *Posit Science*. Retrieved November 21st June, 2009 from http://merzenich.positscience.com/?page_id=143

Merzenich, M. (2009). Sharpbrains Interview. *Brain training, assessments and personal brain trainer*. Retrieved from http://www.sharpbrains.com/blog/category/neuroscience-interview-series/

Mezirow, J. (1996). Contemporary Paradigms of Learning' in Adult Learning. *Adult Education Quarterly*, 46, 3, 158-173.

Miles, M. B. & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook.* (2nd Edition). Thousand Oaks, CA: Sage.

Mindweavers (2008). *PC Software to Improve brain health. Mindfit*. Available from http://www.mindweavers.com

Morgan D., L. (1997). *Focus groups as qualitative research*. London: Sage Publications.

Myers, G. & Macnaghten, P. (1999). Can focus groups be analysed by talk? In J. Kitzinger & R. S. Barbour (Eds.) *Developing focus group research: politics, theory and practice* (pp. 173-185). London: Sage.

National Institute of Adult and Continuing Education (2009). *Mental health and wellbeing and lifelong learning for older people,* Briefing Sheet 72. Leicester: NIACE. Retrieved from http://www.niace.org.uk/sites/default/files/project-docs/92-Mental-health-wellbeing-older-people.pdf

NEnet at www.neuroeducational.net (2011): Paul Howard-Jones [coordinator]. Graduate School of Education, University of Bristol.

NERVE: *Neuroscience Educational Resources Virtual Encycloporta* (2008). Retrieved from http://www.ndgo.net/sfn/nerve/

New York Academy of Sciences, nyas.com. (2011). Retrieved from http://www.nyas.org/

New York Academy of Sciences eBriefing (2007). Your Brain and Yourself: Perspectives on Our Golden Age in Neuroscience. *William A. Haseltine Foundation for Medical Sciences and the Arts.* Retrieved from www.nyas.org/ebriefreps/ebrief/000676/pdf/YourBrainandYourself.pdf

Neugarten, B. L. (1996). *The Meanings of Age: Selected Papers*. Chicago: The University of Chicago Press.

Nielsen-Bohlman, L., Panzer, A. M. & Kindig, D. A. (Eds.) (2004). Health Literacy: A prescription to end confusion (Executive Summary). A report prepared for the *Committee of Health Literacy, Board on Neuroscience and Behavioural Health at the Institute of Medicine National Academies*. Washington: National Academies Press. Retrieved from http://books.nap.edu/openbook.php?record_id=10883&page=R1

Niglas, K. (2000). Combining quantitative and qualitative approaches. *European Conference on Educational Research*, Edinburgh. Retrieved from http://www.leeds.ac.uk/educol/documents/00001544.htm

Nordin. A. (2011). Making the Lisbon Strategy Happen: a new phase of lifelong learning discourse in European policy. *European Educational Research Journal*, 10, 1, 11-20.

OECD Organisation for Economic Cooperation and Development (2007). *Understanding the brain: the birth of a learning science*. Paris: *OECD* Publishing. Executive Summary retrieved from http://www.oecd.org/dataoecd/42/33/38811529.pdf

OECD, Organisation for Economic Cooperation and Development (2008). *Innovating to Learn, Learning to Innovate.* Retrieved from http://www.oecd.org/dataoecd/62/62/41656508.pdf

Palmer, P.J. (1998, 2007). *The Courage to Teach: exploring the inner landscape of a teacher's life* (10th Anniversary edition). San Francisco: Jossey-Bass

Park D.C. & Reuter-Lorenz, P. (2009). The Adaptive Brain: Aging and Neurocognitive Scaffolding. *Annual Review of Psychology*, 60, 173-196.

Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods*. (3rd Edition). London: Sage.

Pert, C. 1997. *Molecules of Emotion*. New York: Scribner.

Phillipson, C. (2000). Critical and educational gerontology: relationships and future developments. In F. Glendinning (Ed.) *Teaching and Learning in Later Life: theoretical implications* (25-37). Aldershot: Ashgate Publishing Company.

Phillipson, C. & Ogg, J. (2010). *Active ageing and universities: engaging older learners*. London: Universities UK.

Pickering, S. J. & Howard-Jones, P.A. (2007). Educators' views of the role of Neuroscience in Education: A study of UK and International perspectives. *Mind, Brain and Education*, 1, 3, 109-113.

Plano Clark, V. L. & Creswell, J. W. (2011). *Designing and Conducting Mixed Methods Research* (2nd edition). Thousand Oaks: Sage.

Popper, K. (1963). Conjectures and Refutations, London: Routledge. Also P. Keagan, pp. 33-39; from Theodore Schick, (Ed.), *Readings in the Philosophy of Science, Mountain View*, CA: Mayfield Publishing Company, 2000, pp. 9-13. Retrieved from http://www.stephenjaygould.org/ctrl/popper_falsification.html

Posit Science, *Brain Training Software*, positscience.com. [Chief Scientific Officer: M. Merzenich]. Available from http://www.positscience.com

Prawat, R. & Floden, R. (1994). Philosophical Perspectives on Constructivist Views of Learning. *Educational Psychologist*, 29, 1, 37-48.

Pring, R.(2000). The Relevance of Educational Research. *Oxford Review of Education*, 26, 3/4, 495-501.

Rabbitt, P. (1993). Does it all go together when it goes? The nineteenth Bartlett memorial lecture, *The Quarterly Journal of Experimental Psychology*, Section A, 46, 3, 385- 434.

Race, P. (Ed.) 1999. *2000 Tips for Lecturers*. London: Routledge.

Race, P. (2000). Downloads. Available at http://phil-race.co.uk/downloads/

Race, P. (2010). *Making Learning Happen* (2nd Edition). London: Sage.

Raynor, S. (2006). *A teaching elixir or best-fit pedagogy? Do learning styles matter?* SENCO. Retrieved from Learning and Thinking at http://www.teachingexpertise.com/articles/teaching-learning-styles-369

Reid, G. (2005). Learning Styles and Inclusion. London: Sage.

Reuter-Lorenz, P. A. (2002). New visions of the aging mind and brain. *Trends in Cognitive Sciences*, 6, 9, 394-400.

Roberts, P. (2000). *Education, literacy, and humanization: Exploring the work of Paul Freire.* London: Bergin & Garvey.

Robertson, I. (2000) *Mind Sculpture: Unlocking Your Brain's Untapped Potential.* New York: Fromm International.

Rogers, A. (1996). *Teaching Adults* (2nd edition.). Buckingham: Open University Press.

Rogers, C. (1969). *Freedom to Learn: A View of What Education Might Become*. Columbus, Ohio: Charles Merill.

Rogers, J. (2001). *Adults Learning* (4th Edition). Buckingham: Open University Press.

Rogers, P., Berg, G., Boettcher, J. & Howard. C. (2009). *Encyclopedia of Distance Learning*, 2, 66-67. London: Idea Group Inc.

Rooney, P. (2005). *Researching from the inside - does it compromise validity?* Dublin: Dublin Institute of Technology. Retrieved from http://level3.dit.ie/html/issue3/rooney/rooney.pdf

Rorty, R. (1979, 2009). *Philosophy and the mirror of nature.* (30th anniversary edition). Woodstock: Princeton University Press. Retrieved from http://books.google.com/books/princeton?hl=en&q=&vid=ISBN9780691141329&btnG.x=5&btnG.y=9

Rose, C. & Nicholl M. J. (1998). *Accelerated Learning for the 21st Century: The Six-Step Plan to Unlock Your Master-Mind.* New York: Dell Publishing.

Rose, D. H., & Meyer, A. (2002). *Teaching every student in the digital age: Universal Design for Learning*. Alexandria, VA: ASCD. Available at http://www.cast.org/teachingeverystudent/ideas/tes/index.cfm

Rowbottom D. P. & Aiston S. J. (2006). The Myth of 'Scientific Method'. *Contemporary Educational Research Journal of Philosophy of Education*, 40, 2, 137-155.

Rundle S & Dunn R. (2000). Building Excellence: the learning individual and the guide to individual excellence. *Performance Concepts International.* Retrieved from http://building-excellence.com/2/demo/Guide-to-Excellence.pdf

Ryan, G., W. & Bernard, H., R. (2000). Data management and analysis methods. In N.K. Denzin & Y.S. Lincoln (Eds.) *Handbook of qualitative research* (2nd Edition), pp. 769-802.

Ryff, C. D. & Marshall, V.W. (Eds.) (1999). *The self and society in aging processes*. New York: Springer Publishing Company.

Sargant, N. (2000). *The Learning Divide Revisited*. Leicester: NIACE.

Scarmeas, N. & Stern, Y. (2003). Cognitive reserve and lifestyle. *Journal of Clinical Experimental Neuropsychology*, 25, 5, 625-33.

Schuller,T. & Bostyn, A.M. (1993). Learning: Education, Training and Information in the Third Age. *The Carnegie Inquiry into the Third Age, Research Paper No. 3*. Dunfermline: Carnegie UK Trust.

Schuller,T. & Bostyn, A.M. (1996). Learners of the Future: preparing a policy for the third age. In P. Raggatt, R. Edwards & N. Small (Eds), *The Learning Society*, London, Routledge.

Schuller, T. & Watson, D. (2009) *Learning Through Life: Inquiry into the Future of Lifelong Learning*. Leicester, NIACE.

Scotland's Futures Forum (2007). *Growing older and wiser together: A futures view on positive ageing*. Edinburgh: Scottish Government. Retrieved from http://www.scotlandfutureforum.org/assets/library/files/application/1215680454.pdf

Scotland's Futures Forum (2009). *What should a Scottish Learning Society look like?* Edinburgh: Scottish Parliament. Retrieved from http://www.scotlandfutureforum.org/assets/library/files/application/Prof_Schuller_seminar.pdf

Scottish Government (2007). *Skills for Scotland: A lifelong skills strategy*. Edinburgh: The Scottish Government. Available at http://www.scotland.gov.uk/Publications/2007/09/06091114/0

Sfard, A. (1998). On Two Metaphors for Learning and the Dangers of Choosing Just One. *Educational Researcher*, 27, 2, 4-13.

Shank, G. D. (2002). *Qualitative Research: A Personal Skills Approach*. Columbus, Ohio: Merrill Prentice Hall.

SharpBrains at www.sharpbrains.com (2011): Member of Scientific American Partner Network.

Smith, G.E., Housen, P., Yaffe. K., Ruff, R. et al. (2009). A Cognitive Training Program Based on Principles of Brain Plasticity: Results from the Improvement in Memory with Plasticity-based Adaptive Cognitive Training (IMPACT) Study. *Journal of the American Geriatrics Society*, 57, 4, 594–603.

Smith, M. K. (1999). Learning theory. *The encyclopedia of informal education* Retrieved from www.infed.org/biblio/b-learn.htm

Smith, M. K. (2001). *David A. Kolb on experiential learning,* the encyclopedia of informal education. Retrieved from http://www.infed.org/b-explrn.htm

Smith, M. K. (2002). *Malcolm Knowles, informal adult education, self-direction and anadragogy*. The encyclopedia of informal education. Retrieved from www.infed.org/thinkers/et-knowl.htm

Society for Neuroscience at www.sfn.org, (2011). Washington.

Society for Neuroscience (2007). *What Are Neuroscience Core Concepts?* Retrieved from http://www.sfn.org

Society of Neuroscience (2008). *Brain Facts: A primer on the brain and nervous system*, Washington. Retrieved from http://www.sfn.org/skins/main/pdf/brainfacts/2008/brain_facts.pdf

Sork, T. J. (2009). Applied Ethics in Adult and Continuing Education Literature. *New Directions for Adult and Continuing Education*, 123, 19-32.

Soulsby, J. (2000). *Learning in the Fourth Age*. Sudbury: Department for Education and Employment.

Soulsby, J. (2009). Response from the *Association for Education and Ageing* to Department for Innovation, Universities and Skills' Consultation Paper, *The Learning Revolution*.

Stake, R. (1995). *The art of case research*. Thousand Oaks, CA: Sage Publications.

Stanford Encyclopedia of Philosophy, Richard Rorty, (2001). Retrieved from http://plato.stanford.edu/entries/rorty

Stern, D. N. (2004). *The Present Moment in Psychotherapy and Everyday Life*. New York: Norton.

Stern, Y. (2002). What is cognitive reserve? Theory and research application of the reserve concept. *Journal of the International Neuropsychological Society*, 8, 448-460.

Stern, Y. (2006). Cognitive Reserve and Alzheimer Disease. *Alzheimer Disease Association*, 20, 2, 112-117. Retrieved from http://www.cumc.columbia.edu/dept/sergievsky/cnd/pdfs/cognitivereserve.pdf

Stern, Y. (2007). Build your cognitive reserve: Interview. Retrieved from http://www.sharpbrains.com/blog/2007/07/23/build-your-cognitive-reserve-yaakov-stern/

Stern, Y., Habeck, C., Moeller, J., Scarmeas, N., Anderson, K.,E, Hilton, H.,J, Flynn, J., Sackeim, H., & van Heertum, R. (2005). Brain networks associated with

cognitive reserve in healthy young and old adults. *Cerebral Cortex*, 15: 4, 394-402

Sternberg, R. J. (Ed.) (1995). *Wisdom: its nature, origins, and development*. Cambridge: Cambridge University Press.

Strauss, A. & Corbin J. (1998). Basics of Qualitative Research (2nd edition). Introduction. London: Sage.

Sure Start Children's Centres. *Department for Education*. Available at http://www.education.gov.uk/childrenandyoungpeople/earlylearningandchildcare/surestart/a0076712/sure-start-children's-centres

Swindell, R. & Thompson, J. (1995). *An International Perspective of the University of the Third Age*. Retrieved from http://www3.griffith.edu.au/03/u3a/includes/linked_pages/file_downloader.php?id=306&prop=5&save=1

Sylvan, L. J. & Christodoulou, J. A. (2010). Understanding the Role of Neuroscience in Brain Based Products: A Guide for Educators and Consumers. *Mind, Brain, and Education*, 4, 1, 1-7.

Szűcs D. & Goswami, U. (2007). Educational Neuroscience: Defining a New Discipline for the Study of Mental Representations. *Mind, Brain, and Education*, 1, 3, 114-127.

Sylwester, R. (1997). *A celebration of neurons: An educator's guide to the brain*. Alexandria, VA: Association for Supervision & Curriculum Development.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (Applied Social Research Methods, No. 46). Thousand Oaks, CA: Sage.

Taylor, K. (2006). Brain Function and Adult Learning: Implications for Practice. *New Directions for Adult and Continuing Education,* 110, 71-85.

Taylor, K. & Lamoreaux, A. (2008). Teaching with the brain in mind. *New Directions for Adult and Continuing Education*, 19, 49-59.

Taylor, E.W. (2001). Transformative learning theory: a neurobiological perspective of the role of emotions and unconscious ways of knowing. *International Journal of Lifelong Education*, 20, 3, 218–236.

Tennant, M. (1990). Life-span developmental psychology and adult learning. *International Journal of Lifelong Education*, 9, 3, 23-236

Theory into Practice Database. (Copyright 1994-2011, G. Kearsley). Available at http://tip.psychology.org/

Thorndike. E. L. (1999) [1913]. Education Psychology: briefer course. New York: Routledge, cited in *Answers.com*. Retrieved from http://www.answers.com/topic/edward-thorndike

Tough, A. (1999). Reflections on the study of lifelong learning. *New Approaches to Lifelong Learning* (NALL) Conference Paper 08, Toronto.

Tough, A. (2002). The Iceberg of Informal Adult Learning. *New Approaches to Lifelong Learning* (NALL) Conference Paper 49, Toronto.

Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson (Eds.) *Organization of Memory*. New York: Academic Press. Available at http://alicekim.ca/EMSM72.pdf

Tulving, E. (2002).Episodic Memory: From Mind to Brain. *Annual Review of Psychology*, 53, 1-25.

Tummons, J. (2007) *Becoming a Professional Tutor in the Lifelong Learning Sector*, Exeter: Learning Matters Ltd.

Twitchell, S., Cherry, K. E. & Trott, J. W. (1996). Educational strategies for older learners: suggestions from cognitive ageing research, *Educational Gerontology*, 22, 2, 169 -181.

University of the Third Age (U3A), 2009. *Starting a U3A group*. Retrieved from http://www.u3a.org.uk/about-u3a.html

United Nations (2005). *Population Challenges and Development Goals. Department of Economic and Social Affairs, Population Division*. New York: UN.

United Nations Educational, Scientific and Cultural Organisation. (1972). *Third International Conference on Adult Education*, Tokyo. Available at http://www.unesco.org/education/educprog/50y/brochure/tle/140.htm

United Nations Secretariat (1999). *Long-range world population projections, based on the 1998 revision*. Ref No.ESA/P/WP/120.

United Nations World Assembly on Ageing (2002). *Productive ageing: voluntary action by older people.* Retrieved from http://www.un.org/swaa2002/prkit/productiveageing.htm

Varma, S., McCandliss, B. & Schwartz, D. (2007). Scientific and Pragmatic Challenges for Bridging Education and Neuroscience. *Educational Researcher*, 37, 3, 140-152.

Vaughn, S., Schumm, J. S. & Sinagub, J. (1996). *Focus group interviews in education and psychology*. London: Sage.

von Glaserfeld, E. (1989). Cognition, construction of knowledge and teaching. *Synthese*, 80, 1, 121-140.

von Glaserfeld, E. (1995). A Constructivist Approach to Teaching. In J.Gale & L. Steffe (Eds.), *Constructivism in Education*, (pp. 3-16). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Vygotsky, L. S. (1978). Mind in Society: Development of Higher Psychological Processes. Cambridge: Harvard University Press. Retrieved from http://generative.edb.utexas.edu/classes/knl2008sum2/eweekly/vygotsky1978.pdf.

Walker, J. (1998). Mapping the learning of older adults. *Adults Learning*, 10, 2, 14-16.

Walter, P. (2009). Philosophies of Adult Environmental Education. *Adult Education Quarterly*, 60, 3, 3-25.

Wenger, E. (1998). *Communities of practice: learning, meaning, and identity*. Cambridge: Cambridge University Press.

West, W., Rosser, S. & Monani, S. (2006). How Learning Styles Impact E-learning: a case comparative study of undergraduate students who excelled, passed, or failed an online course in scientific/technical writing. *E-Learning and Digital Media*, 3, 4, 534-543.

Whalley, L. J. (2001). *The Ageing Brain*. Chichester: Columbia University Press

Whalley, L. J., Deary, I. J., Appleton, C.L. & Starr, J. M. (2004). Cognitive reserve in the neurobiology of cognitive ageing. *Ageing Research Review*, 3, 4, 369-382.

Williamson, A. (1997). 'You're never too old to learn!' Third-Age perspectives on lifelong learning. *International Journal of Lifelong Education*, 16, 3, 173 -184.

Willingham, D., T., & Lloyd, J., W. (2007). How Educational Theories Can Use Neuroscientific Data. *Mind, Brain and Education*, 1, 3, 140-149.

Withnall, A. (2006). Exploring influences on later life learning. *International Journal of Lifelong Education*, 25, 1, 29-49.

Withnall, A. (2010). *Improving Learning in Later Life*. Abington, Oxon: Routledge.

Withnall A., & Percy, K. (1994). *Good practice in the education and training of older adults*. Aldershot: Ashgate Publishing Ltd.

Withnall, A. & Thompson, V. (2003). Older People and Lifelong Learning: Choices and Experiences. *Research Findings 13*, University of Sheffield, Economic and Social Research Council *Growing Older Programme*.

Wolf, M. A. (1998). New approaches to the education of older adults. *New Directions for Adult and Continuing Education*, Spring, 77, 15-25.

Wolfe, P. (2001). *Brain Matters: Translating Research into Classroom Practice*. Alexandria, VA: Association for Supervision and Curriculum Development.

Wolfe, P. (2006). The Role of Meaning and Emotion in Learning. *New Directions for Adult and Continuing Education*, 10, 35-41.

Wolfe, P. (2007). Brain compatible practices for the classroom. *National Professional Resources, Inc*. Video preview available at http://www.nprinc.com/video/dbcc.htm

World Health Organisation, (2002). *Active Ageing: A policy framework*. Geneva: WHO.

Wright, M. & Grabowsky, A. (2011). The role of the adult educator, in helping learners access and select quality health information on the Internet. *New Directions for Adult and Continuing Education*, 130, 79-88.

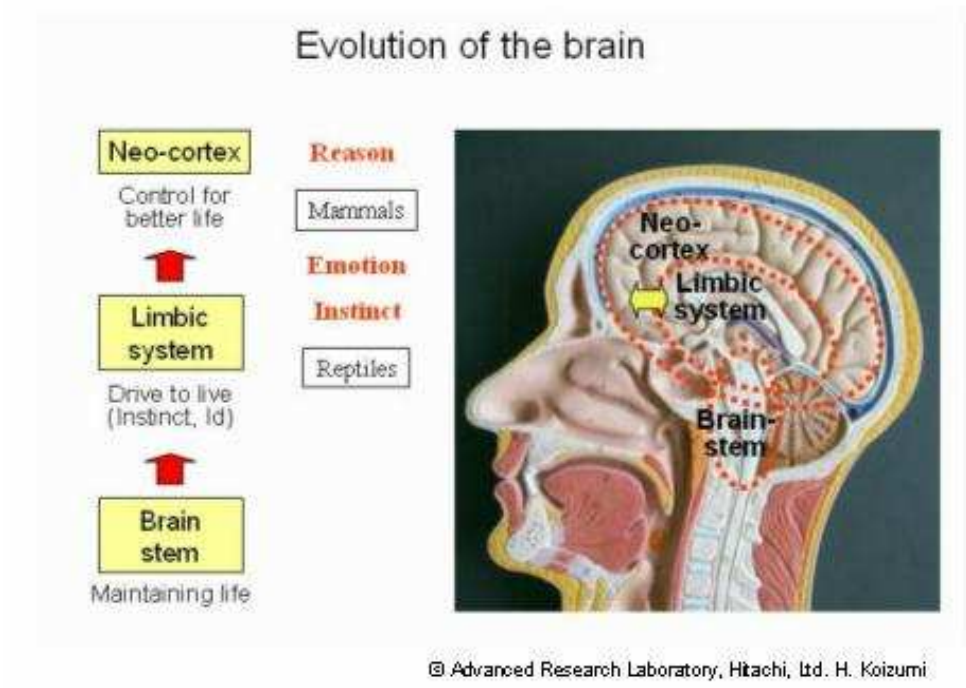
Yang, B. (2003). Toward a holistic theory of knowledge and adult learning. *Human Resource Development Review*, 2, 2, 106-129.

Yang, B., Zheng, W. & Viere, C. (2009). Holistic Views of Knowledge Management Models. *Advances in Developing Human Resources*, 11, 3, 273-289.

Yin, R. K. (1994). Case study research: Design and methods (2nd Ed.). Beverly Hills, CA: Sage Publishing.

Zull, J. (2002). *The art of changing the brain: Enriching teaching by exploring the biology of learning*. Sterling, Virginia: Stylus Publication, LLC.

Zull, J. (2006). Key aspects of how the brain learns. *New Directions for Adult and Continuing Education*, 110, 3-9.



Permission granted by the Centre for Research and Innovation

Evolution of the Human Brain Map:
OECD Brain Maps, http://www.oecd.org/edu/ceri

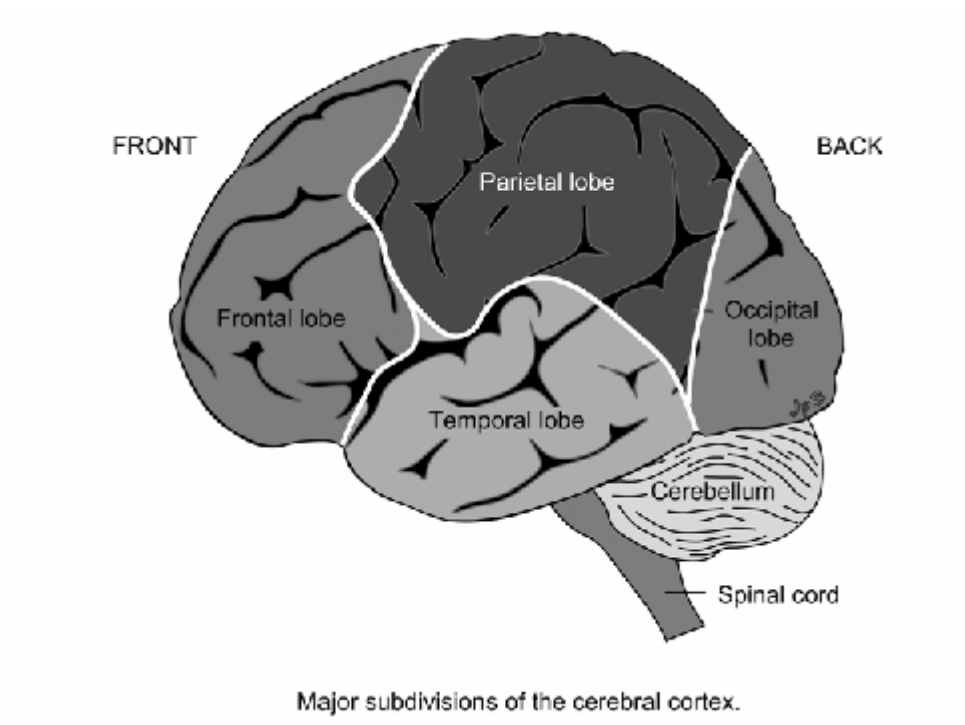
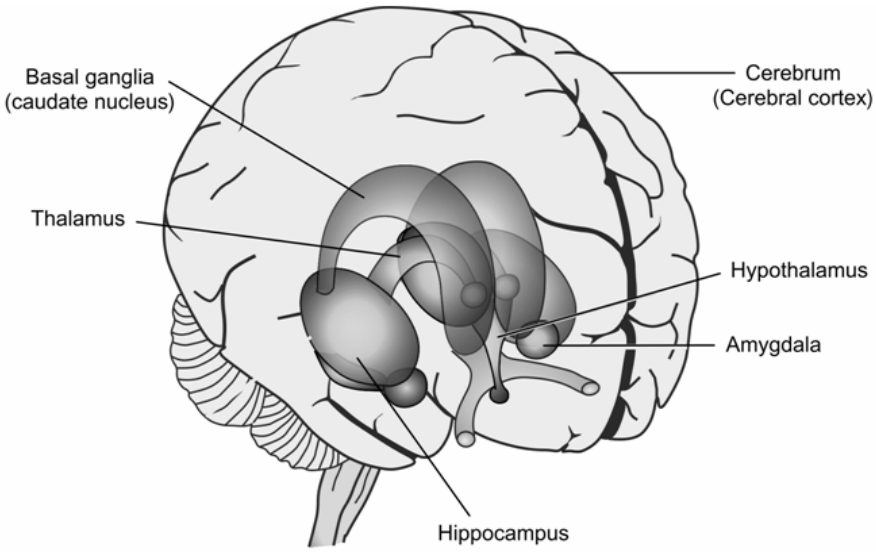


Figure 2.
Major subdivisions of the cerebral cortex:

OECD (2002), *Understanding the Brain - Towards a New Learning Science*, p.45
http://www.oecd.org/edu/ceri



Inner structure of the human brain, including the limbic system.

Figure 3. Inner structure of the human brain, including the limbic system:
OECD (2002), Understanding the Brain -- Towards a New Learning Science, p.57
http://www.oecd.org/edu/ceri

Cerebral cortex: A sheet of neural tissue that is outermost to the cerebrum. It plays a key role in memory, attention, perceptual awareness, thought, language, and consciousness. It is divided into symmetric left and right cerebral hemispheres.

Basal ganglia: Situated at the base of the forebrain and strongly connected with the cerebral cortex, thalamus and other brain areas.

Thalamus: Involved in sensory perception and regulation of motor functions.

The limbic system: the set of brain structures that forms the inner border of the cortex.

The following structures are considered to be part of the limbic system:

Hippocampus: Required for the formation of long-term memories and implicated in maintenance of cognitive maps for navigation.

Amygdala: Involved in signalling the cortex of motivationally significant stimuli such as those related to reward and fear

Hypothalamus: Controls body temperature, hunger, thirst, fatigue, sleep and circadian cycles.

Appendix 2 Permission Request - OECD

Dear Val Bissland,

Thank you for your request. There are no objections concerning the reproduction of the 3 maps mentioned in your message. Please cite them as follows:

Figure 2. Major subdivisions of the cerebral cortex:
OECD (2002), Understanding the Brain -- Towards a New Learning Science, p.45,
http://www.oecd.org/edu/ceri
Figure 3. Inner structure of the human brain, including the limbic system:
OECD (2002), Understanding the Brain -- Towards a New Learning Science, p.57,
http://www.oecd.org/edu/ceri
Evolution of the Human Brain Map:
OECD Brain Maps, http://www.oecd.org/edu/ceri

Best regards,
Aleksandra

Aleksandra Sawicka (Ms.)
Rights & Translation, OECD Publishing
Public Affairs and Communications Directorate
OECD
2, rue André Pascal
75775 Paris Cedex 16 / France
Tel : +33 1 45 24 84 38
Fax : +33 1 44 30 90 30
aleksandra.sawicka@oecd.org
rights@oecd.org
www.oecd.org
www.oecd.org/terms

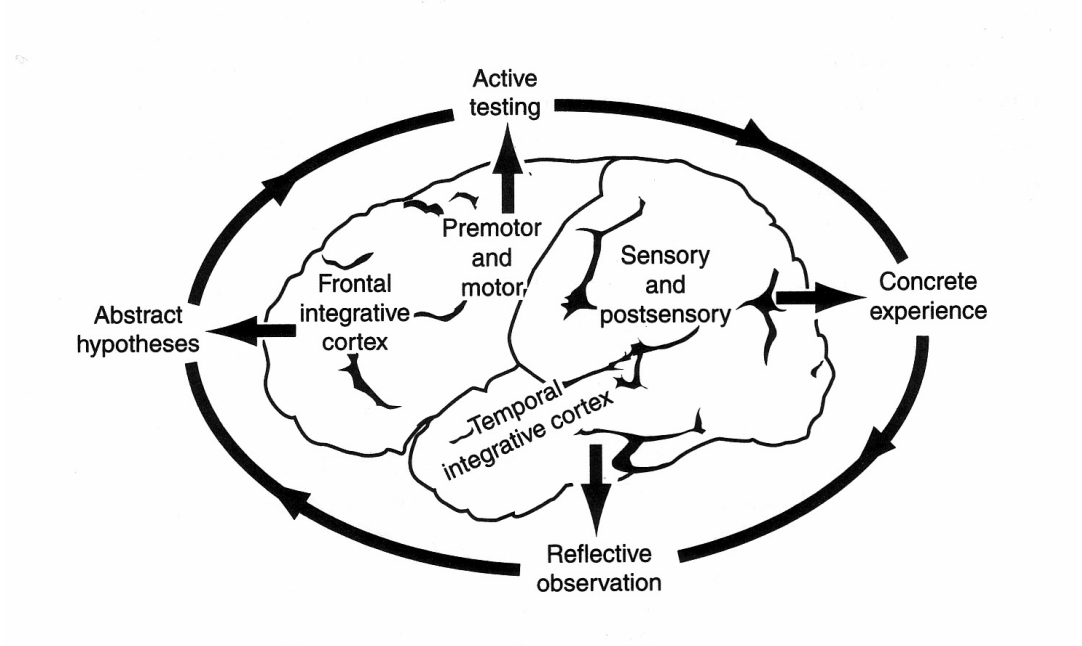
From: Val Bissland [mailto:v.bissland@ntlworld.com]
Sent: 11 January, 2010 3:10 PM
To: Rights, PAC
Subject: Brain Maps

Dear CERI,
I am contacting you to request permission to use the 3 maps itemised below available at
http://www.oecd.org/document/22/0,3343,en_2649_35845581_15356630_1_1_1_1,00.html

- Major Subdivisions of the Cerebral Cortex
- Inner Structure of the Human Brain
- Evolution of the Human Brain Map

Your publication "Understanding the Brain: The Birth of a Learning Science" is a key text which I reference and I would of course, in addition, credit OECD with the brain maps.

Appendix 3 Zull Figure



The experiential learning cycle and regions of the cerebral cortex reproduced with permission from Professor James Zull (2002).

Zull's four pillars of learning are experiencing → reflecting→ creating→ testing→ and their position and functions are explained as follows:

1. experiencing: in the sensory cortex, at the back of the brain, data is gathered. This includes vision and auditory 'packages' which evoke emotions which become part of the rich sensory input.

2. reflection: information flows towards the associative regions near the back of the brain (sensory, post-sensory and temporal cortices) where integrations and associations between old and new information form:

3. creating: meanings and sensory data flow to the front integrative cortex where conscious thought and planning form. Here comprehension comes together – and we form intentions, recall, feelings, decisions and judgements.

4. testing: the ultimate step in learning is checking understanding. This is done through activation and involves the motor cortex, otherwise the knowledge remains inert.

Re: Permission Request
James Zull [jez2@case.edu]
Sent: 05 April 2011 13:13
To: Valerie Bissland

Permissiom is granted. I am glad my work is useful to you. J. Zull

On Tue, Apr 5, 2011 at 5:31 AM, Valerie Bissland <v.bissland@strath.ac.uk> wrote:
Dear Professor Zull,
I am contacting you to request permission to use your model of learning and the brain as depicted on your webpage - http://www.case.edu/artsci/biol/people/zull.html

I am writing a thesis on ways of learning in later life and plan to use some of the findings from neuroscience in my analysis. I would like to put your illustration in the appendix of my submission. Your book, "The Art of Changing the Brain", is a key text to which I refer and I would, of course, credit your illustration.

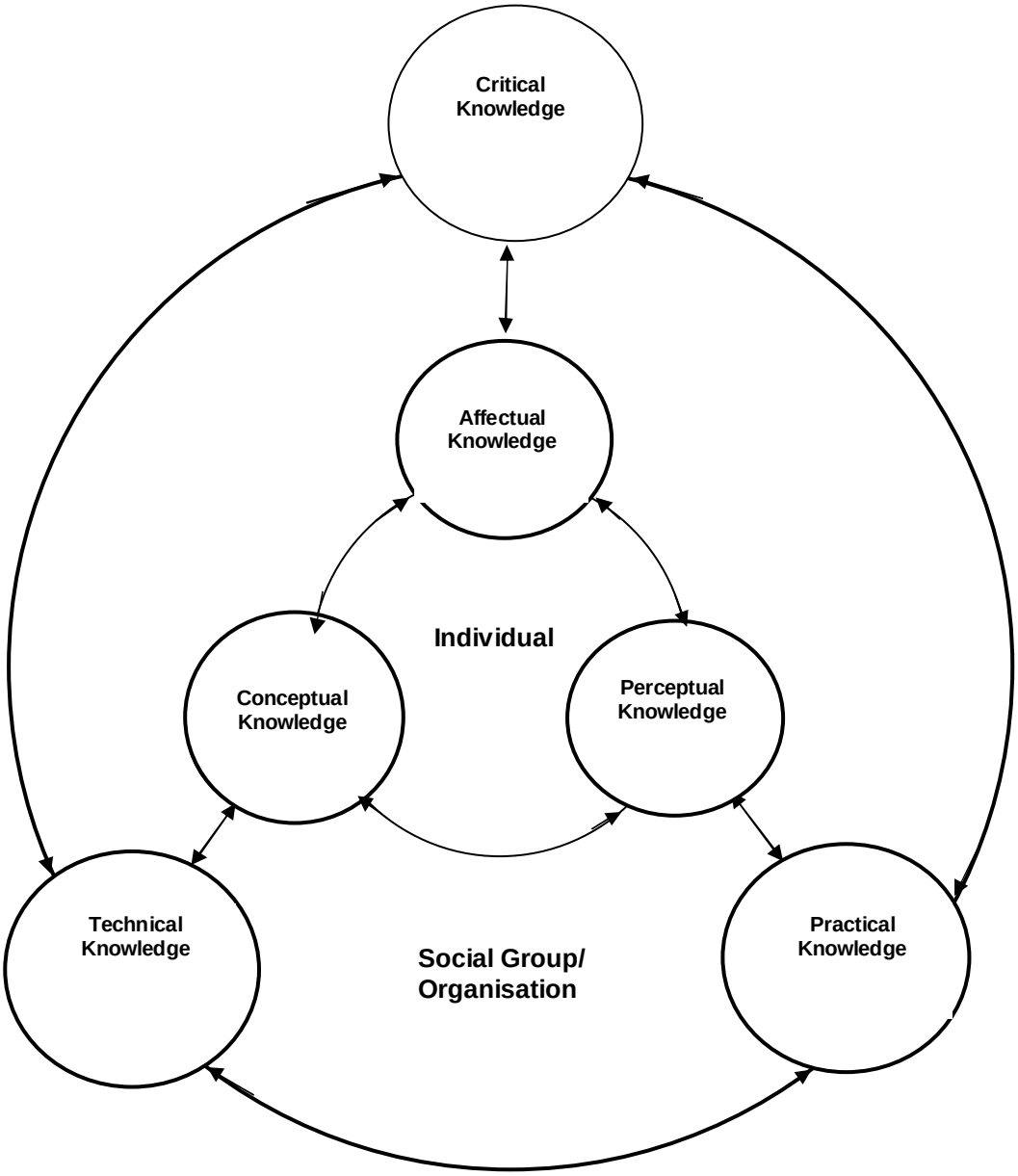
I look forward to your reply.

Kind regards,

Val Bissland

Val Bissland BA MA MBPsS
Centre for Lifelong Learning,
University of Strathclyde,
Glasgow,
Scotland.

Appendix 5 **Yang figure – Dynamic relationships**



Holistic Theory of Knowledge and Learning: Dynamic Relationships between Individual, Organisation and Social/Cultural Contexts (Yang, 2003).

Permission granted by Professor Baiyin Yang, Tsinghua University, Beijing, 2010

The inner ring represents individual learning, while the outer ring represents the dynamic relationships with dominant discourses in the person's social group (or circle) in terms of practical, technical and critical (values/needs) knowledge.

Appendix 6 Yang's (2003) Facets and Layers

Yang's Holistic Learning Theory: A summary of knowledge facets and layers

	Knowledge Facets		
Knowledge Layers	**Conceptual**	**Perceptual**	**Affectual**
Foundation	Axioms, assumptions beliefs, premises	Habits, social norms traditions, routines	Values, aspirations ideals, visions
Manifestation	Theories, principles, models, conceptual frameworks, formulas	Tacit understandings know-how, intuition, mental models	Attitudes, motivations, needs, ethics, Moral standards
Orientation	Rationality	Reality	Liberty
Source: Yang (2003)	(Explicit)	(Implicit)	(Emancipatory)

Yang's (2003) original labels of the knowledge facets are shown in brackets above. These were re-conceptualized as Conceptual, Perceptual and Affectual knowledge by Yang, Zheng and Viere (2009).

Appendix 7 Permission Request – Professor B. Yang

Baiyin YANG, Ph.D.
Cheung Kong Scholar Professorship
Chair, Department of Human Resources and Organizational Behavior
School of Economics and Management
Tsinghua University
Beijing, P. R. China 100084
Office: 327G, Shunde Building
Telephone: 86-10-62796314
Fax: 86-10-62772021
E-mail: yangby@sem.tsinghua.edu.cn

-----Original Message-----
From: Valerie Bissland [mailto:v.bissland@strath.ac.uk]
Sent: Friday, April 16, 2010 7:16 AM
To: yangby@sem.tsinghua.edu.cn
Subject: Permission

Dear Professor Yang,
I wish to ask your permission to reproduce in my thesis Figure 2 from your 2003 article -

Toward a holistic theory of knowledge and adult learning. Human Resource Development Review, 2(2), 106-129.

I hope to complete my doctorate soon and I am using your holistic theory to explain some of my results investigating learning in later life.
I attach a copy of the model.
Kind regards,
Val Bissland

Centre for Lifelong Learning
Strathclyde University.
t: 07971 910093
e: v.bissland@strath.ac.uk
w: http://www.strath.ac.uk/cll/

Yes, you have my permission to use the figure. Please see attached article where I have re-conceptualized explicit, implicit and emancipator knowledge as "Conceptual, Perceptual, and Affectual Knowledge".

Baiyin YANG, Ph.D.
Cheung Kong Scholar Professorship
Chair, Department of Human Resources and Organizational Behavior

Appendix 8 Letter to participants

Department of Educational Studies,
University of Strathclyde
76 Southbrae Drive, Glasgow G13 1PP

CONTACT ADDRESS
Val Bissland,
Senior Studies Institute,
University of Strathclyde,
40 George Street, Glasgow G1 1QE
e: v.bissland@strath.ac.uk
t: 0141 548 4706

Address 1st May, 2002

Dear

Discover Your Learning Style

I invite you to participate in a small scale study into Learning Styles. The first stage is completing a questionnaire. I emphasise this is not a test – there are no right and wrong answers – just preferences. Afterwards, we will discuss learning styles and look at the results. We will finish by 1pm at the latest. I would be grateful if you would return the slip below, give me a ring or email to confirm you are coming. I hope to see you on the 20th.
Best wishes,

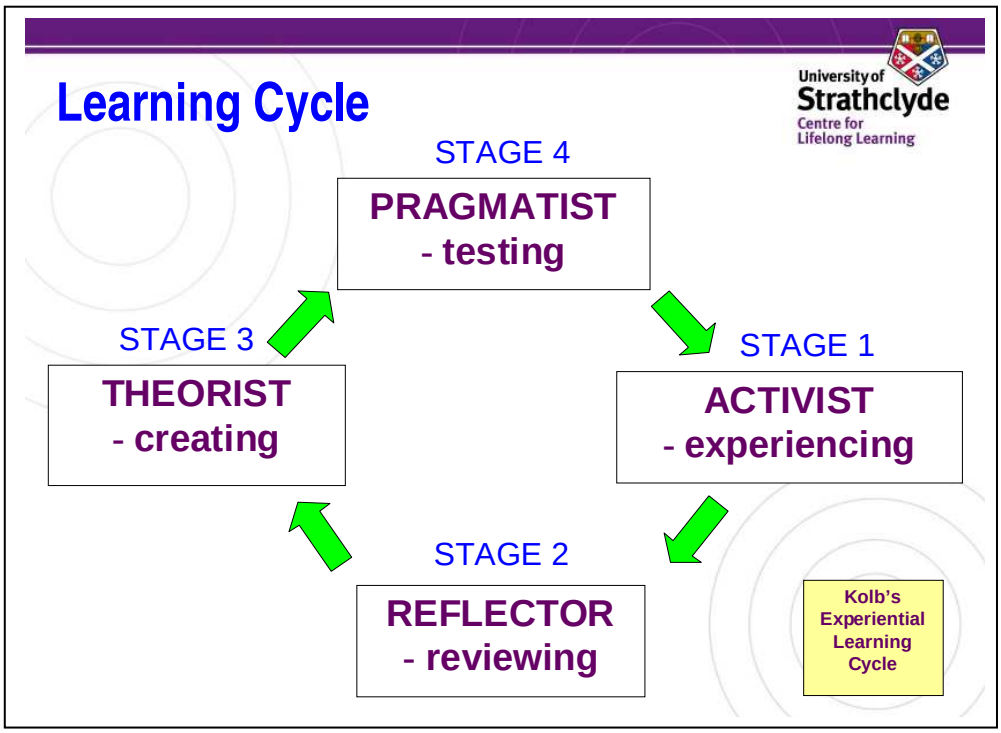
Val Bissland

Discover Your Learning Style

Monday **20th May**, Senior Studies Institute, Room 330 at 11.30

Name_____will attend the learning styles session.

Appendix 9 Honey and Mumford (1986) Learning Styles



The experiential learning cycle (experiencing→, reviewing→, creating→ and testing→) does not have to begin at stage 1, because it is a continuous loop. Kolb's (1984) experiential learning model is based on the premise that learning is both an experiential and a reflective process, and this produces four forms of knowledge, each linked to a stage. The learner usually develops a liking for one stage (or a combination of stages) and these preferences produce a Learning Style.

LEARNING STYLES QUESTIONNAIRE

revised 1986

This questionnaire is designed to find out your preferred learning style(s). Over the years you have probably developed learning 'habits' that help you benefit more from some experiences than from others. Since you are probably unaware of this, this questionnaire will help you pinpoint your learning preferences so that you are in a better position to select learning experiences that suit your style.

There is no time limit to this questionnaire. It will probably take you 10-15 minutes. The accuracy of the results depends on how honest you can be. There are no right or wrong answers. If you agree more than you disagree with a statement put a tick by it (✓). If you disagree more than you agree put a cross by it (x). Be sure to mark each item with either a tick or cross.

☐	1.	I have strong beliefs about what is right and wrong, good and bad.
☐	2.	I often act without considering the possible consequences.
☐	3.	I tend to solve problems using a step-by-step approach.
☐	4.	I believe that formal procedures and policies restrict people.
☐	5.	I have a reputation for saying what I think, simply and directly.
☐	6.	I often find that actions based on feelings are as sound as those based on careful thought and analysis.
☐	7.	I like the sort of work where I have time for thorough preparation and implementation.
☐	8.	I regularly question people about their basic assumptions.
☐	9.	What matters most is whether something works in practice.
☐	10.	I actively seek out new experiences.
☐	11.	When I hear about a new idea or approach I immediately start working out how to apply it in practice.
☐	12.	I am keen on self discipline such as watching my diet, taking regular exercise, sticking to a fixed routine, etc.
☐	13.	I take pride in doing a thorough job.
☐	14.	I get on best with logical, analytical people and less well with spontaneous, 'irrational' people.
☐	15.	I take care over the interpretation of data available to me and avoid jumping to conclusions.
☐	16.	I like to reach a decision carefully after weighing up many alternatives.
☐	17.	I'm attracted more to novel, unusual ideas than to practical ones.
☐	18.	I don't like disorganised things and prefer to fit things into a coherent pattern.
☐	19.	I accept and stick to laid down procedures and policies so long as I regard them as an efficient way of getting the job done.
☐	20.	I like to relate my actions to a general principle.
☐	21.	In discussions I like to get straight to the point.

☐ 22. I tend to have distant, rather formal relationships with people at work.

☐ 23. I thrive on the challenge of tackling something new and different.

☐ 24. I enjoy fun-loving, spontaneous people.

☐ 25. I pay meticulous attention to detail before coming to a conclusion.

☐ 26. I find it difficult to produce ideas on impulse.

☐ 27. I believe in coming to the point immediately.

☐ 28. I am careful not to jump to conclusions too quickly.

☐ 29. I prefer to have as many sources of information as possible - the more data to think over the better.

☐ 30. Flippant people who don't take things seriously enough usually irritate me.

☐ 31. I listen to other people's points of view before putting my own forward.

☐ 32. I tend to be open about how I'm feeling.

☐ 33. In discussions I enjoy watching the manoeuvrings of the other participants.

☐ 34. I prefer to respond to events on a spontaneous, flexible basis rather than plan things out in advance.

☐ 35. I tend to be attracted to techniques such as network analysis, flow charts, branching programmes, contingency planning, etc.

☐ 36. It worries me if I have to rush out a piece of work to meet a tight deadline.

☐ 37. I tend to judge people's ideas on their practical merits.

☐ 38. Quiet, thoughtful people tend to make me feel uneasy.

☐ 39. I often get irritated by people who want to rush things.

☐ 40. It is more important to enjoy the present moment than to think about the past or future.

☐ 41. I think that decisions based on a thorough analysis of all the information are sounder than those based on intuition.

☐ 42. I tend to be a perfectionist.

☐ 43. In discussions I usually produce lots of spontaneous ideas.

☐ 44. In meetings I put forward practical, realistic ideas.

☐ 45. More often than not, rules are there to be broken.

☐ 46. I prefer to stand back from a situation and consider all the perspectives.

☐ 47. I can often see inconsistencies and weaknesses in other people's arguments.

☐ 48. On balance I talk more than I listen.

☐ 49. I can often see better, more practical ways to get things done.

☐ 50. I think written reports should be short and to the point.

☐ 51. I believe that rational, logical thinking should win the day.

☐ 52. I tend to discuss specific things with people rather than engaging in social discussion.

☐ 53. I like people who approach things realistically rather than theoretically.

☐ 54. In discussions I get impatient with irrelevancies and digressions.

☐ 55. If I have a report to write I tend to produce lots of drafts before settling on the final version.

☐ 56. I am keen to try things out to see if they work in practice.

☐ 57. I am keen to reach answers via a logical approach.

☐ 58. I enjoy being the one that talks a lot.

☐ 59. In discussions I often find I am the realist, keeping people to the point and avoiding wild speculations.

☐ 60. I like to ponder many alternatives before making up my mind.

☐ 61. In discussions with people I often find I am the most dispassionate and objective.

☐ 62. In discussions I'm more likely to adopt a 'low profile' than to take the lead and do most of the talking.

☐ 63. I like to be able to relate current actions to a longer term bigger picture.

☐ 64. When things go wrong I am happy to shrug it off and 'put it down to experience'.

☐ 65. I tend to reject wild, spontaneous ideas as being impractical.

☐ 66. It's best to think carefully before taking action.

☐ 67. On balance I do the listening rather than the talking.

☐ 68. I tend to be tough on people who find it difficult to adopt a logical approach.

☐ 69. Most times I believe the end justifies the means.

☐ 70. I don't mind hurting people's feelings so long as the job gets done.

☐ 71. I find the formality of having specific objectives and plans stifling.

☐ 72. I'm usually one of the people who puts life into a party.

☐ 73. I do whatever is expedient to get the job done.

☐ 74. I quickly get bored with methodical, detailed work.

☐ 75. I am keen on exploring the basic assumptions, principles and theories underpinning things and events.

☐ 76. I'm always interested to find out what people think.

☐ 77. I like meetings to be run on methodical lines, sticking to laid down agenda, etc.

☐ 78. I steer clear of subjective or ambiguous topics.

☐ 79. I enjoy the drama and excitement of a crisis situation.

☐ 80. People often find me insensitive to their feelings.

[*] Honey and Mumford 1986

Learning Styles – General Descriptions

Activists

Activists involve themselves fully and without bias in new experiences. They enjoy the here and now, and are happy to be dominated by immediate experiences. They are open-minded, not sceptical, and this tends to make them enthusiastic about anything new. Their philosophy is: "I'll try anything once". They tend to act first and consider the consequences afterwards. Their days are filled with activity. They tackle problems by brainstorming. As soon as the excitement from one activity has died down they are busy looking for the next. They tend to thrive on the challenge of new experiences but are bored with implementation and longer term consolidation. They are gregarious people constantly involving themselves with others but, in doing so, they seek to centre all activities around themselves.

Reflectors

Reflectors like to stand back to ponder experiences and observe them from many different perspectives. They collect data, both first hand and from others, and prefer to think about it thoroughly before coming to a conclusion. The thorough collection and analysis of data about experiences and events is what counts so they tend to postpone reaching definitive conclusions for as long as possible. Their philosophy is to be cautious. They are thoughtful people who like to consider all possible angles and implications before making a move. They prefer to take a back seat in meetings and discussions. They enjoy observing other people in action. They listen to others and get the drift of the discussion before making their own points. They tend to adopt a low profile and have a slightly distant, tolerant unruffled air about them. When they act it is part of a wide picture which includes the past as well as the present and others' observations as well as their own.

Theorists

Theorists adapt and integrate observations into complex but logically sound theories. They think problems through in a vertical, step-by-step logical way. They assimilate disparate facts into coherent theories. They tend to be perfectionists who won't rest easy until things are tidy and fit into a rational scheme. They like to analyse and synthesize. They are keen on basic assumptions, principles, theories models and systems thinking. Their philosophy prizes rationality and logic. "If its logical its good." Questions they frequently ask are: "Does it make sense?" "How does this fit with that?" "What are the basic assumptions?" They tend to be detached, analytical and dedicated to rational objectivity rather than anything subjective or ambiguous. Their approach to problems is consistently logical. This is their 'mental set' and they rigidly reject anything that doesn't fit with it. They prefer to maximise certainty and feel uncomfortable with subjective judgements, lateral thinking and anything flippant.

Pragmatists

Pragmatists are keen on trying out ideas, theories and techniques to see if they work in practice. They positively search out new ideas and take the first opportunity to experiment with applications. They are the sort of people who return from courses brimming with new ideas that they want to try out in practice. They like to get on with things and act quickly and confidently on ideas that attract them. They tend to be impatient with ruminating and open-ended discussions. They are essentially practical, down to earth people who like making practical decisions and solving problems. They respond to problems and opportunities 'as a challenge'. Their philosophy is "There is always a better way" and "If it *works* it's good".

Honey & Mumford (1982), Manual of Learning Styles

LEARNING STYLES QUESTIONNAIRE – SCORING

You score one point for each item you ticked(✓). There are no points for items you crossed (×).

Simply indicate on the lists below which items were ticked.

2	7	1	5
4	13	3	9
6	15	8	11
10	16	12	19
17	25	14	21
23	28	18	27
24	29	20	35
32	31	22	37
34	33	26	44
38	36	30	49
40	39	42	50
43	41	47	53
45	46	51	54
48	52	57	56
58	55	61	59
64	60	63	65
71	62	68	69
72	66	75	70
74	67	77	73
79	76	78	80
_____	_____	_____	_____
Totals			
_____	_____	_____	_____
Activist	*Reflector*	*Theorist*	*Pragmatist*

Ring your scores on this chart and join up.

Activist	Reflector	Theorist	Pragmatist	
20	20	20	20	Very strong preference
19				
18		19	19	
17	19	18		
16			18	
15		17		
14				
13	18	16	17	
12	17	15	16	Strong preference
	16			
11	15	14	15	
10	14	13	14	Moderate preference
9				
8	13	12	13	
7	12	11	12	
6	11	10	11	Low preference
5	10	9	10	
4	9	8	9	
3	8	7	8	Very low preference
	7	6	7	
2	6	5	6	
	5	4	5	
	4		4	
1	3	3	3	
	2	2	2	
	1	1	1	
0	0	0	0	

Honey and Mumford 1992

Appendix 13 Post-LSQ

Feedback Questionnaire

To be completed after scoring the Learning Styles Questionnaire.
Place a tick [✔] next to the correct response where appropriate.

Please record your raw scores

Activist	Reflector	Theorist	Pragmatist
_____	_____	_____	_____

1. When adjusted using the chart what were your strongest preferences?

2. Do you think this/these are reasonably accurate descriptors of your learning preferences?

   [A]Yes [B] No

3. Please comment on what you thought were the most useful/interesting aspects of this questionnaire?

4. What aspects, if any, were not particularly relevant to you?

5. Do you think the ways you have learned have changed over your lifetime?
   [A]Yes [B] No

6. If the answer to the above is Yes, in what ways?

7. How do you like material presented? Give your order of preference using 1-2-3, with 1 being the best way.

   [A] I learn well when material is illustrated in some way. ☐

   [B] I learn well by listening to an expert. ☐

   [C] I learn well when I can work on the material in a hands-on, practical way. ☐

8. What kind of learning situation would 'switch you off'?

Do you grant me permission to use this data anonymously, in any future publication?
[A]Yes [B] No

Signature:_____Name:_____

Tel:_____ Email:_____

Appendix 14 Respondents who completed the LSQ

Group A (Assistant tutors)

	Pseudonym	Age band	Gender
A1	Harriet	60-69	F
A2	Mhairi	60-69	F
A3	Julia	50-59	F
A4	Greta	70-79	F
A5	Norma	60-69	F

The five women were undertaking a short course at the SSI, to enable them to deliver personal development classes in the community. They had been teachers and brought specialist knowledge and understanding of their own intellectual development to the discussion.

Group C (Computer Club)

	Pseudonym	Age band	Gender
C1	Martin	60-69	M
C2	Jenny	60-69	F
C3	Beryl	70-79	F
C4	Brenda	70-79	F
C5	Charles	70-79	M
C6	Christine	60-69	F
C7	Aiden	60-69	M
C8	Ernest	60-69	M
C9	Miriam	60-69	F
C10	Paul	70-79	M
C11	Jo	60-69	F
C12	Angela	70-79	F
C13	Laura	70-79	F
C14	Katherine	70-79	F
C15	Jonathan	60-69	M
C16	Eddy	70-79	M
C17	Joyce	70-79	F

This group (7M: 10F) belonged to one of the many 3Ls Student Association's clubs which met within the Centre to develop and share their knowledge. Six students were also 'Computer Buddy' volunteers who took part in a scheme to introduce novice users to email and the internet on a one-to-one basis through an online training package. Therefore, they were involved in helping others learn practical skills and this aspect featured in their discussion group.

Group S (Spring Into Life Class)

	Pseudonym	Age band	Gender
S1	Claire	50-59	F
S2	Cheryl	60-69	F
S3	Molly	70-79	F
S4	Rowena	50-59	F
S5	Graham	60-69	M
S6	Lena	60-69	F
S7	Nan	70-79	F
S8	Bridget	60-69	F
S9	Diana	60-69	F

Group S participants (1M: 8F) had attended a self development class I offer, save for one person, who had responded to a notice posted in the Centre. The class was aimed at people at the point of leaving full time work or already retired and looking for ways to use time more creatively.

Group M (Mind Power Class)

	Pseudonym	Age band	Gender
M1	Aileen	50-59	F
M2	Esther	50-59	F
M3	Isaac	60-69	M
M4	Muriel	50-59	F
M5	Linda	50-59	F
M6	Patrick	60-69	M
M7	Una	60-69	F
M8	Magda	60-69	F
M9	Kim	60-69	F
M10	Chrissie	50-59	F
M11	Martha	60-69	F
M12	Gordon	60-69	M
M13	Dee	60-69	F
M14	Adam	60-69	M
M15*	Andy	60-69	M
M16*	Maureen	70-79	F

The participants (5M: 11F) had attended my class on boosting the brain and memory. M15 and M16 had missed completing the Learning Style Questionnaire but wished to attend the focus group meetings.

Group R (Current Affairs Class)

	Pseudonym	Age band	Gender
R1	Cara	50-59	F
R2	Joseph	60-69	M
R3	Adele	60-69	F
R4	Julian	70-79	M
R5	Magda	70-79	F
R6	Wynn	60-69	M
R7	Rhea	60-69	F
R8	Ida	60-69	F
R9	Maria	60-69	F
R10	Jill	60-69	F

The participants (3M: 7F) had attended a class which discussed contemporary issues and I had not taught these students. I did not organise a focus group with this class because of time constraints.

* M15 and M16 did not complete the LSQ.

Each group has a title which reflects the dominant themes.

.

Group A		**Age band**
A1	Harriet	60-69
A2	Mhairi	60-69
A3	Julia	50-59
A4	Greta	70-79
A5	Norma	60-69
Group C		
C1	Martin	60-69
C3	Beryl	70-79
C7	Aiden	60-69
C10	Paul	70-79
C12	Angela	70-79
C13	Laura	70-79
C14	Katherine	70-79
C15	Jonathan	60-69
C16	Eddy	70-79
C17	Joyce	70-79
Group S		
S1	Claire	50-59
S3	Molly	70-79
S4	Rowena	50-59
S9	Diana	60-69
Group M		
M4	Muriel	50-59
M5	Linda	50-59
M9	Kim	60-69
M10	Chrissie	50-59
M12	Gordon	60-69
M15	Andy	60-69
M16	Maureen	70-79

Group A: Didactics
All were retired educators who discussed widely the benefits of articulating thought through dialogue for deeper understanding and also understanding others' perspectives. They all related to the subject through memories of their past learning and professional development.

Group C: Peer learning
Six out of the ten in this group were actively engaged in teaching basic computer skills as 'computer buddies' in the Centre. They tapped into their school days to convey the change from 'chalk and talk' to practical learning and, in particular, talked about the need for visual aids. Also, the power of learning by teaching others was firmly endorsed. The computer buddies tended to be more vocal.

Group S: Diversity
Three of the four had been members of my personal development class (One was recruited independently). They discussed diverse learning modes, such as 'trial and error', the value of discussion and of observing others. One person described her complex learning history and the development of her belief in debate for good understanding, together with visual and practical strategies. One person in this group tended to veer away regularly at a tangent.

Group M: Learning Styles
This group had been members of a class on improving the mind. They linked into their childhood learning experiences and their present preferences for practical activities. Also, in this group was one person with repeated exposure to the LSQ who used the discourse of Learning Styles as a way of conceptualising change. This was unique in the sample and led others in the group to discuss their results.

Appendix 16 Table of LSQ & Post LSQ Key Results

Key to Tables below

A	Activist	**LS -**	**Learning Style**	
R	Reflector	S or VS	Strong or very strong	**Purple**
T	Theorist	M	Moderate LS	**Blue**
P	Pragmatist	L or VL	Low or very low	
Chg -	Changed ways of learning	**Acc**	LS accurate	
VAK -	Visual, Auditory, Kinaesthetic Style			

Group A

	Pseudonym	Age band	A	R	T	P	LS	Acc	Chg	VAK style
A1	Harriet	60-69	VS	M	M	VL	**A**	✔	Yes	KVA
A2	Mhairi	60-69	VL	VS	VS	M	**RT**	✔	Yes	KVA
A3	Julia	50-59	L	S	L	VL	**R**	✔	Yes	VKA
A4	Greta	70-79	M	S	VS	M	**TR**	✔	Yes	AVK
A5	Norma	60-69	VS	L	M	S	**AP**	✔	No	KVA

Group C

	Pseudonym	Age band	A	R	T	P	LS	Acc	Chg	VAK style
C1	Martin	60-69	L	S	M	L	**R**	☒	Yes	KVA
C2	Jenny	60-69	M	M	VL	L	**RA**		Yes	KVA
C3	Beryl	70-79	M	VS	VS	VS	**RTP**	✔	Yes	VKA
C4	Brenda	70-79	M	S	L	VS	**PR**	☒	Yes	AVK
C5	Charles	70-79	M	L	S	L	**T**	☒	No	VKA
C6	Christine	60-69	M	M	L	S	**P**	✔	Yes	K
C7	Aiden	60-69	VS	VS	VS	VS	**ARTP**	✔	Yes	K
C8	Ernest	60-69	VS	M	VS	VS	**ATP**	☒	No	VKA
C9	Miriam	60-69	S	S	S	VS	**ARTP**	✔	Yes	KVA
C10	Paul	70-79	L	S	VS	M	**TR**	✔	Yes	VKA
C11	Jo	60-69	M	M	M	M	**ARTP**	✔	Yes	K
C12	Angela	70-79	M	VS	VS	VS	**PTR**	☒	Yes	VAK
C13	Laura	70-79	S	M	M	M	**A**	✔	Yes	VKA
C14	Katherine	70-79	L	S	S	M	**TR**	✔	Yes	VAK
C15	Jonathan	60-69	M	VS	VS	M	**RT**	✔	Yes	KVA
C16	Eddy	70-79	VS	S	VS	VS	**ARTP**	✔	Yes	VKA
C17	Joyce	70-79	M	VS	M	S	**RP**	✔	Yes	AKV

Group S

	Pseudonym	Age band	A	R	T	P	LS	Acc	Chg	VAK Style
S1	Claire	50-59	S	L	L	M	A	✔	No	VKA
S2	Cheryl	60-69	M	S	M	L	R	✔	No	VAK
S3	Molly	70-79	L	S	S	M	RT	✔	No	VAK
S4	Rowena	50-59	VS	L	S	M	AT	✔	Yes	VAK
S5	Graham	60-69	VL	S	S	VS	PRT	☒	Yes	AKV
S6	Lena	60-69	VS	VS	VS	M	ART	✔	Yes	KAV
S7	Nan	70-79	M	VL	L	L	A	✔	Yes	AVK
S8	Bridget	60-69	M	VL	VL	VL	A	☒	Yes	AVK
S9	Diana	60-69	M	VS	M	M	R	✔	Yes	VKA

Group M

	Pseudonym	Age band	A	R	T	P	LS	Acc	Chg	VAK Style
M1	Aileen	50-59	L	VS	S	L	RT	✔	Yes	KVA
M2	Esther	50-59	L	VS	S	L	RT	✔	Yes	KVA
M3	Isaac	60-69	M	M	VS	VS	TP	☒	No	K
M4	Muriel	50-59	M	S	S	S	RTP	✔	Yes	K
M5	Linda	50-59	VS	VS	S	M	ART	✔	Yes	VAK
M6	Patrick	60-69	M	VS	S	S	RTP	✔	Yes	VKA
M7	Una	60-69	L	S	VS	S	TRP	✔	Yes	VKA
M8	Magda	60-69	M	S	S	L	RT	✔	No	VKA
M9	Kim	60-69	VS	VL	L	L	A	✔	Yes	VKA
M10	Chrissie	50-59	VS	S	VS	S	ATRP	✔	Yes	VKA
M11	Martha	60-69	L	S	S	M	RT	✔	Yes	KVA
M12	Gordon	60-69	L	S	VS	S	TRP	✔	Yes	KVA
M13	Dee	60-69	M	S	S	L	RT	✔	Yes	VKA
M14	Adam	60-69	M	S	M	L	R	✔	Yes	KVA

Group R

	Pseudonym	Age band	A	R	T	P	LS	Acc	Chg	VAK Style
R1	Cara	50-59	M	S	S	M	RT	✔	Yes	----
R2	Joseph	60-69	L	VS	VS	M	RT	✔	No	VAK
R3	Adele	60-69	VS	L	L	M	A	✔	Yes	VAK
R4	Julian	70-79	VS	M	M	VS	AP	✔	Yes	KAV
R5	Magda	70-79	VS	VL	VL	S	AP	✔	Yes	AKV
R6	Wynn	60-69	S	M	M	S	AP	✔	Yes	K
R7	Rhea	60-69	M	L	S	M	T	✔	Yes	KVA
R8	Ida	60-69	M	M	VS	VS	TP	✔	No	KVA
R9	Maria	60-69	S	M	VL	VL	A	✔	Yes	KVA
R10	Jill	60-69	M	S	VL	L	R	✔	Yes	KVA

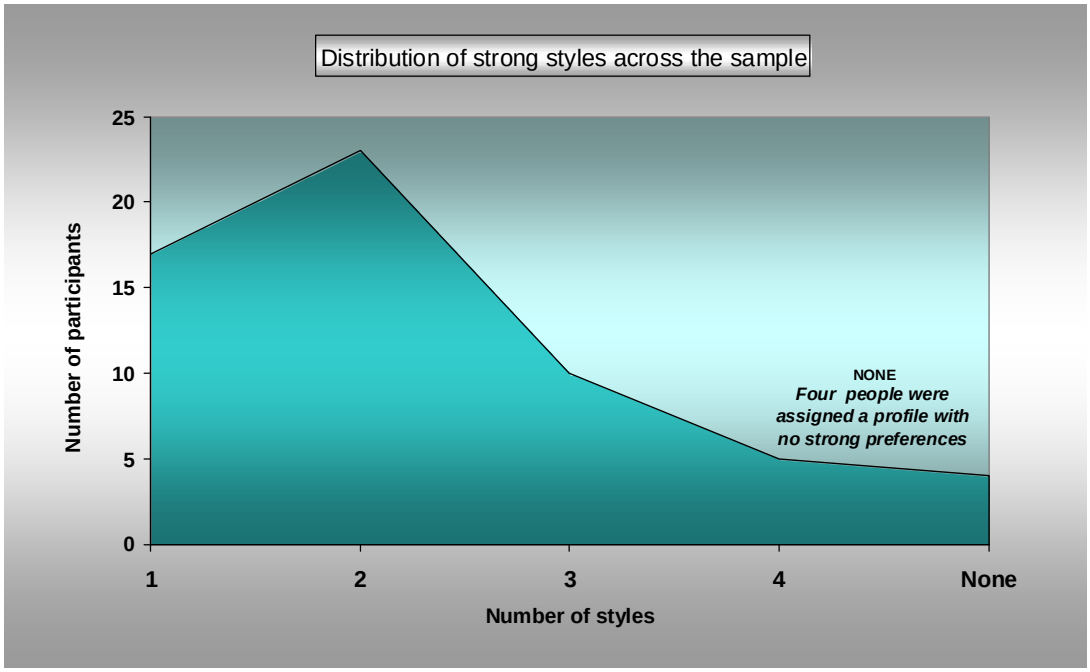


Figure 1: Acquiring two strong styles occurred most often with 23 out of 55 participants being assigned two strong styles (42%). 17 were assigned one strong style (31%), 10 had three strong styles (18%) and 4 had four strong styles (7%). Only 4 respondents produced no strong style.

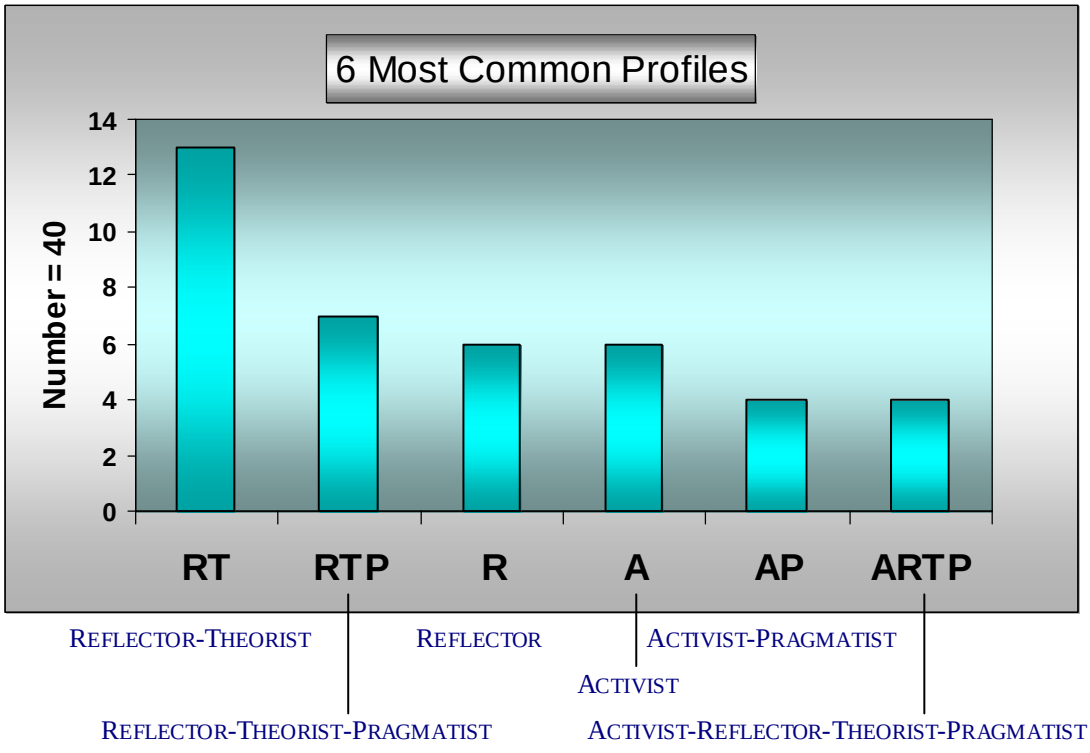


Figure 2: The six most common profiles. Reflector-Theorist (n=13) profile was well ahead of the others.

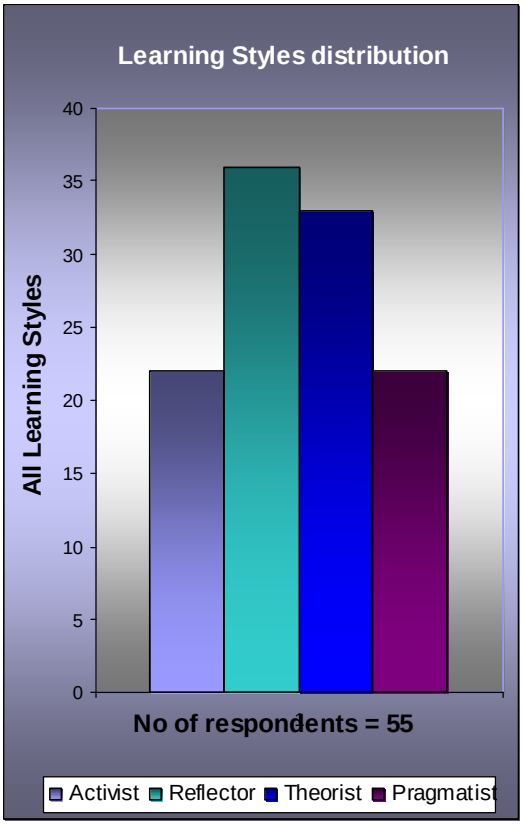


Figure 3:
Learning Styles across the whole sample

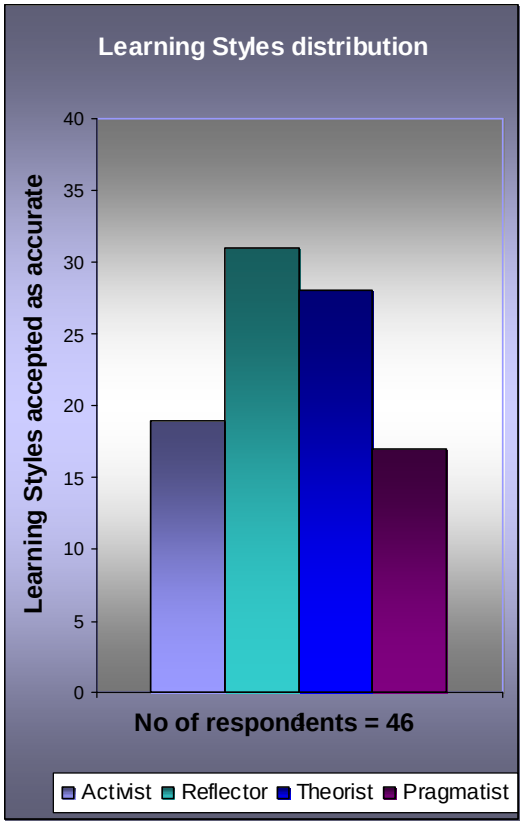


Figure 4:
Learning Styles accepted as accurate

A comparison of distribution of all styles against the accepted styles. No particular style stood out as being rejected more than another.

Appendix 18 Useful / interesting aspects of LSQ

Post-LSQ Question 3

50 participants wrote an answer to this question. Replies suggested three categories: A) **Significance** B) **Experience** and C) **LSQ as a Tool.**
Classification was not always clear-cut because of short-hand expressions. Some people mentioned more than one aspect and all were recorded.

A: SIGNIFICANCE: This indicated the activity was meaningful in some way.
1. Comments referring to own LSQ result. These broke down into three types:
i) **confirming ii) surprising iii) insightful.**

i) Confirming Result

'Confirmation I am a reflector.' '[R]elatively accurate in my case.'

'The results reflected my views on my learning preferences, though less strongly than I had anticipated.'

'Verified what I already know.'

ii) Surprising Result

'I feel I am also pretty much a pragmatist – perhaps others would disagree.'

'I found it surprising I had such an even spread.' 'It comes as a surprise.'

'Surprised at the evenness of the scores.'

'Surprised at results.' 'Surprised I was so low on activist.'

'Would not have thought 'reflector' would have been so dominant.'

iii) Insightful Result

'Can either confirm or negate one's self concepts.'

'Discovering I was a strong activist but also a moderate pragmatist.' 'Highlighted changes influenced by age.'

'Identifying my main learning style.' 'Insights into own and others' preferences.

'Interesting to consider different styles – gave one more insights into my own preferences.'

'Making me think about my attitudes.'

'Pinpointing how one approaches situations/subjects.'

'Relating it to past experiences.' 'Results.'

'Self Examination - aspects of myself I had not considered before.'

'Self Knowledge.' 'Showed up contradictions.' 'Thinking about how I have changed over the years.' 'To get objective assessment of one's learning style.' 'To really see my shortcomings.' 'Useful in showing ways where more care could be taken by me.'

2. Some comments were construed as more general. These could be divided into:

i) **developmental** aspects ii) **diversity**

i) Developmental Aspects

'Can use as a basis for further development.'

'Encouragement and consider how to learn.'

'Highlighting the need for balance.' 'Indication of contra-indications.'

'Insight into needs.' 'Reflects adaptable to new learning.'

ii) Diversity

'Discovering the different types of learners.'

'Everyone is very different in their learning procedure.'

'Raising awareness of others' learning styles as well as my own.

B. EXPERIENCE OF COMPLETING THE LSQ

These responses were classified as indicators that particular aspects of doing the LSQ had been interesting.

'A new experience in considering an unfamiliar area of self-assessment and knowledge.' 'All interesting.' 'Giving your opinion.'

'Having to stop and think about the answers.' 'Making you answer questions for which the answer could have been either agree or disagree.'

'Method of scoring and collating scores.' 'Scoring sheet.'

'The analysis of the answers to the questions to produce the appropriate learning style.'

C. LSQ AS A TOOL

These responses referred to more technical aspects of the LSQ, not necessarily to personal result. Two subcategories were identified:

1.1 LSQ Features

'Covered a broad range of behaviour.' 'Information about learning styles.' 'Notes on different learning styles.' 'Seemed to be aimed at establishing the kind of person, not just learning preferences.' 'Use of teaching styles.'

1.2. Ways of conceptualising learning.

'General definitions.' 'It will help me to understand construction of training courses I occasionally still attend.' 'Parts of the learning cycle.' 'Questions were well thought out and responses should reflect personality, learning and communication.' 'Taking the subjectivity out of the subject and carried out in an interesting way.' 'The four stages of the learning chart.' '[T]he theory behind Kolb's work.'

4. Irrelevant aspects of LSQ

There were only a few comments in response to this question, the implication being that completing the LSQ was, for most, a plausible exercise. Two people drew attention to the fact that their LS Profile was not right. One person said the LS Profile only confirmed what she already knew.

Other Comments:

'All worthy of reflection.' 'Most of it was relevant.'

'[Does not apply to learning at] meetings, discussions, [or reading] reports.'

'I wondered how far it relates to the Myers-Briggs typology, which I find has a powerful influence on thinking styles and learning.'*

* The MBTI is an attempt to understand styles in a way that conceptualises and measures personality in terms of preferences in how people perceive the world and make decisions (Sternberg & Zang, 2001). Sternberg and Zang's model of cognitive styles comes closer to what we think of as personality traits than the LS models. However, it is virtually impossible to draw hard and fast boundaries in this field as different researchers produce their own finely nuanced theories about the dimensions of human variability.

Appendix 19 Changed ways of learning

Post-LSQ Question 6

If the respondents answered Yes to Question 5 (concerning change over time) they were invited to comment. The categories of response included the past and personal interests, new choices, work, IT and audio-visual and were condensed into the four broad areas. Boundaries between categories are not rigid with inevitable overlap. Where a respondent expressed two or more ideas in their statement this was placed in the appropriate section.

A: LIFE EXPERIENCE

'As a 5 year old I built mechanical models, not from a given design, but creatively. School and university encouraged more reading. Some disasters in repairing punctures, vacuum cleaners etc. encouraged careful reading of manuals before attempting to get involved in tasks'.

'As you become older you tend to draw upon experience to blend with information received to produce a more balance viewpoint.'

'Circumstances alter when work involves meetings, teamwork etc.'

'Changed to have become more practical – learning at school, university was traditional - and new methods introduced during teaching career brought about changes.'

'Having taught primary pupils have learned from my own mistakes in presenting classes.'

'I feel I have been constantly learning all my life as general life experience, both in private and in business – has been a huge learning curve.'

'Over a lifetime new interests arise, opportunity to study later in life at University.'

'With experience you broaden your interests.'

'When working, trained myself to learn.'

B: COGNITIVE-EMOTIONAL CHANGE

'Do not want to go into [the] details.' 'Now [g]o into things in depth.'

'Have become increasingly reflective.' '[L]isten more and keep an open mind.'

'Looking at things from more than one point of view.' 'I have more patience now.'

'I think things through more.'

'Learning through choice therefore selecting subjects I want to know more about.'

'[L]ess inclined to have pre-conceived ideas and make assumptions.'

'Less reliance on straight memorising, more on reference points'

'More patience.' 'Much more reflective.' 'Much more reflective with age.'

'Now find it hard to absorb material presented in lecture format only.'

'[R]ather rise to new challenges.',

C: CHANGING WORLD

'Concentrate on what is best at the time.'

'Having to adapt to new technologies in all aspects of life.' '[I] like visual aids.'

'More input from with audio-visuals aids including IT.'

'[M]ore computer-oriented now with students learning less individually one-to-one, as IT has taken off. '[M]ore sources of information due to new technology.'

'More student participation – less formality.'

'New imaginative teaching aids and hands-on learning.'

'Participation has increased and this helps.'

'Teaching is not by rote so much nowadays.'

'The opportunities to learn by doing/discussion/ are far greater than in the 'old days' and lead to better learning and a more enjoyable experience.'

'There is now more visual learning.' 'Visual aids and audio.' 'Mind-mapping.'

D: STYLE CHANGE

'Adapted for ways I found better for me.'

'As I have taken more classes, especially practical arts/crafts courses.'

'As a teacher/lecturer I have adapted to very active and interactive styles of teaching.' 'Have gone from rote "sponge" learning to proactive learning.'

'I think I have become more activist over the years.'

'Later life – Interaction/discussion.' 'Less reading.'

'More inclined to have a go and learn by trial and error.'

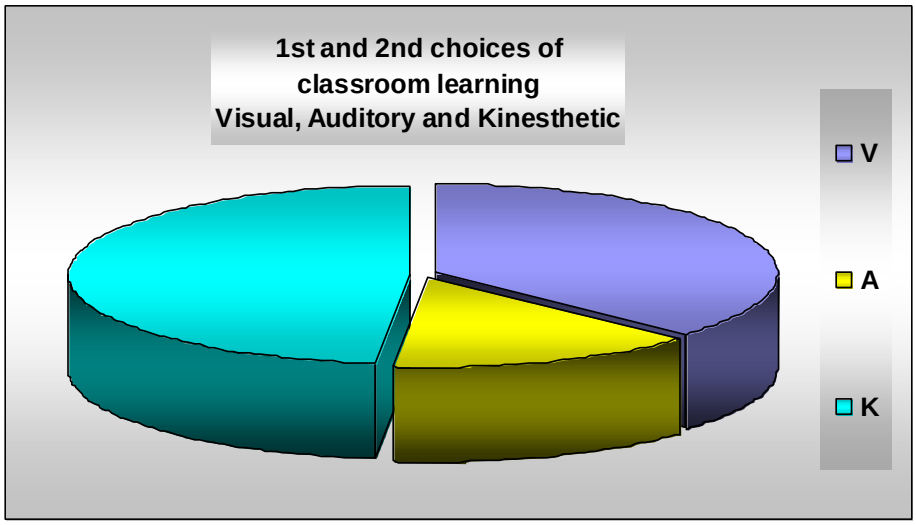
'Moved from activist to reflector/theorist.'

'Possibly was more of a pragmatist in the past.'

'Previously very strong pragmatist. Now stronger theorist and less activist.'

'Tend to be more pragmatic than in younger life.'

Appendix 20 VAK styles



Post-LSQ Question 7

When 1st and 2nd choices are combined almost half the sample have a kinesthetic component with the auditory element low at 18 %.

'VAK' styles refer to a modality-specific approach (Coffield, 2004, p.10). This particular classification of learning styles had not been discussed with the groups as this is not part of the LSQ approach to preferences. (Kolb's cycle focuses on how people process information rather than how they receive information.) Therefore, the Post-LSQ used the everyday expressions for visual, auditory and kinesthetic modes of - 'prefer material to be illustrated', 'listening to an expert' and 'a hands-on, practical approach' respectively, and participants were asked to put them in order of preference.

The order does not represent equal gaps between choices - someone could learn almost equally well in Visual and Kinesthetic modes but find Auditory for prolonged periods quite incompatible with their style and a very unlikely choice. The forced ordering was thus a broad brush approach and not intended to identify a personal 'VAK' style but give a general indicator of sensory style. One participant made the point: *S9 (R): 'Auditory for me is a very low preference, as I am mainly a visual person.'*

Appendix 21 ‘Switch off’ learning situations

Post-LSQ: Question 8

The responses were organised into four categories with the remarks centred round verbal presentations delivered with little or no engagement with the listeners. (Lectures were mentioned specifically by several respondents.)

Presenter's Characteristics	Communication Style	Content	Technical
Boring voice	Chalk & talk	Complicated descriptions	Dull Powerpoint with too many words
Expressionless	Lectured at	Cramming in material	No audio visual
Lack of enthusiasm	Monologue	Facts and numbers	
Long-winded	No Interaction	Gimmicky	
Monotonous delivery	No demonstrations	Masses of material	
No eye contact	No discussion	Mathematical models	
Poorly organised	No diversions	Not stimulating	
Self absorbed	No feedback	No practical content	
Static	No graphic aids	Rambling	
Too fast	No handouts	Theory only	
‘Ums' and 'Errs'	No opinions invited	Too much detail	
Uninvolved	No visuals		
	Non participative		
	Reading notes		
	Too long		
	Totally verbal		

It is unlikely that all these aspects would have been encountered together, but many of these elements may have been experienced by people who have attended adult education over an extended period. The top-down model of instruction, ‘banking education’ (Friere, 1970/2000) which cultivates respect for ‘the expert’ and ‘expert’ knowledge, excludes learners from involvement and discourages different perspectives.

Appendix 22

Focus group participants -
Table of LSQ & Post LSQ Key Results

	Pseudonym	Age band	A	R	T	P	LS	Acc	Chg
Group A									
A1	Harriet	60-69	VS	M	M	VL	**A**	✔	Yes
A2	Mhairi	60-69	VL	VS	VS	M	**RT**	✔	Yes
A3	Julia	50-59	L	S	L	VL	**R**	✔	Yes
A4	Greta	70-79	M	S	VS	M	**TR**	✔	Yes
A5	Norma	60-69	VS	L	M	S	**AP**	✔	No
Group C									
C1	Martin	60-69	L	S	M	L	**R**	☒	Yes
C3	Beryl	70-79	M	VS	VS	VS	**RTP**	✔	Yes
C7	Aiden	60-69	VS	VS	VS	VS	**ARTP**	✔	Yes
C10	Paul	70-79	L	S	VS	M	**TR**	✔	Yes
C12	Angela	70-79	M	VS	VS	VS	**PTR**	☒	No
C13	Laura	70-79	S	M	M	M	**A**	✔	Yes
C14	Katherine	70-79	L	S	S	M	**TR**	✔	Yes
C15	Jonathan	60-69	M	VS	VS	M	**RT**	✔	Yes
C16	Eddy	70-79	VS	S	VS	VS	**ATPR**	✔	Yes
C17	Joyce	70-79	M	VS	M	S	**RP**	✔	Yes
Group S									
S1	Claire	50-59	S	L	L	M	**A**	✔	No
S3	Molly	70-79	L	S	S	M	**RT**	✔	No
S4	Rowena	50-59	VS	L	S	M	**AT**	✔	Yes
S9	Diana	60-69	M	VS	M	M	**R**	✔	Yes
Group M									
M4	Muriel	50-59	M	S	S	S	**RTP**	✔	Yes
M5	Linda	50-59	VS	VS	S	M	**ART**	✔	Yes
M9	Kim	60-69	VS	VL	L	L	**A**	✔	Yes
M10	Chrissie	50-59	VS	S	VS	S	**ATRP**	✔	Yes
M12	Gordon	60-69	L	S	VS	S	**TRP**	✔	Yes
M15	Andy	60-69	No LSQ profile						
M16	Maureen	70-79	No LSQ profile						

Key

A	Activist	**LS -**	**Learning Style**
R	Reflector	S or VS	Strong or very strong
T	Theorist	M	Moderate
P	Pragmatist	L or VL	Low or very low LS
Chg	Changed ways of learning	**Acc:**	accurate
VAK Style	Visual, Auditory, Kinesthetic Preferences		

Key to Coding Speakers

Each speaker is coded by group, with the second number itemising the order of their contribution (for example, A2-2, Mhairi's 2nd contribution). The names have been anonymised and the LSQ result is beside each name. Where a LSQ result was rejected by the individual, this is indicated.

Key to Coding Text

A commentary is provided at the start of each entry to give an overview, sometimes with an explanation or identification of a motif or metaphor.

Motif: An identifiable conceptual thread running through a contribution.
Metaphors: Metaphors provide insights into underlying themes.

Colour-coded Column

One way to differentiate between ways of speaking about learning is to categorise the kind of language used that convey *states of mind, actions, claims to knowledge, abilities and achievements*. (Gee, 2005). Below is a guide to this categorisation (based on Gee's constructs), with examples drawn from the group transcripts. Words rarely fit exactly into tight-fitting categories but the coding gives a ready guide to styles of language used.

Pairs of constructs:

Ability-Constraint (**can-cannot**).

Ability statements **-** for example: *'I am able to discuss…', 'It's possible to learn', 'I can draw…'.*

Constraint statements**,** for example: '*we don't all hear the same thing', 'I did not go on'.*

State-Action (being-doing)

State statements: for example**,** *'when I was younger', 'I was qualified', 'they had the confidence'.*

Action statements: for example, *'saying what you think', 'discussing things and exchanging ideas'.*

Cognitive leading to ⇨**Achievement, Success or a Claim**

Cognitive statements**:** for example, *'I think', 'I find, 'what the word meant'.* (Cognitive is abbreviated to **Cog**.)

Achieve statements**:** for example, *'I wrote a 9-page wonder', 'I had lots of theoretical knowledge'.*

Affective statements (in the literature **emotional affect** is the term used to convey the way emotions affect cognition, either negatively or positively): for example**,**

'It did not suit me', 'a wealth of information', 'a good experience', 'attractive to me'.

'I-predicate' type statements (Colour-coded in **bold** in the coding columns**)**

When participants specifically refer to themselves - speaking in the first-person or making a clear reference to self (me/my) - this can be part of a process that Gee calls creating a "socially situated identity" (Gee, 2005, p. 141). These can reveal underlying discourses, for example, *'I am talking about maturity..', 'I enjoy it more', 'I had to understand…' '..my memory of school is not liking it'.*

The **'I-predicate'** divide into the same categories as above-

- **affective** - expressing emotion**:** *'I enjoy…' ; 'I did not like…'*
- conveying **ability** – *'I am able to…'*, or **constraint** – *'I had to…'*
- imparting information about a **state** - *'my experience was …'* or an **action** *'I actually failed…'*
- a **cognitive** statement talking about thinking processes – *'I realise…', I know…', 'personally speaking'* or an **achievement** statement about attainment or aspiration – *'my strengths were..', 'I got good at it'.*

Apart from 'I-predicates' the participants use various pronouns, as they switch – sometimes mid-sentence - to generalisations, to express views about learning.

"You" is used frequently, meaning 'one', as in '*what you are learning...'* and *'you find…'*

"We" also appears, as in *'we don't all hear the same thing'* and *'we have maybe just learned…'*

"It" is used when referring to a longer process previously described, as in, *'it was a completely different way of learning'* and *'It gives you the confidence.'*

How some people positioned themselves within their groups through the use of cognitive "I" statements was revealing. The subtle codes people sometimes use to establish their socially-situated identity is something we are normally only aware of intuitively in social situations. In general, the more descriptive accounts, the more 'state-action' and 'ability-constraint' I-predicates were used. The more abstract and achievement-based, the more cognitive I-predicates were in evidence. Ten people did not use affective I-predicates (e.g., I want, I like) but spoke mainly in terms of thinking and achieving.

Below are the first 10 minutes of coded dialogue for each group – A, C, M and S, with a brief introduction and the 'Motif' and/or metaphor indicating the main thrust of the contribution.

Group A

A1 Harriet (Activist)

The respondent articulates her thoughts on learning (in a general rather than a personal way), using the language of understanding, explanatory knowledge claims and learning processes. She draws attention to the dialogic process and its multiple benefits and illustrates this by citing an example of a LLL class she has experienced where these principles had been put into practice.

Motif: *Dialogue*

Metaphor: *'a healthy way of learning'*

A1-1	**Coding**
1 I think	**1 Cog. "I"**
2 it is always beneficial	**2** Cog. Claim: beneficial (linked to L7)
3 to have an ongoing dialogue, in a sense	**3** Action statement – dialogue
4 because sometimes you don't know	**4** Cog. statement: not knowing
5 what you know	**5** Cog. statement: Meta-cognition
6 or what you have learned	**6** Cog. "you" - the learner
7 until you talk about it, until you actually speak.	**7** Action "you" – Speech x2
8 And you find	**8** Cog. "you" – 'the learner'
9 that part of the learning process	**9** Learning process
10 is transforming thought into dialogue	**10** Action – dialogue
11 and into discussion.	**11** Action - discussion
12 And that's why I find	**12 Cog. "I"** (linked to L15)
13 in the sessions we have had with yourself	**13** Classroom Activities
14 you don't spend too long in handing out information	**14** Action tutor
15 without saying 'What do you think about that?'	**15** Dialogic Action tutor: questioning
16 And so that process of learning is a mixture	**16** Action: learning
17 of being given information,	**17** Action: receiving info.
18 seeing it visually and then,	**18** Action: viewing information
19 not only saying what you think yourself,	**19** Action - Verbalising thoughts
20 but, you know, learning,	**20** '*You know*' ; engaging the group
21 sometimes, with great surprise,	**21** Affective statement: great surprise
22 what other people's perceptions are	**22** Cog. statement: Others' reality
23 of what has been given.	**23** Action: Given info
24 I think - information with discussion –	**24 Cog. "I"** : Method (linked to L25/26)
25 is a very healthy way of, not only learning,	**25** Cog. Claim: 'very healthy' method
26 but retaining and understanding,	26 Ability: retain and understand
27 understanding and retaining,	**27** Ability: emphasising the above
28 what you are learning.	**28** Cog. "you" - the learner

A2 Mhairi (Reflector/Theorist)

Developing the Dialogue Motif, Mhairi makes the point succinctly in one sentence that we tend to focus on certain aspects of a communication that have relevance to us and she infers that words without personal meaning to the listener may not really register. Therefore, different trains of thought are inevitable in a group of people 'hearing' the same thing. Discussing these differences is a way of highlighting diverse perspectives and alerting us to what we may have missed.

Motif: *Sense-making*

Metaphor: *'fine-tune the information'*

A2-1	Coding
1 I would agree	**1** **Cog. "I"** :Convergence
2 that being able to discuss	**2** Ability: Discussion
3 what we have maybe just 'learned'	**3** Cog. Possible learning in class
4 is quite illuminating	**4** Cog. Claim (modest): insight value
5 because you then realise	**5** Cog. "you" : 'the learner'
6 that we don't all hear the same thing,	**6** Constraint: different speech filters
7 we don't all take the same thing	**7** Constraint: different interpretations
8 from what you hear and	**8** State: listening
9 it allows you to fine-tune the information	**9** Ability: sense-making
10 that you have received.	**10** State: receiving info

A4 Greta (Theorist/Reflector)

This contribution moves thinking about learning in general to an example of an *'eye-opening'* professional experience when Greta's beliefs about knowledge and understanding changed after teaching parents through exploration of meaning. The language shifts from the measured cognitive expressions of explanatory knowledge construction of the two previous contributors to the dialogic world of social interaction, where metaphors in the narrative help to clarify the nature of the former primary teacher's experience. The full range of I-predicates are utilised.

Motif: *Experiential Learning*

Metaphors: *'an eye-opener'*, *'miles off the track'*, *'wealth of information'*

A4-1	Coding
1 I actually thought	**1** **Cog. "I"** :
2 – I don't mean that I had 'sussed' it –	**2** **Cog. "I"** : - Reference to expertise
3 but in teacher training	**3** State statement
4 and doing other things, how I learned	**4** **Achieve "I"**: life-course experience
5 I had lots and lots of theory	**5** **Achieve "I"**: lots of theoretical knowledge
6 but I did not really have the practical stuff.	**6** **Cog. "I"**: missing knowledge
7 And when I had to teach it to adults	**7** **Constraint "I":** (**Narrative** begins)
8 I had to understand it myself	**8** **Constraint "I":** had to understand
9 and in doing that it was they who taught me	**9** Action "they": teaching
10 the bits that I thought in theory	**10** **Cog. "I"** : theoretical knowledge
11 – "Oh yes, this does happen"	**11** Dialogic claim
12 it didn't.	**12** Theory v practice
13 and not because they were unique.	**13** Reference to a normal set of parents
14 I remember throwing up one word	**14** **Action ("I")** : teaching
15 on the blackboard - 'Holidays'	**15** Brainstorm
16 to a group of parents	**16** Learning scenario
17 and then asking them to think	**17** **Action ("I")** : asking meanings
18 on what the word meant to them.	**18** Cognitive Action: meaning
19 And it had a wealth of information for me	**19** **Affective "me":** 'wealth'
20 because if you ask the same of children	**20** Children v Adults
21 you assume they know what you are meaning	**21** Cognitive assumptions
22 -and you are miles off the track.	**22** State: misunderstanding metaphor
23 And that was an eye-opener to me.	**23** **Affective "me"**: enlightenment
24 I am talking about maturity by that time.	**24** **State**: **"I"** - ('I was mature')
25 It was not the children I'd been teaching for years	**25** **Action "I"** : Children v Adults
26 - it was their parents that were teaching me	**26** Cog. "they": parents teaching
27 and asking me	**27** Action: Questioning the teacher
28 "What did I mean by that word?"	**28** Dialogic Cog. question – to teacher
29 They had the confidence	**29** State: confidence
30 whereas children don't.	**30** Children v Adults

A5 **Norma** (Activist/Pragmatist)

The style of this contribution reflects the same dialogic mode of expression as the previous speaker and portrays contrasting learning environments from the past which evoke strong and influential emotions. This is in evidence through the use of ten affective-I predicates, expressing liking, not liking, wanting, enjoying, not bearing, 'turned off'.

Motif: Dialogue; personal achievement space (Gee, 2005)

A5-1	**Coding**
1 I think	**1 Cog. "I"** :
2 it's possible to learn in different ways	**2** Ability Claim**:** Flexibility
3 if the situation requires it.	**3** Situational factors
4 I think I do prefer learning things	**4 Affective "I" :** preference
5 where there is a dialogue.	**5** Action**:** Dialogue
6 When I think back to my schooldays	**6 Cog. "I"**
7 my strengths were in learning languages	**7 Achieve "I"**: learning languages
8 which did involve a lot of talking	**8** Action**:** talking
9 and I think I did learn more and retained more	**9 Cog. "I"** :learning and retention
10 because I did like that form of learning.	**10 Affective "I"** : like talking
(7 normal lines of text not included here as Norma contemplates when discussion might be difficult and cites student doctors having to learn large amounts of factual information.)	
11 I realise	**11 Cog. "I"**
12 that very much of the teaching long ago	**12** Past teaching
13 when I was at school	**13 State "I"**: being a pupil
14 (teaching) was lacking in dialogue.	**14** Constraint: lack of dialogue
15 Maybe that's possibly why	**15** Mild claim
16 I was completely turned off	**16 Affective "I"** :
17 going further with my education then.	**17 Constraint "I"** : learning inhibited
18 I was very glad to leave school at 17	**18 Affective "I" :** glad
19 and I did not go on to further education then,	**19 Constraint "I"** : HE blocked
20 because, although I was qualified to do it –	**20 Achieve "I"**: qualified
21 I had enough Highers –	**21 Achieve "I"**: `had Highers
22 but I couldn't bear	**22 Affective "I" :** couldn't bear
23 the thought of going on to University.	**23 Affect** statement
24 That's quite interesting to me now.	**24 Affect** statement: curiosity
25 I went to a normal university as a mature student	**25 State "I"**: mature student
26 which I did enjoy very much	**26 Affective "I" :** enjoyment
27 because we had tutorials,	**28 Action** "we" : tutorials
28 we were able to discuss things.	**28 Ability** "we" : discussion
29 I liked that form where there was a lecture,	**29 Affective "I" :** mixed methods
30 lectures plus tutorials – the combination.	**30** Combination learning
[VB: That would tie in with your preferred LS as an activist.	
31 My memory of school is not liking it	**31 Affective "I" :** not liking
32 while my memory of University was I loved it	**32 Affective "I" :** loved it
33 and wanted it to go on forever.	**33 Affective "I" :** wanted it
34 It was a mixture - solitary learning,	**34** Method : solitary learning
35 plus listening to lectures plus talking,	**35** Method: lectures + discussion
36 and a lot of socialising	**36** Method : social interaction)
37 with other people learning the same thing	**37** Social interactive learning
38 which was a very good experience.	**38** Affective Claim**:** good experience

A2 Mhairi (RT)

In her second contribution the speaker changes from speaking in general terms to giving her personal view. As a former science teacher, she had been happy adopting a studious approach. However her awareness has shifted to appreciate a more interactive way of learning. She raises the issue as to whether this shift might be linked to maturing.

Motif: *Discussion*

A2-2	**Coding**
1 I think	**1 Cog. "I"**
2 I have become more aware	**2 Cog. "I"**: more aware
3 that there are alternatives.	**3** Cog. Statement: alternatives
4 It suited me just to get down and say -	**4 Affective "me"**: suited me
5 "This is what I am learning,	**5 Cog. "I"** : dialogic statement
6 I am happy with this." (spoken in staccato style)	**6 Affective "I" :** happy - dialogic statement
7 But I am now aware	**7 Cog. "I"**: aware
8 that probably I enjoy it more	**8 Affective "I" :** enjoy
9 discussing things and exchanging ideas	**9 Action "I" :** discuss and exchange
10 which I was not too aware of before.	**10 Cog. "I"** : more aware
11 I don't know –	**11 Cog. "I"**
12 maybe it is a maturing thing, an ageing thing?	**12 State:** maturity, being older

A1 Harriet (A)

In her second contribution Harriet continues to develop her motif by raising the emotional aspect of fear of admitting not understanding and how discussion can open up greater possibilities for deeper understanding and recognition that you can know more than you think.

Motif: *Ongoing Dialogue*

Metaphor: *'vital clue'*

A1-2	**Coding**
1 And when you have this continual dialogue	**1** Action: 'continual dialogue'
2 it is one way of overcoming the fear	**2** Constraint: state of fear
3 that people have of admitting that	**3** Constraint: revealing
4 they don't understand something because,	**4** Constraint: not understanding
5 by developing the whole issue and discussing,	**5** Action "you**":** developing discussion
6 you are picking up just a wee bit more information	**6** Action "you": acquiring information
7 and in among all of that will be the vital clue	**7** Ability: clue
8 to not only understanding,	**8** Achieve**:** understanding
9 but having a depth of understanding about it.	**9** Achieve: deeper understanding
10 It gives you the confidence then to say –	**10** Affective "you" **:** confident
11 "Yes, I know about this."	**11** Achieve "I" : Dialogic cog. statement

A3 Julia (Reflector)

Julia (who arrived slightly late) follows Norma's pattern of relating learning to her changing life experience but in a different way, as can be seen by the absence of affective I-predicates compared to Nancy (with a similar length of contribution). Julia's style is to talk in a detailed way about her achievements, actions and states, and her two affective statements are implied rather than explicit – for example, 'quite an experience'. She talks also about 'the culture shock' of the management course

but she does not articulate the impact this had on how she felt. It could be argued that she is reinforcing her socially-situated identity in the group as a competent learner able to tackle any form of learning.

Motif: *Change*

Metaphor: 'culture shock',

A3-1	**Coding**
1 I was interested	**1 Cog. "I"**
2 in your learning experience (Norma)	**2** Linked to Norma
3 because you were talking about	**3** Action "you"
4 going back to college as a mature student	**4** Action "you"
5 and I was thinking about	**5 Cog. "I"**
6 how my learning had changed.	**6** Cog. Change
7 I had been at college up to the mid seventies –	**7 State**: **"I"** –
8 lectures, reports, exams – fairly formal stuff.	**8** Methods : formal
9 Then I went through a series of evening classes	**9 Achieve "I"** : (Evening classes)
10 - history, politics things like that –	**10** Subjects
11 where you were being lectured at.	**11** Methods : lectures
12 Then I went back to do a post-grad. qualification	**12 Achieve "I"** : post-grad.
13 at the end of the 80s and that was a culture shock.	**13** Affect statement: shock
14 It was a completely different way of learning.	**14** State statement: 'different way'
15 We were put into groups	**15** State statement: 'into groups'
16 because we were doing a management qualification	**16** Achieve statement:
17 and we were being taught	**17** Methods : group work
18 how to work with each other	**18** Action "together"
19 and everything was done in a negotiated way	**19** Action "negotiated"
20 and that was quite an experience.	**20** Affect statement: reaction to new experience
21 Then I changed direction again,	**Action "I" :** changed
22 gave up the intellectual bit and	**Action "I" :** gave up
23 went into arts and crafts and	**Action "I" :** went into
24 that was a different way of learning	Cog. Statement:
25 because I was learning to weave,	**Action "I" :** weaving
26 learning about textiles.	**Cog. "I"** :
27 It was hands-on	Methods : learning by doing
28 which I had not ever done before	**Action**: **"I"** : novice learner :
29 and I got reasonably good at it.	**Achieve "I":** 'good at it'
30 But I also still went back and read it up	**Cog. "I"** : reading
31 and researched it.	**Cog. "I"** : research
32 Being interested,	Affect statement: interest
33 knowing how it worked	Cog. statement: knowing
34 and doing it,	Action statement: doing
35 then reading up about weavers and lace-makers.	Cog. statement: reading up.

Group C

C15 Jonathan (Reflector/Theorist)

This opening contribution begins with childhood recollections of sitting at a desk being '*fed stuff*'. Jonathan claims in a factual manner that perhaps this is not a good way to learn later in life and states that the way he finds best is doing examples and interacting with the tutor.

Motif: '*Passive Schooldays versus Active Engagement*.

Metaphors: 'fed stuff'

C15-1	**Coding**
1 Initially it is very much a childhood thing	**1** State: pupil
2 where you sat there	**2** State: passive
3 and the teacher fed stuff to you	**3** State: empty vessel
4 without any interaction on your part.	**4** Constraint: lack of interaction
5 Then, I think,	**5 Cog. "I"**
6 later on in life you realise	**6** Cog. "you" : later in life
7 that maybe wasn't the best way for you.	**7** Cog. Claim.
8 Personally I always find	**8 Cog. "I"**
9 doing, both examples and	**9 Action "I" :** examples
10 interactive with the teacher or tutor	**10 Action "I" :** interactive
11 is better than just sitting there and	**11 State:** passive
12 listening to the tutor.	**12 State:** listening to the tutor
13 That certainly was my experience.	**13 State:** experience of learning

C1 Martin (Reflector/Theorist: **NO**)

Martin begins his contribution with his memory of the formality and de-personalised nature of undergraduate classes, and learning by rote. He is attracted now to learning by doing and finishes with a wry comment about the LSQ which did not appear to indicate this. In fact, his activist and pragmatist scores were the lowest which, according to his current ways of learning, should be the highest.

Motif: *Learning by doing*

Metaphor: *'one-way' traffic*

C1-1	**Coding**
1 My experience, certainly in academic education,	**Action**: **"I"** :
2 to put it that way,	State: building identity
3 was very much tutor to large class,	State: impersonal
4 around 100 at university, situation	State: mass education
5 very, very formal and very 'one-way' traffic.	State: passive learners
6 Since then, certainly latterly, since I retired,	State: retired
7 moving on to the 'doing',	**Action "I" :** changed
8 rather than learning by rote,	Method: rote learning
9 certainly has become much more attractive to me.	**Affective** statement: attractive
10 But still from the survey it seems to suggest	LSQ reference
11 I still revert to my childhood.	State: childhood

C14 Katherine (Theorist/Reflector)

At the start Katherine builds her credentials to talk authoritatively about learning by implying a lifetime's involvement, both as a learner and a teacher. She is not explicit about how she got her pupils to 'assimilate' learning but seems to be advocating the merits of 'Chalk and Talk' with its emphasis on teaching from the front. She claims that things taught this way are firmly embedded in memory while things learned practically fade after two years unless used. The discourse of *'Chalk and Talk'* is the focus which follows the pattern of the previous two speakers of talking about learning in a fairly abstract way. There are five 'constraint' statements at the end of her contribution.

Motif: *'Chalk and Talk'.*

C14-1	**Coding**
1 I have certainly been well aware over a long life	**1 Cog. "I"** : over lifetime
2 and I've been tackling learning	**2 Cog. "I"** : tackling
3 in different areas one way and another,	**3** State : wide experience
4 just the way things panned out.	**4** State: life experience
5 And I found out	**5 Cog. "I"**
6 we all started off with the 'chalk and talk'	**6** State: :Chalk & Talk
7 and 'sit up straight'	**7** Dialogic Action: Regimentation
8 and one thing and another.	**8** Building momentum
9 But then, of course, when I came to	**9 Action "I"**
10 the actual teaching bit as well,	**10** Teaching Discourse
11 obviously I was much interested then	**11 Cog. "I"** : much interested
12 in learning how people were going to assimilate	**12 Cog. "I"** : assimilation
13 anything I was giving them.	**13 Action "I" :**
14 It certainly developed	**14** Achieve statement
15 and is still developing, I may say.	**15** Achieve statement : reinforcing
16 I find that the	**16 Cog. "I"**
17 old 'chalk and talk'	**17** Teacher talking
18 really had its merits,	**18** Cog. Claim : merits
19 you know,	**19** Building engagement with group
20 because an awful lot of stuff was dinned into you	**20** Action statement : insistent repetition
21 and is still there.	**21** State statement : retention
22 Whereas if you are learning practically,	**22** Action statement : learn by doing
23 unless you are going to be using it –	**23** Constraint statement: using it
24 I found anyway,	**24 Cog. "I"**
25 unless you are going to be using it regularly,	**25** Constraint statement: regular use
26 it fades.	**26** Constraint statement: memory fades.
27 It's probably in there somewhere	**27** Ability claim: Memory storage.
28 but it's not so easy to recall	**28** Constraint claim: retrieval prob.
27 if you have not done it for a couple of years.	**29** Constraint statement: time

C12 Angela (Pragmatist/Theorist: NO)

Angela picks up on Katherine's assertion that early rote learning is necessary. She then moves to the lecture scenario (Martin's theme) and adds her own memory of finding the environment intimidating and not conducive to debate, causing her to *'drift off'*. Angela explicitly makes the point forcefully that this environment was constraining rather than enabling. Her finishing remarks convey her distaste for being "*talked at*" at this stage.

Motif: *Passive Lectures*

C12-1	**Coding**
1 I agree with Katherine	**1 Cog. "I"**
2 because the stuff you got at the beginning	**2** State "you" : pupil

3 I think,	**3** **Cog. "I"**
4 you had to have that	**4** Ability Claim: a necessity
5 because you assimilate it.	**5** Cog. "you" : Assimilation
6 But once, as you stated, Martin,	**6** Martin
7 when you were sitting in a big group of people,	**7** State "you" : in large group
8 and you were being lectured to,	**8** State: being lectured
9 you tended to drift off –	**9** Constraint "you": drift
10 at least I did.	**10** **Constraint "I"** : drift
11 I tended to drift off,	**11** **Constraint "I"** : drift - repeat
12 because you thought,	**12** Cog. "you"
13 "I disagree with what he said there"	**13** **Cog. "I"** :Dialogic cog. statement
14 but I can't say'.	**14** **Constraint "I"** : lacking confidence
15 I wasn't bold enough to get up.	**15** **Constraint "I"**: lacking boldness
16 I'm learning more now	**16** **Achieve "I"**: learning
17 but at my leisure	**17** **Ability "I"** : when able
18 and in my own way and	**18** **Ability "I"** : my way
19 no one is talking at me all the time.	**19** **Affective "me"**: what suits me.

C10 **Paul** (Theorist/Reflector).

Paul opens up a new theme of importance for him - being able to visually represent information. However he postulates that some learning is only feasible through practical experience, such as learning to sail. As soon as he learned to sail, he wrote a short booklet on his experience. His range of expressions is wider than previous speakers – using cognitive, affective, action-oriented, ability and achievement statements. His sentiment that the best way to learn is to teach met with approving noises and laughter from the group. Six out of the ten participants are part of the volunteer project in the SSI offering introductory one-to-one sessions to computer novices. His comments had resonance for them as IT coaches.

Motifs: *Visual learning* and *Learning by teaching*

C10-1	**Coding**
1 I've always been very conscious	**1** **Cog. "I"**
2 of wanting some	**2** **Affective "I"**: want
3 visual explanation of what's happening.	**3** Cog. : visual
4 Some of the best draughtsmen were joiners.	**4** Cog. Claim
5 I've always wanted to	**5** **Affective "I"**
6 either draw down or……	**6** **Action "I"** : draw
7 if I get an instruction on how to go somewhere	**7** **Cog. "I"** : directions
8 I can normally draw a map	**8** **Ability "I"**: draw
9 without writing down everything that's said	**9** **Achieve "I"**: no words
10 and I always think visually.	**10** **Cog. "I"** : visual
11 However – practical subjects –	**11** Subjects
12 you can't just do on paper.	**12** Constraint "you" : paper
13 When I was taught to sail –	**13** **Achieve "I"**: sailing
14 as well as needing the theory	**14** **Constraint "I"** : theory
15 of where the wind was and the boat pointing…	**15** Cog. Statement: navigation theory
16 And soon after I had learned to sail	**16** **Achieve "I"** : sailing
17 I wrote a 'nine-page wonder'	**17** **Achieve "I"** : writing
18 on 'How to sail a dinghy'.	**18** Booklet
19 I found and now I'm finding	**19** **Cog. "I"** : **x2** emphasis
20 one of the best ways to learn is	**20** Cog. claim
21 to try and teach it.	**21** **Action "I"** **:** teach it

C7 Aiden (Reflector/Pragmatist/Theorist/Activist)

Aiden draws on contributions from Katherine and Angela and refers to 'block' teaching meaning a 'block' of learning delivered in lecture format. He indicates that he likes this but agrees that the experience is subject to concentration 'drift'. This is somewhat contradictory but he goes on to indicate that he really prefers visuals and practical aspects to be included.
He concludes by commenting on the good coverage of the topic in our discussion by the group and to the valuable points people have made. Possibly he thinks things have been fully covered and there is not much more to add. Alternatively he could be helping to build social cohesion in this group of fellow Computer Club members.

Motif: *Chalk & Talk*.

C7-1	**Coding**
1 I think	**1 Cog. "I"**
2 the 'block' teaching,	**2** Method : 'block' of lecturing
3 as Katherine said –	**3** Convergence
4 the chalk and teaching method is very good.	**4** Cog Claim: **'**Chalk and Talk'
5 Certainly you need that chalk & board method	**5** Cog Claim: need
6 I find with the 'block' teaching	**6 Cog. "I"**
7 as Angela said,	**7** Convergence _____
8 you drift off more,	**8** Constraint statement: drift
9 whereas if you are getting the visual	**9** Ability statement: visual
10 and the practical aspects	**10** Ability statement: practical
11 I find it is more conducive	**11 Cog. "I"** : conducive
12 to my way of working.	**12 Affective "me"**
13 I think	**13 Cog. "I"**
14 the topics we have covered are very good	**14** Achieve "we": group discussion
16 and everyone has put in valuable aspects.	**16** Achieve "we": group discussion

C3 Beryl (Pragmatist/Reflector)

Beryl reflects on the comments made about schooldays and relates that, through her experience of watching her grandchild develop at school, she believes children have greater learning ability compared to older adults, which causes some light-hearted comments and laughter. She declares that she has always been helped by visual aids and finds them a definite advantage now, along with suitable practical activities.

Motifs: *Schooldays* and *Active Engagement*.

C3-1	**Coding**
1 I think	**1 Cog. "I"**
2 when you are younger –	**2** State: 'younger'
3 when we were talking	**3** Reference to group discussion
4 about learning at school,	**4** Schooldays
5 it's easier for children to learn by rote	**5** Cog. Claim: method
6 because their learning ability is much greater	**6** Ability Claim: children
7 than it is – personally speaking –	**7 Cog. "I"**
8 when you come to later life.	**8** State: 'later life'
[Some indecipherable asides and light laughter from the group]	
9 I think of my granddaughter and	**9 Cog. "I"** : Narrative
10 what she can take in at school –	**10** Schooling
11 it's amazing really.	**11** Affective Claim : (I am amazed)
12 You forget how much they have to learn.	**12** Cog. Claim: School learning
13 I think, in a way,	**13 Cog. "I"**

14 I have always required	**14** **Constraint "I"** :
15 or it has always helped me	**15** **Ability "I"** : helped
16 to have a visual aid as a support,	**16** Ability Statement: visual aids
17 especially now,	**17** Learning in later life
18 if people are talking	**18** Talking teacher
19 visual aids for me are definitely an advantage.	**19** Cognitive claim: visual aids
20 And, as Paul said,	**20** Convergence Paul
21 doing it practically afterwards if it's appropriate.	**21** Action statement: practical activities

C16 Eddy (Reflector/Pragmatist/Theorist/Activist)

Eddy states his agreement with the previous reflections on early learning and adds that, at school, pupils have no choice but to accept the methods. He expresses his preference for small groups as he experienced this in the forces and liked the resulting interaction. He also agrees that teaching someone else is the best way to learn as it pinpoints gaps in one's own knowledge.

Motifs: *Small Groups* and *Learning by Teaching*.

C16-1	**Coding**
1 I think I agree with most of what has been said	**1** **Cog. "I"** :
2 about early learning.	**2** State: 'early learning'
3 You really have no option anyhow –	**3** Constraint: no options
4 you are there and you are going to learn.	**4** Constraint: Empty vessel
5 What I have found	**5** **Cog. "I"**
6 as life has progressed	**6** Life course experience
7 I prefer smaller groups,	**7** **Affective "I"**: preference
8 almost one to one type teaching because,	**8** Method: one-to-one teaching
9 I find you can react very much more quickly.	**9** **Cog. "I"** : Claim: quicker reactions
10 There are very few of us	**10** State: 'us'
11 could stand up in front of 100 people	**11** Constraint:
12 at the age of 18 and 19	**12** State: 'young adults'
13 and say anything	**13** Action statement
14 but we are more likely to say it	**14** Ability "we" : speak
15 in a one to one or a small group.	**15** Method: small group
[VB: What would you classify as a small group?]	
16 Something like about 6 -10.	**16** Method: small group
17 I've had a fair amount of experience of that in the forces	**17** State: Life course experience
18 where that was the size of teaching [groups].	**18** Group size
19 I also agree	**19** **Cog. "I"**: Convergence
20 with what has been said about the best way	**20** Cog. Claim: best way
21 to really learn is to try to teach the subject.	**21** Action statement **:** teach it
22 Once you try to teach it	**22** **Action "you"** : teach
23 you find your failings very, very quickly.	**23** Constraint "you" : failings
24 You are asked questions	**24** Interactive - questions
25 and you cannot answer them.	**25** Constraint "you" : no answers
26 Therefore you have to go back to the book.	**26** Action "you" : search

C13 Laura (Reflector/Pragmatist/Theorist/Activist)

Learning is something Laura has always enjoyed and she endorses the opportunities afforded by the LLL programmes with its choices and stress-free learning. Her enabling language, using a mix of ability, achieve and affective statements, highlights her positivity towards the programme.

Motif: *Later Life*

Text C13-1	**Coding**
1 When I was younger	**1 State "I":** 'pupil'
2 I've always enjoyed learning.	**2 Affective "I"**: enjoyed
3 The benefit of getting older is	**3** Ability statement : benefit
4 that you can choose what to learn.	**4** Ability "you" : choice
5 I think I was probably ambitious	**5 Achieve "I"**: ambitious
6 when I was younger and	**6 State:** 'younger'
7 I enjoyed doing well.	**7 Affective "I"**: success
8 I must admit now	**8 Cog. "I"** ; now
9 that I think this over-50s	**9 Cog. "I"** : over 50s
10 is a great opportunity for everyone to choose	**10 Cog. Claim**: opportunity
11 what they want	**11** Affective statement: learning
12 and enlarge on it	**12** Achieve statement: enlarge
13 without having the stress of exams	**13** Ability statement : no stress
14 and the rest of it.	**14** No study pressures

C17 Joyce (Reflector/Pragmatist/)

The contribution of the last member in this group of 10 is brief. I have not included her end comments on her lack of promotion because she moved positions at work. She states that she likes a tutor to have a sense of humour and refers to the work-based learning she did regularly as she voluntarily moved jobs within her company.

Motif: *Variety*

C17-1	**Coding**
1 I find if I want to learn	**1 Affective "I"**: want
2 I need someone with a sense of humour	**2 Constraint "I"** : tutor type
3 But I like variety.	**3 Affective "I"**: variety
4 I can't stick with anything for too long.	**4 Constraint "I"** : variety
5 I worked in the same place	**5** State: same work place
6 but I did different jobs every 2 or 3 years	**6 Achieve "I"**: changed jobs
7 I was always learning something new.	**7 Achieve "I"**: always learning.

Group M

M12 Gordon (Reflector/Theorist/Pragmatist)

Gordon's opening contribution is short and to the point and he states he has no conception of having had a learning style. Rote learning is mentioned as the way he has 'lodged' things in his mind. He cites some memory techniques he is aware of but has not really pursued.

Motif: *Memorising*

M12-1	Coding
1 The answer for me is no.	**1** Cog. "me" : unaware
2 Learning for me tended to be	**2** Cog. "me" : learning
3 a rote learning sort of thing.	**3** Ability : rote
4 Just trying to lodge things in your mind	**4** Action "you" : lodge in mind
5 by memorising	**5** Ability : memorising
6 rather than any sort of linkage	**6** Not used : linking
7 or use of imagination	**7** Not used : imagination
8 I expect so.	**8** Cog. "I" : expectation
9 One thing I had heard of was using linking	**9** Cog. "I" : heard about
10 to try and remember people's names	**10** Ability: name remembering
11 but I had not broadened that in any way.	**11** Constraint "I" : not broadeded

M15 Andy (No LS profile)

Like the previous speaker, Andy had no learning style awareness and he also had not done the LSQ. Andy's reference point is his memory of exams and his strategy of memorising information. This had more to do with repeating back facts to pass exams, than understanding. This may be evidence that Andy endorsed surface-level rather than deep-level strategies but it may have been the case that this was all that was required at that time (engineering training) with little emphasis on the synthesis of ideas or analysis of information. He referred to his style as 'crisis learning' and uses a range of cognitive, action, and constraint statements.

Metaphor: *Crisis learning*

M15-1	Coding
1 I wasn't aware of any particular preferred way of learning.	**1** Cog. "I" : unaware
2 I knew the most effective way of learning.	**2** Cog. "I" : effective way
3 It was called crisis learning the day before the exam. (Laughter)	**3** Action: 'crisis learning'
4 I may have done better if I had taken more time.	**4** Constraint "I" : more time
[VB: Did you have a style or a strategy for learning fast?]	
5 Yes, I tended to write myself very short notes	**5** Action "I" : short notes
6 which I could visualise within an examination situation.	**6** Ability "I" : visualisation
7 As soon as I went into the exam	**7** Action "I" : examination
8 I would write down these brief notes	**8** Action "I" : write down
9 because again I was not confident of remembering them.	**9** Constraint "I" : uncertain
10 It was not necessarily a preference – it was a strategy.	**10** Cog. "I" : strategy

M9 Kim (Activist)

The immediate reference to her LS was not surprising as Kim produced very low scores on the other three LS dimensions and this had left an impression. She agreed the activist profile was accurate but was surprised the others were so weak and had made a comment on the post-LSQ about her 'shortcomings'. She addresses the issues of LS awareness through the narrative of failing an important exam. Her strategy of writing out lecture notes may have helped her pass the exam but so also would the additional attention given to ensuring the critical material was understood. Although the dynamic interaction between emotion, cognition and memory may have been known intuitively at the time of Kim's training it is only recently that neuroscience has been able to show the neural pathways of the brain that make this explicit.

Motif: *Learning Strategies*

M9-1	**Coding**
1 I don't think my LS used to be as strong.	**1 Cog. "I"** : appraisal
2 I used to prepare for exams the way A___ said	**2 Action "I"** : prepare
3 Except the very first time I went to college	**3 State:** college student: **Narrative**
4 one subject I actually failed and had to resit	**4 Action "I"** : resit
5 and I was really worried about it.	**5 Affective "I":** worried
6 The lecturer said to me –	**6** Narrative
7 'Go home and rewrite all your notes.	**7** Action statement: (Dialogic) rewrite
8 When you do that read from the beginning.'	**8** Action statement: (Dialogic) read
9 And that particular subject I remember more	**9 Cog. "I"** : remember
10 than I did with all the short-term things, but	**10 Constraint "I"** : Short-term
11 I had not realised the power of writing down	**11 Cog. "I"** : writing
12 I think the way I learn now is purely practical	**12 Cog. "I"** : practical learning
13 because I find it very difficult –	**13 Constraint "I"** : difficult
14 – languages for example.	**14** Language learning
15 I think I learn better from a tape	**15 Cog. "I"** : listening
16 than reading a book.	**16 Constraint "I"** :reading

M4 Muriel (Reflector/Theorist, Pragmatist)

An articulate explanation of the development of her learning styles profile in her working life characterises Muriel's unique contribution as no one else had completed a LSQ before. Her profile gave strong but not 'very strong' readings on each of the above categories. She has a clear sense that her styles changed as work made different demands on her. After being retired for three months she was surprised that her profile had lost its 'very strong' characteristics. As a consequence of this detailed exposition on Learning Styles Muriel's contribution ranges over the full spectrum of cognitive-achieve, ability-constraint, state-action and affective lexicon.

Motif: *Learning Styles*

Metaphor: grovelling,

M4-1	**Coding**
1 Because of my work I've been aware that	**1 Cog. "I"** : aware
2 there are such things as learning styles	**2** learning styles
3 I was quite interested because	**3 Cog. "I"**
4 when I was at college	**4 State**: student
5 I discovered that	**5 Cog. "I"**
6 I had never really worked at school	**6 Constraint "I"** : never worked
7 because I didn't see the point.	**7 Constraint "I"** : no point
8 But suddenly I wanted that certificate	**8 Affective "I":**

9 - I needed to do something	**9 Constraint "I"** : need to do
10 And I find it fascinating that nobody told me	**10 Affective "I"**: fascinating
11 but I discovered that drawings …	**11 Cog. "I"**: drawing
12 I used to very often reduce the material	**12 Cog. "I"**: reduction
13 into the petals of a flower - bright blue.	**13** Concept mapping
[VB: You were not taught that?]	
14 No. Isn't that interesting!	**14** Affective statement
15 Human beings can come up with their own answer.	**15** Cog. Claim: human beings
16 I had to pass the exam	**16 Constraint "I"** : pass
17 and in these days it was rote learning.	**17** Method: rote
18 I had to use the visual and	**18 Action "I"**: visual
19 I suppose I've always been a practical person.	**19 Ability "I"** : practical
20 The pragmatist in me has always been very strong.	**20 Ability "I"** : pragmatist
21 It's interesting – because of my job	**21 Cog. "I"**
22 I have done the LSQ a number of times	**22 Cog. "I"** : LSQ
23 and I'm fascinated by this result	**23 Affective "I"**: fascinated
24 because generally I can make the connection	**24 Cog. "I"** : connect
25 between what I am doing and	**25 Action "I"**:
26 who I am and the results.	**26 Affective "I"**:
27 And when I did it first many years ago	**27 Cog. "I"** : LSQ
28 I was a very strong pragmatist	**28 Ability "I"** : strong pragmatist
29 – the rest were away down here.	**29** Constraint statement : others very low
30 I started off in education	**30 State "I"**: at start
31 with theorist grovelling down at the bottom.	**31 Constraint "I"** : low theorist
32 And as I went through my career it changed.	**32** State statement: change
33 The last time I was a most strong reflector	**33 Ability "I"** : strong reflector
34 which in a way in curious for a pragmatist	**34 Affective "I"**: curious
35 because I feel that is predominantly me.	**35 Affective "I"**: feel a pragmatist
36 But I had over the previous two years been doing a lot of developmental work	**36 Achieve "I"** : development work
37 and a huge amount of reading to do	**37 Achieve "I"** : much reading
38 that so it made sense.	**38** Cog. Claim: sense
39 This time to be honest it does not make a lot of sense.	**39** Cog. Claim: no sense
40 I'm not working, have not done for 3 months,	**40 State "I"**: not working
41 and that obviously has made a difference.	**41** Cog. Claim: difference
42 Why or how I have no idea.	**42 Cog. "I"** : no idea

M10 Chrissie (Activist/Reflector/Theorist/ Pragmatist)

This respondent had not had any assessment of LS before but she had a lay person's understanding of being a strong *'critical reflector'* confirmed by feedback from her family. She suggested that it was because she had not gone on to further education that she had never completed a LSQ. This line of thinking is likely to be a consequence of following on from Muriel who gave such a detailed account of her LS development, perhaps leaving an impression that it was the norm in higher education. Chrissie indicates that completing the LSQ had been a useful exercise for her helping her to expand her perception of her capacities, as not only a reflector but also a pragmatist, an activist and, especially, a theorist. Her contribution is peppered with cognitive statements which ties in with being a thoughtful reflective person. She also spoke to me afterwards about how useful if would have been earlier in her life to have completed a LSQ and have had the tools to think in broader terms about her ways of learning.

Motif: *Learning Styles*

M10-1	Coding
1 I think	**1 Cog. "I"**
2 I have always been fairly aware of my LS.	**2 Cog. "I"** aware
3 I am quite a critical reflector, I would say.	**3 Ability "I"** : critical reflector
4 I know I drive my family mad.	**4 Cog. "I"** : claim
5 I probably reflect too much.	**5 Cog. "I"** :mild claim
[VB Have you been aware of this right through your life?]	
6 Yes, yes. Interestingly I left school very early	**6 State "I"**: early school leaver
7 so I did not go on to further education	**7 Constraint "I"** :
8 so I am not really sure what my LS would be.	**8 Cog. "I"** :
9 So I am quite interested to see how my scores	**9 Cog. "I"** :
10 are very even – that surprised me.	**10 State** : even scores
11 That I'm a bit of a theorist	**12 Ability "I"** : theorist
12 surprised me	**12 Affective "me"**: surprised
13 I thought I was just a reflector.	**13 Ability "I"**: reflector
14 I can't take things on face value –	**14 Cog. "I"** : claim
15 I like to go away and	**15 Affective "I"**:
16 think about them,	**16 Cog. "I"**
17 go back, look at the notes critically analyse.	**17 Cog. "I"**: analyse
18 I found this test very interesting –	**18 Cog. "I"** : test interesting
19 I've never done anything like this before.	**19 Action "I"**: LSQ – new thing

M16 Maureen (No LSQ)

This respondent had completed an Open University course earlier in her life and said the exams made her think in a "more positive" way. This is counter intuitive as most people find exams a formidable hurdle. I did not question this but conjecture that having to "write down" answers focuses the mind and meant she got more from the course. She contrasts the limited number of OU tutorials with face-to-face teaching which is now her preference and distinguishes between learning for learning's sake and for the enjoyment of being in a class where one can share ideas and contribute (as in an OU tutorial).

Motif: *Face-to-face*

Text M16-1	Coding
1 I like face-to-face learning.	**1 Affective "I"**: face to face
2 One thing about doing any exams,	**2** Ability statement: doing exams
3 it makes you think in a more positive way	**3 Cog. "I"**: positive way
4 because you have got to write down.	**4** Cog "you": write down
5 But now that I am older	**5** State: older
6 I do the classes for pleasure	**6 Affective "I"** : pleasure
7 as well as for learning.	**7 Cog "I"** : learning
8 I like it face-to-face.	**8 Affective "I"**: face to face
9 I think I'm more reflective about	**9 Cog "I"** : more reflexive
10 what I take in when face-to-face	**10 Ability "I"**: take in
11 with a tutor giving information.	**11** Tutor-led class
12 I grasp things better.	**12 Achieve "I"**: grasp things
13 What I missed (in the OU) was	**13 Constraint "I"** : missed
14 one did not get many tutorials.	**14** State : few tutorials
15 I like those	**15 Affective "I"**:
16 because you could share ideas	**16** Ability "you": share ideas
17 and contribute in some way.	**17** Ability "you": contribute

Group S

S3 Molly (Reflector/Theorist)

Molly has to learn to do certain practical things since the death of her husband and talks about being on a "steep learning curve". She indicates that the rote learning of her earlier years has been abandoned gradually with recourse now to trial and error learning. She uses a number of state-action and constraint I-predicates interspersed with the cognitive.

Motif: *Trial and Error*

Metaphor: steep learning curve

S3-1	**Coding**
1 When I was a teenager	**1 State "I"**: teenager
2 I was very prone to try	**2 Ability "I"** :
3 and learn by rote.	**3 Cog. "I"** : rote
4 I've dropped that to a great extent over the years.	**4 Action "I"** : dropped
5 I wonder	**5 Cog. "I"**
6 - trial and error is the way I learn.	**6 Action "I"** : trial and error
[**7** It's more to do with things I am having to learn	**7 Constraint "I"** : having to learn
8 because I am on a steep learning curve	**8 Cog. "I"** : steep
9 since my husband died.	**9 State "I"**: widowed
10 He always did DIY - the physical things	**10** Division of roles
11 and now I am having to	**11 Constraint "I"** :
12 'poke' my head in (laughing) under the bonnet	**12 Action "I"** : car inspections
13 and try to figure out	**13 Cog. "I"**
14 what it is that needs to be done.	**14 Cog. "I"** : car repairs
15 So it is not rote learning any more.	**15 Action "I"** : not rote

S1 Claire (Activist)

The second contributor states explicitly that she is a 'slightly insecure' learner and that is particularly why discussion appeals to her so strongly. She talks in terms of trying to be more successful but not always achieving this. She feels she needs reassurance that she is making the right decisions.

Motif: *Discussion*

S1-1	**Coding**
1 I find that when I try to learn	**1 Cog. "I"**
2 I like to either discuss it with somebody	**2 Affective "I"**: discuss
3 or read up about it - just to get the facts.	**3 Cog. "I"** : read the 'facts'
4 That is my main way of learning -	**4 Cog "me"** : my way
5 I love discussing things.	**5 Affective "I"**: discuss
6 Sometimes I have a bit of doubt,	**6 Constraint "I"** : doubt
7 so I like to have a bit of a discussion.	**7 Action "I"** : discussion
8 I think, like M___, you learn by experience.	**8 Action "I"** : experience
9 I try to be more successful	**9 Achieve "I"** : trying
10 than I was in the past but not always.	**10 Constraint "I"** ; not always
11 I probably feel that that is my best way.	**11 Affective "I"**: mild claim
12 I think probably in fact I feel slightly insecure.	**12 Constraint "I"** : slightly insecure
13 'Yeah, that's right, that's right – go ahead'.	**13** Dialogic affective comment.
14 I like that reassurance.	**14 Affective "I"**: reassurance

S9 Diana (Reflector)

This respondent tells a complex story, different in texture from the previous two speakers. She elaborates on her learning history starting with her Montessori background (self-directed learning activity in primary school), through secondary education and higher education to her development as a lecturer. Some of the detail is omitted in the table. The key message is that she stopped using straight lecturing and began included interactive discussion and feedback. Later in the discussion she elaborates on how stimulating this was with young students who often said provocative things to keep the discussion going and how memorable some of these sessions were.
She also mentions her exploration of mind-mapping and the accelerated learning method. It is interesting that she uses no I-achievement predicates. This may have been sensitivity towards other less academic members or a natural modesty, preferring ability statements like *'I find that helps'*.

Motif: *Dialogue*

S9-1	Coding
1 I went to a Montessori school.	**1 State: "I"** : Montessori pupil
2 I learned to do a lot of touching, feeling,	**2 Action "I"** : touching, feeling
3 making connections with different shapes.	**3 Action "I"** : connections
4 and project work, long before they were doing	**4 Action "I"** : projects
5 very much project work in education.	**5** Scottish education
6 In secondary it was moving into listening	**6 State: "I"** : listening
7 and University the same,	**7 State: "I"** : listening
8 although I liked hearing visionary lecturers.	**8 Affective "I"**: visionaries
9 In later years I was convinced that	**9 Cog. "I"** : convinced
10 lecturing was not the way,	**10** Constraint statement : not the way
11 although I began myself as a lecturer	**11 State: "I"** : lecturer
12 at teacher training college.	**12** at college
13 I switched after about three years	**13 Cog. "I"** : switch
14 into short lecture, discussion, lots of feedback	**14 Action "I"** : new method
15 so that it was much more interactive.	**15** Action statement :
16 So I have always been keen on	**16 Affective "I"**: keen
17 immediacy and interactive things.	**17** Interactive methods
18 But I also find more and more in later life	**18 Cog. "I"** : Later life
19 that I reflect a lot on	**19 Cog. "I"** : Reflect
20 what I am learning.	**20** Cog. statement : learning
21 I'll sit down and I'll say OK -	**21 Action "I"** : say
22 – I've been reading X and Y –	**22 Cog. "I"** : read
23 'What am I getting from that?'	**23** Dialogic cog. question
24 I feel in the past.	**24 Affective "I"**: in the past
25 I never did enough of that.	**25 Constraint "I"** : lack of reflection
26 I read masses of things,	**26 Cog. "I"** : read masses
27 I did lots of things and somehow	**27 Action "I"** : did lots
28 it was only when people talked to me	**28** Action "people": talking
29 that I realised what I had been doing.	**29 Cog. "I"** : realisation
30 (Also) I have had to learn two languages,	**30 Constraint "I"** : had to learn
31 and I found that very difficult	**31 Constraint "I"** : difficult
32 so I have used accelerated learning	**32 Cog. "I"** : accelerated learning
33 and looked into some of the research	**33 Cog. "I"** : researched
34 doing actions, visual things, drawing pictures,	**34** Action statement
35 sticking bits of paper on the settee and so on.	**35** Action statement
36 It is not my natural way of doing it	**36 Constraint "I"** : not natural
37 but I find that helpful.	**37 Ability "I"** : helpful
38 I also use a lot of mindmaps.	**38 Action "I"** : mindmaps
39 I draw pictures and do snakes coming out.	**39 Action "I"** : pictures
40 I find that helps.	**40 Ability "I"** : helpful
41 I like that.	**41 Affective "I"**: like

S3 Molly (Reflector/Theorist)

Molly recalls the experience of being in a class of 50 which made rote teaching the only option for a teacher expected to try and educate that number.

S3-2	**Coding**
1 So different from the ordinary school.	**1** State statement : (**SD**)
2 I was brought up in a school	**2** **State "I"** : brought up
3 where the class all recited the times table.	**3** Rote method (**LD**)
4 It was almost mandatory and	**4** State statement : mandatory
5 very much the style in Scottish schools.	**5** State statement : method rote
6 The teacher had about 50 in the class.	**6** State statement : large classes (**LD**)

S4 Rowena (Activist-Theorist)

Rowena's first short sentence is a constraint statement which is unusual. It may be that she feels overwhelmed following on from Diana's exposition of her learning experiences and the need to lay out her own position - books are not for her but films compensate. She later describes how she learned to be a nurse by observation and memorisation of procedures rather than reading. She was interested in crystal reading and also revealed that, as a child, she perceived her older sister as the 'clever' one, who was given privileged access to books. This has left her with a feeling of being undervalued and may have made her more sensitive than many to feelings of inadequacy. This may also be one of the reasons her conversation diverts to her personal interest in people's emotional needs. She appears to fit her activist profile as a busy person happiest doing things and learning by doing with a strong connection to people in distress. This would make her disposition ideal for a ward nurse. This is perhaps a good example of discourse analysis providing, what Gee suggests is "deeper and more humane interpretations" (Gee, 2005, p. xi).

Motif: *A people person*

S4-1	**Coding**
1 I am not a reader.	**1** **Constraint"I"** : not a reader
2 The way I read a book every week	**2** **Ability "I"** : 'my way to read a book'
3 is to go to the cinema.	**3** **Action "I"** : cinema going
4 If I see a film - that's my story.	**4** **Ability "I"** : seeing
5 I'm more visual than anything.	**5** **State "I"** : visual
6 I love studying people more than anything.	**6** **Affective "I"**: people watching
[When you did your nursing did you not have a certain amount of theory though?]	
7 There was a lot of theory.	**7** State statement : theory
8 But that was fine. I'm OK doing things	**8** **Action "I"** : doing
9 - just by copying other folk doing it.	**9** **Action "I"** : copying
10 I would memorise it.	**10** **Cog. "I"** :memorise
11 When you were doing your compositions	**11** Action "you" : compositions
12 I'd remember so-and-so had done that	**12** **Cog. "I"** :remember
13 I did not really read much - no.	**13** **Constraint "I"** : read
14 If I was handed a piece of paper	**14** Reading task
15 I'd say**, '**I'll do that later'.	**15** Dialogic **Constraint "I"**
16 Plus I have a lot of common sense. No brains….	**16** **Ability "I"**: common sense.

Because of a number of diversions Group S transcriptions cover less ground in 10 minutes. However, with only four in this group, each person's contribution is covered and they contain different ideas.

Appendix 24 Focus Group C: Script

C1_Martin, C3_Beryl, C7_Aiden, C10_Paul, C12_Angela, C13_Laura, C14_Katherine, C15_Jonathan, C16_Eddy, C17_Joyce.

Q1 How aware have you been of preferring certain ways of learning over others?

C15_Jonathan : Initially it is very much a childhood thing. You sat there and the teacher put out the material without any interaction on your part. Then, later on in life you realise that was not the best way for you. Personally, I find doing examples and interactive with the teacher or tutor is better than just sitting there and listening to the tutor. That was my experience.

C1_Martin :My experience of academic education was very much tutor to large class (around 100 at university) very formal and very one-way traffic. Since I have retired, moving on to doing, learning by doing, rather than learning by rote, certainly has become much more attractive to me. Still from the Q it seems to suggest I still revert to my childhood. (Laughs) (Comment from group member 'Your second childhood'!)

C14_Katherine: I have certainly been well aware over a long life – and I've been tackling learning in different areas one way and another – just the way things panned out. We all started off with the chalk and talk and sit up straight and one thing and another. Then, of course, I came to the actual teaching bit as well. Obviously, I was much interested in learning how people were going to assimilate anything I was giving them. It is certainly developing and is still developing, I may say. I find that the old chalk and talk really had its merits, you know, because an awful lot of stuff was dinned into you – and is still there. Whereas if you are learning practically – I found anyway – unless you are going to be using it regularly, it fades. It's probably in their somewhere but it's not so easy to recall if you have not done it for a couple of years.

C12_Angela : I agree with Katherine because the stuff you got at the beginning you had to have that to assimilate it but once, as Martin said, you were sitting in a large group of people, and you were being lectured to, you tended to drift off, at least I did, because you thought – I disagree what he said there but I can't say. I wasn't bold enough to stand up. I'm learning more now but at my leisure and in my own way and no one is talking at me the whole time. (Laughter)

C10_Paul :I've always been conscious of wanting some visual explanation of what's happening. Some of the best draughtsmen were joiners. I've always wanted to draw down or…… If I get an instruction on how to go somewhere I can normally draw a map without writing down everything that's said and I always think visually. Whereas, my wife is the opposite. She wants it all verbally. However, practical subjects, you can't just do on paper. When I was taught to sail that was obviously a very practical thing as well as needing the theory of where the wind was and where the boat was pointing and so on. And soon after I learned to sail I wrote a nine-page wonder on how to sail a dinghy and I found that one of the best way to learn is to try and teach it.

C7_Aiden : I think the block method …..I find the chalk and teaching method is very good. Certainly you need that chalk and talk bit. With the block teaching you drift off more, whereas if you are getting the visual and the practical aspects I find it is more conducive to my way of working. I think everyone has put in the valuable aspects of it.

C3_Beryl : I think when you are younger – learning at school – it's easier for children to learn by rote because their learning ability is much greater than – personally speaking – when you come to later life. I think of my granddaughter and what she can take in at school – it's amazing really. You forget how much they have to learn. I think in a way I have always required or it has always helped me to have a visual aid as a support, especially now, if people are talking visual aids are definitely an advantage. And as Peter said, doing it practically afterwards if it is appropriate.

VB: All the modern research says that is a good way of learning.

C16_Eddy : I think I agree with most of what has been said about early learning. You really have no option anyhow – you are there and you are going to learn. What I have found as life has progressed is that I prefer smaller groups, almost one to one type teaching because I, I find you can react very much more quickly in a small group. There are very few of us could stand up in front of 100 people at the age of 18 and 19 and say anything but we are more likely to say it in a one to one or a small group.

VB: What would you classify as a small group?

C16_Eddy : Something like about 6-10. I've had a fair amount of experience of that in the forces where that was the size of teaching on specific subjects. I also agreed with what has been said about the best way to really learn is to try to teach the subject.

You when you try to teach it you find your failings very quickly. You are asked questions that you cannot answer. Therefore you have to go back to page 2 of the book.

VB: That's why those of you who are buddies have probably improved your skills quite a lot finding things out as people ask awkward questions.

Voice from group (Peter) - Is that why teachers always look miserable? (Laughter)

C13_Laura : When I was younger I always enjoyed learning. The benefit of getting older is that you can choose what to learn. I think I was also ambitious when I was younger and I enjoyed doing well. I have to admit now that I think this over 50s is a great opportunity for everyone to choose what they want and enlarge on it without having the stress of exams and the rest of it.8.41

VB: Yet some people still feel coming to University is something they don't want to do. I think maybe because they don't know how pleasant it can be, rather than stressful.

C17_Joyce :I find if I want to learn I need someone with a sense of humour. But I like variety. I can't stick with anything for too long.

VB: Do you mean the subject or the pace?

C17_Joyce: I worked in the same place but I did different jobs every 2 or 3 years.

Q2. How have the ways you like to learn changed over time?

C12_Angela: Teaching has changed over the years.

VB: It's not so much about teaching but the way you like to learn. I think you may have answered that in the first question.

C14_Katherine: I think it is more than the way you like to learn – it's the way you find works which is usually something you like to do anyway.10.38

VB: Yes, that's true – motivation.

C10_Paul :I've always been lazy about reading but when I really need to find something out – yes, I'll get my head into a book and read it – say a car manual because I want to do something dramatic to my car I will read the manual very, very carefully, twice or three times and then go and do it. I'm lazy about reading it for the sake of it.

C1_Martin :I think it is the case that you have more choice in what you do when you get older in what you do and it comes down to motivation. At school and University you have got a course and hopefully you enjoy it but sometimes you don't but you follow it and get to the end. Now the world's your oyster. You can choose whatever you want to do in whatever order you want to do it and at this stage it is much less structured or can be much less structured and more individually suited. If it was me I would just stop doing it and find something more enjoyable to do (laughs). I think this is the big difference in what was during a career when you had to go on courses all career-orientated – maybe ambition as well drives that – now it is intrinsic - what I am motivated to do is what I enjoy doing.

VB: Yes, taking pleasure.

C14_Katherine: It is the difference between when you are younger there are two ways… I mean, if you have to learn something to pass an exam or for whatever reason it's either something you want to know or something you need to know. Maybe you need to know to get a certificate and then you are finished with it. I think that is a big factor. We don't have that now we are older - we can choose what we like to learn – there is nothing we need to know really in that sense. So we can know concentrate on things we like to know.

VB: Do you not think there are still some things we need to know? For example, if you want to use modern banking systems you need to learn to use certain things. So there are certain pressures in a way to learn.

C14_Katherine :The same applies also to the Buddy thing. People come along because they want to find out about it the they find out there are bits of it they need to know about before they can get on to something else.

VB: I think the Buddy scheme is a good example of people not really sometimes wanting to get in there but knowing they need they really need to get in there and make this leap.

C12_Angela: It's because of their families, so they are able to communicate with some of their family. The children nowadays are so hyped up about computers. They come in and say they have done such and such. And you think - I've never tried that. You've got to keep going with them.

VB: If people get shut out then there is a world closed to them that they could be enjoying.

C13_Laura: Do you not think there should be some structure to your learning rather than just ad libbing, so to speak?

VB: People learn in different ways. If you are a very strong activist then you will probably just get on and start doing it and learn by making mistakes whereas someone else might want to come to a course and feel they need the structure. There are different ways of approaching things.

C10_Paul : How many people have read cover to cover the instructions for their computer. Do you really read all that?

C1_Martin : Do you really understand it? Laughter and comments.

C10_Paul : Do you read the instructions for your car? (General babble)

C14_Katherine : Back to computers which is a better example. I just look up the bit I want to know. If it is how to retrieve messages, I read that.

VB: And do it.

C14_Katherine And do it. How to key in a number. I just read that bit – and do it. Alternatively give it to one of my grandchildren.

C10_Paul: Suddenly appears on the screen a flashing envelope. Do you know what to do? It's a bit…..

C14_Katherine: No, but I could look up the book.

C10_Paul: But you might not be carrying the book with you. (Various overlapping comments.)

Q3. What different styles of teaching have you experienced over the past 10 years?

C15_Jonathan: I certainly experienced the tutor-led teaching which can be excellent for 20/30% of the class but always some fall behind while the tutor seems to have this course set that they have got to do this, got to do that. That's fine – they have got to get on with it but then you fall behind if you are not in that percentage that is not keeping up. Another method of learning which I have experienced - here you go into a class – a computer class – and they give you the manual or a book and the first few pages explain the topic and then the next few pages ask you to do examples and you work at your own rate. Then again all the class moves at different levels - not tutor-led but tutor er…

VB: Moderated?

C15_Jonathan: Yes, moderated.

VB: So the tutor is floating about.

C15_Jonathan: Yes, floating around and I find that is very good. 16.44

C10_Paul: I agree completely. I did a computer course like that and I found it much better than other courses I have done since where I am trying to keep up and you miss something.

C15_Jonathan: I think the difference is in the first method the tutor has to have everyone moving at the same rate and that's impossible. So you have to move at the speed of the slowest. If you move at the speed of the slowest then the other ones get bored and fed-up. So I think this business of giving you information you can read through, you can do the examples, and you can call on help if you get stuck, seems to work very well.

VB: Do you think we should be introducing that here?

C15_Jonathan: I have experienced it here. But there is one difficulty which you have to get over – that is, the material. If the material is not first class then it fails. So you have to have them material well prepared so when you are teaching you have to have a good description of it which the students has to understand and move on to do the examples.

C10_Paul: HK's materials were first class – there is not doubt about that. It told you where to switch on the computer for a start. (Laughter from group).

C1_Martin: Some subjects lend themselves better to that approach and I agree with you the material has to be first class but if you are doing, as I have done, archaeology and architecture – gothic architecture – it is helped by illustrations but in fact, most of it is talk and showing. So the best part of that course was in fact when we did the site visit which was Durham – and that was really very interesting. The course came to life seeing the actual buildings. So it can be difficult to get the practical built in to the course. But I agree the material has to be first class.

C15_Jonathan: Of course, there are always things that are not. You have to adapt methods.

VB: Do you think the architectural course would have been better if it had perhaps more video or internet related sites?

C1_Martin: Video is interesting in the sense that you can illustrate, move on and stop, and picking up Paul's point can progress at a pace. Whether you could do a course where everyone had access to their own video and proceed at their own pace – that would be an interesting development. I've never seen that tried but obviously from a tutor's point of view if the equipment is there.

Chalk and talk is cheap – the equipment is dear and it doesn't work sometimes. So there are more hazards but I think you need to keep looking at courses to see if they can be developed in new ways.

VB: There is a whole new raft of online courses coming that are using the technology in a much more interactive way where students actually dialogue with each other as part of a net meeting when they can sit at their computers and discuss what they have been learning. This discussion aspect plays a vital part. How many of you have been in a class where discussion plays a vital part in understanding the material?

C14_Katherine: A current affairs class is a fine example of that.

C13_Laura: See the language classes are slightly different in that respect. You are learning lesson by lesson as it were. There again it depends on the feedback. I prefer to have an exercise and get it corrected and discuss afterwards the mistakes other people have made. You learn quite a lot from feedback.

VB: That is one good example of the use of discussion. Any others?

C16_Eddy: When I was a part-time assistant on the courses upstairs the feedback on them was very important – ongoing feedback. Word processing for example, the pupil is feeding back to the lecturer all the time.

C10_Paul: And I would say the whole buddy programme, if you regard the buddies as learners we tend to learn an awful lot when asked a question we cannot answer. I go and seek help from him or him …I've been learning.

C14_Katherine: I learn more than other people learn from me.

VB: I think the wonderful idea up there it is like a workshop. People are not passive – they are actively seeking out the information they want at that moment in time. It is a very effective way of learning.

C10_Paul : The sad thing is the pupil theoretically gets nothing out of it. Remember the day you wanted to set up your labels. I couldn't help you but I found out because John….

C15_Jonathan: But that is part of the interactive side. Yes, yes, yes – (chorus of voices).

C12_Angela: Sometimes you are asked questions you really could not answer. One person asked a technical question about how email travelled through the telephone. And I thought I should be concentrating on how to send email not the mechanics of it.

C15_Jonathan: I think that is a good example of how different people require different explanations. Some people accept it is done like this, press these key, and others will say – why? (Background babble) 23.35

VB: That would be a theorist, you see. They want answers to why and how?

C13_Laura: I think men are better at that. (General noise and laughter). You might get more succinct explanations from a male.

VB: Women are supposed to be good talkers so that shouldn't be the case.

C15_Jonathan: I get frustrated with people who don't ask that sort of question. They say – Oh, I don't want to know. I just want to get on with doing this.

VB: They are the pragmatists. They just want to get to the bottom line. Has it got a function. Never mind how we get there – just get us there

C16_Eddy: One thing I must say about this I think we must thank you very much for getting all these people in here to teach us – the buddies.

C12_Angela: It has taught us patience.

VB: I think the buddy group has formed a community now which is great. It is not just individuals volunteering. There is a sense of community.

C13_Laura: That's another thing with lectures – It depends on the lecturer how communicative the class is. That makes a big difference. 25.09

VB: A lot also depends on how you structure a room. If you put everyone at desks where they are distanced from each other it builds barriers – especially for shy people, reflective people who don't particularly like making their voices heard. Tutors have to think about that. Let's look at another question.

Q 4 Do you tend to select activities that are the way you like to learn or do you make adjustments if the teaching style does not suit you?

C13_Laura: If you find you are not being stretched or whatever or not gaining anything from it, work at home on the subject and try and contribute to the class. This never really works awfully well though. The class never seems to join together. It is only now

and again one experiences this and I think it is the tutor's fault actually. No, not quite because sometimes you can get a class that just wants to sit back and be passive and that lends itself to a very uninteresting class.

C3_Beryl: I think the first thing to say is that it is more difficult for you to learn under those circumstances.

C10_Paul: I recall in the class teaching how to use spreadsheets. The tutor was leading the class – tutor-led rather than paper-led, and he wanted to move onto the next stage and I had to say – Hold on! I realised then that there were other people who were less vociferous but they also wanted him to receive further explanations. So the student has to shout. 27.48

VB: So you have to make your feelings known. A good point, Paul.

C3_Beryl: And I think nowadays tutors are more willing to adapt to the people they are teaching than at one time. At one time tutors were held in awe and no one dared ask a question never mind challenge them. That has gone to a great extent. That's great because it makes for a good atmosphere in the class. You are all working and learning together.

C10_Paul: Is it the tutors that have changed or have we changed as we have got older and have less respect for tutors.

VB: The view here is that you are coming and paying for lessons and you should expect the best quality teaching.

C14_Katherine: But you are also paying with your time which is not going to be repeated, so you do want to make the best use of it.

VB: It is certainly right that if tutors are not meeting your expectations you should be expressing this. I don't think it is just a matter of respect – people have different expectations now – you don't expect to be lectured to unless it specifically says so in the class description.

C7_Aiden: If I have a lot of problems I'm going to speak to the tutor - one to one - to see if he can come round to my way of learning. I would not intend to upset the whole class.

C10_Paul: When you were 10 you would probably not have stood up and said to the teacher - Hold on. I don't understand that.

C17_Joyce I find these taster sessions excellent because if you don't like it you don't go back.

C14_Katherine And if you like the style you certainly will go back for more.

VB: If you try a new subject and you feel engaged by the style, presentation and the subject then you are more prepared to take the risk with a ten week class.

C13_Laura I think we are lucky here with having such a wide variety of subjects.

VB: To get back to the point about style. Lesley, for example, found a book on the subject and did a bit of reading at home to compensate for dullness in the class. Any other ways to make the subject more accessible to yourself?

C12_Angela: You could look on the Internet. Take the Egyptology class. The guy who did it gave us websites and you could back and learn more than he could tell you in the two hours. You could go through the temples and burial chambers on a virtual tour.

C1_Martin: That's the advantage of modern technology. All that is accessible to you at home. You don't have to trot off to a library. I think that is one of the marvellous changes.

C12_Angela Say you are going to a place. You can look through the gallery – Salvador Dali museum, for example, on the Internet and know exactly which part to got to see particular pictures, so not waste time when you were there. 33.28

Q 5. Have you ever given up a class because of a clash between your preferred learning style and the teaching style?

C12_Angela: I've never given up but sometimes I've been rather bored by the end of it.

VB: I hope you recorded this in your evaluation sheet.

C15_Jonathan: This is one of the big changes that there are evaluation sheets. A few years ago if you came to a class and you didn't like it - tough luck. There was no opportunity to say anything. There is maybe another step to be taken there and that is to get the expectation of the student before you start. They may be on the wrong course or you may have to change it to suit.

C16_Eddy: On one of the courses I was on recently as an assistant the lecturer did that very thing at the start of the course. He went round each person. I thought this was extremely good because you now knew exactly what each of the 12 people were looking for. Whether we were getting the truth or not, I'm not sure because after the first two they were all different.

VB: It also raises expectations in the class – here is a tutor who is tuning in to what the students want to learn. It is not about the expert but how can to work together to achieve what you want. So you are creating a dialogue which good teaching should be about – a rapport and two-way communication.

C15_Jonathan: One way I found it useful with presentations is not only to ask expectations but use a flipchart to record what people expect and as you move through the presentation tick these things off and when you get to the end people can see that you have covered these points and there should be no surprises in the evaluations.

C13_Laura: What happens if there is an expectation that you cannot fulfil?

C15_Jonathan: That is the danger. I've fallen into that trap as well.

VB: This way of gathering information also means that the class begins to get to know each other.

C15_Jonathan: One of the disappointing things I have found as an assistant computer tutor is that we get a class of students and the tutor just goes straight into the learning without any introduction. I've tried to change that but I don't have full control at the moment but I will have shortly.

VB: This is good feedback. Maybe teachers still think too much that teaching is only delivering information and not attending to setting the right mood for good learning.

C10_Paul: I remember attending one language course where the course did not follow the syllabus promised as almost everyone had been on it the year before so they just carried on. That was not good for me as a newcomer.

Q6. How do you judge that you have learned something? How do you know you have got it?

C14_Katherine: I think if you start to build on what you have learned and it leads you to do other things, not necessary exactly what you learned. I think that would be one way.

C1_Martin: Apply what you learn naturally without giving it too much thought. And build from there and feel a sense of satisfaction and enjoyment.

C10_Paul: If you can do something that you could not do before like word processing.

C12_Angela: Scanning a picture - making it smaller, enhancing. A practical outcome.

C7_Aiden: Maybe you see something on TV and it clicks with what you have learned and you see how things move from A to B logically.

VB: It literally has transformed your knowledge. Higher level thinking where more and more brain cells are connecting. They say experts are people who have this highly developed collection of brain cells concentrated and linked together, and when there is a problem they can make new connections to find solutions. Expertise does not stop with ageing. If there is something you are good at keep working on it and it will keep getting better.

C7_Aiden: So your network is switching all the time.

C1_Martin: If you can actually teach someone else what you have learned you really have learned it. That is the full circle.

C15_Jonathan: If a student you teach has learned what you have taught them then they should be able to reproduce that knowledge.

Appendix 25 Matrix of links between neuroscience and older adults

6 components of neuroscience with links to later learning

Different Educational Audiences

	For **Older Adults** Learning in Later Life	**About** **Older Adults** The general public	**For** **Educators of older adults** Professionals
Inquiry	**Brain health:** memory types, emotions, learning and the brain, mind-body connections.	**Brain research:** cognitive, emotional and social neuroscience, lifespan development.	**Linking principles** **and substance of research:** neuroscience and psychology, lifespan development, neuroeducation for older adults.
Neuro-science in action	**Classes/ seminars/** Brain boosting, memory improvement, promoting healthy brain maintenance.	**Advocacy:** Public education about neuroscience, influencing perceptions of later life, challenging stereotypes of ageing.	**Professional development:** Programmes built on - neuroeducational principles, innovative ways of teaching & learning.

To tease out the components of educational neuroscience in later life, I have constructed a 3 x 2 matrix to depict possible elements and activities.

Across the top of the matrix are three different audiences for neuroscience:
(1) older adults interested in maintaining mental capital and wellbeing
(2) general audiences interested in brain research and maintaining cognitive health
(3) professions involved in working with older adults

On the left side of the matrix are two types of activities. The first is "Inquiry" - the emerging body of knowledge and insights about the brain and the links to what we already know and believe about the brain, behaviour and lifespan development.

The second is "Neuroscience in Action" - includes the design, delivery and evaluation of appropriate programs for the three different audiences.

Separating the study of educational neuroscience from its practical applications in the field and identifying three different audiences facilitates an analysis of six areas of possible development and will allow discussion of where neuroscience could potentially have the greatest influence.