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Learning Styles and Neuro-Linguistic Programming Representational Systems in Nurse Education.

Robert Leo Burton

A Thesis Submitted To The University Of Huddersfield In Partial Fulfillment Of The Requirements For The Degree Of Doctor Of Education (EdD)

Date Of Submission

01.09.04

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Abstract

The main aim of this study was to investigate student nurses' learning experiences. The study had two main aims:

1. To investigate the relationship between Learning Styles and Neuro-Linguistic Programming (NLP) representational systems in Pre-Registration Nurse Education.
2. To explore NLP representational systems as a means of enhancing teaching and learning in Pre-registration Nurse Education

Learning Style theory is well recognised in education, although there are some criticisms related to its validity and reliability. NLP is making a major impact on communications, learning and development in the commercial, health and sports sectors. Cognitive Psychology and the concepts of information processing and learning strategies encompass both learning style theory and NLP and is therefore utilised as a theoretical framework in this study.

The study was conducted in two parts: Firstly, a questionnaire was delivered to student nurses to ascertain their learning style and internal representational preferences. From this a correlational approach was established to highlight important relationships. Secondly, some of the students were video interviewed to determine how they structured their learning experiences internally and how this was demonstrated in their body positions.

The findings showed that Honey and Mumfords' Theorist learning style was most strongly preferred amongst this sample population. The Visual internal representational system was preferred over the Kinaesthetic and Auditory modalities. The Theorist learning style and Visual modality also showed a positive correlation, as did Activist and the Smell modality.

It is recognised that learning style preferences should be used for students to gain awareness of ways to enhance their learning, and that rich, multi-sensory learning environments should also be encouraged. In the light of the findings in this study it is suggested that the visual modality be utilised, via the use of visual tools and metaphor, and that approaches such as problem based learning (PBL) should be considered in order to benefit students of all learning style preferences.

Chapter One

Introduction

1.1 Introduction And Background To The Study

This chapter identifies the background of the study before going on to develop and explain its aims. The current context of Nurse Education is discussed and a brief introduction to the concepts of Learning Styles, Neuro-linguistic Programming and the overarching theoretical framework of cognitive psychology will be included.

The rationale for the study and the research questions are introduced and a brief introduction to the research methodology, population and sample, and ethical issues are presented.

1.2 Background To The Study

The idea of developing this particular study comes from two main interests of the author, in Learning Styles and Neuro-Linguistic Programming (NLP). Previous research into learning styles conducted by the author used Honey and Mumford's (1986) Learning Styles Questionnaire (LSQ), to ascertain the learning styles of common foundation student nurses undertaking the Diploma of Higher Education (Nursing Studies). Issues of consistency with the Honey and Mumford Learning Styles Questionnaire and the students' own perceptions of issues pertinent to their learning were evaluated (Burton, 1997).

A descriptive research approach was used, and a convenience sample of common foundation student nurses was given the Honey and Mumford Learning Styles Questionnaire (1986). Out of the 243 distributed, a response rate of 139 (57.2%) was

achieved. The preferred learning style was Reflector, followed by Activist, Pragmatist and Theorist. Demographic factors of age, gender, intake and previous educational experience were also tested against the preference, with the only significant result being that males are more likely to score higher on Activist items than females. Following this, a further sample of five students were randomly selected from those having completed the questionnaires and asked questions in a semi-structured interview pertaining to their perceptions on their personality, learning methods, problem solving skills and preferred teaching methods. The data were analysed using a content analysis approach and the results showed some consistency in their statements with their results on the learning style Questionnaire. The interview data highlighted that students found distinct differences between learning in a theoretical setting and a practical situation and much preferred the latter.

The author has since trained and qualified as a Licensed Master NLP Practitioner and Trainer. One of the main principles of NLP is consideration of ways that the learner interprets information and experiences in relation to their approaches to learning. From this, the question that particular learning style preferences might be related to the approaches learners use in interpreting and processing information internally, as proposed in NLP was considered. This study investigates some of these issues.

1.3 Aims Of The Study

The aim of this study is to investigate possible relationships between specific Learning Styles and Representational Systems (Modalities) from Neuro-Linguistic Programming (NLP), with two specific outcomes:

1. To investigate the relationship between Learning Styles and NLP representational systems in Pre-registration Nurse Education.

2. To explore NLP representational systems as a means of enhancing teaching and learning in Pre-registration Nurse Education

The first aim would demonstrate further knowledge by providing more detail of individuals' structure of their learning style preferences and ways of internally representing learning experiences. The second aim would investigate how such structures (of internal representations), within the wider field of NLP, could be used to enhance learning for student nurses. In exploring the above, the over-arching aim of this study is to increase the learning potential of students, particularly student nurses.

1.4 The Changing Context Of Nurse Education

Currently Nurse Education is going through numerous changes. The integration of pre-registration nursing in Higher Education is now firmly established and 'Project 2000', which replaced traditional nurse training approaches has now itself been replaced. Two major documents 'Making a Difference' (DOH, 1999) and 'Fitness for Practice' (UKCC, 1999), have now become the main influences on Nurse Education courses.

'Making a Difference' (DOH, 1999) proposed that it was important to develop more flexible approaches to Nurse Education and training, with higher quality placements and better teacher support, helping students to gain practical skills. More career opportunities from Cadet to Nurse are to be developed, as well as a commitment to

lifelong learning and continuing professional development. The Government initiated a number of partnership sites and organisations, to develop, pilot and evaluate the first wave of these new type courses, recognising the partnership between the NHS and universities and underlining the need for shared commitment. Therefore it can be seen that adaptive and flexible courses of Nurse Education need to be developed, and it is important to recognise the learning needs of the students within this.

'Fitness for Practice' had a remit of:

> 'Proposing a way forward for pre-registration education that enabled fitness for practice based on health care need.'
> UKCC, (1999, p2-4).

The report recommended the expansion of a graduate preparation, a more structured sequencing and balancing of theory and practice in order to promote an integration of knowledge, attitude and skills. It proposed that interpersonal and practical skills should be fostered through the use of problem-based learning, skills laboratories and the use of information technology. All of these recommendations will impact on the way that pre-registration curricula are developed, and the issue of how students learn will necessarily become more prominent. Therefore the two documents 'Making a Difference' and 'Fitness for Practice' will have a major influence on new Nurse Education developments, and will be kept under consideration in this study.

As the 'partnership sites' for these 'new' courses were only identified in December 1999, with the first cohorts commencing in September 2000, this study looks at both current methods of pre-registration Nurse Education and preparation, that of the Diploma of Higher Education (Dip. HE) in Nursing Studies, commonly known as 'Project 2000' and those students commencing the new style 'Making a Difference'

(MADEP) courses. It should be noted that due to the many changes of recent years, Nurse Education courses have been continually responding and adapting to need, so the new courses still maintain and build upon many of the best practices of the previous courses.

Glen (1995) states that changes in Nurse Education provided by the development of diploma courses, and a move to forming links and integration with Higher Education establishments resulted in changes to accreditation systems, organisational structures and teaching and Learning Styles, as well as the shape and content of nursing curricula. These changes have occurred as Nurse Education has increasingly moved away from health care settings into more academic institutions which have their own established rules and regulations on teaching and learning, and the structure, development and credit given for particular courses and approaches used within them. Although this quote is dated it is still relevant to Nurse Education today. Miller et al (1994) stated that the intended outcome of the previous 'Project 2000' programmes was to produce critical, knowledgeable 'doers' with an ability to solve problems, and respond autonomously and flexibly to changing and differing situations. In 'Making a Difference' (DOH, 1999), this is echoed and supported:

> 'We need practitioners who are fit for purpose, with excellent skills, and the knowledge and ability to provide the best care possible in a modern NHS.'
> DOH, (1999, p23).

The response to this report is therefore a need to increase the opportunities for learning, in order to create a learning society and to reduce 'theory- practice' gaps. The above factors, and the need for variety of theory and practice bases, create a broader learning milieu than the usual college classroom.

The existence of a dichotomy between theory and practice has long been recognised and leads to a number of issues related to teaching and learning. According to Cunningham (1994) there are two different worlds: one where in the classroom specialisations, subjects, systems, skills and structures are taught, and the other the world of practice, where most of what is needed to be learned is learned. The latter relates mainly to responding to problems, being people oriented, and often about the learning of patterns and processes. He argues that if emphasis is placed on theory, there can often be little application without constraint from the theory as the theory brings with it many rules and limitations in utilisation within many differing individual situations. If the focus is on practice, constraints may occur due to the lack of knowledge of how to solve particular problems that arise. The ideal is to find the balance of integration. This can be seen as a particular issue in nursing where at present fifty percent of the course is practice based and fifty percent is theory based. Difficulties in making connections between theory (the focus of the Higher Education institution) and practice (in the clinical context) have long been a feature of professional Nurse Education (Cope et al, 2000).

Research into early Diploma of Higher Education Nursing courses showed that students experienced difficulties because of the academic nature of the course and its relationship with practice, in the way that both may differ from the individual's expectations (Leonard and Jowett, 1990). The problems related to gaps in individual's past academic experience, weakness in their study skills and their expectations of what is involved in becoming a nurse (Miller et al, 1994). The students have to work in environments where they have to adjust and integrate ideas from one context to another, and this is a major aspect of their training. Camiah (1998) found that nurse tutors, in

moving to Higher Education settings, were actually perpetuating didactic approaches to teaching and learning instead of developing student-centered approaches to learning. She suggested that nurse teachers should develop more progressive approaches to facilitating learning. These issues are still important today:

> 'We intend to provide more career opportunities from cadet to nurse consultant... tailoring education and training to individual needs and lifestyles.'
> DOH, (1999, p24).

1.5 The Use Of Learning Styles In Education

According to Riding and Rayner (1998) a learning style refers to an individual set of differences that include personal preferences for certain instructional approaches, or an association with a particular form of learning, together with differences in intellectual or personal psychology. Busato et al (1998) refer to a definition by Vermunt (1992) that a learning style is simply, 'a way that a student learns'. This may seem a little too simplistic, yet suggests that learning is a very individual issue for all students. However there are many, varied models which attempt to categorise the different ways that students learn according to different theorists. This aspect will be discussed in more detail later in Chapter Two. Carland et al (1994) place Learning Styles within the wider field of cognitive styles, in terms of thought processes and patterns employed by individuals, as do Riding and Rayner (1998, p15) who describe a learning style as an 'individual's preferred and habitual approach to organising and representing information.' This statement provides a link with NLP in understanding how individuals structure their experiences and preferences.

Learning style theory has been developing over the last three decades. Ostmoe et al (1984) described a learning style or preference as the likes or dislikes a person has for particular sensory modes and conditions of learning, including preferences for particular

learning strategies. Murray-Harvey (1994) gives a more detailed definition, arguing that students:

> 'Possess biologically based physical and environmental learning preferences which, along with well-established trait-like emotional and sociological preferences, combine to form an individual style profile.'
> Murray-Harvey, (1994, p373-388).

This statement does create a link to the concept of set preferences and suggests that a learning style could be resistant to change. However Vermetten et al (1999) cite previous research studies indicating that changing the learning environment evoked parallel changes in the students' learning behaviours. This gives rise to an alternative notion that learning style can be changed by the context of the learning environment. It is because of these differing concepts of Learning Styles as traits, preferences, strategies, or whether they are static or changeable which lead to criticisms of learning style theory, in that there does not appear to be any unified agreement of it. Such criticisms will be addressed in Chapter Two, particularly in light of issues raised by Coffield et al (2004).

There are a number of factors that contribute to how individuals benefit from particular learning experiences. These include teaching styles and methods, motivation, attention, previous education and sociological factors as well as individual Learning Styles. Lapeyre (1992) states that learning styles could be seen as both the learners' approach to study and ways in which he or she looks for meaning whilst learning a new task. This is a useful definition and one that links to the thrust of this study. By understanding how specific learning styles function, the meaning of them to the individual may become more apparent.

Coffield et al (2004) raises criticisms of the claims of some learning styles theorists, suggesting that some of the tools utilised to identify students' learning styles are not valid or reliable. However, they also suggest that the main benefit for students in developing an awareness of their learning style is in the meta-cognition; of gaining some insight and awareness into how they might learn, and therefore, by the very nature of thinking and debating such issues, strategies for improving their approaches to learning can be developed. These issues will be discussed further in Chapter Two.

1.6 Neuro-Linguistic Programming (NLP)

One of the thrusts of the study is to investigate the relationship between the learning style preferences (taken from Honey and Mumford 1986, 1992) of student nurses with their internal sensory representational systems or modalities. The concept of internal sensory representational systems is an aspect of the field of 'Neuro-Linguistic Programming' or NLP. Representational systems are a way of representing experiences using our senses (O'Connor and McDermott, 1996). Neuro-linguistic Programming was developed by Dr. Richard Bandler (formerly a student of mathematics and computer programming), and Dr. John Grinder (a Linguist), in the late 1970s.

NLP is making a major impact on communications, learning and development in the commercial, health and sports sectors. Currently it is fast developing within the field of education and training and an inaugural 'NLP in Education' conference was held in July 1998. However it is noted that there is very little published research based evidence of NLP other than reports of case studies and the use of NLP techniques

(Atkinson, 1994, Lawley, 1997), and this is very much the case in its application in the education field.

NLP has been described as 'the art and science of personal excellence' (O'Connor and Seymour, 1990, p1). It deals with the filtering of information through the neurological processes of sight, sound, touch, smell, and taste, and our reactions to this. These experiences are then structured internally by the individual utilising sensory-based representations. For example, a smell may instigate a specific memory for someone (or vice versa) and a sound may do the same for someone else. These internal representations are known as the representational systems or modalities (Bandler, 1985). Bandler also described NLP as the investigation of the subjective experience of a human being, the use of language in the ordering of thoughts and actions, and the ways that ideas and actions are organised in order to produce results. Harris (1999), describes NLP as;

> 'A tool for modelling excellence, utilising specific techniques for analysing performance, particularly in how the mind processes information, together with methods for installing strategies for achievement.'
> Harris, (1999, p8).

Those who demonstrate excellence or achievements are used as models in this process, or the way an individual demonstrates some excellence in some aspect of their life may be used as the model. Bandler and Grinder (1975) first looked for structures and patterns within the work of three highly regarded psychotherapists of the time, Fritz Perls (Gestalt therapy), Virginia Satir (Family therapy) and Milton Erickson (Hypnotherapy). In completing this work they found certain similarities in structures and patterns used by all and developed these in formulating their ideas of Neuro-Linguistic Programming.

Neuro-Linguistic Programming has three components to it. In NLP the 'Neuro' relates to voluntary and autonomic nervous systems, through which we process experiences. This highlights the importance of neurology and physiology in the human information system, including mind/body relationships. The 'Linguistics' relates to language and non-verbal systems in how we code, organise and attribute meaning to these neural representations. The 'Programming' refers to the process of how we as humans install regular and systematic patterns of responses in our human functioning (Harris, 1999).

Representational systems are the senses we use to represent our experiences to ourselves. These sensory modalities include sight (Visual), hearing (Auditory), feeling (Kinaesthetic), smell (Olfactory) and taste (Gustatory). These are often cited in NLP terms as VAKOG (O'Connor and McDermott, 1996, p65). The finer distinctions of these modalities are known as submodalities (see Appendix One).

Hall (2000) argues that,

> 'We learn that ultimately we experience our subjective sense of reality at the submodality level...we learn that the specific qualities of those sights, sounds, and sensations cue our brain neurology about how to respond to and feel about our experience.'
> Hall, (2000, p169).

Hall and Belnap (1999) previously pointed out that these representations fall into two main systems, the lead system and the preferred system. The lead system is the representational system that inputs the information into consciousness. The preferred system is the representational system that an individual uses most in thinking about and organising experiences (Hall and Belnap, 1999). It is the investigation of these representational systems and their relationship to learning styles that underpin this study. It is generally recognised that more research on NLP is needed in order for the

field to become more widely recognised and accepted, and for it to be used more in teaching and learning.

The main criticism of NLP is the lack of evidence to support its claims. In considering the lack of major research, Hancox and Bass (1995) debate whether NLP should actually be investigated scientifically or academically, due to the eclectic nature of the development of the field, and questions about its applications in practice. This application often works on the basis that 'if something doesn't work then try another approach' (Bandler, 1985, p54). Another similar pre-supposition of NLP is 'there is no failure only feedback,' (Alder, 1992). However this pre-supposition could also be seen as being related to the scientific approach in that it develops generalisations from observed particulars. The scientific approach could be considered a process of *agreement* and *difference*. The agreement would occur in discovering cause and effect relationships, and the difference would occur in discovering those relationships that could be discarded or eliminated (Brown, Fauvel and Finnegan, 1981), hence 'no failure only feedback.' Hancox and Bass (1995) conclude that by utilising relevant approaches, NLP could be investigated in such a way as to satisfy academic investigators and NLP practitioners alike, and result in an increased dialogue between the two communities. It is hoped that this study may add to the research based information available to both the academic doctrines and NLP practitioners.

1.7 Cognitive Psychology

Cognitive psychology forms an umbrella, and a framework for the basis of this study. It could be argued that both learning style theory and NLP fall within it. It is necessary to discuss this briefly at this point.

According to Brunas-Wagstaff (1998), many research studies and theories in psychology relate to the broad aim of understanding generalities of human behaviour. Some of this may relate to developmental psychology such as defining human behaviour at different life stages. Some may be related to how individuals apply general rules in governing human social interactions (social psychology). Another approach to psychology is that of investigating how humans think, process information and solve problems, the subject of cognitive psychology. These definitions appear to give some clarity to the introductory concept of cognitive psychology. However, a difficulty that can be encountered by researchers is the overlapping of this one field of study with another. Therefore although definitions of particular concepts can be given, there are not always clear boundaries between differing schools of thought. Some may be polar to each other, yet at the same time share similarities. For example, in discussing issues of processing, individuals may have very differing approaches, yet they are pertinent and accepted in cognitive psychology. It is with this suggestion of overlap, which may include some similarities and differences, that cognitive psychology will be looked at. That is to say that in this study cognitive psychology accepts competing and opposite ideas as they may come in line with umbrella terms that may cross theoretical boundaries.

According to Millenson (1995), cognitive psychology refers to knowledge and thought, and thus is a psychology predominantly concerned with thinking, reasoning and problem solving. As a result of this much cognitive psychology is concerned with verbal behaviour. However it is stated that imagery and visualisation are also important factors in cognitive psychology. They are also important factors to be

considered within the representational systems of NLP. Millenson (1995) further points out that cognitive psychology also concerns itself with perception, how we get our knowledge, what form we represent it in and in particular how we process this information. Although Millenson does not substantiate this, it is a reasonably useful, albeit simplistic description of what cognitive psychology actually is. It is also the first indicator of a relationship between the NLP concept of representational systems or submodalities within the field of cognitive psychology. A further point that Millenson makes is that cognitive psychology actively embraces the mind as its definitive subject matter, differing from behavioural psychology, which tends to refer mainly to the stimulus response relationship of a human or animal with their environment. Behavioural approaches concentrate mainly on the development of behaviours (usually observable) as opposed to internal thought processes.

A similar definition of cognitive psychology is provided by Gross (1992, p9) who states that 'cognitive processes refer to ways in which knowledge of the world is attained retained and used.' This develops a wider definition than Millenson (1995) including attention, memory, perception, language, thinking, problem solving, reasoning and concept formation. Many of these concepts are integral to NLP.

1.8 Rationale For The Development Of The Study

Lauder (1996) puts forward a model of how student nurses interact with their experiences, and then construct theories (from them) in order to make sense of them. The basis of these 'Alternative theoretical frameworks' (the knowledge representations underpinning the practical actions of nurses), lies in the constructivist theories (theories of how individuals construct meaning to their experiences and

understandings) of education and cognitive psychology. Lauder (1996) argues that there is a tension between these alternative theoretical frameworks (i.e. constructions created by the students) and formal theories. This alludes to the 'theory-practice' gap tensions mentioned earlier. The tensions develop as most structured or formal knowledge is placed in a context or theory; however this can at times be separated from the actual practice and values of the nurse. Carland et al (1994) state that:

> 'Understanding the way students think and react to stimuli can aid facility in planning and structuring educational methodologies for maximum effectiveness.'
> Carland et al, (1994, p413).

Therefore teachers could be encouraged to develop methods to reduce the tensions between theory and practice by understanding the representations that student nurses may utilise. Understanding how representational systems function in conjunction with learning styles may help in such teaching and learning developments.

Lewis (1998) highlights how important the nurse teacher is in the development and socialisation of student nurses. However he points out that the longer the student spends in the college or university setting, the more likely their representation of nursing will be like their teachers. This can then lead to confusion for the student in relation to the practice of nursing in that the reality of the practice is different from the representation that the teacher has provided.

One way of enhancing the learning experience for the student nurse, with an outcome of creating a 'knowledgeable doer', or competent practitioner, could be to utilise possible relationships between sensory representational systems and learning styles in order to make learning more effective. It is also important to look at the ways in which the Higher Education setting for Dip (HE) nursing students facilitates or provides the

necessary requirements of the student in order to develop them to their fullest potential. By investigating the relationship of NLP representational systems to learning styles, new insights into teaching and learning might be generated. How learning styles develop, or are manifested by an individual may come to light, therefore giving a further understanding of the nature of learning styles and thus how they may be utilised by individuals and organisations. It is hoped that this study will develop the body of knowledge, which can be applied in both the fields of Nurse Education and NLP. Investigating the relationship of these representational systems to learning styles could lead to the development of a wider knowledge of approaches to use in order to enhance learning experiences for nursing students within the Higher Education setting.

This study explores the uses of NLP in Nurse Education by investigating the sensory representational systems with the learning styles of Honey and Mumford (1992) that are already recognised to some extent in Nurse Education. In doing so, it is anticipated that more effective and appropriate teaching and learning strategies can be developed for use in the field of Nurse Education in order to meet the diverse range of student learning needs.

1.9 Research Question Development And Methodology

This study hinges around the research question of what, if any, are the relationships between the Honey and Mumford (1986) learning style preferences and the NLP representational systems of student nurses.

This investigation incorporates two approaches in order to provide a quantitative and qualitative aspect to the study. The first approach utilises correlational methodology, the systematic investigation of relationships of two or more variables (Burns and Grove, 1995). Data was collected by means of the Learning Style Questionnaire (LSQ), (Honey and Mumford, 1986). The 'Primary Perceptual Modality Inventory', (PPMI), (Markowski and McVoy, 1998) and The 'Identify your Preferred Thinking Pattern', (IPTP), (Knight, 1995). Although not powerful enough to draw causal interpretations the correlation helps to identify relationships and potential confounding variables (Raulin and Graziano, 1995). The quantitative data collected related to scores from the tools mentioned and will be ordinal in nature. Therefore the data were analysed using Spearman's Rho Correlation co-efficient, which indicates the magnitude of relationships between variables measured on the ordinal scale (Polit and Hungler, 1993).

Secondly, semi-structured interviews are used to gather qualitative data regarding the representational systems of student nurses undertaking the Dip (HE) nursing studies. Interviews are flexible and adaptable ways of finding things out and qualitative data may be useful in supplementing and illustrating the quantitative data obtained (Robson, 1993). This will allow the researcher to focus on issues of particular importance to the research question, and probe and clarify comments that the informant can give freely, with the researcher acting as guide and not controller (Rose, 1994).

1.10 Population And Sample

The population under study was pre-registration student nurses undertaking the Dip (HE) nursing studies, a course that leads to an academic qualification and registration as a nurse with the Nursing and Midwifery Council . All students in all intakes (and therefore all years and branches of the course) of the pre-registration nursing courses within one HE institution were given a choice to participate. This provided an approximate potential number of 530 informants for the quantitative aspect of the study. This is thought to be adequate size for the statistical tests sought. Although such a convenience sample can be criticised, as there is little opportunity to control biases, it is relatively inexpensive, accessible and requires less time. It should be noted that the student population even in one HE institution will contain variations and characteristics representative of the general population and of nursing students in HE institutions across the UK.

1.11 Ethical Issues

As the researcher may be known to the potential respondents as a lecturer on their course, there may be some ethical implications and biases involved. It was hoped that these would be kept to a minimum by ensuring all respondents gave their consent to be involved and they were assured of confidentiality at all times. A letter of permission from the relevant Head of Department was sought and granted. This can be seen in Appendix Two. In considering the time spent in completing the questionnaires and conducting the interviews, it was anticipated that the findings of this study would contribute to the development of the new proposals for Nurse Education in relation to aspects of teaching and learning. It was also envisaged that the findings might influence the nature of learning in Higher Education settings, or at

least add to the information available for learners and teachers alike, as to how best approach individual learning.

The relevance of the study to Nurse Education in its current context is quite considerable, as Higher Education continues to seek alternative and perhaps more cost effective teaching and learning approaches for students. Brown (2000) discusses the development of the Institute for Teaching and Learning (ILT, now known as The HE Academy), following recommendations of the Dearing Report (1997). Members of the HE academy must show expertise in teaching and the support of learning, contribution to the design and planning of learning activities, assessment and giving feedback, developing effective learning environments and student learning support systems, and finally in reflective practice and personal development. By gaining a further understanding of student nurses' learning styles and their information processing approaches, hopefully some of these issues can be developed, applied and evaluated in Nurse Education and in the wider field of education in order to develop teaching and learning approaches that meet the needs of students.

It is hoped that the findings of this study will be disseminated in seminars and further developed in the School of Human and Health Sciences, and School of Education and Professional Development of the University in which it is based, together with articles published in refereed educational and nursing journals and presented at appropriate conferences.

Chapter Two

Review of the Literature

2.1 Introduction

This chapter develops the concepts introduced in Chapter One, and explores each of them in more detail. The concepts covered are;

- Nurse Education In The UK
- Cognitive Psychology
- Neuro-Linguistic Programming (NLP) including representational systems (modalities and submodalities)
- Learning Styles.

By discussing the above it is hoped that the relationships between learning styles and NLP representational systems can be established and their use as the basis of the study explained. In addressing factors related to Nurse Education, learning issues related to student nurses should also be explored. In summary, the use of cognitive psychology as a theoretical framework will be explored.

2.2 Nurse Education In The UK

Nurse Education in the United Kingdom is now firmly established within universities and the Higher Education setting. Cope et al (2000) point out that student nurses must be prepared for facing the challenges of nursing by ensuring that their practice is underpinned by a well-developed knowledge base. They show that the reforms in Nurse Education stemming from Project 2000 sought to increase the emphasis of higher order knowledge in nursing preparation. This can however lead to difficulties in the relating of theory to practice unless teaching and learning is well organised and finely balanced. The overwhelming amount of theory and its inapplicability to the

'nightingale stereotype' (nurses assisting doctors to heal sick people) became a source of distress to many project 2000 students (Howard, 2001).

A study by Davies et al (2000) looked at the career prospects and opinions of project 2000 trained and traditionally trained nurses. They state that project 2000 aimed to increase the professional status of nurses and enhance acquisition of skills for autonomous practice. However, their results showed no evidence to support these expectations. There had been an assumption that diploma based nurse training may introduce a different type of candidate, but this was not shown to be the case in relation to age range, prior education, gender and social or family responsibilities. This could suggest that it is the nursing role itself that is motivating to individuals, no matter what the form of the preparatory education takes. It must be remembered that applicants to nursing cannot choose the way they are educated; rather the educational approach is dictated by governmental policies, national body interpretations of these and the educational approaches of the Higher Education Institutions. Together, these create routes that those wishing to become nurses must follow if they wish to achieve their vocation.

However, Higher Education, as a place for delivering pre-registration nursing courses, does not only affect those receiving the training. Research conducted by Camiah (1998) showed that after the initial move to Higher Education, nurse teachers demonstrated only limited skills in dealing with modularised programmes, allocating places and converting modular content into curricular hours of theory and practice. Nurse teachers were found to be perpetuating a didactic approach to teaching instead

of encouraging the more student-centred approach to learning that Higher Education espouses.

Hicks and Hennessy (1997) point out that much emphasis is placed on developing evidenced-based care in the UK and that practitioners (including nurses) should ensure their practice is founded on scientifically derived findings rather than on intuition and tradition. Pirrie (2001), argues that this move towards evidenced–based practice and education is a reaction to social and political forces based on sustained attacks on the quality and function of educational research. Health care and education are both very complex processes and their measurement is difficult and controversial. The increasing demands placed upon services in which nurses are employed, and expectations of Higher Education, have fuelled attempts to deploy resources more effectively, resulting in evidence based practice or education having an emphasis.

> 'Evidence based practice is not a panacea: it is as much a social and political value of the moment'
> Pirrie, (2001, p132).

Nurse teachers have found themselves involved in radical changes at organisational level, such as new management structures, altered lines of accountability and revised teaching roles within universities (Stew, 1996). All of the above issues could create tensions for Nurse Education and nurse teachers. There has certainly been a shift over the past ten years from the 'apprenticeship-style' training that took place in previous Nurse Education systems, to the straight fifty-fifty percent split of theory and practice that now exists in the 'Making A Difference' curricula (DOH, 1999). Although there has been a move away from the 'sitting with Nellie' concepts of practice there is still very much a need to encompass theory and practice together in a coherent way. Cope et al (2000), state that:

> 'Professional education courses recognize the need for higher order learning and require students to demonstrate its acquisition.... It is certainly the case that higher order learning does not necessarily lead to competence in practice and it has long been recognised that being knowledgeable is not, of itself sufficient for expertise.'
> Cope et al, (2000, p851).

The UKCC (1999), later to become the 'NMC'; Nursing and Midwifery Council, highlighted a perceived imbalance in the common foundation programme (CFP) of project 2000 nursing courses, in terms of the weighting given to theory and practice, and recommendations were made for the CFP to be a straight fifty–fifty percent split of theory and practice, as previously students had spent more time in theory in the former part of their courses. (The CFP is the first part of the Dip HE Nursing courses where students from all different specialities follow a common programme of foundation subjects and topics). There was also a perceived imbalance in the emphasis placed on adult nursing care issues, sometimes at the expense of the other nursing branches of child, mental health and learning disabilities nursing within the CFP. Therefore it was recommended that the CFP be reduced to one year and the student to spend more time in activities related to their own chosen branch of nursing.

Part of the concern arose from the skills of those going into nursing employment from Project 2000 courses, in that it was considered that:

> 'Newly qualified nurses and midwives are coming on to the wards without the full range of skills needed for effective practice.'
> DOH, (1999, p24).

This aspect is supported by research from Kapborg and Fischbein (1998) who found that many nurses had 'reality shock' when beginning their qualified professional roles, particularly where they worked in areas in which they were unfamiliar or unacquainted. Although they could deal with technical issues very well, they

struggled with dealing with patients and other professionals. The research subjects also stated they had found vast differences between classroom-taught subjects and the reality of practice. These difficulties arose if the theory taught in the classroom did not have direct relevance to practice and they had to assimilate the relationship themselves. Although this qualitative study was completed in Sweden it echoes very much the apparent situation in the UK demonstrated in the quotation above (DOH, 1999).

Corlett (2000) describes the theory practice gap as a discrepancy between what nurses are taught in the classroom and what they experience in practice; she states that educationalists are often the perpetrators of the theory practice gap. Some of the issues involved in causing the 'gap' were application of the theory in the practice setting, out of date practices espoused by teachers, idealistic theories versus realistic situations, lack of time for practitioners to explain the application of theory, sequencing of theory in relation to the practice and lack of communication. One major issue discussed by Corlett (2000) is the fact that students see little relevance in the theory taught at the time of their experiences in practice, yet on reflection and with retrospection eventually see the value of it. She suggests that nurse educators should provide the student with experiential learning, problem based learning and reflective approaches. However these are difficult to facilitate and it needs to be a regular structured process. In the current educational climate this is a luxury that can not always be afforded by nurse teachers.

Therefore, because of the issues discussed above, it was recognised that practice-based teaching needed to be further emphasised by the DOH (1999). The DOH

suggested that this emphasis should be met by setting targets for increasing teacher support for students on placement and by increasing the number of practitioners having joint appointments with universities. This should enhance the status of practice–based teaching. It was also pointed out that there should be stronger and more effective working relationships between the NHS and universities. In the UKCC's response '*Fitness for Practice*' (1999), recommendations were made for changes to the project 2000 curricula. These recommendations included the already mentioned reduction of the common foundation programme, to one year only and that the sequencing and balance of theory and practice should promote an integration of knowledge, skills and attitudes. However, this response may not go far enough. In order for these developments to benefit students of nursing, the UKCC (1999) proposed that the whole concept of learning and how student nurses learn needed to be investigated. This is particularly important as Nurse Education now takes place in the Higher Education setting within universities, and it is important to develop ways in which integral learning and application of theory in the practice setting are promoted in line with these recommendations. The DOH (1999) has also stated that they want an increased level of practical skills within the nurse training programme. This may create tensions, as the development of project 2000 was to provide the nurse with higher order knowledge, hence the move to Higher Education and an increase in the theoretical input to fifty percent. Now it appears that the DOH is requiring another approach, with a change of emphasis towards (or back to) practical elements. Miller et al (1994) stated that the intended outcome of Project 2000 programmes was to produce critical, knowledgeable 'doers' with an ability to solve problems, and respond autonomously and flexibly to changing and differing situations. However, research into early Diploma of Higher Education nursing courses showed that students experienced

difficulties because of the academic nature of the course and its tie with practice, in the way that both may differ from the individuals expectations (Leonard and Jowett, 1990). The problems related to gaps in their past academic experience, weakness in their study skills and their expectations of what is involved in becoming a nurse (Miller, Tomlinson and Jones, 1994). Welsh and Swann (2002) state that cynics could argue that project 2000 had failed. However the new recommendations from 'Making a Difference' do not suggest a lowering of academic standards, so the concept of the 'knowledgeable doer' still has relevance. Although nursing curricula have now changed in emphasis due to the 'Making a Difference' recommendations, many distressing elements of the project 2000 courses remain. Howard (2001) highlights that these mainly come in the form of time pressure due to academic workload and pressure on interpersonal relationships, due to having extended workloads as compared to other students in Higher Education. Research conducted by Eaton et al (2000) suggested that many former diploma nursing students gave the academic nature of the course, financial problems and the lack of practical nursing opportunities as possible reasons for leaving the course. Degree nursing students gave similar reasons yet were less likely to suggest the academic aspect as a reason for leaving.

Bowden and Marton (1998) point out that traditionally universities have fallen into two categories, concentrating on teaching or research. They argue that instead of trying to look at the relationship between teaching and research in an institution, the nature of the relationship between individual learning and collective learning should be considered. In this way the university can be seen as a 'university of learning', incorporating both teaching and research aspects. This is an important aspect, which relates to the focus of this study. Students' learning styles and their approaches to

learning will be scrutinised mainly on an individual level, although some of the findings will be discussed in relation to approaches needed at the collective level.

In terms of teaching in universities, the process traditionally has been to give instruction and knowledge to learners in relation to objectives. According to Vermunt (1998) in instructional designs, the designer dictates how the learners need to behave in order to realise the objectives, with little account taken of the learning processes. This is in essence a transfer of knowledge from an external source to the learner. Vermunt points out the counter argument that learning is not necessarily such a passive, externally directed consumption of knowledge, but an active, constructed, self-directed process where the learner builds an internal representation of the knowledge and then make interpretations from them and their experiences. This is much more widely recognised today and is the concept that drives this current study, especially in relation to nursing students who have to be both part of the university education system and the wider professional practice system of nursing with an ever increasing demand for research/evidence based practice. Hicks and Hennessy (1997) pointed out that care cannot be delivered unless justified on proper empirical grounds. A consequence of this has been the development of a research-based health care culture of which nursing plays an important part. However it is difficult to expect large institutions to change what have been very successful methods, particularly in the economic climate of today. Changes have to be seen to be working. Hayes and Allinson (1998) discuss how organisations have implicit and explicit rules that prescribe the way that members behave:

> 'So long as rules lead to behaviours that produce desired results there will be no need to change the rules. The only requirement will be for individual

> learning. Organisational members will have to learn to be in accordance with the rules.'
> Hayes and Allinson (1998, p848)

Therefore Nurse Education finds itself in a situation where it is relatively new and with a need to 'prove itself' within the field of HE. However Nurse Education itself is an established system that it arguably brings with it, or develops learning methods and approaches that add to the repertoire of the Higher Education Institutions, on an individual or collective level. Hayes and Allinson (1998) describe collective learning as occurring when a group recognizes that something offers a more effective way of functioning. This may lead to a refinement of organisational rules. Nurse Education is in somewhat of a dilemma having only fairly recently begun to learn the rules of Higher Education (as related to the points made earlier by Stew, 1996), and is now being directed by the Department of Health to ensure a strong practice base in the development of future nurses.

Eklund-Myrskog (1997) discusses concepts proposed by Marton and Säljö (1976), described as 'Surface and Deep Learning':

> 'In a surface approach students paid attention to separate facts and details. They were passive in the learning process and their only intention was to reproduce the text. In a deep approach students wanted to understand what the author wanted to say about a certain problem or principle. They were active in the learning process and looked for relations in the text and between the text and the world around.'
> Eklund –Myrskog, (1997, p373).

There is definitely a move in Higher Education towards assisting the student to learn, rather than providing the means by which they are taught. This is not a new concept. Heron (1989) stated that teaching is no longer to do with imparting knowledge and 'doing things with' the student, instead it is redefined as facilitation of self directed

learning. In this way the responsibility for the learning rests with the student. The facilitator has the responsibility of helping the students to learn in a learning group. This is similar to what De Bono (1971) described as 'first-hand' learning, which in its basis is a form of stimulus-response learning. De Bono's concept of 'second-hand' learning relates to the concept of learning about situations by being exposed to them, but not necessarily being involved in them (from books, television, demonstration etc). This means that the learner is making interpretations whilst disassociated from the actual real experience. The obvious advantage of first hand learning is that the response of the student can be changed or developed in new situations. The disadvantages are that the student can potentially be exposed to dangerous situations, or situations where there is a necessity for standards to be maintained and in which they, as novices, could be unable to effectively contribute. This obviously creates tensions between the needs of the student, the profession and the education providers themselves. It must be remembered that education is now very much in the 'market place', and there is the necessity for observable success, yet at the same time opportunity for a greater number of people to access Higher Education. Therefore a cynical view of promoting self-facilitated learning could be suggested: that by placing the responsibility with the student, more learning can be seen to be taking place for more people with minimal resources particularly in terms of teacher input used. Rust (2000) argues that funding of courses may need to be reviewed as staff time and workloads would be reduced in a student centred approach to choosing learning activities, although this change could lead to more flexible and innovative approaches for formative assessment if staff time and workloads are redistributed. Kenny and Kendall (2001), in discussing Nurse Education in Australia, point out similar arguments that seem applicable in this country,

> 'There is increasing pressure within nursing schools to devise ways in which current programmes can be taught with reduced classroom contact, and thus cost saving, but with no reduction in quality.'
> (Kenny and Kendall, 2001, p649)

Lecouteur and Delfabbro (2001) argue that there has been much dissatisfaction regarding the quality and nature of the Higher Education experience in recent years, as a result of funding pressures and a growing emphasis on research-based performance indicators. They suggest that, according to these issues, the incentives for, and satisfaction from, good teaching have been eroded.

Ramsden (1997) suggests that there is a 'hidden curriculum' at work whereby students, instead of developing problem solving and analytical skills, merely devote their attention to techniques needed in meeting the requirements of the assessment. This is particularly noticeable in modularised courses. Welsh and Swann (2002) point out that the modular system may encourage students to take an instrumental view of their course. Progress is seen to be a matter of 'passing modules'. This therefore demonstrates the conflict between the intentions of the educationalists and the students. No matter what the educationalists intend, the students will more often than not be focussed on doing whatever is necessary to pass. This could be interpreted as a cynical view yet it has real implications. Nurse Educationalists have rules to adhere to in relation to the content of programmes set out by national and government bodies. They also have the rules and organisational principles of the Higher Education establishment to follow, in order to deliver courses within the current economic climate. Therefore it is easy to recognise how actual learning for students can be a complex issue within such limiting circumstances. The need for nursing students to demonstrate a sound theoretical knowledge base (usually compartmentalised into

modules), and the pressure on developing their professional role in practice (a very important factor for the students), could be perpetuating the theory practice gap, as the students will not only compartmentalise theory from practice but they will also compartmentalise module from module. By doing so learning in relation to their nursing role is separated into unrelated aspects. What is needed is an approach whereby they can learn to function effectively in practice by accessing and utilising relevant knowledge as necessary.

Nurse Education could be caught in a dilemma with these changes and tensions. Nurses need to demonstrate that they have learned various aspects of both theory and practice related to nursing. Therefore due to large intakes and the amount of theory needed there is a considerable amount of formal input taking place for the student nurse within the university setting. This accords with Dilts and Epstein (1995) who point out that teachers often have to teach the students 'what' is required of them in order to pass their required element or course, as opposed to facilitating the learning 'how to learn' about the particular topical focus. This situation can be recognised by teachers who may commonly experience students asking whether the particular topic being taught will be needed for the end assignment in order to pass the element of the course, and therefore place great emphasis on 'what' they should know as opposed to 'how' they should get to know it. This supports the earlier mentioned suggestions of Hayes and Allinson (1998) in how organisations have rules, and individuals learn the rules in order to be a member of the organisation. This could be seen as an indication of the need to achieve a specific award for merit and confirmation, as opposed to benefiting from the actual learning itself. Thus, the 'ticket', 'certificate' or 'credit' (usually related to modules) is more important than the learning itself. Indeed support

for this point can be seen in that many professional services require certification evidence before someone can practice within that profession, and nursing is a prime example of this. One way of countering this is to use the reflective practitioner approach, based on Schön (1987). D'Andrea and Gosling (2001) state that this emphasises an approach where the professional needs to reflect critically on their own performance. They also argue that the enhancement of student experiences of learning can be difficult to measure and that there is a presumption that a sufficient answer lays in the effectiveness of meeting outcomes. This occurs when a student achieves the objectives of the course. These objectives can be recommended from publicly accountable organisations, and it is obvious that professions and those within public serving occupations need to demonstrate standardisation for the protection of public interest. Certification is a way of identifying the student has met the necessary standards. However, understanding needs to be demonstrated in the practical application of what is learned and certification cannot be enough by itself.

Facilitating experiential type learning may help in reflective practice and should not necessarily be seen as a negative factor in moving towards meeting targets and standards. Dilts and Epstein (1995) argue that most of the major learning processes a person goes through in all of their lifetime are learned through experiences as opposed to being taught. They give examples of the vast amount of learning that takes place up to the age of five such as learning to stand, walk and talk and so on. If the emphasis in current education was slightly changed, reward could be given for the learning 'how' as opposed to knowing 'what'? Perhaps nurse students could be involved in approaches where they are taught to learn how to approach practical situations and access and utilise relevant theory as necessary. This could be demonstrated through a

reflective approach suggested by Schön (1987). In situations such as Nurse Education, the issues are not exactly quite so simple and there are many complexities to address. However, since the introduction of Project 2000, nursing curricula have identified the need for, and contained, elements of reflection as being fundamental in the development of nurses. Smith (1998) undertook a qualitative study with nursing students and concluded:

> 'That there was some evidence that reflection involved the integration of practice experience and academic knowledge and that there is a reassessment of old perspectives so that some views and ideas may be rejected, whilst others are maintained. Students moved from acceptance of information to the questioning and critiquing of arguments and professional assumptions, particularly concerning their relevance and appropriateness for practice.' Smith, (1998, p897).

Durgahee (1998) had different findings. This study found that students were at times unwilling to accept the self-directed nature of their education as they had expectations of learning from the teacher, and in being passive recipients of the knowledge from the teacher. He found that some students perceived that whatever comes from the teacher has professional and academic currency and value. However he argues that if students are given the right type of support, reflection can enhance professional education. Reflection should be purposeful, promoting active collaboration and critical thinking in a supportive framework. Finally he concludes that teacher preparation for practice-based professions should include facilitation and reflective learning as alternative teaching methods. These are easy to manage with smaller groups. However in larger groups such as the nursing intakes this cannot always be the case.

All of the above-mentioned issues and complexities are of relevance in this study in investigating how student nurses learn.

2.3 Cognitive Psychology

Nurse Education provides the main context of this study. The focus of this study is the inter-relationship between learning styles, NLP representational systems and their placement within the discipline of learning theory, particularly within the framework of cognitive psychology. According to Hall (2000) NLP would be located in the constructivist school within the school of cognitive sciences, especially cognitive psychology. The concept of learning styles can also be placed within this field. Riding and Wheeler (1995) point out that the concept of 'style' has been used in the psychological study of individual differences in learning and behaviour. They also tie in the constructivist concept to this, in that a construct is a psychological idea or notion. Examples of constructs are intelligence, extraversion and neuroticism. Style constructs appear in different areas such as personality, cognition, and other psychological fields such as perception, learning and behaviour. Best (1999) describes constructs as people using whatever it is they retrieve from memory in trying to create a coherent story about their experiences. Although specifically related to memory, this is a useful definition as a construct can be seen as an effort made by the individual to develop a meaning for an experience or phenomena. There is therefore a need to explore how learning styles and NLP can be located within the field of cognitive psychology and this is discussed in the next section.

Bredo (1997), cited in Phye (1997), argues that learning theory falls into two main camps, behaviourism and cognitivism. This polarisation of the two however creates theoretical and practical difficulties. Firstly, it is theoretically difficult to understand the relationship between learning mechanical skills and more complex symbolically mediated learning, and practically, because polarised views lead to producing one-

sided specialists who operate in a one-sided way. Bredo relates how both behaviourism and cognitivism arose out of 'functional psychology' whose leading proponents were James, Mead and Dewey. The functional approach held the belief that learning developed as part of a response to the environment and a need to develop along evolutionary survival lines, including the development of higher thinking. This concept of survival is supported by Jensen (1995) in reviewing psychological approaches, who points out that humans are evolving powerful higher intelligence in order to meet the biological functions of eating, sexuality and surviving. He quotes Gazzaniga (1992) stating

> 'Learning may be nothing more than the time needed for an organism to sort out its built in systems in order to accomplish these goals… all we are doing in life is catching up with what our brain already knows.'
> Jensen, (1995, p5).

This may seem a simplistic statement, yet one that can be seen to be supported by Rose and Nicholl (1997, p32) who state that the human brain is 'not primarily designed for thinking.' They state that attributes most commonly associated with thinking (perception, language and intelligence) represent only a small amount of volume of the brain's areas of responsibilities to keep us alive and functioning. The major part of the brain ensures that one learns, reacts and adapts in order to survive.

As mentioned earlier, behavioural psychology developed from the arena of functional psychology. According to Atkinson et al (1993) the behavioural perspective has been pivotal in the study of learning. They state that it is underpinned by the three main assumptions:

- Simple classical or operant associations,
- That the laws of learning are applicable to all species and that,
- Learning is a result of external environmental causes.

Atkinson et al, (1993).

However this can be criticised, as behaviourism arose at a time when there was a need for legitimising psychology as a science with positivistic, empirical results (Bredo 1997). Therefore as external events and their relationship to behaviours can be easily controlled, observed and monitored they can be given empirical support.

The above three assumptions of behaviourism can be tentatively accepted. However, there are some weaknesses in firmly accepting them. Firstly, it is accepted that associations do play an important part in learning (as in the first point of simple classical and operant associations) yet are only a basis as opposed to an entirety in the learning process. Gagné (1970) highlights conditioned responses as rule one of a complex learning chain (of eight rules of learning), calling it 'Signal Learning'. However it is argued that the association is not real learning, as it is usually an involuntary response to some external stimuli.

In questioning the assumption that all species learn in the same way, we need to look at capacities of different species for learning. Rose and Nicholl (1997) argue that the human brain is a 'Triune Brain', in that it is physically made up of three structures highlighting evolutionary changes. The first part of the brain is the Brain stem, described as the reptilian brain, which is the area of brain similar in structure to lower life forms such as reptiles and birds. The second structure is the limbic system, which is similar in structure to that of other mammals. Humans have a further brain structure

known as the 'Neo-cortex' thought to be the seat of human intelligence. Jensen (1995 p33) describes the function of the Neo-cortex as the ability to detect and make patterns of meaning. Therefore the actual structures of the brain, as well as its size, actually differ from that of other animals, so the idea of all species learning the same way can be questioned. The structure of the neo-cortex gives rise to the concept of humans being able to create representations internally. These basic structures related to survival are important factors to remember in relation to learning. This would particularly apply if Maslow's (1954) hierarchy of needs is accepted where physiological and safety needs form the basis of needs to be fulfilled, before any seeking of involvement with others and development of self esteem and self actualisation can be sought.

The aspect of all learning being a response to external stimuli can be questioned by applying cognitive aspects, and the issue of humans being able to undertake abstract problem solving without any environmental exposure to particular situations. Problem based learning takes place without the learner needing to be in the actual situation. They work through the problem in a manner that encourages reasoning abilities through a systematic problem solving approach to managing real life situations (Creedy and Hand, 1994). Again Problem based learning needs the learner to be immersed in the process as opposed to being passive recipients of knowledge (Doring et al, 1995).

According to Quinn (1995), Cognitive Psychology represents a paradigm shift away from the reductionist approach of the behaviourist to a more expansionist approach with systems thinking. Hartley (1998), states that it focuses on internal events. Learning results from inferences, expectations and making connections. Instead of acquiring habits, learners acquire plans and strategies and prior knowledge is important. The

environmental influence is not to be dismissed altogether, as a large amount of cognitive processing is related to the perceptual features of the learner and the task within the learning context. This is another indicator of the link to internal representational systems used by human beings.

The aspect of all learning being a response to external stimuli can be questioned by applying cognitive processing aspects and the idea of abstract problem solving without any actual environmental exposure to particular situations. This concurs with the work of Piaget who highlighted different stages of development for children. The last two stages he described as being the 'concrete operational' stage and the 'formal operation' stage. Where individuals can manipulate ideas to a far greater extent, as they have the ability to think in terms of possibilities, rather than actual states of the world (Eysenck, 1996). It is this very idea of information processing that does not necessarily involve actual experiences in the real world that separates cognitive psychology from pure behavioural learning psychology. However it must be noted that abstract experiences do have to have some basis in the real world and often assumptions need to be tested out in the real world to ensure their validity. Interpretation of these experiences is down to the individual.

> "No two human beings have exactly the same experiences. The model that we create to guide us in the world is based in part upon our experiences. Each of us may, then, create a different model of the world we share and thus come to live in a somewhat different reality."
> Bandler and Grinder (1975, p7).

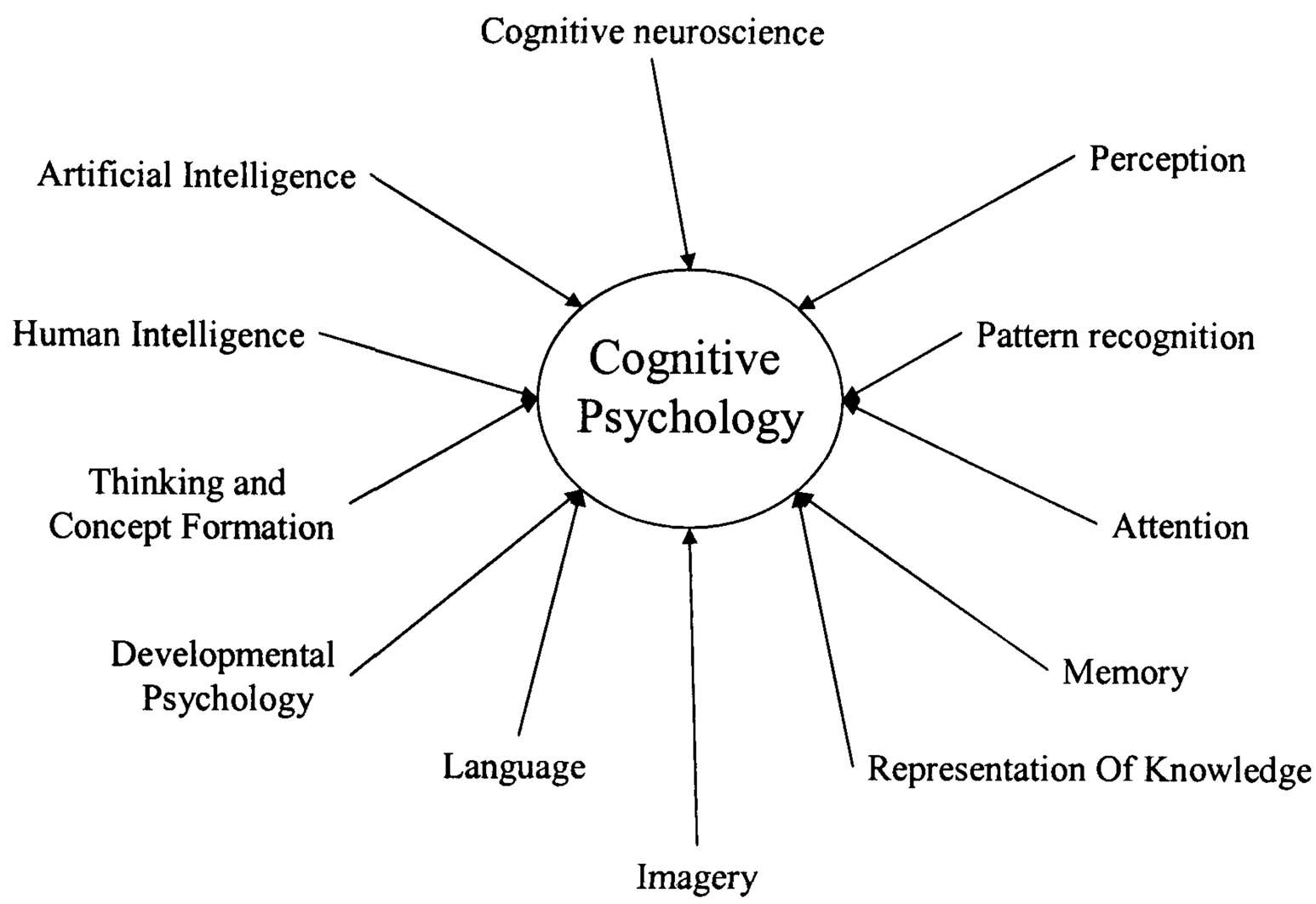
According to Parkin, (2000) the concept of internal representations or 'Cognitive Maps' was suggested by the research of Tolman. The notion was that learning had a goal and therefore animals developed the best strategy they could to meet that goal including

developing whatever flexibilities were needed to achieve it. This was studied by experimenting with rats in mazes, and then changing the pattern of the maze, or mode of transport (swimming or walking), through the maze. If a truly stimulus response system worked then the rats should be slow in learning the new methods. Tolman found that the rats still found the food very rapidly as they had managed to generalise their behaviours. Thus another criticism of the behavioural school was provided and the concept of internal information processing supported.

Eysenck (2001) states that cognitive psychology is usually considered in relation to the information processing approach. The main assumptions of this are that information made available from the environment is placed through the brain's processing systems (attention, perception, memory). These processing systems act on the information and provide meaning, sometimes similar to the way that a computer would act. Research in cognitive psychology is designed to find out the processes and structures that underlie cognitive performance. Solso (1998), adds a further aspect to the above stating that cognitive psychology is also concerned with the study of the thinking mind and how knowledge is used to solve problems, to think and to formulate language. Within the information processing approach there are a set of basic assumptions. Cognition can be understood by it being comprised of a series of sequential stages. Processing takes place at each stage. Each stage receives information from previous stages. Information from the outside world is transferred into the neurological system as symbols or indeed internal representations. This can be seen as an act of three stages, detection of stimuli, storage and transformation of stimuli and finally a production of responses. This is quite a simplified version of cognition yet provides an extra stage not fully accepted in pure behavioural theory, that is the storing and transforming of the external stimuli

internally. According to Solso (1998) cognitive psychology has many research interests as can be seen in the figure 2.1 below.

Figure 2.1: Aspects Of Cognitive Psychology



These topics are supported as a basis for cognitive psychology by Best (1999) and Eysenck (2001), who also add reasoning and problem solving as major aspects of cognitive psychology. Importantly, Solso (1998) states that the topic of internal representations of knowledge is a particular interest in cognitive psychology. Therefore as these concepts are similar to those proposed in NLP (to be discussed later) it provides a useful framework for this study

However Best (1999) points out that as well as information processing, another cognitive psychology approach should be considered, that of the connectionist approach. The main thrust of this idea is that it differs from the information processing approach in that it suggests the brain's neural network as working in a parallel fashion

when processing information as opposed to a sequential staged fashion as simple information processing suggests. Therefore connectionists argue that information processing is more of a single unit approach rather than a number of units processing in stages as cooperating units.

It is necessary to begin to focus upon the aspects of cognitive psychology that are more pertinent to this particular study. That is not to say that other aspects do not have value in this study or do not apply, only that the whole of cognitive psychology is so complex that it would be impossible to include everything at this stage. Therefore the aspects of representations will now provide the main focus of discussion.

Central to the concept of information processing systems in cognitive psychology is the hallmark of internal representational systems. According to Pinker (1994) a representation is a physical object whose parts and arrangement correspond piece for piece to some set of ideas or facts. Internal representations of the outside world are made use of by providing information that cognitive systems use to manipulate and draw conclusions about the environment before responding (Groome et al, 1999). This ability is defined early in childhood and was recognised by the work of Piaget. According to Goswami (2001), Piaget highlights four stages of development:

1 The Sensory Motor Period: 0-2 years

2 The Period Of Pre-Operations: 2-7 years

3 The period Of Concrete Operations: 7-11 years

4 The Period Of Formal Operations: 11-12 years.

Goswami, (2001, p260).

The use of internal representational systems can be seen to develop in the first stage the sensory motor period, by the concept of 'Object Permanence' (the concept of understanding that objects continue to exist even when they are hidden from view). According to Goswami (2001) object permanence can only possibly occur if there is a cognitive representation of the object. Burton and Bodenhamer (2000), suggest that humans have representations in the form of different types of data, nominal, ordinal, interval and ratio. However they do not specify the formats that these data take. In representing using nominal data, representations are put into categories. With ordinal data the representation can be compared or ranked against the qualities of other representations. With Interval data the same rules apply as for ordinal (comparison) yet even more detail is added, that is the qualities of the differences in the representations are evaluated. In ratio data representations are exposed to higher order thinking as it contains the previous three levels and highlights interrelationships and meaning between them all.

> 'Children gain the ability to process data on a more complex level after the age of seven and increase this ability until maximal development around 11-12.' Burton and Bodenhamer, (2000, p 18,19).

Eysenck (2001) discusses Gregory's (1972) claims that perceptions are 'constructions from floating fragmentary scraps of data signalled by the senses and drawn from memory banks, themselves constructions from the past.' Therefore the brain acts on information from the outside world by checking on it with information stored on the inside.

The acting on this information can be developed into the form of hierarchical structures according to Cohen (2000). She states that:

> 'Models Of representation comprise a higher super-ordinate level where information is represented in a more general form and lower subordinate levels where information is represented more specifically.'
> Cohen, (2000, p1).

Cohen (2000) argues that hierarchical structures of representation have cognitive functions that operate on four principles, control, access, analogy and economy. The control functions include planning, monitoring and decision taking. Models such as memory utilise storage of representations economically and include methods of effective access to them. Finally representation of knowledge facilitates the identification of useful analogies in order to make sense of it. All of the above link these concepts to the previously mentioned aspects of information processing (either serially or parallel), the concept of creating constructs to give meaning, and abstract problem solving resulting in responses that manifest themselves into behaviour. Williamon and Valentine (2002) also discuss hierarchical organisation and describe it as a cognitive principle of wide generality that applies to the encoding and retrieval of both motoric and symbolic information. Their research supports the above ideas also, and they point out that the hierarchical structures contain encoded information with which associations are made (similar to the analogy as mentioned by Cohen, 2000). There are also retrieval cues and retrieval structures that help in the accessing of the encoded information. The encoded information can be developed into patterns or schema through associations to events or knowledge.

Colcombe and Wyer (2002) describe two types of representation: those used to represent generalisations and those used to represent specific events. They call a generalised representation as a 'schema', 'script' or 'prototype' and a representation related to a specific event as an 'exemplar'. A prototype therefore could be an example

of representing a set of behaviours that a person would generally go through perhaps in visiting a restaurant (such as booking a table, ordering food, paying the bill). An exemplar relates to representations related to specific events that might have occurred (Having food spilled onto you, having a major argument). Therefore representations can be used within memory and in planning for the future or responding to novel situations where there are some characteristics that can be tested against previously processed information.

However Colcombe and Wyer (2002) point out that the use of representations is quite a complex activity. If one is reading about a series of events they may be likely to construct a mental simulation or representation of these events. However within the processing detail can be added by the individual that are not alluded to and become integrated into the representation. Sometimes the individual might construct a 'pointer' to the prototype along with some rules of translation. Therefore they may have a pointer to a pre-existing representation and a pointer to an exemplar based on equivalent representations. In doing so meaning is attached to the representation. Vermunt (1998) cites Duffy and Jonassen (1992), who argue that,

> 'Learning is an active process where the learner builds up internal knowledge representations that form a personal interpretation of their learning experiences. These representations constantly change on the basis of meanings people attach to their experiences.'
> Vermunt, (1998, p150).

Solso (1998) alludes to research that shows prototype development (conceptual categorising) in children. In research by Ross (1980), children were shown a sequence of toys that were similar (such as toy furniture). When the same toys were shown in pairs with toys that were not similar and had not been previously seen were added, the children spent longer investigating the novel toy, showing them noting a difference.

Solso (1998) describes this as the abstraction of patterns. These then serve as a prototype. New information is checked against the prototype and either recognised or rejected. In rejection the information may be checked against other prototypes or new ones created. This fits nicely with Cohen's concept of economy and access to memory as quick associations can be made and the information processing can be speeded up. In this way, some experiences may be constant therefore the need to represent them consciously is lessened, as they become a habituation, the process of responding unconsciously to experiences that are constant. Experiences tend to be noted consciously when there is an element of difference or change to the ongoing experience (Grinder et al, 1977).

Antonietti et al (2000) include information processing as a part of 'metacognition', which concerns thinking processes, awareness of aspects of mental work, and beliefs and knowledge about strategies used to carry out a task. The following metacognitive components need to be involved in problem solving:

- Deciding upon the nature of the problem
- Selecting components or steps to solve the problem
- Selecting the strategy and selecting a mental representation for information
- Allocating resources, and monitoring solutions

Sternberg (1996).

Therefore the use of internal representations can be seen to play a major part in such aspects as memory, problem solving and learning. It is now necessary to discuss NLP, which forms a large part of the basis for this study.

2.4 Neuro-Linguistic Programming (NLP)

This section will discuss aspects of Neuro Linguistic programming (NLP), particularly how the concept of internal representations is included within the discipline. The discussion will give an overview of NLP, internal representational systems, language and internal representational systems and creating change through representational systems.

2.4.1 What is NLP?

According to Dilts et al (1980) Neuro-Linguistic Programming (NLP) is the basic process used by all human beings to encode, transfer, guide and modify behaviour.

> ' "Neuro" (derived from Greek *neuron* for nerve) stands for the fundamental tenet that all behaviour is the result of neurological processes. "Linguistic" (derived from the Latin *lingua* for language) indicates that neural processes are represented, ordered and sequenced into models and strategies through language and communication systems. "Programming" refers to the process of organising the components of a system (sensory representations in this case) to achieve specific outcomes.'
> Dilts et al, (1980, p2).

From the above definition it could be argued that humans differ from their animal counterparts because of the language or linguistic aspect. Animals may still have the 'neuro' and 'programming' elements of the process in developing their behaviours yet obviously do not have the linguistic elements that humans have. However it should be noted that animals still have many other complex ways of communicating with each other, utilising all of the senses, including the use of frequencies of sound, light and smell that humans are unable to detect.

McKenna (1993) states that NLP is not an invention; it is a discovery. Neither is it a philosophy; it is a set of practical tools for acting effectively in the world. This is a

simplistic statement yet does encapsulate NLP and its claims. However it could be argued that as more elements are discovered and utilised within the field then it is not necessarily an approach that can stand in its own context.

Modalities describe the form or mode of the internal representational systems as mentioned above, based on the Visual, Auditory, Kinaesthetic, Olfactory and Gustatory senses in which the individual interprets the world and responds to it. Information from the external world is taken in via the five human senses and the same five senses are used to process information internally. We see pictures, hear sounds and have feelings on the inside (Bandler and MacDonald, 1988).

NLP first began development in the early 1970s when Richard Bandler, a student of psychology, computing and mathematics at the University of California began working with John Grinder an Assistant Professor of Linguistics. They modelled three renowned therapists of the time who excelled in their field, Virginia Satir (family therapy), Fritz Perls (Gestalt approaches) and Milton Erickson MD (hypnotherapy) also drawing on the insights of others that excelled in the communication field. Bahn (2001) discusses the use of modelling as a form of social learning theory, relating to the work of Bandura (1977), and states that most human behaviour is learned through modelling others. It allows for a more efficient and safer way of acquiring complex behaviours than by trial and error. This can also be developed into performances with the individual at times being able to develop different behaviour to the models studied. If modelling is used as imitation only then it is limited, yet observers learn more if they are able to acquire new cognitive skills and new patterns of behaviour through observation. It is upon these observations that the development of NLP was

based, yet is also a reason why it is often criticised, as there is a lack of empirical findings to substantiate the claims. Some have even classed it as a 'pseudo-science' as it is based on largely unvalidated interventions, which are not empirically sound (Herbert et al, 2000). However it could be argued that the areas where NLP was developed from, namely gestalt therapy, linguistics and hypnotherapy, have been subjected to empirical approaches and academic rigour. This does lead to another criticism, which suggests that it overlaps, or has similar aspects to other fields such as hypnosis; in fact Wright (1999) suggests that although it has a complex sounding name in many ways it is just a form of hypnosis. On the other hand Ginger (2003) states that NLP is one of the 20 methods of psychotherapy currently recognised as psychotherapy, however does point out that there is a difference between the NLP therapist and the more generally trained NLP practitioner. This is a fact that is confusing in itself, as it does not perfectly encapsulate what either person does or how they do it. Bandler and Grinder certainly utilised their observations of the above named therapists and many others in developing the model now known as Neuro-Linguistic Programming (NLP). It is therefore necessary to draw upon the early works of Bandler and Grinder and others in reviewing aspects of NLP that are relevant to this study.

One of the main difficulties in utilising NLP is the lack of research studies verifying the claims made by those that developed it, although there are some recent studies that use NLP within them as methodology or as part of an approach being studied. Dowlen (1996) investigated NLP in management learning finding that there was some appreciation of its use particularly the aspects of rapport and sensory system thinking. There is reference within this report to the lack of, or contradictory evidence, related

to the success of NLP. Georges (1996) discussed the use of NLP meta-programmes in selection and staffing, suggesting their beneficial use in decision making. These studies were fairly small scale and appear to lack empirical rigour in themselves. Torres De Miranda et al (1999) carried out a stronger study utilising an experimental and control group of mothers within a shanty town Day Centre. They found that there were positive effects in child development, home environment and maternal mental health found following the use of NLP interventions. However, although pleased with these results they were only marginally significant. Sutherland (2000) also found beneficial effects from using NLP techniques to treat clinical depression which were statistically significant. She does call for further research in order to replicate these findings. Ashok and Santhakumar (2002) investigated improvement of quality in three different occupational groups and state they found beneficial results based on NLP interventions. Bolstad and Prochazka (2003) discussed two case studies, which suggested that the participants responded well to NLP interventions in reducing chronic pain. Brown (2004,) reports a qualitative study investigating NLP meta-programmes in the classroom suggesting that it is beneficial if the teacher matches these. In this case Brown describes meta-programmes as personality preferences that influence language and behaviour of individuals at an unconscious level. He also suggests that individuals found it potentially useful to be aware of such preferences in order to assist them in improving their learning experiences. These studies portray the NLP model as an acceptable approach; however there appears to be very little critical comment on its rigour within them. It is important to note that since the 1970s, the techniques and approaches Bandler and Grinder first developed within the NLP model, which others are now developing, have been and are increasingly being used

internationally in therapy, sports, business, management and education (O'Connor and McDermott, 1996).

2.4.2 NLP And Internal Representational Systems (Modalities and Submodalities)

As mentioned earlier, the main precept of internal representational systems is the fact that these systems take information from the outside world and then represent this information internally using the same sense mechanisms, such as Visual (sight), Auditory (hearing) or Kinaesthetic (feeling). Also included are Olfactory (smell) and Gustatory (taste). These modalities can sometimes be referred to in NLP terminology by the acronym 'VAKOG'. Grinder and Bandler (1976) state that the above three mechanisms (Visual, Auditory and Kinaesthetic) appear to be the major input channels and these provide us with information which we use to organise our experiences. Dilts et al (1980) state that the NLP model suggests that all distinctions humans make concerning the internal or external environment can be represented in terms of these systems.

Within each of these modalities are a number of specialised receptors, which carry specific types of information (submodalities). The type of information included in a submodality refers to the distinctions within the specific sense modality to which it is related. According to McDermott and O'Connor (2001) submodalities are the qualities of the inner world, the smallest building blocks of our experience. Colour and brightness for example are submodalities of the Visual modality. Volume and tone are examples from the Auditory modality, and temperature and pressure are

examples from the Kinaesthetic modality. More examples of submodalities can be found in Appendix One. Grinder and Bandler (1976) point out that information filtered in through one sensory system can be processed internally using a different sensory system. For example external sounds (such as the crackling sound of a log fire burning) could be easily internally transformed into a visual representation (a picture of a fire). Language acts as a representation of our experiences. It provides us with a mechanism to represent experiences in different representational systems to the actual one experiencing the event. According to Pinker (1994), language is a distinct piece of the biological make up of the brain. This is how humans create their map of the world. It relates to how schema, exemplars and pointers (Colcombe and Wyer 2002) are developed, yet is more specific. According to Hall and Belnap (1999) NLP accepts the cognitive behavioural model and mental processing, and enhances this by focussing on the five sensory modalities. These could be considered as the basic components of thought. The ways that information is represented or re-presented informs the way humans program themselves and learn. Hall and Belnap (1999) point out that submodalities are,

> 'The qualities of our representational systems that allow us to speak with even more precision and specificity about the contents of our thoughts..... It essentially provides the finer coding (or encoding) for the "mind".'
> Hall and Belnap, (1999, p18).

According to O'Connor and Seymour (1990) Visual, Auditory and Kinaesthetic modalities are the primary representations used in western cultures. The sense of taste and smell are not so important (unless the person is a cook or chef, or needs it for a specific purpose) and are often included as subsections in the Kinaesthetic category. Humans tend to have preferred representational systems whilst thinking, that is they pay attention to one sense representation more than another, depending what they are

doing or thinking about. They specialise in the kind of information they process and mainly pay attention to it. Therefore some people could be described by their preferred representational system; some are primarily Visual, some Auditory and some Kinaesthetic (Grinder and Bandler, 1981). However this preferred representational system might not always be the first representation used in developing or accessing a thought or memory. Often there may be an input in or through one of the other representational systems that then lead into the preferred representational system. This is known as the lead system. O'Connor and Seymour (1990) state that this is the internal sense that we use as a handle to reach back to a memory or thought and it is how information reaches the conscious mind. For example a memory could be sparked with an internal picture (Visual) of someone and then this can lead immediately to a feeling (Kinaesthetic) about that person. In this case the Visual modality is the lead system and the Kinaesthetic is the preferred system.

Although the factors discussed above can be considered similar to concepts from cognitive psychology such as the internal processing of schema and prototypes, differing terminology has been chosen to suit NLP, which may lead to confusion when discussing similar aspects defined in other areas that may be accepted as having a scientific basis.

2.4.3 Internal Representational Systems and Language

One of the areas that NLP uses as a basis is the study of linguistics, which does have a strong academic and philosophical basis. The individual's most highly valued or preferred representational system can usually be identified by the predicates that the

person uses in their language. Predicates appear as verbs, adjectives and adverbs in sentences used to describe experience (the linguistic aspect of NLP).

> 'Predicates are words used to describe the portions of a person's experience which correspond to the processes and relationships in that experience.'
> Grinder and Bandler, (1976, p9).

Humans distinguish themselves from other animals by the creation and use of language (Bandler and Grinder 1975). Language is used to represent experiences firstly to ourselves, and then to others. Hall (1998) describes language or the use of words as a meta-representation system, that is 'representations of representations.' Hall (1998) states that using words enables individuals to comment on the things they see, hear and feel. Firstly they use sensory based or descriptive words and these let them speak with clarity, and precision about their modality referents. The choices of words used indicate the representational system they are using. Habitual use of one kind of predicate will indicate a persons preferred representational system (O'Connor and Seymour, 1990).

A person that prefers the Visual representational system will use words like 'see', 'picture', 'colour', 'bright', and 'dark'. The Auditory system will be referred to with words such as 'in tune', 'sound', 'loud', 'hear', 'tell'. In the Kinaesthetic system words such as 'feel', 'weighing', 'grip', 'grasp', 'hold', 'pressure', 'stress', would be evident as predicates. Sensory-based words code or represent (as a symbol of a symbol) the information that individuals want to pass on about sights, sounds sensations tastes and smells within their processing of information. More examples of predicates can be found in Appendix Three. In this way humans use words to evoke the most basic language of the mind (Hall and Bodenhamer 2000). Some of these terms may seem to fit in to one modality or the other, but there may at times be terms that overlap or do not easily fit into any modality.

Dilts et al (1980) state that the representational systems form a three-part network, input, representation/processing and output. Again this provides us with the concept of NLP emerging as a discipline within the cognitive psychology field. The first stage is where information is gathered and feedback is gained from the environment (internal and external). Then there is representation/processing including the mapping of the environment and establishing behavioural strategies and finally, output is the casual transform of the representational mapping process. However the main factor that highlights differences with NLP and the basic cognitive approach is the detail (submodalities) of these representations and the effect upon individuals. In knowing this detail, aspects of how they relate to various situations can be understood. By finding out what works well in the way they represent material the individual can be helped in various strategies such as learning or decision making. It is how these representations are used by the person, that provide key information in how best to approach the situation in which they require development or change.

It must be noted however that these approaches can only be as effective as the person instigating them, and as NLP highlights individual differences, these must be taken into account in terms of the differences of the approaches of different NLP practitioners.

2.4.4 Internal Representational Systems And Strategies Of Behaviour, Change And Learning.

According to Bandler and MacDonald (1988) when NLP was first used to study subjective experiences, the structure of meaning was found to occur in the specific sequence of representational systems (known as strategies) that the person used to

process information. O'Connor and Seymour (1994) state that strategies are ordered sequences of thoughts resulting in ordered sequences of actions. Strategies involve different ways of thinking, in pictures sounds and feelings and different tasks require different strategies. Antionetti et al (2000) allude to something similar when they discuss the concept of Meta cognition; in that they argue it concerns not only control over thinking processes and awareness of various aspects of mental work but also includes beliefs and knowledge used to carry out a task. Marks (1999) discusses representations and describes them as mental imagery. He suggests that mental imagery is part and parcel of everyday activity in the form of thinking, problem solving memory and imagination. In the case of NLP, beliefs and knowledge become part of the representational system strategies themselves. Therefore these representations, sequences and strategies form the basis of behaviour (internal and external) of individuals. It could be argued that memory formation and retrieval and imagination all use strategies based on the representational systems and their submodalities.

According to Grinder, De Lozier and Bandler (1977), a useful model in considering representational system strategies is that of the '4-tuple.' A '4-tuple' is a Visual representation (or formula) of experience. That is that any persons experience at any point in time can be represented in relation to the Visual, Kinaesthetic, Auditory and Olfactory representations they have (hence the number 4). Grinder et al (1977) however, do not explain why the Gustatory sense is left out of this formula. Therefore any experience can be described in those terms <V, K, A, O> (Visual, Kinaesthetic, Auditory, Olfactory). This can represent the persons experience in relation to the events occurring both externally and internally at any point in time. What is being experienced Visually, Kinaesthetically, Auditorily, and Olfactorily can then be ascertained. For

example a person reading this work may see the words written on the page and notice the light shining through a window, also they may also notice the weight of the document in their hands or the weight of their body against a chair as they sit. They may hear the sounds of the pages turning or other sounds emanating from the environment, and finally they may notice the smell of the room and the freshness of the air in the immediate environment. All of these things are contributing to their current experience. This can be demonstrated in the format of the formula <V, K, A, O>. In remembering situations or imagining future situations these experiences can also be included as a strategy or descriptor of the events. Harland (2001) states that memory should be considered to be a present experience. Conscious content arises at several levels.

> 'That conscious content, whether it be a sensory representation of external reality or a sensory representation of internal imaging is a process of serial selection in the brain..... This stage of cerebral activity takes the complex coded output of parallel processing and generates a simpler, coded selective output, which allows me to reconstruct or imagine other times and places.'
> Harland, (2001, p16).

All our overt behaviour is controlled by internal processing strategies (Dilts et al 1980) and everyone has strategies for motivating themselves, learning, teaching and decision-making. This does suggest that the behavioural learning theory model does not fit with this framework if viewed in its traditional stimulus response structure. However responses could be thought to be developed quickly and unconsciously through rapid processing of the strategies after exposure to certain stimuli (that is 'neuro' and 'programming'). A response may not be available in conscious awareness, yet a person may operate unconsciously and rapidly in relation to certain stimuli such as is apparent in the aspect of 'fight or flight' in response to danger (O'Connor and Seymour 1994). Harris (1999) describes unconscious processing as mental processes that are 'out of awareness'. This is a simplistic, yet reasonable description. For example a person does

not consciously have to be thinking about a specific experience yet a smell, sound, sight or feeling may immediately return them to a vivid memory, or spark a new idea that they were not consciously considering at that time, which in turn will affect their behaviour. These experiences can then be exposed to questioning, and through conscious processing the '4-tuples' and strategies can be identified. Dilts et al (1980) state that a '4-tuple' can be used to represent an individual's total experience, whether it originates in the world external to the reader or not. This is an important point because in NLP there are distinctions to be made in the person's experience from the external and the internal world. It is possible, according to Grinder et al (1977), to distinguish which portion of the experience described in the '4-tuple' originates in the world external to the person and which is generated by the person's own internal processes. For example again, the person reading this document may notice the words on the pages of the document and feel the weight of the document and also hear the words (that are written on the page) being spoken as *internal dialogue* and smell the freshness of the environment. This difference between external and internal processing can be seen thus $< V^e,K^e,A^i,O^e>$ (e =external, i=internal). Someone *remembering* an outing to the seaside may remember the sights of the flashing lights of amusement arcades, the feel of the wind against their faces and the crunching of the sand underfoot, hear the noise of the sea as it laps onto the beach and the cries of gulls as they fly nearby and remember the smells of candy floss and the freshness of the sea air. In this case as it is remembered the experience is totally internally generated and can be demonstrated in the formula, $<V^i,K^i,A^i,O^i>$. In this way individuals create representations for experiences and thoughts and these experiences have very specific detail accorded to them. Individuals create a 'map' of their experiences.

2.4.5 Internal Representational Systems and Constraints

According to Hall (1998) humans operate in the world and on the world via their 'maps'.

When the 'map' is changed the person can experience the changes associated with it.

> 'If we change our representations at the level of sensed representations, our nervous system uses its out-of –conscious neurological processes to respond differently.' Hall, (1998, p10).

Bandler and Grinder (1975) in discussing the concept of 'maps' state there are two main points to consider. Firstly there is a necessary difference between the world and any particular model or representation (map) of the world and secondly the models of the world that individuals create will themselves all be different. This builds on the concept that the 'map is not the territory', meaning a representation is not necessarily exactly the same as the actual aspect it represents, yet it can be useful as it shares similarities in its structure. Bandler and Grinder (1975) argue that different individuals, who in sharing the same experience will often recount it differently, demonstrate this point. They explain that these differences are due to neurological constraints, social constraints and individual constraints. This can be demonstrated in the table 2.1 below:

Table 2.1: Representations and Their Relationships to the 'Real World.'

A's Model Of The world	B's Model Of The World	C's Model Of The World
Linguistics Abstractions Sensory Awareness	Linguistics Abstractions Sensory Awareness	Linguistics Abstractions Sensory Awareness
The Territory Of The World – Experience In The World		

Hall, (2000) p75.

Hall (1998) states that each of these three constraints on human mapping works in a systemic way.

> 'The beliefs and values developed individually and socially become perceptual filters at the neurological level. They create our habits of thought, emotion, speech, perceiving and relating. They reinforce the cultural maps that we have received, thus confirming our "reality".'
> Hall, 1998, (p12).

Neurological constraints refer to the straightforward aspects of what human beings can actually sense. Bandler and Grinder (1975) discuss how there are many experiences physically happening to the planet and immediate environments that humans cannot neurologically process or sense. For example sound waves occur in frequencies above and below our range of hearing that some other animals are able to sense. There are ranges of light waves that we are physically and neurologically unable to detect without specialised technology. Also there are factors such as radiation levels that humans are unable to detect on a sensory level without sensitive technological equipment. Therefore, straightaway there is a difference between the actual world in which we operate and what humans are capable of perceiving, even though they are exposed to all of these out of awareness factors all the time.

The social constraints refer to those experiences that are socially defined. For example different cultures develop differing languages due to their social experiences. Some cultures such as the Inuit have many different words for the word 'snow' because, in their experience, snow plays a large part of their daily life and they come across many different forms of it. Altmann (2001) states that newborn infants are set up to organise what they hear in linguistically relevant ways, as if they were able to recognise the building blocks of the world it will subsequently learn.

> 'For the infant language is not an independent entity divorced from the environment in which it is produced and comprehended; it is a part of that environment, and its processing utilises mental procedures that may not have evolved solely for linguistic purposes.'
> Altmann, (2001, p135).

Therefore the richness of experience leads to the distinctions different social groups make. Bandler and Grinder (1975) describe the social constraints as:

> 'The categories or filters that to which we are subject as members of a social system: Our language, accepted ways of perceiving, and all the socially agreed upon fictions.' Bandler and Grinder, (1975, p 10).

Therefore the constraints that this gives individuals in creating maps is that they are created through this social filter and therefore two individuals from differing social backgrounds will have differing social filters and therefore view the world and their experiences within it differently. However Bandler and Grinder (1975) point out that this is the constraint that is most easily changed as humans can experience different social systems, learn new languages and add these to their repertoire of social experiences. Hall (1998) points out that social constraints involve the cultural presuppositions coded in the language, beliefs and values of the society.

Finally the individual constraints are described as being based upon the representations individuals create as a result of their own unique personal history. No two individuals' life histories will ever be the same, although they may share similarities, at least some aspect of these are different and unique. Bandler and Grinder (1975) state that it is the filtering through individual constraints that creates the profound differences among human beings and the way in which they create models of the world. It is with these three constraints (which themselves are representations) that individuals go on to create models, maps or representations of the world, forming their perceptions and resulting in the way they behave.

> 'The most pervasive paradox of the human condition which we see is that the processes that allow us to survive, grow, change and experience joy are the same processes which allow us to maintain an impoverished model of the world – Our ability to manipulate symbols, that is, to create models. So the processes, which allow us to accomplish the most extraordinary and unique human activities, are the same processes that block our further growth if we commit the error of mistaking the model

for reality. We can identify three general mechanisms by which we do this, generalisation, deletion and distortion.'
Bandler and Grinder, (1975, p14).

2.4.6 NLP Meta Model

It is necessary to investigate the issues of generalisation, deletion and distortion before returning to the representational systems, submodalities and strategies as these themes underpin many of the factors in how certain behaviours or approaches develop in individuals and in how they can be changed.

According to Battino and South (1999) generalisations are when individuals take a part or component of their model of the world and let that represent the whole category from which that part was taken. Deletions are where a person pays selective attention to their experience and thereby ignores part(s) of their internal or external reality. Distortions are shifts or distortions of experiences in the world. O'Connor and McDermott (1996) state that the three concepts of generalisations, deletions and distortions transform sensory experience into internal representations, and then transform the internal representations again into language that is used about our experiences and behaviours. In this way the original experience is transformed from its actual format for the person because of the generalisations, deletions and distortions occurring through neurological, social and individual constraints.

Bandler and Grinder (1975) developed a model representing how these generalisations, deletions and distortions are developed into well-formed or ill formed outcomes, which become evident in language, and how they can be challenged or developed. They called this the 'Meta-Model' and based it on transformational grammar from the field of

linguistics. Transformational grammar was suggested and discussed by Noam Chomsky. It is a theory of language. It constitutes an early attempt at the exploration of properties common to all languages (Maher and Groves, 1996).

> 'We use language to represent and communicate our experience – Language is a model of our world. What transformational grammarians have done is to develop a formal model of our language, a model of our model of our world, or simply Meta model.'
> Bandler and Grinder, (1975, p24).

More detail of the Meta-model can be seen in Appendix Four . According to O'Connor and Seymour (1990) the meta-model (of NLP) uses language to clarify language; it prevents people from deluding themselves that they understand what specific words mean, especially words spoken by others. It acts as a way of reconnecting the language with experience. Altmann (2001) states that much research has been conducted in the last thirty years or so concerned with the processes of identification and integration of knowledge (through language), as well as with the nature of the dynamically changing mental representations that encode integrated meanings. It has been known for many years that humans do not maintain an accurate record of the precise words that make up sentences. Instead they maintain the propositional content of them. It is even suggested that the surface form of sentences is lost. If this is so it is easy to see how individuals can have impoverished expectations of themselves and the world. Altmann (2001) seems to support the concept that it is basically a representation of the actual sentence that is maintained by the individual, which shows the cross over of NLP and linguistics within a psychological framework.

Bandler and Grinder (1975a) state that according to transformational grammar every sentence of natural language has two distinct representations, 'Surface structure' and 'Deep Structure'. Although applied to language at this stage this could be considered to

be similar to the concepts of surface and deep learning discussed earlier in relation to the points made by Eklund–Myrskog (1997). Surface learning is a basic recalling of what has occurred and deep learning is developing an understanding of the issues and concepts. In language terms the surface structure relates to the actual words spoken and written. Deep structure refers to the actual representation and its meaning. For example the sentence '*the window was broken*' has the surface structure of the actual words spoken or written. In considering the deep structure there are many levels that can be explored to find meaning, such as someone broke the window, it was in the past, there is an object (window) and there possibly could have been some instrument involved. According to Bandler and Grinder (1975a) the entire process that links deep structure to its surface structure is called 'derivation'. The above sentence demonstrates one of the meta-model distinctions, that of deletion. What are missing or deleted from the sentence are the agent, the time/place, the instrument and so on and so forth. The surface structure of sentences in language occurs because of the processes of deletion, generalisation or distortion. Therefore it is necessary to explore what can be derived from the surface structure to provide the deep structure. The surface structure itself is a representation from the deep structure of which it derives.

Meyer (2000) in investigating memorising distinguishes between memorising before understanding, and memorising after understanding. Memorising before understanding could be viewed as surface level learning where the individual cannot by definition produce temporal, deep level (transformative) learning outcomes. In this case the material is not comprehended and rote or repetition of these aspects is a strategy that 'puts words in the throat'. The material is mechanically stored for some purpose and then forgotten. In memorising after understanding the process of memorising is the same

as understanding. The process does not need to be repetitive or surface level because the act of memorising and understanding are coincidental and occur together. In NLP if individuals have learned strategies and behaviours at a surface level then it is necessary to assist the individual in exploring ways of finding the deep level structure of their learnings, thoughts emotions and behaviours.

Altmann (2001) states that:

> 'Through language we each of us cut through the barriers of our own personal existence. In doing so we use language as an abstraction of the world within and around us.'
> Altmann, (2001, p129).

The ways that people use language to communicate their model/representation of the world is subject to the universal processes of human modelling such as deletions, generalisations and distortions (Bandler and Grinder, 1975). The meta-model assists in this by providing a framework for understanding how the process works and providing challenges to provide the derivation and seek the deep structure. In so doing the person's model of the world can be challenged and utilised for beneficial changes:

> 'The meta-model is a series of questions that seek to reverse and unravel the deletions, distortions and generalisations of language. These questions aim to fill in missing information, reshape the structure and elicit specific information to make sense of the communication.'
> O'Connor and Seymour, (1990 p92).

However, Dilts (1993) states that although they are referred to as 'challenges', the responses to these linguistic aspects are actually responses designed to gather higher quality information from the subject.

Generalisation is a technique necessary in order to cope with the world where there is a need to apply general rules to similar aspects. Knowing what a door is and how it works is of usefulness when individuals come across similar objects corresponding to the

category of door. However, generalisations become limiting when they are applied without question to all similar categories. For example always pushing a door would not serve well when the individual meets a door that requires pulling in order to open. A simplistic example yet one that shows the principle. Bandler and Grinder (1975) state that:

> 'The same rule will be useful or not depending on the context – that is, that there are no right generalisations, that each model must be evaluated in its own context. Further more this gives us a key to human behaviour that seems to us to be bizarre or inappropriate – that is, if we can see the person's behaviour in the context in which it originated.'
> Bandler and Grinder, (1975, p14).

McDermott and O'Connor (2001) state that generalisations occur as we deduce rules from a small number of instances, for example calculating by using laws of arithmetic. They state that generalising is essential. Unknown factors in life can only be dealt with by individuals using what already know. This is a belief found in cognitive learning theory especially espoused by Ausubel (1968) in what is termed an advanced organiser, the best way for learning to take place is by building on what the learner already knows. However, it becomes a problem and limiting for the person if they pick the wrong example to generalise from, apply the same generalisation to every new experience or do not stay open to learn from new experiences and develop new generalisations. For example beliefs can be considered to be generalisations and such issues as racism and sexism occur because of this. It would be foolish to generalise and think that all individuals from one race or gender are bad or deficient in some way.

Deletions are also a necessary tool for operating in the world. Bandler and Grinder (1975) state that deletions are a process whereby attention is paid selectively to particular dimensions of our experiences therefore excluding others. For example, in a crowded room with many people having discussions and therefore there being a general mingling

of sounds individuals have to filter out most of that sensory (particularly Auditory) information in order to listen to one particular person's voice and conversation. When driving a car there is a multitude of sensory information bombarding the driver, yet they again have to delete much of the external information such as the scenery outside, noises in the environment, the movement of the car itself in order to concentrate on the task in hand. Bandler and Grinder (1975) state that deletions reduce the world to proportions that individuals are then capable of handling. This reduction may be useful in some contexts yet limiting and painful in others. For example someone that constantly fears failure may have deleted all the aspects in their life when they have been successful and limited their behaviours as they focus on perhaps one or two examples of when they have failed. McDermott and O'Connor (2001), explain that deletions are necessary or individuals would be overwhelmed by the amount of sensory information available to them if they were not selective about where attention is placed.

Distortions occur when a person changes the meaning of the experience so that their interpretation of it is very different to the actual experience itself. It is a process whereby humans can make shifts in their experience of the sensory data (Bandler and Grinder 1975). For example mental rehearsal is a process whereby we imagine the events of something that has not yet happened. Therefore the only possible way for this to have occurred is through distorting thoughts and creating or omitting sensory data from strategies that are made up. Artists are an example of people that use distortion in a creative way to give expression to their perceptions or imaginations of the world. In the same way in that it can be creative it can also be limiting as the real message of an interaction or experience can be distorted, such as a child believing that parents are often criticising or restricting them when all the parent is doing is making sure they are safe

and healthy. Hall (1998) describes this as inaccurately representing something in our neurology or linguistics that can create limitations or resources. Distortion is a tool very useful for people such as designers or planners, who, for example, look at a piece of land and imagine what it would look like with a new building on it so that they can therefore develop new designs and ideas.

The meta-model provides a way of finding out specifics and reframing meanings so that these generalisations, deletions and distortions can be refined and used as resources. The linguistic factors in these processes are as follows: In deletions there is often a lack of specificity about certain situations. Common linguistic deletions are recognised by unspecified nouns or lack of referential index in the sentences delivered by the individual. This means that for example someone could be hurt in an accident. The unspecified noun and lack of referential index would be related to 'who' was in the accident and 'what type' of accident was it. This could also lead to many more questions in order to find the deep structure of the statement. Other deletions include unspecified relationships or comparative deletions; this means that someone could say 'things are getting worse'. What is missing is the reference to 'what it is worse than'. Unspecified verbs are also deletions. For example someone could say they 'travelled' here today. What is deleted from the structure is the 'mode' of the travel. Nominalisations are another form of deletion. They are quite powerful as they usually change the meaning of something from a dynamic process into a categorical state. Normally, if something is to be nominalised it must be a noun, a tangible object. However humans often say they have 'depression' or 'anxiety' or a 'learning block'. These statements take on the appearance of, and seem to have become, nouns yet they are unable to be seen, touched, heard, or measured as you would any other object (O'Connor and Seymour, 1990). In

this way the dynamic process has become static and therefore appears as un-moveable for the individual. Returning the noun to a verb, e.g. 'what is depressing you? How do you know when you are feeling anxious? What is blocking your learning?' can challenge this.

Lost performatives are another form of deletion. Lost performatives refer to statements made such as, 'you must always do this.' 'Doing x is bad'. The lost performative relates to the speaker/originator of the statement being deleted from the sentence as a whole. In doing so the statement appears to become a rule (Hall and Bodenhamer, 2000). Enquiring who made the statement, or asking, 'according to who' makes the challenge? In this way the nature of authority and its reality related to the concept can be investigated.

Generalisations include universal quantifiers, and modal operators of possibility, impossibility, or necessity (Hall, 1999). A universal quantifier refers to statements that are made and related to all experiences (such as 'all' and 'every'). For example someone might say, 'I'm always quiet.' or 'this happens every time'. These types of phrases admit no exception to the rule so become limiting by simplifying the world to this one way of being (O'Connor and McDermott, 1996). Modal operators of possibility, impossibility, or necessity become limiting as people may say 'I can't do this' (impossibility), or 'I have to do this' (necessity). These can be challenged easily by asking 'what would happen if you did/didn't?' In doing so the person has to think of the consequences of their actions, which can also be explored.

Statements made that become distortions include cause–effect assumptions about others, such as mind reading, cause effect, causational beliefs, complex equivalence and presuppositions ("silent assumptions", Hall 1999). Presuppositions form the basis of many of the linguistic patterns identified in NLP. Basically they make assumptions about the content of the sentence without explicitly stating it. In cause–effect statements the individual makes the distortion that some person or aspect causes something else to happen: 'My wife makes me feel angry.' is an example of this. It is an ill-formed statement as it involves the belief on the part of the speaker that one person (or set of circumstances) may perform some action that causes some other person to experience some emotion or inner state (Bandler and Grinder 1975). This provides the presupposition that the individual experiencing this therefore does not have a choice but to respond in this way, which is not always true.

> 'Sentences of this type identify situations in which one person does some act, and a second person *responds* by feeling a certain way. The point here is that, although the two events occur one after another, there is no necessary connection between the act of one person and the response of another. Therefore sentences of this type identify a model in which the client assigns responsibility for his emotions to people or forces outside of his control. The act itself does not cause the emotion; rather, the emotion is a response generated from a model in which the client takes no responsibility for experiences which he could control.'
> Bandler and Grinder, (1975, p 52).

The challenge is to be made in relation to the person's understanding of the connection and this needs to be explored ('how does your wife specifically make you angry?' Dilts (1993). This could be seen as a particularly important point in considering classical conditioning. The idea being that there does not necessarily have to follow an expected response to a given stimulus.

A complex equivalence means that an individual has taken two situations and linked them together, therefore attributing them with meaning. It signifies the relationship

between words (or actions) and the set of experiences it represents. Basically people create expectations through complex equivalences; certain behaviours have meaning linked to expectations (Grinder et al 1977). For example someone might think that people not smiling means they are unhappy. Or if people are not looking whilst they are talking then they are not paying attention (O'Connor and Seymour, 1990). This can often be the case if someone who has a preferred internal representation in the Visual modality is interacting with someone whose preferred modality is Kinaesthetic. As there is a mis-match in their approaches one could misinterpret the other's behaviour as not being responsive. In the case of complex equivalences given above, the connection between the stimulus (someone not looking) and the interpretation (they are not paying attention) needs to be challenged, perhaps by asking, 'how do you know that that actually means that?' or 'are there any times you have encountered people not looking and you know they have been paying attention?'

'Mind reading' is quite similar and in this case individuals develop the belief that others are making judgments. Hall (1998) states that it is the attributing knowledge of another's internal thoughts, feelings and motives. For example saying 'She doesn't like me', or 'The group will be bored by me.' The challenge is to find out what indicates this meaning to the person, how do they actually know this? Otherwise this distortion occurs as a form of rehearsal and can be a form of self-fulfilling prophecy.

The meta-model serves the purpose in recognising these semantic arrangements of deletion, generalisation and distortion and providing the challenges or responses needed to create a fuller representation of the actual situation for individuals. Bandler and Grinder (1976) argue that when people come to therapy expressing pain and

dissatisfaction the limitations, which they experience, are typically in their representation of the world and not in the world itself. It could be argued that although this statement refers to a therapeutic setting, the same could be said for the arena of education and the way that people learn. Bandler and Grinder (1975) state that the Meta-model is therefore useful because it allows us to: 1. Gather information, 2. Identify the limitations of the individual's model and 3. Specify techniques that can be used for change. These three factors play a large part in NLP as they provide the tools for how to recognise and challenge language aspects that represent the person's experience of the world. These factors also highlight how these aspects can be limiting or empowering and then, how methods for change can be employed. Words function as a symbol of the sensory representations and these sensory representations function as a symbol of the actual experience (Burton and Bodenhamer, 2000). Therefore it could be argued that language is a way of accessing the internal representations of individuals in order to discover their experiences of the world and therefore change or enhance it for them. It is necessary now to return to submodalities as exemplars of experiences.

According to Harris (1999), a major feature of NLP is its ability to help people make fine distinctions between elements and then manipulate these elements in their imagination to create new and effective experiences. However the notion of 'manipulating' someone often brings with it negative connotations of subversion and deceit. NLP, however, has a strong sense of ethics integrated within it in what is referred to as 'ecology'. The same processes that are utilised in order to gather the information and assist with the promotion of change (or recognition of limitations) can also be utilised for the person to discover what the consequences would be of remaining with the limiting beliefs and behaviours, or if they made changes. The concept is similar to that of

any ecological system in that if you make changes to one part of the system this has an effect on all the other parts of the system. If a person becomes more assertive, as an example, they may find that the people around them do not respond positively to the change and leave or avoid their company. Hall (1999) states that un-ecological changes will either not last, or might create conflicts or more problems. If the impact of the changes are not investigated and checked to see whether they will serve the individual well, it may on one level look good, but on another could create disastrous results for the person. This may be because there are conflicting outcomes, and that the change may affect another behaviour that is valuable to the individual. Also the positive functions of the behaviour they currently have may be important to the person, so it is important that this function is not lost in the changes (Hall, 1999). In making these checks it gives the individual an opportunity to keep their lives balanced within all of the systems and contexts that they live.

It is recognized, however, that much of the above discussion is based on developments derived from transformational grammar and incorporated into the NLP model, so claims that these are pure NLP may be challenged. However the NLP developers do pay credence to this fact.

2.4.7 Using NLP as an Approach to Change/Learning

According to Bandler and McDonald (1988), when creating change by directing someone's brain there is a need to remove as much metaphorical description as possible, requiring a need to go down to the most basic components of brain processing, the submodalities. By doing this methodically and sorting out the submodalities, it is possible to understand how people can make transitions. However, it must be

remembered that a tool is only as effective as the person using it. Saamio (2000) points out that whether an approach is successful or not does depend on the style of the therapist.

There are varied ways to elicit the actual submodalities that a person accesses when referring to a particular state. As mentioned earlier, the structure of individuals' experiences can be demonstrated and explored through the structure of the sentences within the language that they use. As well as representing their experiences by different representational systems they also base their communication on these.

> 'Communication occurs in a number of forms such as natural language, body posture, body movement, or in voice qualities, etc. We call them *output channels.*'
> Grinder and Bandler, (1976, p 12).

Grinder and Bandler (1976) state that by utilising the same or similar predicates that the person you are interacting with is using will help in creating clearer and more direct communication. To utilise such words within the context of the above-mentioned meta-model responses or approaches improves the communication process in empowering or changing aspects for the individual. Someone identified with a preferred representational system in the Visual modality should be spoken to with words that match the Visual modality, Auditory with Auditory and Kinaesthetic with Kinaesthetic.

Although up to now there has been a focus on words as a means to investigating the submodalities of individuals' representational systems, Dilts et al (1980) state that this is only one portion of our communication. A tremendous amount of information is communicated through the non-verbal aspects of our communication. O'Connor and Seymour (1994) discuss classic research conducted by Albert Mehrabian (1972),

pointing out that in interpersonal communication the main impact is considered to come from the non-verbal aspect. This accounts for fifty five percent of the interaction followed by voice tonality at thirty eight percent and words appearing to have the least impact with seven percent. Richards, McWhirter, and Smallwood (2003) have questioned these figures, however, as they argue Mehrabian's research was mainly related to facial expression in relation to describing non-verbal behaviour and was described as not being generalisable. The main emphasis suggested in most literature related to NLP suggests that non-verbal communication takes place out of conscious awareness. In the same way people access their internal representational systems unconsciously. Therefore it can be difficult for individuals to recognise the sensory experiences they are having without much investigating by an external person. By paying close attention to specific non verbal aspects, it is believed in the field of NLP that a great deal of information regarding the person's preferred representational system as can be gained through utilising the meta-model (Dilts et al 1980).

Dilts et al (1980) state that there are behavioural cues (non verbal), which indicate the representational system that the person is accessing. According to O'Connor and Seymour (1990), there are visible changes in our bodies when we think in different ways. The way we think affects our bodies and vice versa. Grinder and Bandler (1976) give an example of someone who says they are comfortable, yet many of their non verbal elements such as their body posture perhaps being stiff and upright, breathing being shallow and irregular, having a harsh voice and a rapid rate of speech, may suggest otherwise. This is recognised as incongruity. In such a case, one of the forms of communication (verbal or non-verbal) appears invalid. The verbal message and the non-verbal message do not match. By accepting the verbal message, the Meta-model can be

utilised to investigate the true meaning of the communication for the person. By accepting the non-verbal aspect the meta-model can also be used to give an enriched account of the situation. However, if the verbal message only is accepted as true without further investigation, this can create inelegance in its exploration. Grinder and Bandler (1976) go as far as to say that verbal messages conveying a message that differs from a non-verbal message could be considered a form of deceit.

Dilts et al (1980) state that there is an endless range of possible indicators and accessing mechanisms available to an individual's sensory experience.

> 'By paying attention to the systematic and recurrent behaviour that people go through as they communicate and act, we have discovered a number of non-verbal cues which may be used to index the sensory specific processes people run through during behavioural activity. These include eye position, tonal and tempo qualities of the voice, breathing rate and position, skin colour changes, body temperature, heart rate, posture and muscle tonus.'
> Dilts et al, (1980, p 77).

In order to pay attention to such aspects it is important to 'calibrate' the subject. Just as one calibrates a machine (learning its unique responses and gauging it), calibrating to another human being entails learning to use sensory awareness to recognise the unique facets of another's experience as they process information and go in and out of states (Hall, 1999). Bandler and Grinder (1979) state that when you ask a human being a question they always give the answer non-verbally, whether or not they express it consciously or verbally, and what is needed is the sensory apparatus to attend to sensory experience. Individuals' representational systems come through in a number of ways.

According to Dilts et al (1980), any part of a system (such as the neurological/ biological system of humans) is affected if there is an occurrence in any other part. Therefore any

patterns of interaction between the parts can be identified, predicted and utilised. Also in humans all external behaviours (macro and micro) are a result or transformation of the internal neurological processes. Therefore these micro and macro behaviours carry with them information about those processes. They conclude that:

> 'All behaviour, then is in some way a communication about the neurological organisation of the individual- a person can't not communicate.'
> Dilts et al, (1980, p77).

One of the main behaviours that have been identified within the field of NLP as an indication of a person accessing differing representational systems is related to eye movements. According to O'Connor and Seymour (1990), individuals move their eyes in systematic ways depending on how they are thinking. In NLP these are called eye-accessing cues because they are visual clues that the person is accessing information. Bandler (1993) describes any behavioural cue that indicates processing of a certain sensory system as an accessing cue. Grinder et al (1977) state that when a person is accessing their representational systems, perhaps in relation to a state or to make reference to something, some picture, some feeling, some sound and some smell may be accessed at the unconscious level. As this moves into consciousness people typically use some body movement or eye-scanning pattern to access the information.

Observation of these movements, and their calibration, can then lead to an understanding of how the person organises their internal representational systems, strategies, thoughts and behaviours. Identifying and associating these movements through calibration to particular modalities and submodalities can then promote creative and effective responses to the subject (Grinder et al, 1977). As the person accesses their representational systems they are attempting to recover the deep structure derived from some surface structure of language used. This is known as a trans-derivational search

(TDS). The person is accessing representations that are either remembered or constructed. The subject hears the surface structure, recovers the deep structure and activates trans-derivational search in order to provide meaning to the statement. The eye scanning signifies that the person is using their neurology to search for the right representation.

Dilts et al (1980) state that the eye movements people make as they are thinking and processing information provide a remarkably accurate index for sensory specific neurological activity:

> 'Movements of the eyes up and to the left stimulates (in right handed people) eidetic images located in the non-dominant hemisphere. The neurological pathways that come from the left side of both eyes (left visual fields) are represented in the right cerebral hemisphere (non dominant). The eye scanning movement up and to the left is a common way people use to stimulate that hemisphere as a method for accessing visual memory. Eye movements up and to the right conversely stimulate the left cerebral hemisphere and constructed images – that is, visual representations of things that the person has never seen before.'
> Grinder, et al, (1977, p34).

Eye movements are not a new notion in psychology. Research by Hermanns et al (1999), showed that people with anxiety to spiders registered eye movements lasting significantly longer by paying more attention to pictures of spiders as opposed to flowers, when shown under experimental conditions. Ward et al (1996) stated that visual attention is often conceived as a high-speed serial system moving rapidly from one object to another at rates of a few dozen milliseconds per item. However, their experiments suggested that attention was usually paid to the first item in a series, which then interfered with attention paid visually to subsequent items. Both of these studies were conducted using technology that tracked the movements and focussing of the subjects' eyes. What is important to note, however, is that these eye movement studies

focus on the movement of the eyes when focussing on external stimuli. In NLP eye movements are important in recognising when the person is accessing internal stimuli.

Dilts et al (1980) noticed that when people were accessing particular modalities and submodalities (which were also reflected in their predicates) their eyes moved in particular directions for a fleeting moment before answering a specific question or making a statement. However there is little empirical evidence to support the reliability of these findings. Below in table 2.2 is a generalisation of their findings:

Table 2.2: Eye Accessing Cues

Accessing Cue	Representational System Indicated
Eyes up and To the left	Eidetic Imagery (V)
Eyes up and to the right	Constructed Imagery (V)
Eyes defocused in position	Imagery (V)
Eyes down and to the right	Internal Dialogue (A)
Telephone positions (eyes move towards ears)	Internal Dialogue (A)
Eyes left or right, same level of gaze	Internal Auditory (A)
Eyes down and to the right	Body Sensations (K)
Hand(s) touching on midline	Body Sensations (K)

O'Connor and Seymour (1990) point out that in neurological literature these movements are known as lateral eye movements (LEM). In NLP they are called eye accessing cues because they are visual cues that let us know people are accessing information. There is some innate neurological connection between eye movements and representational

systems. It should be noted that these rules do not apply to all people, yet are common indicators in the main of these types of accessing. O'Connor and Seymour (1990) state that these observations appear to be standard for right handed people and may be reversed for left handed people as the cerebral hemisphere domination is reversed. As mentioned earlier, calibration is important because of some of these individual differences. However, in the main Visualisation is usually signified by eye movements up or to the front, Auditory accessing with eye movements to the side or down to the left and Kinaesthetic with eye movements down or down to the right (Hall, 1999). Looking up and to the left suggests visual remembering, laterally to the left, suggests Auditory remembering and down to the left for Kinaesthetic remembering. Up to the right suggests visually imagining, laterally to the right Auditory imagining and down and right for imagined Kinaesthetic. Calibration is important and plays a crucial role in psychotherapy, communication and teaching because every person has their own unique way of experiencing and responding (Hall, 1999). Therefore it is necessary to check with the person through questioning aspects that they remember or create Visually, Auditory and Kinaesthetically and observe their non-verbal responses in order to gauge their eye movements and other non-verbal behaviours. In doing so it is possible to use this as a basis for their future responses. Dilts and Epstein (1995) state that as well as eye movements as an indication of how individuals access their internal representational systems there are also other indicators for the same. People often assume habitual body postures (or positions), which can indicate a great deal about the representational system the person is using. For example leaning back with head and shoulders up or rounded, with shallow breathing indicates accessing of the Visual modality. Body leaning forward (as in Egan's, 1990, 'SOLER' model with L meaning lean), head cocked, shoulders back, arms folded, even breathing in the diaphragm or the whole chest with prolonged

exhaling indicates accessing of the Auditory modality. Head and shoulders forward and down, with deep breathing indicate accessing of Kinaesthetic modality (Dilts and Epstein, 1995). O'Connor and Seymour (1990) state that as the body and mind are inseparable, how we think always shows somewhere. Therefore, if you know where to look it can be observed. In particular it shows in breathing patterns, skin colour and posture. Dilts et al (1980) point out that there are also gestural accessing cues, muscle tonus changes, tone and tempo of voice as well as the predicates within the person's language that give an indication of the representational systems being accessed. These are more commonly referred to as the B.A.G.E.L. model (Dilts and Epstein, 1995). This acronym stands for Body posture (B), Accessing Cues (A) such as breathing, facial expressions, skin colour changes and other idiosyncrasies, Gestures (G) such as pointing to the eyes or above for Visual, towards the ears or mouth or jaw for Auditory and touching the chest or stomach for Kinaesthetic, Eye movements (E) and Language (L) the use of predicates. Each of these body positions, signals, cues or behaviours, especially if observed together, give an indication of the representational systems used. These can be seen in Appendix Six. Grinder and Bandler (1976) describe these factors as paramessages. That is non-verbal outputs presented simultaneously. These paramessages can be utilised in assessing whether or not the person is congruent in what they are saying, that is that the non-verbal message is consistent with the verbal message:

> 'The term *incongruent*, then, applies to a situation in which the person communicating is presenting a set of messages carried by his output channels which do not match, are not compatible – this person is said to be incongruent. Other people's experience of an incongruent person is confusion.... The terms *congruent* and *incongruent* may be applied to the messages presented by a persons output channels as well as to the person themselves. Thus, if messages carried by two output systems are incompatible, do not fit, do not match, they are incongruent; if they fit, they are congruent.'
> Grinder and Bandler, (1976, p46)

In observing the person's accessing of representational systems, the observations can be utilised in order to communicate effectively with them by creating rapport. Mc Dermott and O'Connor (1996) describe 'rapport' as the quality of trust and responsiveness, which forms the basis of good relationships. Rapport can be gained by pacing the other person's experience. Therefore if someone is indicating that they are relating to or operating from particular modalities and submodalities then it is more elegant to utilise that modality to respond to them. Therefore in using the BAGEL model the body posture, gestures and language can be used to align or match that person. O'Connor and Seymour (1996) point out that good communication comes from appreciating the unique reality of the other person; by demonstrating and tuning in body language, tonality, gestures and words rapport can be easily achieved. Hall (1998) states that rapport is a sense of connection with another, a feeling of mutuality, a sense of trust, created by pacing, mirroring and matching them.

Grinder et al (1977) state that, in the ordinary waking state, most people are continually being distracted by experiences generated either by external stimuli or by experience generated by internal stimuli. The '4-tuple' for any experience can then be highlighted. Dilts et al (1980) state that all overt behaviour is controlled by internal processing strategies. Some strategies (sequences of representations) may work successfully and others can be limiting and unsuccessful. Dilts et al (1980) discuss this concept of a strategy within the framework of a model proposed by Miller, Galanter and Pribram (1960). This model works on the format of test-(T) operate-(O) test-(T) exit-(E), (TOTE). A TOTE is:

> 'Essentially a sequence of activities in our sensory representational systems that has become consolidated into a functional unit of behaviour such that it is typically executed below the threshold of consciousness.'
> Dilts et al, (1980, p26).

These TOTEs (chunks of representations in sequences) can be used to investigate certain aspects of experiences and approaches the individual uses to operate in the world. By identifying and responding systematically to patterning in experiences, humans are able to make portions of experience unconscious that had previously had to be managed at the conscious level (Grinder et al 1977). An example of this is the difference between learning to drive and becoming competent as a driver. In the learning stage everything has to be processed consciously. Once learned, many actions occur spontaneously and unconsciously in carrying out the task.

The TOTE is actually a problem solving approach,

> 'If the conditions of the *test* phase (a comparison of present state and desired state) are met, the action initiated by the stimulus *exits* to the next step in the chain of behaviour. If not, there is a feedback phase in which the system *operates* to change some aspect of the stimulus or of the organisms internal state in an attempt to satisfy the *test* once again. The test-operate feedback loop may recycle many times before the test is passed and the action exits.'
> Dilts et al, (1980, p27).

In utilising this model the individual finds ways to make decisions and be convinced by their actions by checking on their outcomes. O'Connor and Seymour (1990) state that this process is useful as it can be used as feedback to get closer to the goal. Also mistakes are useful within it, as they are results that are not wanted and therefore can be tested again. In whatever aspect the individual is processing, the exit stage is the end point and could be argued to be the point of congruence as the individual is satisfied with the output (unconsciously). NLP refines the TOTE model by specifying their components in terms of representational systems and strategies. In other words the TOTE operates through representational systems. This is achieved through many comparisons. These can take place by gaining information of internal experiences contained in a '4-tuple' and comparing them at each stage through the TOTE procedure.

For example, in hammering a nail the person would use the hammer, hit the nail, this would be checked (tested against some criteria) and if more hammering was needed then this would be actioned (operated), then the comparison (test) would take place again. If the nail did not require more hammering then the procedure would be exited. In order to do such a task the person has to consider the experience. So the nail would be looked at and compared against a representation of what it should look like. External Visual information is compared to internal Visual information. Other modalities can be added to the process such as the Kinaesthetic or Auditory depending on the person's preferred representational systems. For example the Visual system may lead them through the process yet the Kinaesthetic system may be preferred. So the process may not be exited until the external and internal Kinaesthetic representations 'feel' right.

> 'The representational analysis of TOTEs provides an extremely useful way of sorting effective behavioural strategies for particular tasks. This offers a reliable and powerful means for increasing individual or group effectiveness in any occupation or endeavour'.
> Dilts et al, (1980, p35).

Therefore the formula for hammering a nail may be highlighted in the following way: The person hammers the nail and then looks at it (Visual external [V^e]). This is then compared with an internal Visual representation of what it should look like. This will be a constructed image, as it has not yet occurred (V^{ic}). There may be some internal dialogue, 'that doesn't look right' (Auditory internal dialogue [A^{id}]). Then this could be checked against an internal Kinaesthetic as to whether it feels right (K^i). If not then more action will take place and the sequence gone through again. The formula for the strategy is therefore:

$$\text{Hammering nail} <V^e, V^i, A^{id}, K^i>$$

In this case the Visual system is the lead system and the Kinaesthetic system the preferred system. It should be noted that these might be different for different individuals

or for the same individual in differing circumstances and for different requirements. The whole thing linked into the TOTE process would look as follows in table 2.3:

Table 2.3: The 'TOTE' Process and '4-Tuple' Approach to Problem Solving.

Test (T)	Operate (O)	Test (T)	Exit (E)
$=<V^e,V^i, A^{id},K^l>$ If not satisfied then go to →	Hammer nail. Then go to →	$=<V^e,V^i, A^{id},K^l>$ If satisfied then go to →	End strategy

In observing such a person we may notice their body positions change, particularly eye movements; eyes move up and to the right (Visual internal constructed) after looking at the nail, followed by eyes down to the left (Auditory internal dialogue) and then by eyes down and perhaps to the right (Kinaesthetic internal).

Synaesthesias occur when the representation combines systems, mixtures of where pictures, sounds and feelings are mixed together seamlessly (Mc Dermott and O'Connor, 1996). Hall (1998) describes it as an automatic link from one representational system to another without a moment of consciousness to think about it. Therefore an experience can have overlapping representational systems at once and in its sequences or '4-tuples'. For example, although a person may have a preferred modality of Visual, there may also be present sounds and feelings. Bandler (1985) states that if one element of a synaesthesia is changed (such as the submodalities in the Visual modality) then elements of the other submodalities within it will also be affected. The move from the person's lead to preferred systems is an example of a strong synaesthesia. It occurs as an overlap of the internal representational systems (O'Connor and Seymour 1990), colours can often be linked to moods. It is useful to be aware of synaesthesias because in doing so

the representational systems of the individual can be added to. By adding an entirely new representational system, the individual's model of the world is dramatically extended and many new choices become available to them. According to Dilts et al (1980), synaesthesias constitute a large portion of the human meaning making process:

> 'Correlations between representational system activities are at the root of such complex processes as knowledge, choice and communication.....By making these correlative patterns explicit, Neuro-Linguistic Programming provides a working model, an applied technology for the strategic utilisation of correlative patterns to secure any behavioural outcome.'
> Dilts et al, (1980,p23).

As mentioned earlier NLP is used to: 1. Gather information, 2. Identify the limitations of the individual's model and 3. Specify techniques that can be used for change (Grinder and Bandler, 1976). To do this it is important to access the very basic aspect of individuals' experiences, that of their representational systems. The representational systems can be investigated by utilising the BAGEL model of Dilts et al (1980): body posture, accessing cues, gestures, eye movements and importantly language. The Meta model is an aspect of language that utilises and recognises the generalisations, deletions and the distortions that the individual uses and can be used to create enhanced models of the world for the person. Also in the language they use, the predicates can be noticed as a verbal form of expression of the internal representations that they are accessing in creating their model of the world. From this the person's lead and preferred representational systems and any synaesthesias can be identified and investigated. Then the strategies they develop for particular aspects of thinking learning and behaving can be elicited. To put this simply, the individual's situation can be enhanced through assisting in representing the present state, representing the outcome state and representing the resource states needed (Dilts et al, 1980). Representational systems could be considered like the numbers on a telephone, the way that they are sequenced

leads to different outcomes, and as such certain states or resources might be like particular telephone numbers. If the number is not providing the desired response it is necessary to rectify it by changing the sequence.

2.4.8 The Case For Using NLP in Research

The above section has been developed utilising the original and subsequent works of those considered leaders in the NLP field. A major criticism of NLP relates to the matter of objective evidence that NLP techniques work and that the fundamental operating principles stand up to academic analysis (Hancox and Bass, 1995). They state that NLP has gained credibility in many areas including the business area since results can be measured in increased performance and revenue. However:

> 'As an epistemology for explaining, codifying and changing human experience, however, it is not widely understood and, in part, this relates to the lack of understanding of NLP by traditional academic and medical communities.'
> Hancox and Bass, (1995,p 38).

They also state that this is unfortunate as NLP has a lot to offer many fields and can in itself benefit from academic research. However NLP was derived from fields of therapy, and medicine and linguistics (transformational grammar) within a cognitive psychology framework, all of which have roots deeply entrenched in academic tradition. So there appears to be little argument about its basis. What is more of an issue is evidence relating to eye accessing cues, predicates and the relationship between these and representational systems.

In terms of evidence, Dilts et al (1980) argue that:

> 'Statistics may support or reveal patterns but they do not establish them; nor do they determine whether a pattern will be useful or not. Statistical averaging may sometimes be used to help find a pattern, but the statistics themselves are not the pattern as they are often assumed to be. Indeed, the behaviour we are studying becomes established, not on the basis of statistical averages, but on patterns. The

> child learning to speak does not assimilate language by taking statistical averages of the words S/he is learning to use, but rather on the basis of the patterns offered by relatives, friends and others as the child is growing up. The overwhelming majority of children become competent native speakers of the language they learn in this way.' Dilts et al, (1980, p78).

This concept is supported by Marks (1999) who states that the subjectivity of consciousness is not an obstacle in scientific study. Under well-controlled conditions, verbal reports provide reliable and valid measures of conscious experience. Individual participants should not be treated as an imperfect measuring device of their own consciousness. As the author is an NLP master practitioner and trainer, having experience in utilizing these methods and with a thorough understanding of the approaches, it is felt that further findings will be added to the field of NLP (in relation to internal representational systems) and the wider fields of learning and nurse education.

Having discussed many aspects of NLP, it is now necessary to investigate Learning Styles, as the thrust of this study is to investigate internal representational systems as presented in NLP and their relationships to learning styles.

2.5 Learning and Learning Styles

This section will focus on learning styles, with a discussion of general learning style issues leading to a more detailed exploration of Honey and Mumford's (1992) theory of learning styles. Criticisms, including the recent overview provided by Coffield et al (2004, 2004a) raised in relation to Learning Styles will be introduced and discussed in the relevant sections. The discussion will include:

- Learning styles and terminology
- Fixed styles and matching/mismatching
- Kolb's and Honey and Mumford's Learning Styles

2.5.1 Learning Styles And Terminology

D'Andrea and Gosling (2001) state that:

> 'The explanations for growth and interest in learning and teaching and educational development are complex. Increased demand for public accountability, the trend towards mass Higher Education, and changes in funding for Higher Education, which in turn has led to greater diversity of students in the sector, have created greater challenges to teachers and learners in Higher Education than they have ever faced before. In addition, more sophisticated forms of learning technologies are substantially increasing the choices open to individual teachers/ learners and institutions, causing a steep-change in the complexity of the teaching task. The burgeoning growth of research into learning and teaching is also raining awareness of the problematic nature of the learning process.
> D'Andrea and Gosling, (2001, p64).

It can be argued that research into issues such as the learning styles of students in Higher Education make an important contribution to this complexity. Many research studies have taken place relating to a range of learning style theories and the need to take account of these when planning learning. It is important to note that learning style theories remain popular in education and are used regularly by educators within curricula and classroom delivery, despite their problematic nature. Over the years there have been many criticisms of the concept as a whole, and of individual learning style theories. The most recent is a major review by Coffield et al (2004, 2004a) which appeared as this thesis neared completion. Coffield et al's report is a literature review covering thirteen of the more popular learning style theories, showing how widespread is their use, and providing a critique of each. Although the overall tenure of the report is critical, it does call for more research to add to the debate on learning styles as a tool in education. They argue that aspects of activity, theory, pedagogy and commercial considerations divide the learning style field.

According to Vermetten et al (1999a) learning involves the application of learning activities in such a way that an individual's knowledge base or his/her repertory of skills changes. Ostmoe et al (1984) describe a learning style or preference as the likes or dislikes a person has for particular sensory modes and conditions of learning, including preferences for particular learning strategies. Although dated, this is a useful descriptor for learning styles. It also presents the impression that sensory modes are involved, which is another link with NLP representational systems and modalities/ submodalities. Hayes and Allinson (1996) suggest that a learning style could be considered to be a subset of cognitive style, which they describe as individual differences in information processing. These comments point to a link between NLP representational systems and learning styles, suggested because of the overarching concept of information processing. Riding and Rayner (1998) suggest that cognitive style is seen as an individual's preferred and habitual approach to organising and representing information. This concept is very similar to the strategy notions and the sequencing of representational systems of NLP. Hayes and Allinson (1998) go on to discuss the fact that differences in the achievement of students ought to be recognised as not just being a result of differences in training, intelligence and experience but in the fact that people differ in their ability to recognise new kinds of responses required in new or changing situations. As they state that a learning style is a subset of a cognitive style, they describe it as a consistent way of responding to, and using, stimuli in the context of learning. By understanding the way that students think and react to stimuli the planning and structuring of educational methodologies for maximum effectiveness can be achieved (Carland et al, 1994). So, according to these authors, the basis of learning style theory is the concept that individuals differ in their approaches to learning. Riding and Rayner (1998) argue, however, that learning styles

are a separate conceptual issue to cognitive style. They argue that learning styles are based on the individual's active response to learning tasks, and state that:

> 'Learning styles should be considered as individual set of differences that include not only a stated personal preference for instruction or an association with a particular form of learning activity but also individual differences found in intellectual or personal psychology.'
> Riding and Rayner, (1998, p51).

They continue by stating that learning styles are divided into four groups of style models:

- The learning process - based on experiential learning and based on orientation to study,
- Instructional preference,
- Cognitive skills and
- Learning strategy development.

This is a useful definition and different learning style theorists can be seen to align within each of these categories or across all of them. The definition could be considered contradictory however, as cognitive skills and learning strategy are deemed a factor of learning styles, yet learning style is argued to be different from cognitive style. These contradictions can lead to confusion in interpreting the literature with such interchangeable terms, leading to some of the major criticisms of the use of learning style theory as a whole. Sadler-Smith (2001) discusses how some of the confusion arises in relation to learning styles, including the terminology related to the theory and concepts itself :

> 'This position reflects a general problem in the literature in which "learning style" is used as a portmanteau term for a range of individual difference constructs encompassing, among other things, learning preferences, learning

strategies, approaches to studying and cognitive style.' Sadler Smith (2001, p292)

This view is supported by Cartney (2000) and Wintergest et al, (2001), who point out that the confusion between strategy and style is also deemed part of the wider issue of overlapping terms. Coffield et al (2004) state that competing ideas of learning styles have led to this proliferation of terms which are used interchangeably in learning styles research. These include learning styles, learning strategies, approaches to learning, cognitive styles or structures, conative styles, thinking styles, teaching styles, motivating styles, learning orientations and learning conditions. Sometimes these are used precisely and at other times are used loosely, providing limitations in the language used about learning styles themselves. Sadler-Smith (2001a) suggests that because of this confusion for both researchers and practitioners alike there is a need to delineate cognitive styles and learning styles as separate constructs. This statement itself is then made just as confusing by his stating 'if indeed they are such' (Sadler-Smith, 2001a, p610).

The two main learning style theorists being considered in this study are Kolb (1976, 1984) and Honey and Mumford (1986, 1992). These will be discussed in detail later in this chapter. According to Riding and Rayner (1998) these theorists fall into the learning process based on experiential learning category as mentioned above. Sadler-Smith and Smith (2004) argue that such proliferation of labels, allied to the indiscriminate use of the term 'learning style', leads to a certain amount of haphazardness, confusion, and divergence in a field that is not unified. For the teacher considering the use of learning styles within their educational approach this can lead to difficulties if the very concept is not clear, and individuals or groups of teachers

have varying notions of what learning styles actually are. This will result in attempted implementation derived from potentially inaccurate conceptions. These are valid points, yet individuals are capable of describing how they prefer to learn and often do allude to some descriptors of learning styles as being relevant to them. There is therefore a need to clarify and explain precisely what the differing terminologies mean or suggest within the educational field.

2.5.2 Fixed Styles And Matching/Mismatching

One area of discussion or debate within the field of learning styles is whether learning style is a fixed phenomenon, or whether it is flexible and adaptable depending upon the learning environment in which the individual is placed. That is, whether an individual will have one approach that suits, therefore only benefiting from specific situations, or whether their approach is changeable, therefore enabling effective learning in differing situations. Vermetten, Vermunt and Lodewijks (1999) point out that the question is whether the learning strategy employed is more of a consistent learning style or whether they are flexible towards the specific situation. This is supported by Ford and Chen (2001) who state that there is empirical evidence to suggest that matching cognitive and learning styles with instructional approaches may have potential in enhancing student learning. They suggest that different individuals seek and process information through different strategies and these strategies will be differently effective in different situations. Also individuals tend to display a consistent learning style for these strategies and these may be more effective in situations where their learning is in matched conditions to their style. Heffler (2001) suggests that it is advantageous to know one's learning style or for teachers to know

those of their groups in order to organize the curriculum with reference to the learning process. This suggests matching the process to the predominant learning style within the group. Hallock et al (2003) support this notion by suggesting that research indicates that when student styles and teaching approaches match, the classroom experience is affected, yielding enhanced learning. Cartney (2000) states that the whole question of matching or mismatching styles is an important one. He refers to previous studies that showed a change in learning styles depending on context (in academic or practice environments) suggesting that mismatching might assist in developing a wider range of styles. Cartney also suggests that if styles vary depending on context (and exposure) then they may not necessarily be relatively stable characteristics but more fluid and changeable dependent upon circumstance. Sadler-Smith and Smith (2004) suggest that as well have having congruence between activity and style, activities which do not match are important to be used as the basis for self development. Woolhouse and Blaire's (2003) findings suggested that although students left their course at various stages this was not necessarily due to the matching/ mismatching issue. They agree that there is no apparent resolution within the literature in relation to matching or mismatching learning styles, although the predominant theme appears to be that matching approaches to styles is useful. Busato et al (1998) looked at whether learning styles change over time. Their work was based on the learning styles suggested by Vermunt (1998). After reviewing the literature they suggest that there are few studies that consider changes in learning style. Their study was based upon the concept of productive activities of learning (students producing research findings and generating ideas) as opposed to reproductive approaches (reproducing what is learnt in examinations). They found that there was not a change in student learning styles from a reproductive learning style to a more

productive style as they moved through their course, and no relationship was found between the year of study and the students' learning style. However the authors themselves state that there was a poor response rate within the sample that could have affected the findings. They criticise the inventory of learning styles they used, stating that it is not specifically designed to account for the later years in Higher Education where there is an emphasis on literature reviewing, writing theses or conducting research. Hayes and Allinson (1998) suggest that styles may produce consistent behaviour across a wide variety of situations over the short and medium term, yet strategies are much more specific and essentially represent the result of conscious decisions an individual makes to cope with cognitive tasks. Murray-Harvey (1994), in discussing instructional preferences of students, states that it was thought that:

> 'Students possess biologically based physical and environmental learning preferences which along with well established trait-like emotional and sociological preferences, combine to form an individual learning style profile. A student's learning style is thus claimed to be largely resistant to change.' Murray Harvey, (1994, p 376).

However in Murray-Harvey's (1994) study, using two questionnaires to measure student learning styles and approaches to learning (strategies) it was found that style and approach actually do constitute two different conceptualisations of how students learn and study. Therefore she argues that it makes sense to refer to learning style and approach as two separate unrelated constructs. The results suggest that the concept of learning style being resistant to change is not supported in the study. This differs from Riding and Rayners' (1998) arguments that students' approaches to study are a form of learning style within the cognitive skills and learning strategies. Hartley (1998) states that the strategies individuals use to learn and study are sometimes more consciously initiated and controlled than their learning styles. This is a useful

distinction and supports the notion that learning styles may be fixed; yet strategies or approaches to learning can be flexible.

Murray-Harvey (1994) states that a consequence of extensive research into individual differences in student learning is that numerous models and conceptualisations of the learning process have been created. Along with this there has been a multitude of instruments designed to measure them. Biggs, Kember and Leung (2001) suggest that many inventories addressing learning processes are derived top down from cognitive psychology, particularly those that address information processing approaches. This results in many different instruments with overlapping conceptualisations and categories. Murray-Harvey (1994) states that this leads mainly to two aspects; students' approaches to learning (learning strategies) and their learning style. Severiens et al (2001) review a model proposed by Curry, (1983) made up of three components: instructional preference, information processing and cognitive personality style, and they suggest that the cognitive personality style is close to personality and therefore relatively stable, suggesting that learning styles tend to be consistent and fixed. This again shows agreement with the above criticisms, as these points tend to suggest that learning strategy, preferences for instruction and learning style are differing concepts. Wintergest et al (2001) suggest that embracing learning styles may have an amount of intuitive appeal, yet difficulties arise when these factors are related to anything other than individual preferences. Riding and Sadler-Smith (1997) suggest that depending on the nature of a given task, some styles will be better suited to some tasks than others and vice versa. This is supported by Hallock et al (2003) who argue that learning styles refer to a singular capability that can enhance learning in some situations and hinder in others.

Fox et al (2001) point out that students approach their study in different ways and this leads to two main theoretical standpoints similar to the argument posed by Murray-Harvey (1994). The two approaches are information processing and student approaches to learning. Students' approaches to learning are mainly based on the notions of Marton and Säljö (1976) in relation to deep learning and surface learning and the motivations of students to learn within this.

2.5.3 Applications of Learning Styles in HE.

In looking at the issue of learning styles of students and Higher Education, Carland et al (1994) state that:

> 'The aim of education should be to facilitate the achievement of all students, regardless of cognitive type; consequently, the importance of knowledge about student typologies lies in aiding students to plan their learning and in aiding teachers to plan instruction to maximise the aptitude and interest of all types.'
> Carland et al, (1994, p414).

However Lecouteur and Delfabbro (2001) argue that:

> 'Increasing attention has been directed towards the more efficient utilisation of teaching resources and skills. ... Considerably less attention has been paid to how teachers' conceptual understandings of teaching and learning might influence the approaches of students. Even less is known about the effects of differences between teacher and student conceptualisations of learning, despite the fact that approaches to learning and learning styles are closely linked to the ways in which courses are taught and assessed.'
> Lecouteur and Delfabbro, (2001, p205).

They state that research has shown that certain methods of teaching and assessment encourage students to adopt particular approaches to learning. In their study, which looked at students' and teachers' views around teacher/student oriented approaches, they found a mix of orientations from students and teachers, and concluded that over arching profiles in regard to teaching and learning do little to enhance understanding

of salient factors in these processes of teaching and learning for those to whom the matters are a fundamental consideration (Lecouteur and Delfabbro, 2001). They suggest that instead of reductionist methodologies attempting to classify aspects of learning approaches there is a need to look at the more complex aspects of how individuals construct their attitudes and approaches to teaching and learning. This is the essence of this study. Although this suggests that learning styles may not seem to be an important consideration this type of investigation of individual approaches and preferences reflects the very basis of the present study. The need to expand teaching repertoires in order to take into account of teaching/learning differences is widely recognised. Biggs et al (2001) point out that many teaching and assessing methods often lead to a surface approach to learning. The use of surface approaches suggests teaching or assessment methods are 'out of kilter' which reflects on the quality of the learning environment. After revising Bigg's study process questionnaire (SPQ) (Biggs, 1987), Biggs et al (2001) suggest that the most effective way of creating high quality teaching and learning is for teachers to take responsibility for ensuring that assessment and other elements in the teaching/learning process are aligned to promote deep approaches to learning. Rosie (2000) states that deep or surface approaches to learning can be context dependent as students may use one approach in one situation and the other in different contexts. He discusses the points raised by Biggs (1999) of a 'blame the student culture' in relation to student achievement, and that 'teaching techniques are always successful' in looking at learning issues. However, both of these extremes fail to address student learning strategies and see assessment as being different from learning activities. This raises questions over how the issue of preferred assessment approaches are addressed, which appears to be lacking in most learning style theory. Birenbaum (1997) did review assessment preferences in relation to

learning strategies and orientations. It was found that individual preferences appeared to be more significant than preferences by group or discipline (types of course studied). In addition, different assessment preferences correlated highly to learning strategy preferences. A suggestion made is to let the student choose the assessment methods from a variety of assessment approaches that are relevant for the particular assessment purpose. The suggestion put forward is that as assessment is related to preferences to learning strategies, the question concerning assessment preferences should be 'Who prefers what?' as opposed to 'What is preferred by most?' This suggests that the issue of defining learning styles in relation to instructional preferences is useful yet limited, as it needs expanding to include assessment preferences. In considering assessment approaches, Rust (2002) points out that many educational texts place assessment as central to educational development of students, yet most teaching staff are at least only partially aware of this relationship. They understand that if work does not produce marks for the student then the student is disinclined to do the work. This suggests that assessment tends to be a surface approach for students, and that is it is used as a means to an end. Rust (2002) argues that when assessment decisions have to be aggregated into one mark or grade, the linkage to learning outcomes becomes even more untenable. In order to provide a deep approach, continuous assessment is needed, with plenty of opportunities for formative feedback. Rust (2000) earlier posited that there should be no summative assessments at all; instead information gathered by students (perhaps in portfolios) should be submitted with evidence identifying how they have met agreed learning outcomes of the course. There could be some difficulties with this approach however, as the basis of learning style theory is related to individual differences and not all

individual learners may prefer such methods of assessment. The variety of portfolios (if individualistic) could lead to problems in standardising assessments.

Riveiro et al (2001) suggest that much of the motivation to learn by students is determined by the goal orientations that they have. Task oriented students are primarily concerned with attaining mastery and knowledge improvement. Learning the material is seen as an end in itself. Performance oriented students have a desire to demonstrate superior skills. For them learning the material is seen as a means. In their study looking at goal orientations and their relationships with cognitive, self regulatory and motivational pursuits, Riveiro et al found that students that were most positively self regulating were those that engaged in learning, understanding and problem solving (deep learning) to develop new skills and achieve satisfaction and to avoid been seen negatively by others. They also suggest that self-regulated learning can be hindered if there is an imbalance between task oriented and performance oriented goals. An interesting finding was that females are more likely to be self-regulating towards learning than males. Sideridis and Kaissidis-Rodafmos (2001) also studied goal orientations as an indicator of students' approaches to learning based on the view that, in students that perceive performance goals as important, the relationship between these and their performances would be stronger. They concluded that student behaviour could only be taken into account when goal importance is included. This suggests that learning styles or approaches could be developed depending on the motivating factors for the student, achievement or learning. A point of caution however, is raised by Cliff (1998), who states that cultural nuances should be taken in to account, as there is research evidence to suggest that Asian (or non-western) students utilise rote learning and memorisation (surface learning) and

achieve excellent results through this method. A study by Park (2001) however shows that students from differing cultures in American schools achieve results through a variety of learning styles and suggests a variety of instructional approaches as being beneficial.

Fang Zhang and Watkins (2001) state that after more than two decades of research investigating cognitive development, student approaches to learning and learning style, the relationship between cognitive development and learning approaches is hard to find. Therefore in their study involving a sample of Chinese and American students, they suggested that a link could be found between cognitive development and students' approaches to learning in predictable ways. Jacobs and Newstead (2000) argue that although there have been a number of studies of learning approaches in students, there is little understanding as to how motivation aspects develop in students. In their study they investigated what motivated students on their course; knowledge, skills or experiences. They found that students at the beginning of the course regarded all three aspects as important. They also found that the importance of skills and experiences declined in the middle years of the course only to increase again in the final year. They suggest this supports the idea that many students have 'second year blues'. However older students rated skills and experiences as more important as motivators than younger students. Kember et al (1999) state that there are two main factors involved in students' motivation to learn; intrinsic and extrinsic factors. However they suggest that there are also other motivators also such as surface motives, deep motives and achieving motives. Career decisions and importance also play an important part in the motivation of students with regards to their course being a necessary pathway to joining their career.

A study by Trigwell et al (1999) found that teacher-centred/information transmission approaches correlated strongly with surface approaches of students. They suggest that deep approaches to learning are related to higher quality learning outcomes, while surface approaches often result in lower quality learning outcomes. Students that perceive they are receiving good teaching tend to have a deep approach to learning. The research also suggests that the learning environment has an effect on the students' experience of learning. This study was based on both teachers and student's perceptions of their relationships and learning, which is different to some of the other studies discussed, which mainly use students as their sample populations. The concept that students' perceptions of learning are closely linked to the learning environment and that this affects their approaches to learning is supported by Dart et al (1999). Their description of the learning environment however tends not to be related to physical aspects, rather the psychosocial aspects such as whether learning is teacher or student centred. Muijs and Reynolds (2001) state that the most important aspect of the learning environment is the relationship between teacher and students. They point out that teachers who are concerned with students' emotional and social as well as academic needs have been found to engender more student involvement in lessons. Dart et al's (1999) study suggests that classroom environments that offered higher levels of personalisation, participation and investigation were associated with deep approaches to learning. These are useful suggestions, yet the sample for this study was school age students so it may not be generalisable to other populations such as students in HE, for example student nurses. It is clear from the above discussion that there are many criticisms related to learning style theory. The difficulties arising from terminology differences are particularly evident. Overlapping terms add confusion to

actual meanings and there are no clear boundaries between concepts. There are also no clear conclusions on the benefits and disadvantages of matching or mismatching activities with an individual's preferred learning style. There are tensions arising from this such as the need to consider the individual's needs against the needs of the student group. Finally there are differing conclusions in relation to the concept of whether learning style changes or is fixed. However, despite all of these criticisms the concept of learning style continues to be researched amongst student groups, some with nursing students and other HE students. The main factor arising out of most of the studies discussed is the need for continued and developing research into the concept of learning styles. It is for this reason that this study has some value.

2.5.4 Kolb's Learning Styles

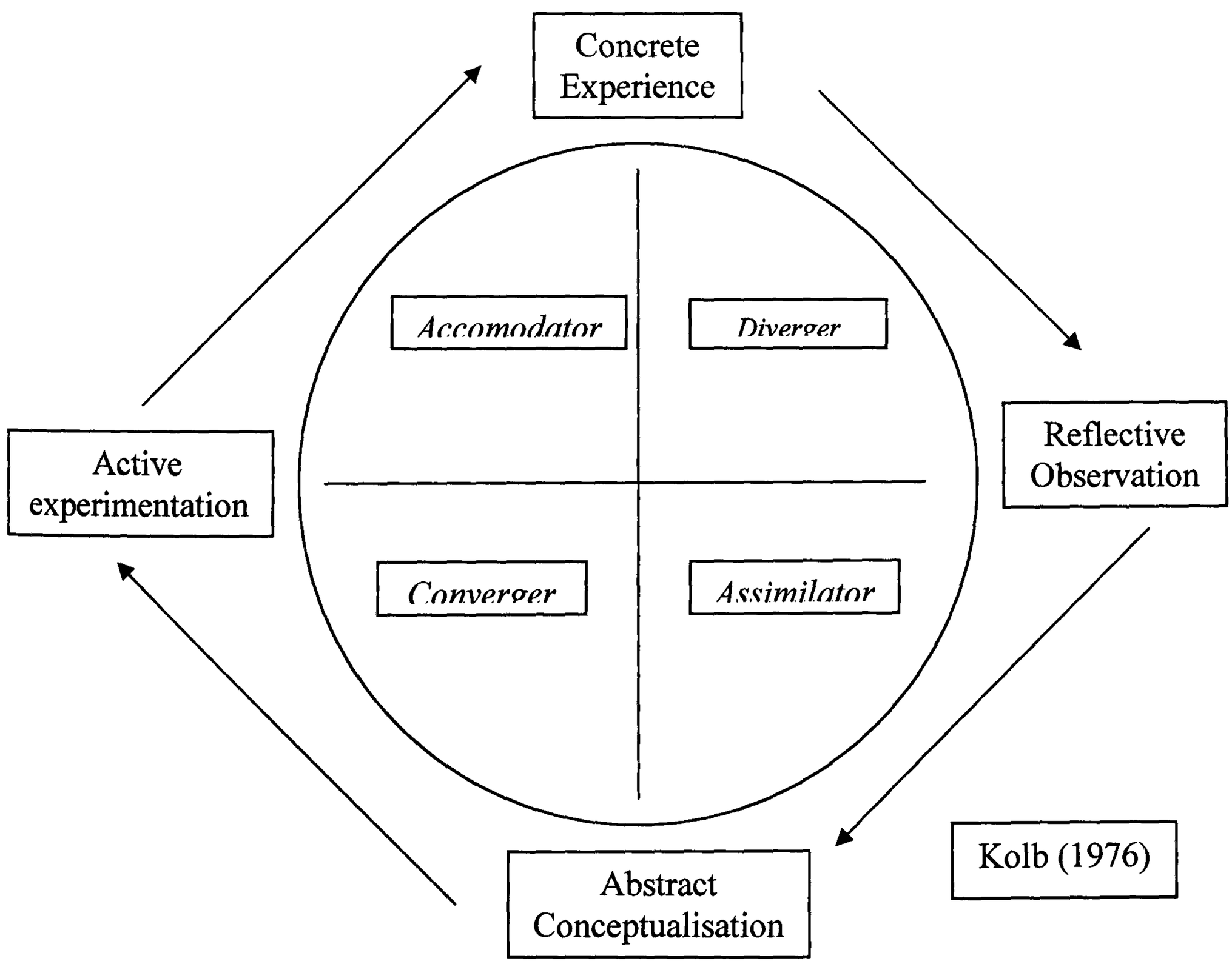
Coffield et al (2004) place both Honey and Mumford's and Kolb's learning style fields within the arena of 'flexibly stable' learning preferences and suggest that as the authors have commercial interests with their product they have little interest in responding to claims made against it.

It could be argued that Kolb (1976, 1984) is a leading proponent of learning style theory. He is a proponent of the idea of learning being a lifelong process between the person and their interactions with the environment, and that there is a relationship between how people learn and the ways in which they respond to life situations.

Kolb sees the person to environment interaction, and therefore the way that he or she processes the information, as a cyclical process. This experiential learning theory defines four phases in the process of learning from experience: ***Concrete Experience***

enables individuals to become immersed in actual situations. ***Reflective Observation*** allows them to reflect on these experiences from different perspectives. ***Abstract Conceptualisation*** is used to develop explanations of what has happened and ***Active Experimentation*** is used to test hypotheses as a problem solving approach. These are the competencies that a person uses to learn (Boyatzis and Kolb, 1995). They are seen as polar to each other, that is active experimentation is entirely opposite to reflective observation and the same goes for concrete experience as opposed to abstract conceptualisation. These can be seen in Figure 2.2. According to Boyatzis and Kolb (1995) individual learning styles are defined by a person's reliance on one of these four modes of learning. They state that these are what cognitive psychologists call learning strategies.

Figure 2.2: Kolb's Learning Cycle and Styles



According to Kolb (1984), the learning style of the person depends upon which segment of the quadrant of the experiential learning cycle they fall into. If they prefer concrete experience and active experimentation they would be labelled as ***Accommodators*** within this framework. Individuals with this style are usually good at carrying out plans and getting things done, and can be very people orientated. ***Convergers*** are excellent in abstract conceptualisation and active experimentation skills. They are not as people oriented, but are good at applying theory to practical situations. ***Assimilators*** use abstract conceptualisation and reflective observation skills. Inductive reasoning and theory building is a strength. Individuals with this style are less people oriented and less practical than other learners. ***Divergers*** enjoy concrete experience and reflective observation. They have good imaginations and can view situations from differing perspectives. They are often very people oriented (Partridge, 1983; Laschinger and Boss, 1984; O'Kell, 1988). Boyatzis and Kolb (1995) point out that at the learning level the application of knowledge is extended in time and space to include generically similar situations. The organisation of the person's knowledge at the learning level is assessed by using Kolb's Learning Style Inventory (LSI). Accordingly, people with specific learning styles take them into life choices that match this. Boyatzis and Kolb (1995) state there are relationships between individual learning style and educational/ career specialisation. This would suggest that any given career or profession would have a high proportion of members with a specific learning style. However with learning styles supposedly having an individual focus, there is little evidence that supports this notion.

Kolb (1984) suggests that learning styles are developed in three phases. Firstly there is ***acquisition*** (birth to adolescence), where the individual develop basic competencies associated with each mode in the four-step cycle. Secondly they begin ***specialisation*** (early adulthood to mid career), where individuals become specialised into style most suitable to their chosen career. The final stage (mid career onwards) is ***integration***, where there is the development of lesser-used learning competencies as they look for more specialised skills in order to reach self-actualisation. Ostmoe et al (1984) argue that learning style is not permanently fixed and may be changed through motivation and interest. Experiences in family, education and work environments result in the development of characteristic learning styles. De Coux (1990) support Kolb's notion that people are attracted to certain careers because of their learning style. If there is a mis-match between the learning style norms and the individual's learning style, then the individual will either need to adapt their learning style to suit or leave the speciality.

Sutcliffe (1993) describes the learning style preference as the likes and dislikes that an individual has for a particular sensory mode or condition for learning. The LSI measures an individual's emphasis on the four learning style orientations and provides a score, which shows abstractness over concreteness, and action over reflection (Boyatzis and Kolb, 1995). A study completed by Cavanagh et al (1995) showed that there were fairly evenly distributed learning styles across a sample of 192 Dip (HE) nursing students, without a particular preference for one main style, although the divergent style occurred most, and there appeared to be favouritism for the concrete experience area. This supports the concept that concrete experience learners tend to choose people oriented professions. However there are some discrepancies in the

research as there was some demographic information that was not completed by all students, but there appeared to be no statistically significant influences on learning style regarding age, gender and previous learning.

Sutcliffe (1993) carried out a semi-structured interview approach investigating whether students changed their learning style according to the subject area studied. From the qualitative analysis it showed that students were showing different styles for different topics. Someone with a preference for convergent learning style, would prefer lecture methods for anatomy and physiology, the reasons being that this topic is very factual and concrete. For the topic of ethics, the divergent style was chosen, involving active learning methods such as seminar or discussion groups, as the topic is more dynamic and debatable. In this particular study the learning style inventory was not administered and the students involved in the sample were postgraduate and 'convenient', so some questions have to be raised as to the validity of the study.

Loo (1999) states that in some studies there were some inconsistencies found in relation to the validity and reliability of Kolb's LSI, resulting in the author refining it. Loo (1999) conducted a study to investigate these issues and maintained that there were some concerns regarding its statistical reliability. However that this does not detract from the usefulness of the LSI as a pedagogical tool. Individuals can improve their own learning by assessing their learning style and identifying ways of improving their own learning in different situations. Honey and Mumford (1986) found that such inconsistencies mentioned above were apparent with the LSI and that the styles themselves did not seem to adequately describe the behaviours they purported to, both from their own and the perspectives of the managers that they initially used the LSI

with. It was for these reasons and their questions over the conceptual basis of the styles that they developed their theory.

2.5.5 Honey and Mumfords' Learning Styles

Another learning style theory is that of Honey and Mumford (1986, 1992). The method of assessing learning styles is achieved by utilising the Learning Style Questionnaire (LSQ, 1986). The LSQ was an adaptation of the LSI of Kolb. Cavanagh et al (1994) state that the Honey and Mumford Learning Style Questionnaire is a tool developed and used within the UK saying that it is used with some success in nursing students. Although the LSQ has not been used as much as the LSI of Kolb it was decided that this particular study would be a vehicle for adding to its use and analysing its effectiveness:

> 'The authors claim some measure of predictive validity that following the administration of the LSQ lecturers are able to anticipate a series of behaviours such as who is prepared to participate in discussion and who will not, and who will experiment with different ways of behaving and those who keep to tried and trusted approaches. Unfortunately such assertions remain untested and emerge as a result of repeated administrations with many different groups; this aspect of the LSQ requires further investigation.'
> Cavanagh et al, (1994, p38).

However it should be noted that the LSQ was originally developed for the use of managers (Honey and Mumford 1986). Therefore questions could be raised over its applicability to other professional groups which the authors seemed quick to exploit.

The authors recognise the debt they owe to Kolb in forming the basis for the LSQ but state:

> 'While we found the circular learning pattern acceptable we grew less happy with the content and results of the Learning Styles Inventory..... Nor did we find his descriptions of the styles as Converger, Diverger, Assimilator, Accommodator, either congruent with our own experiences, or meaningful to many managers with whom we dealt.' Honey and Mumford, (1986, p4).

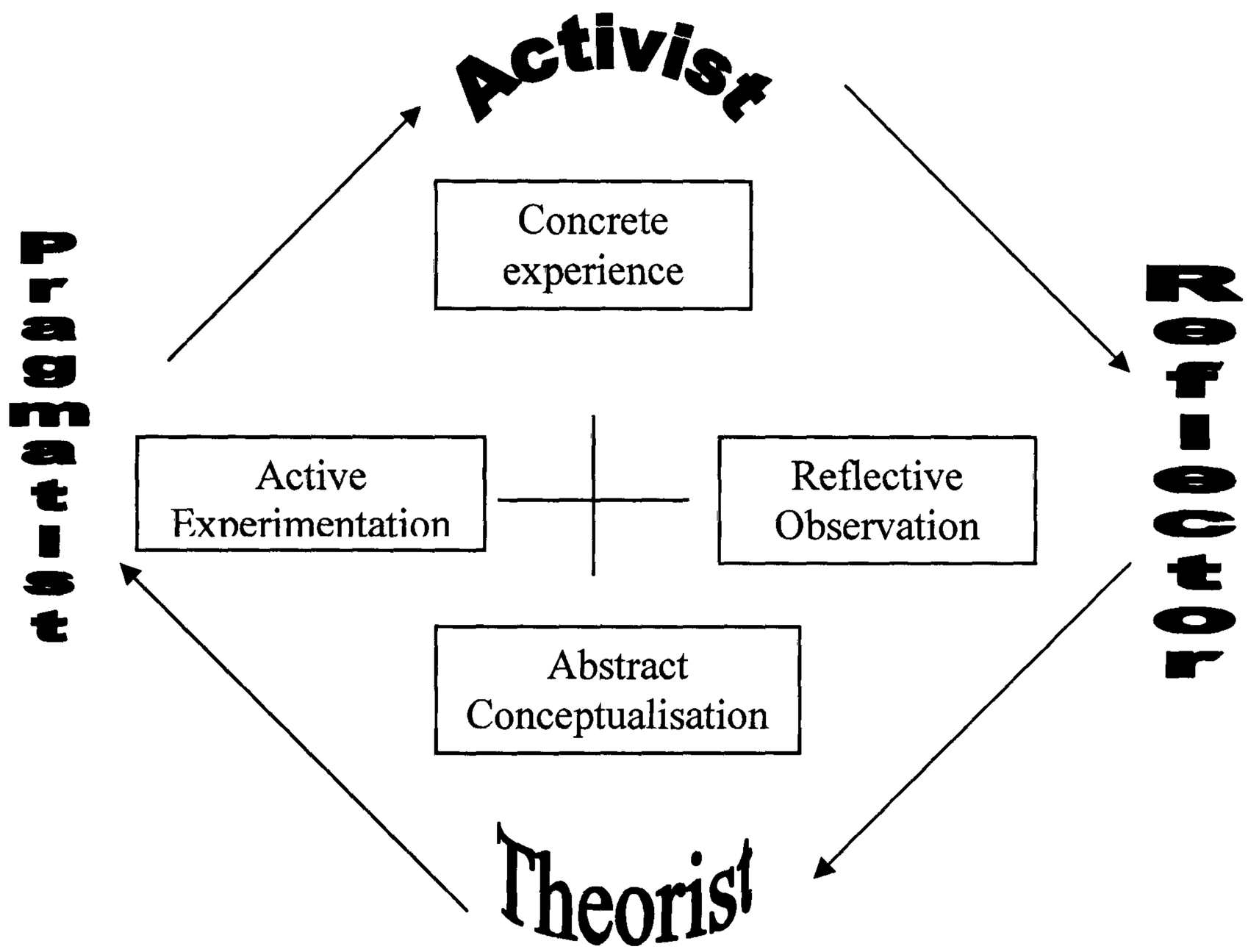
According to Mumford (1999), the styles are consistent with the four stages of the learning cycle, so one of the reasons why individuals do not give appropriate attention to each stage of the cycle is that they simply do not like that kind of learning. This is a simplistic yet useful way of categorising the way individuals learn as it recognises that people do have preferences that they actually feel more comfortable with.

Learning styles are described or explained by the authors as the differing reactions of individuals, explicable by their different needs for learning to be offered. Two people may have the same needs and be offered the same experiences but one may benefit more than the other. The description of the learning styles they developed are similar to those of Kolb but are not viewed as being polar to each other. Therefore a person can have the preference for one learning style and this is not seen as the direct opposite of another style. Their learning style preference could also relate to various aspects of each style. This suggests that an individual can possess or prefer aspects from all the learning styles, which is surely more realistic than the fixed concept of styles. These learning styles are described as Activist, Reflector, Theorist and Pragmatist. Honey and Mumford accept the four-stage process of learning, as mentioned above, however they describe the main differences as being that the questions contained in the LSQ are related to observable behaviours. This can be seen in Figure 2.3.

According to Honey and Mumford, Activists enjoy new experiences, and the immediacy of them. They have a cavalier approach to new situations in that they will try anything and think about the consequences later. The Activist approach is a very busy one, new experiences are relished but long-term implementation and

consolidation loses its interest for them. Stafford (1996) states that if a person has an Activist learning style preference, then it is likely that they engage in activities that they enjoy, like to work in groups, like to be at the cutting edge, and like to generate lots of ideas.

Figure 2.3: Honey and Mumford's Learning Styles



Honey and Mumford (1986)

A person that fits the Reflector learning style is not as impulsive. They tend to stand back and ponder experiences from a number of perspectives. Data and information are carefully collected from a number of sources, and time is taken in forming conclusions. They would remain in an unobtrusive position whilst observing what is happening in and around the situation and the people they are with. The person with a preference for the Reflector learning style likes to think about, observe and mull over

activities, like to 'look before they leap', like to reach decisions in their own time, and likes to think about what they have done before moving on to new experiences (Stafford, 1996). Reflectors tend to be more cautious in their approach without committing themselves (Welsh and Swann, 2002).

Theorists take a holistic view of their world but they like to create structure in their approach. Logical uses of information is important, in that the data they receive should be categorised into some sound law, model or conceptual representation. Objectivity is their key mode of functioning and anything subjective or emotive would not satisfy their approach to learning. The process of deduction as opposed to induction is important. A person with a preference for the Theorist learning style would have to see things holistically, prefer to read about ideas and relate these to other ideas, be able to follow the logic of complicated arguments, analyse and see strengths and weaknesses in arguments, and be good at marshalling arguments to support their own point of view (Stafford, 1996).

Pragmatists are on the other hand welcoming to the use of an inductive approach. They positively seek out new ideas and experiment with them. They act quickly and are keen to solve problems. Pragmatists prefer to have practical solutions to problems made quickly. They are similar to Activists in the need for quick solutions, but different in the fact that they like to think through ideas and then try them out. According to Stafford (1996) the person with a preference for Pragmatist learning style is able to get on with things, able to practice their skills, are often rewarded for getting things right and are able to appreciate the benefit of what they are doing

before they carry it out. They prefer to roll up their sleeves get on with the task and see what happens (Welsh and Swann, 2002).

Honey and Mumford (1986) believe, similarly to Kolb, that knowledge of one's own learning style or that of others will help secure more effective learning, as long as this knowledge is used. The most significant uses are as follows:

- Increased awareness of learning activities, which are congruent or incongruent with the dominant Learning Style of the individual.
- A better choice among those activities, leading to more effective and more economical learning provision. Avoidance of inappropriate learning experiences is good in that early experiences will not put people off.
- An identification of areas in which an individual's less effective learning processes can be improved.
- Development of ways in which specific learning skills can be improved, e.g. planning learning goals or analysing successful performers.

Honey and Mumford, (1986, p5).

These points in themselves seem contradictory. According to Honey and Mumford (1992) if a person has a preference for a particular learning style, then experiences that they become involved in which are not conducive to that style preference will be ineffective. However, they also suggest that learning style preferences can be changed and developed through exposure to differing techniques associated with other learning style preferences. In this case there is a suggestion therefore that the student will acclimatise to the new style. If this is to be accepted, questions need to be raised as to

whether learning style preferences should be taken into account at all, as the learner will adapt their learning styles to the approaches they are experiencing anyway. This is one of the main issues that Coffield et al (2004) raise regarding the use of learning styles; they suggest that care must be taken before accepting the use of learning styles without careful consideration of their validity and usefulness.

The concept of an all rounder is discussed by Honey and Mumford, in that some people may score highly in all learning style categories, and that person will be equally at home with each learning style. However the opposite effect, that of having a low preference for each style, is explained as being related to the person being too selective in their answers, or having an unusually low interest in learning. This again raises questions over the validity of the responses (Honey and Mumford, 1986). This could be viewed as a form of bias, in that a high all round score is a positive aspect of the person and is reflected in the tool, whereas a low all round score reflects on them not completing the questionnaire honestly or being uninterested in learning.

It appears that Honey and Mumford present a 'user friendly' approach to learning styles based on previous learning style theory and tools such as Kolb (1984). They suggest that all learning styles can be acceptable to individuals at different times. These claims do seem to be lacking in empirical support and tend to be a 'cover all' response to criticisms aimed at the theory. Therefore what the theory gains in its utility it loses in its validity, as all options seem to be covered within the concept.

2.5.6 Findings from The LSQ

Honey and Mumford (1992) carried out research into student nurses' preferred learning style and found that the main preference was Reflector, followed by Activist, Pragmatist and Theorist. This was reflected in a similar piece of research carried out by Cavanagh, Hogan and Ramgopal (1994). A previous study by Dux (1989) with general (now Adult branch) nursing students also showed preferences for Reflector and Activist styles with few preferring Theorist and Pragmatist styles. A study by Mcleod et al (1995) also showed the learning styles of speech pathology students as predominantly Reflectors and Activists, with few Theorist and Pragmatist preferences. Shaw and Marlow (1999) investigated science students and also found Reflector learning style to be most preferred. Reflector was the preferred learning style of accounting students using a virtual learning environment, according to Broad, Matthews and McDonald (2004) with a strong showing of Theorist and Pragmatist styles. They suggest that the Reflector or Theorist preference is associated with academic life where a student is expected to think more carefully and question the subject area, where Activist/ Pragmatist is preferred where the subject is applied in practice. There does appear to be some commonality in the findings here particularly that there is some scope for its use with student nurses. Student nurses, however, do have a structured academic and practical split within their learning, which suggests they may need to operate differently in both environments, which may affect their learning. Results could be affected by the context of where the LSQ is administered; academic or practical settings.

Sutcliffe (1993) supports the notion of a discrepancy between the learning styles of nurses due to the dual nature of their learning. That is that nursing students have to

function in both an academic setting, and equally importantly so, if not more importantly so, in clinical practice settings. She suggests this as her study showed nursing students found the use of case study approach in the classroom setting less favourable, with a preference for lecture with discussion/ question and answer. Therefore it appears they are likely to compartmentalise subjects in the curriculum, and only relate clinical aspects within the clinical setting. This suggests that the preferred style in the curriculum context is therefore that of Reflector, whilst the practical setting requires Activists. The research discussed above shows that these styles are commonly recognised within Nurse Education, and therefore they will be utilised as a basis for the study. However, the study will also recognise and consider the criticisms made by other authors as discussed above. By identifying how learning styles are structured in terms of internal representations useful approaches to learning may be developed, and further research related to learning styles, which is a constant suggestion from most studies, will be developed

This is an important aspect if we are to identify the most effective approaches to providing students with experiences that will optimise their learning. According to Parker and Carlisle (1996) the educational philosophies underpinning Project 2000 shifted towards discovery oriented approaches and experiential learning, a style that suits Activists. Therefore this may have an effect on how students learn if this gap between their preferences for learning in practice and theory exists. For example, Frost (1996) supports the use of problem based learning approaches, which is very much student centred rather than teacher led. In this approach the student develops problem-solving skills and is able to recall, adapt and use this knowledge to deal with new situations. Other styles may be reflected within this process, such as generating

ideas, gathering facts together and applying knowledge gained. All of these would mirror the four learning styles of Honey and Mumford. Some students may however prefer a teacher led approach.

There are further criticisms relating to the overlap between Honey and Mumford's learning styles and those developed by Kolb. This is mainly because they are both built upon the concept of the experiential learning cycle. Some suggest that effective learning can only take place if each stage of this cycle (concrete experience, reflective observation, abstract conceptualisation, active experimentation) is completed, or that a learner may learn best if activities are structured to meet their preferences of being at a particular point in the cycle (Edward, 2001, Woolhouse and Blaire, 2003). This in itself adds to the debate around matching or mismatching. Coffield et al (2004) state that Honey and Mumford's claims related to the learning cycle, which can be used as a tool for identifying at which stage of the cycle learners find difficulties therefore being able to develop strategies to overcome this and enhance learning, do have this intuitive appeal, yet still await proper empirical verification. Also they do not clarify the relationship of the styles to the overlapping terms mentioned above which would suggest that the terms they use are more likely to be loose definitions rather than specific concepts such as cognitive style. According to Wallace and Poulson (2003) confusion can occur if the implicit definition of key concepts developed by authors do not match the readers implicit definitions of the concepts. Although Honey and Mumford give simplistic descriptions of the experiential learning cycle, their learning styles and how to change them, the more detailed theoretical alignment of the styles may not be described thoroughly or in detail. Sadler -Smith (1996) suggested that such a blanket term approach might suit managers familiar with the learning cycle,

but they may not satisfy psychologists interested in cognitive style, therefore the array of terms involved need to be clarified.

2.5.7 The Validity Of The LSQ

According to Wintergerst et al (2001), assessment of validity in learning style measurement instruments has been limited except for the Kolb Learning Style Inventory (LSI). They state that validity is a limitation of various learning style tools, particularly internal and construct validity. They suggest there has been more of a focus on external or predictive validity. Heffler (2001) found that there was some test-re-test reliability in the use of Kolb's LSI. However Cartney (2000) suggests that the construct validity of the LSI can be questioned; yet also notes that there may be some face validity. Coffield et al (2004) point out that many studies actually question the robustness of the LSQ of Honey and Mumford and its ability to predict performance. They do however allude to some studies such as Allinson and Hayes (1988) that showed some internal consistency and temporal stability, yet seem to conclude, from other studies, that this agreement is not widespread. Duff (1997), although critical of predictive validity of the LSQ, suggests there was internal consistency with it, supporting the notion of its use with particular samples and suggests that it does provide useful descriptors of how a broad category of learner operates. He suggests however, that the tool is based on a model that is not sufficiently sophisticated and care should be taken in its use in HE. Mumford and Honey (1992) recognise this however and state that caution should be used in implementation of the tool, as they point out that it is not a psychometric instrument and therefore should not be used as a basis for selection. They state that there is no data to support the reliability and validity of the tool as a psychometric instrument. Honey and Mumford claim the best use of the tool is as a developmental aid and that criticisms based on it being anything

other than that are unhelpful. Downing and Chin (2004) utilised the LSQ stating that it was chosen because of its standardisation, wide use in academic institutions and that there are substantial norm data in existence for triangulation purposes with specific groups. It is for these reasons also, that this tool was selected as a basis for this study, whilst recognising the criticisms raised by Duff (1997).

One of the issues raised by Coffield et al (2004) is that the LSQ of Honey and Mumford may not give a clear indication of the actual learning style of the individual. What they suggest is that the learning styles themselves could actually be more aligned to specific personality traits. Sadler-Smith (2001) in reviewing learning styles studies agrees that some interpretations of learning styles may in fact represent aspects of personality types (possibly Jungian), and that some learning styles models may have difficulty in satisfying questions of independence from such constructs or being founded upon robust theoretical and empirical bases. Duff and Duffy (2002) suggest that studies show limited results in relation to the psychometric properties of scores provided by the LSQ. They also point out that more support is available to criterion validity and some correlation between some styles and personality traits (Activist and extraversion) and suggest that some studies generally conclude that learning style is a subset of personality. Furnham et al (2001) suggest there are mixed results where there is some evidence of a relationship between the LSQ learning styles and personality, or where there are clear splits from this. Furnham et al's (2001) study also found overlap between some but not all personality traits and their relationship to the learning cycle, with some more prevalent than others such as extraversion as opposed to neuroticism. A study by Jackson and Lawty-Jones (1996), however, suggested strongly that since all elements of learning style appeared to have

a significant correlation with one element of a personality trait there was some scope in suggesting that learning styles could be fully measured within personality scales and that there is great overlap.

However, in light of the criticisms Coffield et al (2004) suggest the main benefits of considering learning styles should be in raising awareness and creating a dialogue and debate about the nature of learning and the pedagogy involved in learning contexts. They suggest that such discussion does indeed assist in metacognition and self-awareness of the learner and therefore their teachers in order to enhance learning performances. It provides an opportunity to explore the highly complex nature of teaching and address how or why students succeed or fail in their learning. This is similar to the stance adopted by Edward (2001) that by adding results of new experiences (such as discussing the notion of learning styles) existing schema can be redefined, modified or rejected. He suggests that even with reservations, the learning style analysis can help illuminate issues in evaluating and developing programmes. Sadler–Smith (1996) states that there are benefits to be gained in using learning styles within the learning event; as a knowledge base to be used as a starting point of a broader range of learning skills. Indeed many of the researchers above, although recognising the limitations in learning styles and particularly the validity of Honey and Mumford's styles, still adopted the tool as a basis for their research.

In recognising the above limitations within the field of learning styles it is still a valuable exercise to explore the concept within this study whilst being aware that the main benefits are in providing a knowledge base from which discussion about how the learning situation can be improved for student nurses.

2.6 Cognitive Psychology as a Theoretical Framework

Hall (1998) argues that Neuro-linguistic programming (NLP) can be located in the field of cognitive psychology as it mainly operates on the representations or the maps/models that the individual has of the world. The beliefs and values we develop become perceptual filters of information from the external social world at the neurological level, creating habits of thought, emotion, speech, perceiving and relating, ultimately confirming our own reality. Therefore although the areas looked at can be considered quite different, an overview could suggest a relationship within the field of cognitive psychology and learning theory, as these concepts fit nicely with the ideas of schema, prototypes, pointers and meta-cognition as mentioned in section 2.3.

Cognitive psychology deals with how people perceive, learn, remember and think about information (Sternberg, 1996). As discussed earlier, the basis of NLP lay in this area, as do those of learning styles. Cust (1995) argues that although there is acknowledgement of a role for simple behavioural mechanisms involved in learning, the notion that thinking processes play a large part in complex human performances is important. NLP takes account of both aspects of learning in its techniques of analysis and application, both in terms of anchoring (a pattern that links experiences into neurology that can then be used to trigger experiences) and pattern changes through information processing (Hall, 1999).

As mentioned earlier, Gagné (1970 p20) identifies eight types of learning from simple classical conditioning through to abstract reasoning, stating that there is a set of conditions needed for each aspect of learning, therefore accepting and integrating both simple behavioural mechanisms and more complex information processing

approaches. Rogers (1992) discusses three characteristics of adult learning, firstly *domains* of learning involving knowledge, skills, understanding, attitudes and behaviour, secondly *kinds* of learning, involving instrumental learning, communicative learning and emancipatory learning, and finally the *styles* of learning. Sutcliffe (1993) describes a learning style preference as the likes and dislikes that the individual has for a particular sensory mode or condition for learning. This appears directly applicable to the notions of modalities and sub-modalities highlighted in NLP that could be considered to be internally represented sensory modes. Riding and Wheeler (1995) propose that learning styles fall into two categories: The wholist-analytical (process) and the verbal imagery style (representing). They argue that the cognitive style affects the way a person thinks and represents situations from the external world, which would then be related to aspects of performance and behaviour. Therefore the suggestion of a pattern of representation and evaluation resulting in a change of behaviour is emerging from the literature in the fields of learning styles, NLP and cognitive psychology. Spence-Laschinger (1990) describes this situation as the transformation of our experience ultimately leading to learning. Cognitive learning theory involves concepts, insights and generalisations that are developed in one situation that can then be transferred to new situations that may be similar or entirely different (Bigge, 1982). Change may occur not just necessarily in the behaviour of the person, but in the re-organisation of their insights into life situations. The process of exposure, assimilation involving progressive differentiation and integrative re-conciliation may occur, resulting in new learning for the person (Oliver 1993). Barber (1988) highlights four stages of the cognitive learning process: encoding stimuli, comparison, selection and execution resulting in the outcome. This relates to aspects discussed in section 2.4 of NLP and the strategies employed. Hayes

and Allinson (1998) support this by stating that people differently process information, develop abstract concepts and generalisations and assess the consequences of their and other's actions in specific situations. From this it can be seen that the learning style of students may develop in how they approach life experiences. It can also be seen that representational systems or modalities of NLP may have an important role to play in all of the stages. Therefore cognitive learning theory provides the framework for this particular study. Cognitive learning theory also provides the underpinning link between NLP submodalities and learning styles as already discussed.

In this chapter the context of Nurse Education had been discussed. Also the underpinning theoretical framework of cognitive psychology has been introduced. Neuro-linguistic Programming (NLP) has been discussed at length. Learning, and learning style issues, including brief discussion of Honey and Mumford's (1992) learning styles, have been included.

This study aims to investigate the relationship between the representational systems suggested in NLP with the learning styles of Honey and Mumford (1992). In doing so it is hoped that discussion of appropriate approaches to teaching and learning can be developed within Nurse Education.

Chapter Three

Research Methodology

3.1 Aims and Approaches

The aim of this study is to investigate the relationships between specific Learning Styles and Neuro-Linguistic Programming (NLP), especially internal representational systems (submodalities) within the field of NLP, with two specific outcomes:

1. To investigate the relationship between Learning Styles and NLP representational systems in Pre-registration Nurse Education.

2. To explore NLP representational systems as a means of enhancing teaching and learning in Pre-registration Nurse Education.

In exploring the above, the over-arching aim of this study is to increase the learning potential of students, particularly student nurses, by an exploration of how learning styles and their relationship with NLP representational systems might be utilised to maximise student learning.

In order to achieve the above, the research was divided into two main approaches, a quantitative approach and a qualitative approach. In the quantitative approach the main thrust was to use a correlational design. This is designed to investigate the relationships between the student's scores on the Honey and Mumford (1986) Learning Style Questionnaire (LSQ), their scores from the 'Primary Perceptual Modality Inventory' (PPMI, Markowski and McVoy, 1998) and the 'Identify your Preferred Thinking Pattern' (IPTP, Knight, 1995). This type of correlational design is used to obtain information on the characteristics of particular groups, or the occurrences of particular phenomena (Thomson, 1998). The rationale for using this

approach is that there is no realistic way to manipulate the independent variables (students learning styles and submodalities) in an experimental way either practically or ethically and therefore only the relationship between the two can be investigated.

As Cohen and Manion (1994) point out, human behaviour is very complex at both the individual and social level and therefore complex to research. Therefore in order to gain further understanding of these complexities investigating simple relationships between factors and elements deemed to have some bearing on the phenomena is necessary, and correlational research is valuable in achieving this. Morse, Swanson and Kuzel (2001) point out that in answering the research question in quantitative designs, questionnaires may be given to the participants, as questionnaires contain uniform questions and answers that are then quantified for the purpose of statistical analysis. In the case of this study, descriptive statistics and correlations were used. The questions answered were related to individual learning style preferences and preferred in internal representational systems of student nurses.

In the qualitative approach aspect of the study, the design utilised semi-structured interviews. Interviews were recorded using audio/video equipment to gather not only what the respondents have to say but also to record the dynamics or extraneous circumstances and information of what occurred during the interview. This may be important as a respondent may be inarticulate and the response ambiguous, but the researcher may come to understand the meaning through tone of voice and non-verbal language (Babbie, 1995). The problems with this approach is the organisation of the interviewees, and then the time consuming process that the researcher has to be involved in if there aren't research assistants involved in completing all of the interviews.

A mix of approaches was deemed necessary, as it is important to recognise that there are many subjective inferences to be made around the notion of individual learning. According to Meighan (1986), each of our daily actions and interactions are fundamentally dependent upon our subjective, understandings and interpretations of the world. Therefore in investigating individual approaches to learning this is an important underpinning notion in this research, as both individuals' opinions of the answers given on the various questionnaires and their experiences of learning are likely to be mainly subjective. By utilising a mix of approaches and investigating the students' subjective experiences of learning, as well as gaining specific quantitative data through the questionnaires, broader insights into various approaches to learning may be gained. Robson (1993) points out that when researching in the real world (that is research conducted away from laboratory conditions), the control over most conditions is not feasible, even if it is ethically justifiable. Therefore the purpose of research in this situation should be to say something sensible about complex, relatively poorly controlled and according to Robson (1993) generally 'messy' situations.

3.2 The Research Question

The development of a research question is of particular importance in planning research. Such questions are advantageous as they are simplistic and direct. They also invite an answer and help provide the researcher with a focus to direct theirs and the reader's attention (Polit and Hungler, 1993).

According to Cormack (1996) a research question can be either an interrogative or declarative statement. An interrogative statement is a question form that identifies a gap

in nursing knowledge, and a declarative statement is a statement that defines the broad purpose of the study. Burns and Grove (1995) state that the foci of research questions are descriptions of the variables, examination of the relationships among variables and determination of differences between two or more groups regarding the variable. Newell (1994) describes a variable as things that are not constant in the external or internal environment. This is a useful definition as the variables in this study are related to the internal psychological and neurological processing factors of individuals and their thoughts on these and these aspects may not be constant.

In this study one main research question was developed and within it some sub questions. The question could be described as a declarative question if taking into account the above suggestions. According to Polit and Hungler (1993) this often communicates more than just the nature of the problem. The statement may suggest that the research will explore or describe some phenomenon or test and compare phenomena. The word 'problem' is one that perhaps seems at odds with this work, as the focus is not a problem but a need to expand knowledge on a topic, that of learning and its relationship with internal representational systems.

The variables in this study are learning style preferences and internal representational systems (submodalities). Also factors of age and gender were included as another aspect to investigate in relation to the above. However as Newell (1994) points out, in some research subjects are not usually allocated to one or other condition of an independent variable but are divided according to some naturally occurring difference between them. People cannot be assigned to the two conditions (male and female) but the scores related

to a dependent variable (in this case learning styles and internal representations) can be observed by the differences according to the differing gender and ages.

The main research question developed for this study therefore is:

'What are the relationships between the Honey and Mumford (1986) Learning Style preferences with the NLP internal representational systems (submodalities) of pre-registration student nurses?'

This study hinges around the research question of what, if any are the relationships between the Honey and Mumford (1986) learning style preferences with the preferred representational systems of student nurses as highlighted in NLP. That is whether particular scores and learning style preferences are aligned to specific internal representational systems such as Visual, Auditory, Kinaesthetic, (including Olfactory, and Gustatory).

A subset of questions was also developed in order to provide a framework for the research approach:

1. **What are the preferred Learning Styles of student nurses?**
2. **What are the preferred internal representational systems of student nurses?**
3. **What are the relationships between the Learning Style preferences and specific internal representational preferences of student nurses?**
4. **What are the differences in Learning Style preferences by age?**
5. **What are the differences in Learning Style preferences by gender?**
6. **What are the differences in internal representational preferences by age?**
7. **What are the differences in internal representational preferences by gender?**

As mentioned earlier this study utilised two approaches to the data that needed to be collected. Firstly there is an element of quantitative approaches through the use of three questionnaires in a questionnaire package in order to provide the correlational data. Secondly qualitative video interviews were used to gather student nurses perceptions of their learning, their use of sensory predicates and to observe various non-verbal behaviours in relation to the questions asked.

The quantitative aspect and questionnaires used shall now be discussed.

3.3 The Quantitative Approach

A questionnaire package was given to pre-registration student nurses. This questionnaire package comprised three parts, Honey and Mumford's LSQ (1986), 'Identify your Preferred Thinking Patterns' (IPTP) reproduced with kind permission from Sue Knight (1995) and 'The Primary Perceptual Modality Inventory' (PPMI), of Markowski and McVoy (1998). The former is regularly used as a tool for assessing learning styles and the latter two were used to gain information regarding preferred internal representational systems. All three instruments were placed together as one package, with instructions on the front sheet and throughout so as to aid completion. Also on the front sheet there was a request for the respondents to record their age and gender. This questionnaire package can be seen in Appendix Five. As the author had carried out similar research in the past it was felt important to include clear instructions on the front page.

Babbie (1995) states that a questionnaire should be well spread out and uncluttered. An improperly laid out questionnaire may lead the respondent to miss certain questions, and confuse them about the type of data required. Each section of the

questionnaire package was separated so as not to confuse and instructions were provided of what to do next.

3.3.1 The Learning Style Questionnaire

As discussed in Chapter Two, the learning style questionnaire used for this particular study is the Honey and Mumford Learning Style Questionnaire (LSQ) (1986). The LSQ was an adaptation of the Learning Style Inventory (LSI) of Kolb (1976). Honey and Mumford (1986) recognise the debt they owe to Kolb in forming the basis for the LSQ but state,

> "While we found the circular learning pattern acceptable we grew less happy with the content and results of the Learning Styles inventory... Nor did we find his descriptions of the styles as Converger, Diverger, Assimilator, Accommodator, either congruent with our own experiences, or meaningful to many managers with whom we dealt."
> Honey and Mumford, (1986, p4).

Cavanagh, Hogan and Ramgopal (1994) state that the Honey and Mumford LSQ is a tool developed and used within the UK arguing that it is used with some success in nursing students. However although quite popular in nursing education, it should be noted that the LSQ was initially developed for the use of managers (Honey and Mumford, 1986).

Although the LSQ has not been used as much as the LSI of Kolb it was decided that it would be suitable for this study with the author already having used it in a previous unpublished study (Burton, 1997). Honey and Mumford (1986) suggest that their LSQ has face validity due to the fact that most people do not dispute their LSQ result and preference description. In the author's previous study the students did tend to be in agreement with their results and style from the LSQ, therefore supporting this notion.

The main issue to note with these results from the author's previous study are that the strength of preferences were based on norms by applying the formula of the top 10 percent, the next 20 percent, the middle 40 percent, the next 20 percent and the final 10 percent of scores recorded for each style as suggested by Honey and Mumford (1986), based on the scores of the actual respondents and not on Honey and Mumford's (1986) own general norms, and they actually produce a different level of preference for each style when looked at in comparison to the general norms. Therefore there could be seen to be some bias in the general norms advocated by Honey and Mumford when applied to other groups. In the previous study the LSQ was accepted as being consistent, with some face validity, however it suggested that when applied to large groups as opposed to individuals it is necessary to formulate preferences based on the norms of the particular group under study as there may be some bias if Honey and Mumford's general norms are applied (Burton, 1997).

Coffield et al (2004) point out that many studies actually question the robustness and validity of the LSQ of Honey and Mumford and its ability to predict performance. They do however allude to some studies, such as Allinson and Hayes, (1988) that showed some internal consistency and temporal stability; yet seem to conclude from other studies that this agreement is not widespread. Duff (1997) although critical of predictive validity of the tool, suggests there was internal consistency with it, supporting the notion of its use with particular samples and suggests that it does provide useful descriptors of how a broad category of learner operates. He suggests, however, that the tool is based on a model that is not sufficiently sophisticated and care should be taken in its use in HE. Mumford and Honey (1992) respond to this recognising that caution should be used in implementation of the tool, suggesting that

it is not a psychometric instrument and therefore should not be used as a basis for selection. They state that there is no data to support the reliability and validity of the tool as a psychometric instrument. Coffield et al (2004) do allude to this, as Honey and Mumford claim the best use of the tool is as a developmental aid and that criticisms based on it being anything other than that are unhelpful. Downing and Chin (2004) utilised the LSQ stating that it was chosen because of its standardisation, wide use in academic institutions and that there are substantial norm data in existence for triangulation purposes with specific groups. A study by Cavanagh et al (1994), also showed some support for the use of Honey and Mumford's' (1986) LSQ, yet they remain cautious, as discussed in Chapter Two. Valley (1997) states however that the Honey and Mumford classifications of Activist, Reflector, Theorist and Pragmatist are the most well known among commercial trainers and is receiving a significant amount of attention in education probably due to its easiness of use and application. Hayes and Allinson (1996) point out that in management education, Honey and Mumfords' LSQ is a popular measure of learning style. For these reasons and the fact it has also been a popular tool in nursing education it was felt that this questionnaire was of particular use in this study. The author has previously used the tool with student nurses, and has found that they do find the tool easy to use (in relation to answering the questions, yet find the analysis section difficult at times) and tend to agree with the learning style descriptors and the outcomes in relation to themselves.

The LSQ is a questionnaire of 80 statements containing four subscales of twenty items each that form the learning styles as discussed in Chapter Two (Cavanagh et al (1994). These statements relate to Activist, Reflector, Theorist and Pragmatist yet are placed at random throughout the LSQ. According to Honey and Mumford (1986)

these items are in the main behavioural statements in that they describe an action that someone might take, although they concede that some are related to preferences, beliefs and attitudes. The respondent is required to place a tick if agreeing with the statement, or a cross if not, and then add the number of items that were ticked within the subscales of each particular learning style. The LSQ is designed to discover general trends or tendencies running through a person's behaviour and does not place undue significance on any of the items (Honey and Mumford, 1996).

As mentioned earlier Honey and Mumford applied weightings to the raw scores provided within the ranges of the top 10 percent, the next 20 percent, the middle 40 percent, the next 20 percent and the final 10 percent to give the strengths of preferences. Originally there were different norms scales for different groups of people and then general norms based on 1302 people. These preferences based on the general norms for scores attained can be seen in the table below. Honey and Mumford (1986) state that there is a choice available for which group of peoples' norms is used. The general norms can be seen in table 3.1 below:

Table 3.1: Honey and Mumford's General Norms

	Preferences	Activist	Reflector	Theorist	Pragmatist
A Top 10%	Very Strong	13-20	18-20	16-20	17-20
B Next 20%	Strong	11-12	15-17	14-15	15-16
C Middle 40%	Moderate	7-10	12-14	11-13	12-14
D Next 20%	Low	4-6	9-11	8-10	9-11
E Bottom 10%	Very Low	0-3	0-8	0-7	0-8

LSQ profiles with clear distinctions between high and low preferences are fairly easy to interpret. However if all scores and preferences are similar then it is difficult to define one particular learning style. Honey and Mumford (1986) also mention the notion of an 'all-rounder', that is someone that has strong preferences in all styles and they state that this person is likely to benefit from a wide range of learning activities. The aspect that people are more likely to stay with activities that are relevant to their learning style preferences are also difficult to interpret if this is so, although Ford and Chen (2001) state that mismatching styles with activities of learning have also been found to be beneficial as the learner has to adapt and therefore benefits from new situations outside of their usual repertoire of preferences.

The LSQ constituted the first part of the questionnaire and was left in its original format to adhere to the copyright regulations that the authors require. That is that the original only is photocopied and distributed, therefore maintaining the format, branding and copyright of the authors.

3.3.2 The 'Identify Your Preferred Thinking Pattern' Questionnaire

The second part of the package of questionnaires distributed to the respondents was the 'Identify Your Preferred Thinking Pattern' (IPTP) developed by Sue Knight (1995) a proponent of NLP in business in the UK. This questionnaire was found in the appendices at the rear of the book, 'NLP at work' (Knight, 1995). The notion behind its development was to help individuals identify their own preferred thinking pattern so that in doing so they can utilise this to their advantage in the workplace by accommodating this awareness in to their ways of approaching their work, and therefore working more efficiently. Sue Knight was contacted by e-mail and

permission was granted on the basis of the questionnaire being correctly referenced and its source identified.

It is a simple questionnaire and as yet there has been no research provided to support its validity and reliability. Validity refers to whether or not the tool measures what it is supposed to measure by obtaining data relevant to what is being measured, and reliability refers to whether or not the tool will produce similar results if repeatedly used (Eby, 1993). As this questionnaire asks for information related to the respondents own internal thinking processes it is a very subjective and individual tool. As this is so, it is suggested that content validity alone can be assumed, yet criterion, concurrent and predictive validity cannot be claimed at this stage. Content validity is concerned with the representativeness of the questions. Content validity is often accepted in nursing not only because it is the easiest to achieve but also that it is the most subjective form, and many studies in nursing and education are based on the subjective experiences of individuals and groups (Eby, 1993).

The questionnaire comprises twelve questions. These are related to aspects of thinking as the respondent is asked to think about the content of the statement and then supply the response. The response to each question comes in the form of five fixed answers that reflect the five senses, i.e., Visual, Auditory, Kinaesthetic (feelings), Olfactory, and Gustatory (Knight, 1995). Therefore if the respondent thinks of the item in the statement as an image that response is ticked. This could be considered as a 'strict alternatives' type questionnaire (Cormack, 1996). Polit and Hungler (1993) also describe this type of question as a 'cafeteria' question as the student can respond to a selection of answers. This requires the respondent to respond to a question by

answering one of the selections of alternatives. In this case the respondent is at liberty to respond to more than one of the elements, as there are no right or wrong answers (Knight, 1995).

The twelve statements are:

1. Petrol
2. Your Best Friend
3. The way you would most like to spend your time
4. What you did yesterday
5. A time you didn't enjoy very much
6. Your favourite restaurant
7. Something from your early childhood
8. Your work
9. Where you might be tomorrow
10. Something you find difficult to do
11. Something you find rewarding
12. Something you find amusing

Although this is quite a simple questionnaire these types of questions do seem suited for the purpose of this investigation, in that they require answers specifically related to the phenomena under investigation, the individual's internal representational systems. Wihlborg (1999) suggests that reality presents itself in human minds in different ways, conceptions described are related to language and a social/ cultural context and are therefore closely related to the experiences of the respondents themselves. All of the above questions are related to aspects that most adults would have had experience of (except if related to the specific items such as petrol, or

restaurants) and are general enough for the individual to choose their own experience, which they feel, is most relevant to them in answering the question. Therefore some of the answers are remembered experiences and some may be constructed experiences of what is yet to happen. According to Cohen and Manion (1994) misunderstandings of what researchers take to be clear unambiguous language are commonplace and complex questions should be avoided. Therefore the closed questions in this tool appear to meet these criteria as they are simple and it is the individual themselves that provides the context in which they then seek the answer. McColl (1993) states that closed questions such as the ones within this questionnaire can be used for collecting factual information relating to attitudes or opinions. The list of possible answers focuses the respondents' attention on the type of information required so that bias due to misunderstanding is minimised and to facilitate data processing and analysis.

These questions appear unambiguous, although criticism could be placed in the required behaviours of the respondent in the answering of them. Although the instructions ask for the respondent to think of the item and then tick the answer that reflects the 'element(s)' that come to mind, it is not explicitly stated (other than in the actual phrase and word 'element(s)'), whether or not only one or up to all of the answers can be used. If so wished the respondent could tick all five answers, which would suggest very enriched sensory grounded internal representations involving all senses. Alternatively the respondents may only tick one answer per statement or any number in between. However the very fact that the respondents answer in whichever way they choose is related to the way in which they internally represent the statements themselves and believe the way they should be answering based on that.

Each of the answers related to the five sensory internal representational systems are produced randomly, this therefore requires the respondent to think about the answer without becoming too comfortable and complacent in thinking perhaps for example that images are always answer (a) and therefore just ticking (a) all the way through. These could be considered to be rating scales as the respondents are rating which of the answers most matches their thoughts. According to Burns and Grove (1995) most scales measure psychosocial variables and are a crude form of measure. Although there is no rating on this scale, by attaching a score to the answer, the respondent is giving an indication of the strength of the response of each internal representation. However these cannot be compared against each other or ranked within each question. The number of answers given for each question or statement is added to a tally once all the responses are summated. In this way a score can be given between 0 and 12 for each of the five sensory internal representational systems. Robson (1993) points out that closed questions such as the ones in this particular questionnaire are preferable to open ended questions, as they are easier to analyse. Therefore each internal representational system (Visual, Auditory, Kinaesthetic, Olfactory, Gustatory) achieves a simple frequency score. In this case, between 0 and 12, for each representational system. The system that is preferred may have a higher score than the others, yet all could score equally. What is important is the fact that the scores for each representational system can be correlated with scores from the LSQ and the PPMI. It is recognised that this tool has not had widespread use, and there is little evidence of its validity and reliability. It is considered in this study, however, because of its specific nature of investigating internal representational systems.

3.3.3 The 'Primary Perceptual Modality Inventory'

The third and final part of the questionnaire package used is the 'Primary Perceptual Modality Inventory' (PPMI), developed by Markowski and McVoy (1998). The original intention of the use of the instrument was within the field of therapy, particularly couple's therapy.

Markowski and McVoy (1998) accepted the notion developed by Grinder and Bandler (1976) that different individuals tend to have different preferred internal representational systems or modalities. The main modalities that they highlight are the Visual, Auditory and Kinaesthetic. Olfactory and Gustatory representations often seem to come under the umbrella of the Kinaesthetic modality, therefore leaving the main emphasis on the three modalities of Visual, Auditory and Kinaesthetic. This is slightly different to the IPTP, which includes olfactory and gustatory aspects. However Hall (1999) states that the Visual, Auditory and Kinaesthetic modalities comprise the basic components of thought or representation systems.

Markowski (1998) had noticed that individuals within relationships that had different modality preferences to their partners often had communication dysfunctions within their relationships. They suggested that in order to remedy such situations couples could be trained to recognise and communicate in their partner's primary modality.

In order to test these notions they developed the tool and administered it to a sample of 40 couples that were receiving marital therapy and a control group of 40 non-therapy couples. They identified three types of couples, those in which one or both of the partners had no identifiable primary modality, those where both had the same

primary modality and those where the partners had differing primary modalities. They discovered that 47.5 percent of therapy couples compared to 20 percent of non-therapy couples had different primary perceptual modalities (Markowski and McVoy, 1998). These results were found to be significant when a chi-square analysis was applied to the data. This therefore suggested that this mismatch of representational systems could be affecting the relationships. There appears to be no supporting evidence of the validity and reliability of this tool other than this study above. However, it again is considered for use in this study as it specifically addresses the research question and the focus of this study; the NLP representational systems.

The tool is a self-report questionnaire, which in itself comprises three parts. These three parts are related to the Visual modality, the Auditory modality and the Kinaesthetic modality respectively. One of the differences between this and the IPTP of Knight (1995) is that Knight collects data related to the Olfactory and Gustatory modalities, whereas Markowski and McVoy do not address this. Also in the Knight (1995) IPTP each question has a modality based answer. In the PPMI the three parts constitute dedicated sections to each modality. For each part there are twenty questions each with a Likert scale type response. Cormack (1996) states that scales indicate the respondents' possession or performance of whatever the scale claims to measure. For each part the respondent is required to read the statements and relate them to specific experiences from memory. In the Visual section all the statements begin with 'see a...' in the Auditory section all the questions begin with 'hear a...' and in the Kinaesthetic section all the questions begin with 'feel...' For each statement the respondents are then required to record the strength of their experience of the statement on a scale of one to five, from unable, vaguely, fairly well, very well, to

extremely well. According to Cohen and Manion (1994) a scaled response is one structured by a means of gradations, and such responses provide a useful form of analysable data. Burns and Grove (1995) agree that this is a useful way of quantifying data as the various items are summed to obtain a single score and can be referred to as 'summated scales.' The Likert type scale as mentioned above has a value of 1 for unable through to 5 for extremely well. According to Burns and Grove (1995) the responses in the PPMI could be considered evaluative, as the respondent must evaluate how well they can see, hear or feel a particular aspect. Therefore if the respondent was totally unable to see or hear or feel any aspect then the result on each particular aspect or modality would be 20. If they could see, hear and feel everything extremely well then the total score would be 100. This could be criticised as if a person was unable to achieve the stated performance then perhaps a score of 0 would be more feasible as with a score of 1 a positive score is still achieved. Once completed the scores for each section are totalled. Markowski and McVoy (1998) do not give any indication on how strong a score has to be before the modality can be recognised or graded, only that the modality that scores at least three points higher is the preferred modality. This could be considered a weakness in the tool, as there is no actual criteria set at which the modality preference is definitely demonstrated or how they came to the conclusion that three points would indicate the actual preference.

It is recognised that all three questionnaires in the total package provide numerical scores. In the LSQ there are scores of up to twenty for each learning style preference. In the IPTP there are scores of up to twelve for each modality, and in the PPMI there are scores of up to one hundred in each modality. All of these show preference or strength of perception for what it is measuring. Therefore it is possible to correlate the

scores to investigate any relationships between them. That is if the scores on one raise, the question is whether the scores on the others do also? Hinton (1995) states that if so this would constitute a positive correlation. If a score of one increases and the other decreases this is considered a negative correlation. It is necessary to consider that the data is nonparametric as the responses are scores related to categorical answers. Nonparametric data refers to data that have been measured on nominal or ordinal scales (Polit and Hungler, 1993). The use of the questionnaire could also be considered as a form of triangulation in the research, that is, using different methods to measure a particular construct (Redfern and Norman, 1994). This particular approach could be described as 'within method triangulation' as there are different types of the same method (i.e. using different scales) to measure the same concept (NLP internal representational systems).

3.3.4 Distribution Of The Package

The front sheet of the package also contained a coded number. The respondents were asked to complete their name and the number of the questionnaire that they received on a separate sheet so that they could possibly be identified for interview at a later date through voluntary selection, if they gave consent to participate. This recognition was kept totally anonymous and confidential, except to the researcher. Other than for selecting potential interviewees, the names would have no bearing on the results from the investigation and no other information regarding the respondent would be used. The other information such as gender, and age was also included on the accompanying front sheet.

The package of questionnaires was distributed to a cross section of student nurses from different cohorts between 1999 and 2002. Although this is a long period of time it could still be considered cross sectional as the students only completed the questionnaire once therefore providing a 'snap-shot' of their learning at that particular time. Robson (1993) describes cross sectional studies as focussing on the make up of the sample at one point in time and considers it a 'snap-shot 'approach. It is different to longitudinal studies, which consider change or development over time, usually involving the same set of people or same issue. The groups were not being compared to each other and there was no repeat to test differences over time with the students. The purpose was to gather a useful amount of data from students exposed to the same environments, studying the same (or similar) nursing courses. As this study aims to investigate the relationships between learning styles and NLP internal representational systems, it was felt that it would be more beneficial to take the cross sectional/snapshot approach in the first instance to discover any relationships between the variables. Time restraints also made it more realistic to take such an approach. It is recognised that there can be benefits from longitudinal studies to look at changes over time and this could perhaps be the focus of a further study.

The questionnaires were distributed, mainly by the researcher, by face-to-face distribution in class. According to Newell (1993), this type of distribution is useful as the researcher can address issues and misunderstandings as they arise. However, Newell (1993) also discusses the counter argument stating that if the researcher is present respondents are perhaps more reluctant to raise queries. It does however produce a high response rate as the researcher can collect the questionnaires straight away. In the main this was possible however on some occasions with some groups the

researcher contacted the groups whilst they were with other teachers and could therefore only request that they be delivered back to the researcher directly or through the other teacher if they were willing to do so. On some occasions other teachers had to be instructed on the use of the questionnaire in order to distribute it on the behalf of the researcher. One of the difficulties faced by the researcher is the issue of students being burdened by being requested to be the subject of many research studies, particularly since the move to Higher Education settings and with the changing of the curricula to the 'Making a Difference ' course (DOH, 1999). Another factor in this is that an increasing number of nurses are conducting research within the push for evidenced based practice (Burns and Grove, 1995). Student nurses therefore often find themselves being sought as the subjects of both nursing and educational research studies. Obviously completing a large questionnaire, if this is one of many, could be considered a chore, so if it is voluntary as in this case the student may wish to decline. In order to address this the researcher took the opportunity where possible to deliver the questionnaire during a module specifically related to teaching and learning so that there may be some relevance attached for the students in completing the task. Also the students would be familiar with the researcher. It is recognised that there may be an issue of bias in such an approach. Robson (1993) states that in some cases where the teacher is present the students may make a stronger effort to complete the test to please the teacher. However in this situation there are no right or wrong answers and there is no one aspect considered more important than another within the study, therefore the students were not influenced in what to answer within the questionnaires or that one example is better than another, instead only that they were instructed how to complete the package, so therefore the validity of the approach should not be affected.

Corner (1991) argues that educational research has undergone a move towards not just examining outcomes but also context, processes of learning and all that constitutes education in its broadest sense. Advocating a combination of methods, assisting in researching this broad context, the concept of investigator triangulation (consisting of multiple rather than single observations of the same phenomena by the investigator) was applied to this particular study. The combining of methods helps in completing the task of re-examining taken for granted experiences (Koch, 1995).

3.3.5 Pilot Study

A pilot study was conducted to test the suitability of the questionnaire package and its ease of use to investigate the nature of the relationship between learning styles and the modalities and sub-modalities. A group of student nurses were given the Learning Style Questionnaire (Honey and Mumford, 1986) the IPTP and the PPMI to complete. A total of 19 questionnaire packages were used. Most respondents reported ease of use yet had stated that the guidelines and instructions that indicated there were three actual parts to the package needed to be made clearer. Therefore instructions were given on the front sheet and at the end of each questionnaire so that future respondents would be able to use the package relatively easily, by being told what section to complete next. The respondents in the pilot study also complained about the time needed to complete the self-analysis sections of the package particularly the LSQ scoring aspect. It was decided that the researcher would indicate to respondents in the main study that this could be left blank and that the researcher would complete these sections as the relevant information needed was provided in the answer to each section given by the respondents. This also was a factor that led to the respondents

being able to quickly complete the instrument and increase the likelihood of its quick return.

In the collection of the data from the pilot study, some interesting results occurred. These were mainly that those with the higher Pragmatist learning style preference scores were significantly positively correlated to the Auditory modality of representations and likewise, Theorist to Gustatory. These findings came about following the completion and collection of these tools. They were then analysed statistically using Spearman's Rho correlations to review the relationship. The Olfactory and Gustatory modalities also showed some significant results and positive correlations with Pragmatist learning style preferences. Reflectors negatively correlated to both Auditory and Visual representations, which appears surprising as reflection is a Visual predicate in itself and the notion of Reflectors is to watch and listen, gathering information before acting (Honey and Mumford, 1986). The results from the pilot study will be discussed in more detail with the results from the study, however the main purpose of the pilot study was to test the use of the questionnaire. According to Polit and Hungler (1993) the pilot study serves as a means to obtain information for improving the project or improving its feasibility. As there were some significant results this indicated some value in conducting the study and also demonstrated that the use of the questionnaire was quite straightforward. Having made the relevant amendments the questionnaire package was deemed by the author to be suitable for use. The criticisms of the LSQ and the lack of supporting evidence for the support of the 'IPTP' and 'PPMI' are recognised yet due to their utility and specific focus on the research variables they were considered beneficial for use in this study.

It is now necessary to discuss the qualitative approach to the study.

3.4 The Qualitative Approach

Hollway and Jefferson (2000) argue that survey methods and methods involving questionnaires, although useful, can be limited as they miss out the individual, and what their thoughts, feelings and attitudes are regarding particular events and experiences. They state that face-to-face interviewing has become the most common type of qualitative research method used in order to find out about people's experiences in context and the meanings they hold. This is a useful description of the notion that underpins the qualitative aspect of this study. However the interview was not utilised to investigate themeaning of experiences but to explore the subjective structure of experiences and meaning of individuals. This concept is supported by Marks (1999) who states that the subjectivity of consciousness is not an obstacle in scientific study. Under well-controlled conditions, verbal reports provide reliable and valid measures of conscious experience. Individual participants should not be treated as an imperfect measuring device of their own consciousness. This concept underpins this part of the study. That is that the participants' descriptions and responses are acceptable and valid in relation to the topics under investigation as it focuses on their own subjective experiences and responses.

The purpose of the interviews was firstly to elicit content from the respondents regarding their internal representational systems in relation to learning. According to Priest, Roberts and Woods (2002), content analysis facilitates the production of core constructs from textual data through systematic reduction and analysis. They point out

that exploratory studies tend to lend themselves to content analysis in that answers to applied questions can be gained. In doing so questionnaires or interview schedules can be produced.

3.4.1 Qualitative Data Collection

In order to collect such data from the respondents interviews were arranged and the data was collected by the means of videotape recordings. Roberts and Woods (2000), state that audio taped interviews are one of the most widely used methods of collecting data in qualitative studies, and can be adhered to regardless of what type of interview is conducted. However this study also needed to account for what the respondents said, which is very important and also what they did. That is the non-verbal behaviours they displayed whilst giving answers related to specific internal representational systems. Therefore video taped interviews were deemed to be the most appropriate method for achieving this. Pretzlik (1994) states that information can be gathered about people by watching and recording the observed behaviour in some way. Videoing the interviews seemed sensible so that both the verbal content of the respondent and their behaviours could be recorded. It must be recognised however that no judgements were to be made regarding these behaviours and only patterns of behaviour would be recorded and described. Roberts and Woods (2000) point out that videoing interviews is useful as much more data can be stored than in audio taping and that it can be easily collected and managed. However transcribing recorded material from the videotape can be problematic, largely due to incompatibility with audiotape transcription machines. This was found to be the case with this study. The actual collection of the data by video interview was fairly unproblematic, yet the

transcribing of the videos was very time consuming and problematic because of no available technical equipment that can help in the transcribing.

In this qualitative part of the study the researcher is directing attention to the participants' subjective perceptions of their own experiences (Hallett 1995).. Hallett suggests they should then present these with clarity and utilise a process of interpretation to understand their basic structure and meaning. Kelly and Long (2000) support the notion of using qualitative methods in nursing research as they suggest that there are inadequacies in total positivistic enquiries which deny the importance of subjective, social, spiritual and interpretive aspects of people. Qualitative researchers are concerned to stress the internal and subjective dimensions of human consciousness. The essence of qualitative research is to gain insight into the subjective level of the internal processes of the human mind.

The interviewer can use probes to direct the respondent to a more directional response, but the factor of interviewer bias then needs to be carefully monitored. Advocates of unstructured interviews may value and analyse the part played by the interviewer, but in structured interviews this is less valued. There is therefore a need to take careful consideration of these issues (Fielding, 1994).

3.4.2 The Interviews

The researcher conducted all of the research interviews. The format followed a semi-structured interview approach. The participants had been given details of what to expect in and from the interview and the rationale behind it. According to Rose

(1994), the semi-structured interview allows the interviewer to focus on issues of particular importance to the research question. Also to probe and clarify comments made by the informant and to use prior knowledge to help in this process. The role of the interviewer should be one of gentle guidance.

This can be difficult to achieve and Rose (1994) continues, pointing out that the interviewer needs to attempt to achieve some degree of consistency in the interest of collecting the same type of data, whilst being flexible enough to take account of the individuals and the value of any new ideas and themes.

The research questions focused on the perceptions of the participants in relation to their learning. They were asked to describe their approaches to learning. They were also asked to think of situations in the theory setting and the practice setting where they had learned successfully and also less successfully. They were then asked to describe the internal representations or submodalities of these learning experiences.

Gray (1994) describes the role the interviewer must take in such situations. She states that questions should be non-threatening. Therefore the language used reflected the language that the students used themselves or had been exposed to within their experience. The use of technical terms such as 'submodalities' was avoided and the students were simply asked whether the experience produced sights (pictures) sounds or feelings. They were then asked to give the qualities of these aspects in quite simple terms for example, colour or black and white, moving or still, loud or quiet, warm or cold? Gray points out that the interviewer should be flexible so as to alternate between an active and passive role and make decisions of when to probe for further information, therefore managing the pace and direction of the interview in relation to the research question.

> 'In this kind of interview, topics which arise in conversation can be explored and interesting leads pursued. To achieve this I have needed to keep the purpose of the interview in mind and be aware of critically evaluating the information. I have had to get used to continually making decisions regarding the sequencing and phrasing of questions in light of the responses received.'
> Gray, (1994, p69).

These rules were very much applied to the interviews undertaken for this study. All respondents were basically asked the same questions but due to some having different experiences to others there were times when the sequencing phrasing or actual asking of the questions had to be reconsidered. Also as the researcher has experience and skills in Neuro-Linguistic Programming (NLP) the questions needed to elicit such information from the respondents were used based on the meta-model of Bandler and Grinder (1976) in challenging the generalisations, distortions or deletions that the informants offered. In this way the respondents were able to describe their experiences in clear, concise sensory-grounded language.

This notion of flexibility, probing, and rephrasing as necessary is supported by Robson (1993) who states,

> "The general principle is that the research strategy or strategies, and the methods or techniques employed, must be appropriate for the questions you want to answer."
> Robson, (1993, p38).

Each of the interviews lasted approximately fifteen to twenty minutes each. The videos were positioned so that only the respondent could be seen, mainly from the front so that all of their non-verbal behaviours could be recorded. The interviewer could not be seen but the questions can still be heard on the video recordings. It may have been useful to utilise other researchers yet although the process was time and energy consuming, the researcher did find benefits of 'getting to know' the participants and how to refine the process.

It is now important to discuss how permission was gained and how the population and sample was accessed.

3.5 Population and Sample

The population for this study was pre-registration student nurses. The population was from one particular university offering nursing courses. That is students studying on the Dip (HE) or BSc. (Hons) Nursing Studies leading to registration as a nurse on the Adult, Mental Health, Learning Disability or Child nursing branches. The main reason for this is that this is the area within which the author works and operates and the groups of students that he is most in contact with. Both the Dip (HE) and the BSc students were included as they were both on courses that were structured similarly and both undertook many of the same modules and practice experiences and often had shared sessions together. The main difference between the two groups was the balance of modules in terms of their credit ratings.

Northway et al (2001) discuss the benefits of involving student nurses in research projects as being that it provides students with the opportunity to become involved in the research process even in a limited way, and promotes bringing the theory and practice of research closer together. It is well recognised that nursing is moving towards more evidence or research based practice (Carnwell, 2000). Although Northway et al's (2001) study involved students as researchers it highlights the increased understanding the students gained in the process of research and it's benefits in appreciating how research is conducted and how the potential findings can be utilised.

It is recognised that this population and the sample drawn from it is a purposive or convenience sample (Blacktop, 1996). However the focus is on pre-registration student nurses and there are nationwide standards of entry for such students to pre-registration nursing courses, so therefore the group should have some representativeness of the rest of the population of student nurses in the country. As long as they are over seventeen and a half and possess the right qualifications or equivalents, anyone from any background, age, gender or ethnic background can apply for nursing. There are obviously some aspects that cannot be accepted such as certain previous criminal offences or medical issues, yet again these standards are the same nationwide. Cohen and Manion (1994) describe convenience sampling as choosing the nearest individuals to serve as respondents and continuing this process until the required sample size has been obtained.

> 'Captive audiences such as pupils or student teachers often serve as respondents in surveys based upon convenience sampling.'
> Cohen and Manion, (1994, p88).

According to Newell (1996) research relies on samples being representative of the populations in everyday situations. Newell (1996) states that in experimental research and other forms of comparative study the issue of determining from which theoretical population members of a sample are derived is of interest. However in this study there is no experimentation or comparison (other than age or gender) and the sample is made up of people drawn from the general population that have met specific standards and requirements that all student nurses need to have met. Therefore they could be considered representative of the population of student nurses in this country. Atkinson (1996) in Cormack (1996) states that any statement about a sample population based on sample findings can only be a probability statement, as opposed to a fact, meaning that it could possibly be wrong. The issue therefore is to reduce the chance of this happening to

an acceptable level. Burns and Grove (1995) point out that an accessible population is the portion of the target population that the researcher has reasonable access to. The danger is in defining the accessible population too narrowly so that generalisation to larger populations is impossible. In this study all cohorts were approached and the students within them were given the choice of whether to participate in both aspects of the study, therefore nobody was handpicked or chosen by the researcher yet the sample was derived from the total accessible population.

Robson (1993) states that non-probability sampling is usually less complicated to set up and are acceptable when there is no intention to make a statistical generalisation to any population beyond the sample surveyed. Polit and Hungler (1993) state that probability sampling is the random sampling of elements from the population. Simple random sampling involves selecting elements from the population by random methods. As everyone in the population was offered the chance to participate those that did, did so of their own volition and were not chosen by the researcher, therefore reducing any biases in the sample selection. However this cannot necessarily guarantee representativeness, it does though, guarantee that the differences in the attributes of the sample and population are purely a function of chance (Polit and Hungler, 1993). Any participation was through the respondent's prerogative and with their consent. If they did not wish to participate then they were allowed not to. A number of cohorts each averaging 100 students were accessed, amounting to eight hundred students that were approached. Six hundred questionnaires were distributed and four hundred and sixty three were returned. This gives a response rate of seventy seven point two percent (77.2%). Burns and Grove (1995) state that a response rate of lower than fifty percent casts doubts upon the representativeness of the sample so this can be considered a good response rate and

certainly includes enough respondents to undertake statistical analysis of the questionnaires. However, of the total questionnaires returned, thirty had been incorrectly completed, mainly by participants missing parts, or all of the latter sections. Many of these incorrectly filled questionnaires had however completed the LSQ part of the package.

The respondents were all asked to put their names to a form, which included the number of the questionnaire they received. They were told that this was so that if they volunteered to be interviewed their relevant questionnaire could be identified as a cross-reference.

The sample of respondents for interview was developed in much the same way. Obviously it would be difficult to interview the total population so a sub sample of five percent was identified as a reasonable amount of people to interview, as the interviews would be quite complex in their nature in terms of analysis. Again the students, mainly on the latter intakes (2000 onwards), were given the opportunity to volunteer. Some volunteered and others that had originally intended to do so withdrew. A total of twenty-four people were eventually interviewed although originally a number of thirty-six had volunteered. This gave the required five percent of participants required for the qualitative part of the process. All students gave their consent to the process.

3.6 Gaining Permission and Approval

The research proposal for this study was accepted in 1998 after being scrutinised by the University research committee. As there is no experimentation or separating of groups or the trying out of any new approaches or interventions the ethical issues in this research are minimal. However the human rights of the individuals involved is recognised, as is also the fact that the participants knew the researcher. According to Eby (1995) the medical based ethics of autonomy and respect for individuals, beneficence, non-maleficence and justice/fairness are factors that should be recognised within research studies. These principles underpin this particular study. In terms of autonomy the participants were all voluntary, in both completing the questionnaire and in choosing to be interviewed. Their privacy is respected as individuals cannot be identified at any time during the research process and it's recording. The only aspect where they could be identified is by recording their name so that if they were interviewed their questionnaire could be identified. The participants were reassured that these details would be kept safe and private with access allowed only by the researcher and assistants. This is an aspect deemed important in the ethical practice of research (Cerinus, 2001). The aim of the research is to improve teaching approaches if necessary, and there are no procedures throughout the research process where the participants could be harmed in any way. All participants were given the opportunity to contact the researcher if they wished to further discuss any issues.

Behi (1995) discusses the importance of informed consent in research, stating that everyone has a right to informed consent before agreeing to participate. The main issues are what form this should take. All students were informed of the research and the reasons for it and could participate voluntarily in the research without coercion as Behi

(1995) suggests should be the case. By submitting the questionnaires it could be argued that the participants at the same time were giving their consent. Also all students that were interviewed also were asked before commencing if they consented to the process.

During the research study the individual school within which the researcher and the participants were based also developed a school research ethics committee. The chairperson for this committee was approached yet stated that as the study had already been sanctioned through a university research committee and as there were no obvious ethical issues it was unnecessary for it to also go through this procedure. A letter of permission from the head of department to proceed was also sought and given.

3.7 Analysis Of Data

Due to the dual methodology approach of the data collection this led to the necessity of a dual approach to data analysis. Firstly there would be numerical statistical analysis applied to the data gathered from the questionnaire packages, and secondly a content analysis approach on the qualitative verbal data gathered from the interviews and also analysis of the nonverbal aspects. Bradley (1995) argues that two or more methods help triangulation of the research project and can be seen as a means of overcoming the quantitative/qualitative divide.

Once all of the questionnaire packages had been received the researcher went through each individual one by hand, to check for accuracy of completion and to input and collate the scoring from the questions answered (which had been left so that the respondents could complete the questionnaire more quickly). Having completed this all of the data from the correctly completed questionnaires was inputted to SPSS 11.00 a

computer based statistical package. According to Norusis (1993) this is a comprehensive and flexible statistical analysis and data management system. However inputting data can be quite time consuming, but once saved in the package it is quite easy to carry out the relevant statistical analyses.

Various statistical tests were used to analyse the data from the questionnaires. Firstly all of the scores in each learning style were recorded into the statistical package. This would give a range of scores for each learning style and also the preferences could be extrapolated from them and ranked. The gender of the participants was entered by codes related to each category; age was provided as a straightforward number in years. The distribution of this data can then be shown using bar charts. The frequencies of each learning style preference and the total all round scores (found by adding all of the scores together) were also plotted. Descriptive statistics can be used with non-parametric data that is nominal or ordinal such as this data. Non-parametric methods refer to the nature of the data having no distribution assumption made about it (Castle and North, 1995). As the scores are based on statements there is no true measurable value between them as you could measure with distance or time or other continuous data. The data collected from the questionnaires could be considered non-parametric in nature in terms of the measurements being the ranking of objects on the basis of their standings to each other on a specified attribute (Polit and Hungler, 1993). The questionnaire has specific statements (twenty pertaining to each learning style). The statements in themselves are nominal in nature (such as the description of a behavioural trait) if taken individually, but taken as a whole a varying score from zero to twenty could be achieved. As this score relates to categories of behaviours individually interpreted, it can only be considered a rank on the scale and not a

distance bound measurement such as an interval or ratio scale. Someone with a score of twenty Activist items, for example, may not necessarily be twice as much an Activist as someone with a score of ten.

The scores form the IPTP and the PPMI for each category were also recorded. As the IPTP also has scores for olfactory and gustatory elements, which the PPMI has not, these were added to the feelings score to provide one total score, therefore bringing it in line with the three major modalities of the PPMI.

Various cross tabulations were also made. A cross tabulation provides a determination of the number of cases in a situation where simultaneous consideration is given to two or more variables. They are frequently used for describing nominal and ordinal data (Polit and Hungler, 1993).

Correlations were made to investigate the favoured pairings of learning styles to act as a comparison to those proposed by Honey and Mumford (1986). The spearman's correlation coefficient test was used for this, as this test applies to ranked data that is not interval based (Hinton, 1995). The Kendall's Tau-B Correlation co-efficient was calculated for the norms of the scores in this study compared to those of Honey and Mumford. According to Cohen and Manion (1994) the purpose of this test is to determine the degree of agreement for two sets of data ordinal in nature. Cohen and Manion (1994) point out that correlational research is particularly useful in tackling the problems or issues in educational and social sciences as it examines many variables and their relationships together quite quickly. However it does not describe

any cause and effect relationships, only implying concomitance, as it is much less rigorous than the experimental approach.

In order to analyse the video interviews two procedures were used. Firstly each video was transcribed, word for word. This would then be available to use both for content analysis, and to use as a basis for analysing the non-verbal aspects in the person's behaviour from the video recording. According to Mackenzie (1994), the contemporary association between content analysis and research is linked to the development of social science as an intellectual discipline. It takes the researcher further than simply numbering and quantifying words as data to interpreting the content and remains a popular method of analysing qualitative data. Priest, Roberts and Woods (2002) describe content analysis as facilitating the production of core constructs from textual data through a systematic method of reduction and analysis. Text is coded into established categories and then the number of times a similar piece of text or idea occurs within categories can be counted. In this case the categories already exist in relation to the submodalities of internal representational systems. Burns and Grove (1995) state that codes used in content analysis can be descriptive, interpretive or explorative. Descriptive codes refer to data that is organised into particular elements, interpretive codes are related to where the researcher is gaining insight into the processes and exploratory, are derived after theoretical ideas from the study have begun to emerge. Burnard (1995) however criticises the method of content analysis and its intention of finding meanings from the words. Burnard (1995) claims that not all words and phrases are suitable for analysis at a textual level as some words are used as fillers. They do not provide any particular meaning but can provide a sense of the words. This is addressed in this research as the researcher's intention was exactly to discover the meaning of particular

experiences for the respondents by questioning them about the modalities of the very experiences themselves, and therefore the meaning of the experience for the individual.

Burnard's (1995) main point is that there is technology available to reduce transcripts to units of text. However without useful information about the Visual and Auditory qualities of the interview the written word arrived at through reduction could be meaningless. Therefore the latter aspect of the video analysis was to analyse them for precisely these other qualities. The transcripts were inputted to 'Nudist', a qualitative software package in order to complete the content analysis (QSR, NUD*IST4 user guide, 1997). The non-verbal analysis was completed using the BAGEL framework (Body movements, accessing cues, gestures, eye movements and language), of Dilts and Epstein (1995). These were observed and recorded following each of the participants responses to the questions posed by the researcher. A photographic representation of the body positions associated with the different modalities was used as a guide. This can be seen in Appendix Six.

By completing the multi-methods of analysis it was hoped that the research might produce more knowledge on the theory of learning styles and NLP through the use of internal representational systems.

Chapter Four

Findings From The Quantitative Data

4.1 Introduction

In this chapter the results obtained from the data collected from the questionnaires will be presented. The findings in relation to the notion of preferred learning styles and internal representation systems will be explained. In order to understand the nature of the results it is first necessary to outline how the data was managed and then analysed.

4.2 Data Management and Analysis

All the questionnaires were collected and checked by the author by hand, and scores were collated and recorded for each aspect of the questionnaire, Honey and Mumford's (1986), Learning Style Questionnaire (LSQ), the 'Identify your Preferred Thinking Pattern' (IPTP) (Knight, 1995) and the 'Primary Perceptual Modality Inventory' (PPMI) (McVoy and Markowski, 1998). The respondents had been encouraged to leave the scoring sections of the questionnaire package so that they could concentrate on answering the questions, in order to promote quick and effective completion. On each questionnaire package the following was recorded:

- A score (between 0 and 20) for each Learning Style; Activist, Reflector, Theorist and Pragmatist plus the total of all four of these scores.
- The strength of preference that the score represented for each particular style; very strong, strong, moderate, low, or very low (based on the general norms provided by Honey and Mumford (1986).

- The total (between 0 and 12) for each of the modalities included in the IPTP; Visual, Auditory, Feelings, Smell, and Taste. The last three of these were then added together to create one score within the category of Kinaesthetic modality. This was done so that there were three main representational modalities similar to the PPMI and the relationships between them could be investigated more easily.
- The total of the summated scores (between 0 and 100) for each of the modalities included in the PPMI; Visual, Auditory and Kinaesthetic.

These scores were then inputted into SPSS 11.00 for Windows, a comprehensive and flexible computerised statistical analysis and data management system (Norusis, 1993). Although this is a time consuming process it is beneficial for the researcher to be involved in this because it allows him or her to become immersed in the data. Burns and Grove (1995) believe this is a useful and positive aspect of research, since the researcher gets a feel for the data and the results.

All the details from each individual questionnaire were inputted into columns within the SPSS package. Each questionnaire was numbered for reference and from this the respondents that volunteered for interview were identified so that their questionnaires could be cross-referenced to their interview at a later point if necessary.

The scores for the Honey and Mumford (1986) LSQ were then inputted; Activist followed by the Activist preference, then Reflector, Theorist and Pragmatist and so on in the same way. Finally the total of the scores was placed in the last of the columns related to the LSQ. The preferences were initially based on the general norms of Honey

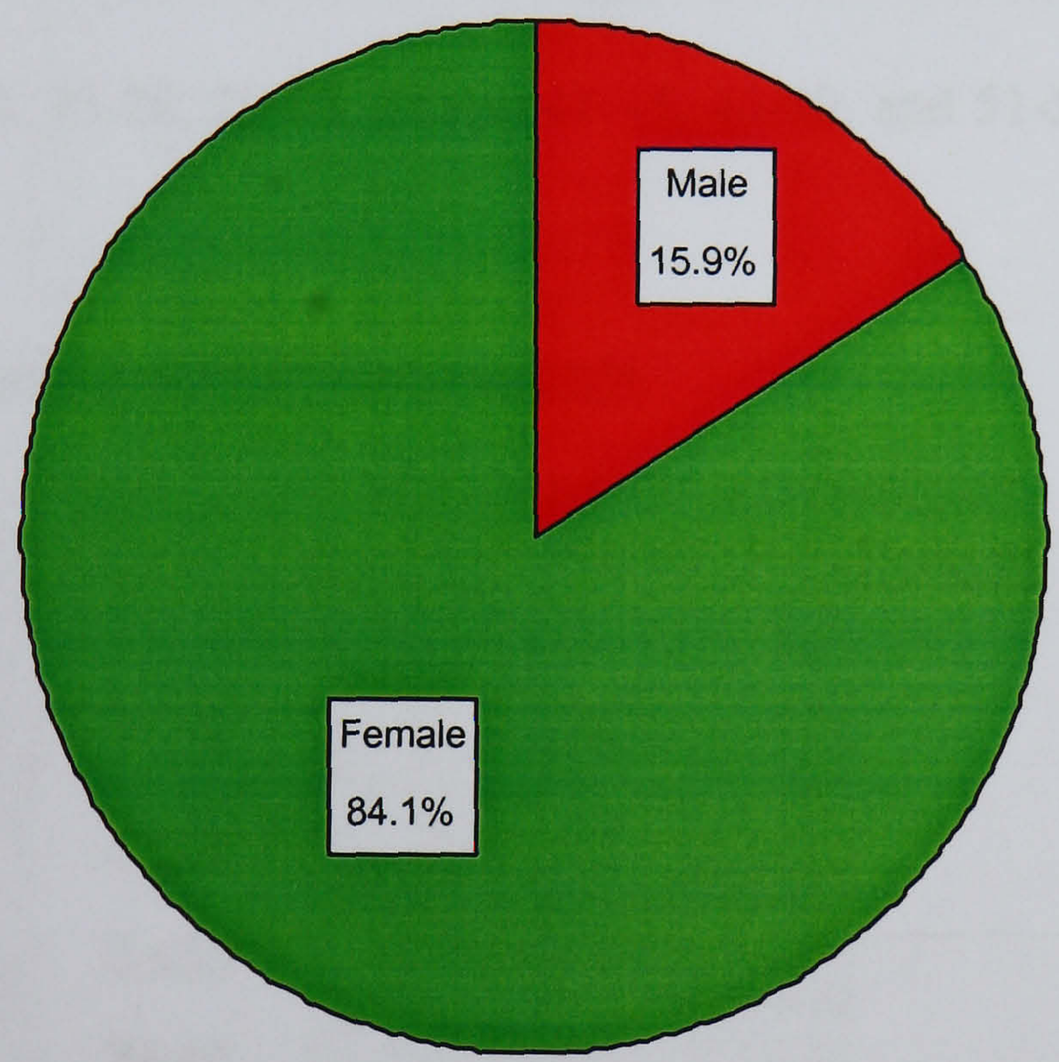
and Mumford (1986). In each of the individual style preferences a value of 5 was given for a very strong preference to a value of 1 for a very low preference. This was so that in statistical analysis the higher number could be correlated with other increasing numbers (of preferences) as an indicator of agreement of strength. Scores were then inputted by column for the Visual, Auditory, Feelings, Smell and Taste modality scores from the IPTP (Scores between 0 and12). A further column was developed for the total of the scores of Feelings, Smell and Taste used to give an overall Kinaesthetic modality score related to the IPTP. This was so that Feelings, Smell and Taste could be placed into one section reflecting Kinaesthetic aspects. This would then give three main representational systems similar to the PPMI. Following this, the scores were inputted into respective columns for the Visual, Auditory and Kinaesthetic modality scores from the PPMI. Lastly, age and gender were inputted in respective columns. Age was inputted as a direct figure and gender was inputted with the nominal classification of 1 for male and 2 for female. The very last column after the initial input of data was whether the respondent had been interviewed. Again this last column was for identification purposes only.

4.3 The Study Population

The total number of respondents replying was 463 from a possible 600; however 30 questionnaire packages had been incorrectly completed, or were incomplete. The remaining 433 were used in the study, giving a response rate of 72.2%. Burns and Grove (1995) state that a response rate of more than 50% is needed as less than this raises doubts upon the representativeness of the sample. Consequently, in light of this, this response rate could be seen as favourable for the collection of valid data.

Of the 433 respondents 84% (364) were female and 16% (69) were male. This can be seen in the figure 4.1 below. This is a reflection of the gender balance within the nursing profession as a whole and compares well to the population of the current intakes of students where the study was conducted, where there are 89% of females and 11% males.

Figure 4.1: Gender of Respondents



As shown in table 4.1 the minimum recorded age was 18 and the maximum age was 54, with a mean age of 27.3 and a range of 36 years. Ages were looked at so that statistical analysis regarding relationships between age and other preferences could be investigated.

Table 4.1: Ages Of Respondents

Ages Of Respondents

	N	Range	Minimum	Maximum	Mean	Std. Deviation
AGE	433	36.00	18.00	54.00	27.3441	7.9759

The ages of respondents were later placed into age groupings based on Levinson's (1978) developmental stages of adulthood and added into a column within the SPSS data sheet. This was to simplify cross tabulation with other data such as preferences of learning style. These developmental stages are as follows: early adult transition (18-22), entering the adult world (22-28), young adult transition (28-33), settling down (33-40), mid-life transition (40-45), entering middle adulthood (45-50), transition (50-55) and culmination of middle adulthood (55-60), (Hayes, 1994). These were then slightly adjusted to ensure that the ages fell into discrete groups in the following ranges: 18-22, 23-28, 29-33, 34-40, 41-45, 46-50, and 51-55. This can be seen in the table 4.2:

Table 4.2: Age Groups of Respondents

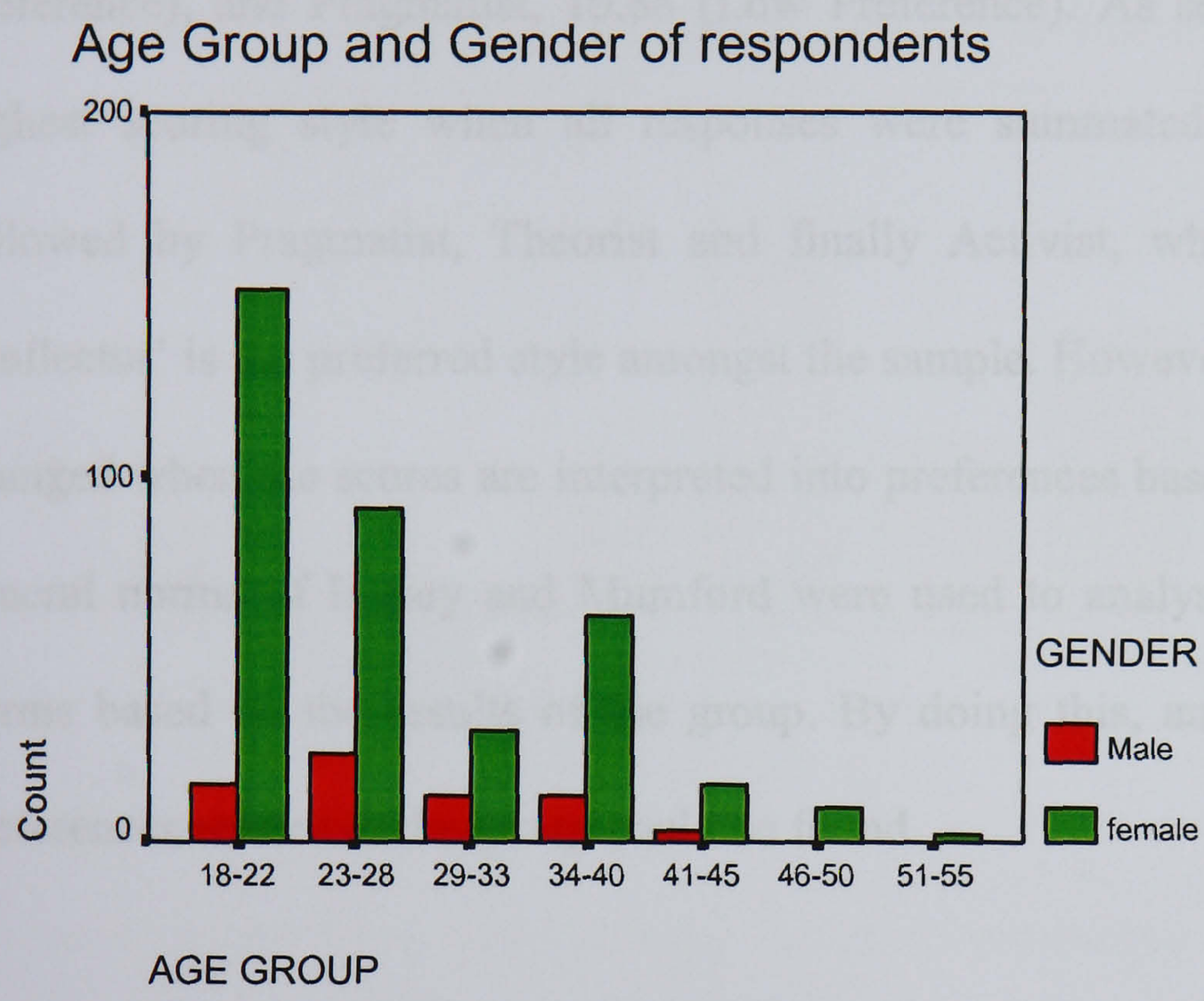
AGE GROUP Of RESPONDENTS

	Frequency	Percent
18-22	168	38.8
23-28	116	26.8
29-33	44	10.2
34-40	75	17.3
41-45	19	4.4
46-50	9	2.1
51-55	2	.5
Total	433	100.0

From the above table it can be seen that the largest age group within the sample is 18-22 year olds (168, 38.8%), followed by 23-28 year olds (116, 26.8%). There were only two people in the latter age group of 51-55, (0.5%).

The age group was also cross-tabulated with the gender of the participants for illustration purposes only to give an indication of the distribution of gender across the age groups. This can be seen in figure 4.2 below.

Figure 4.2: Age Group And Gender of Respondents



The largest group of respondents were females between 18 and 22 (42% of females and 36% of the whole group), although slightly more males tended to be in the age group 23-28 (36% of males and 5.5% of the whole group). This is again in keeping with the recognised demographics of the population used in this study. Interestingly there were no males in the sample above the age of 45.

4.4 Results from the Honey and Mumford (1986) LSQ

As can be seen in table 4.3 below, the highest recorded scores for each of the learning styles from Honey and Mumford's LSQ (1986) were as follows: Activist 19, Reflector 20, Theorist 19, and Pragmatist 19. The minimum scores respectively were Activist 0, Reflector 4, Theorist 2, and Pragmatist 1. It must be remembered that the scores may indicate different strengths of preference within each learning style.

Therefore a higher score than another may not necessarily mean a higher preference for that style as the preferences are based on general or group norms. The respective mean scores were Activist, 10.19, giving an overall average Moderate Preference throughout the sample, Reflector, 14.16 (Moderate Preference), Theorist, 10.3 (Low Preference), and Pragmatist, 10.88 (Low Preference). As seen in the table 4.3, the highest scoring style when all responses were summated is the Reflector style, followed by Pragmatist, Theorist and finally Activist, which would suggest that 'Reflector' is the preferred style amongst the sample. However the inference of this is changed when the scores are interpreted into preferences based on norms. Firstly, the general norms of Honey and Mumford were used to analyse the data and then the norms based on the results of the group. By doing this, an accurate picture of the preferences related to the group could be found.

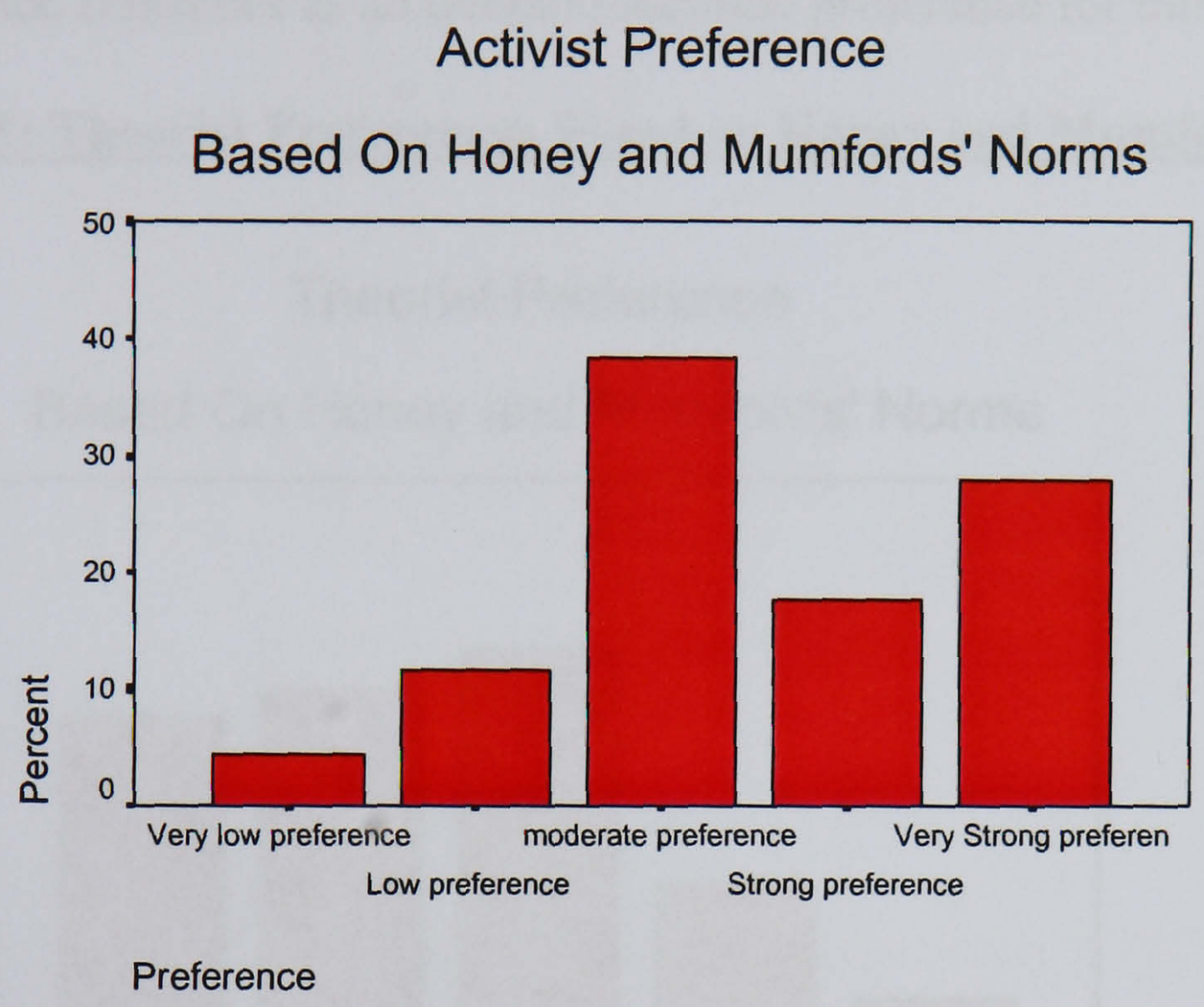
Table 4.3: Descriptive Statistics Of Honey and Mumford's (1986) Learning Style Questionnaire Scores

	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation
ACTIVIST	433	19.00	.00	19.00	4414.00	10.1940	3.6279
REFLECTOR	433	16.00	4.00	20.00	6130.00	14.1570	3.8620
THEORIST	433	17.00	2.00	19.00	4458.00	10.2956	3.6184
PRAGMATIST	433	18.00	1.00	19.00	4709.00	10.8753	3.2013

4.4.1 Preferences Based on the Honey and Mumford's Norms

The scores related to Honey and Mumford's general norms are presented and discussed first. The figures below show how the scores are translated into preferences for the respondents based on the general norms of Honey and Mumford (1986) and the amounts from the sample within those preferences.

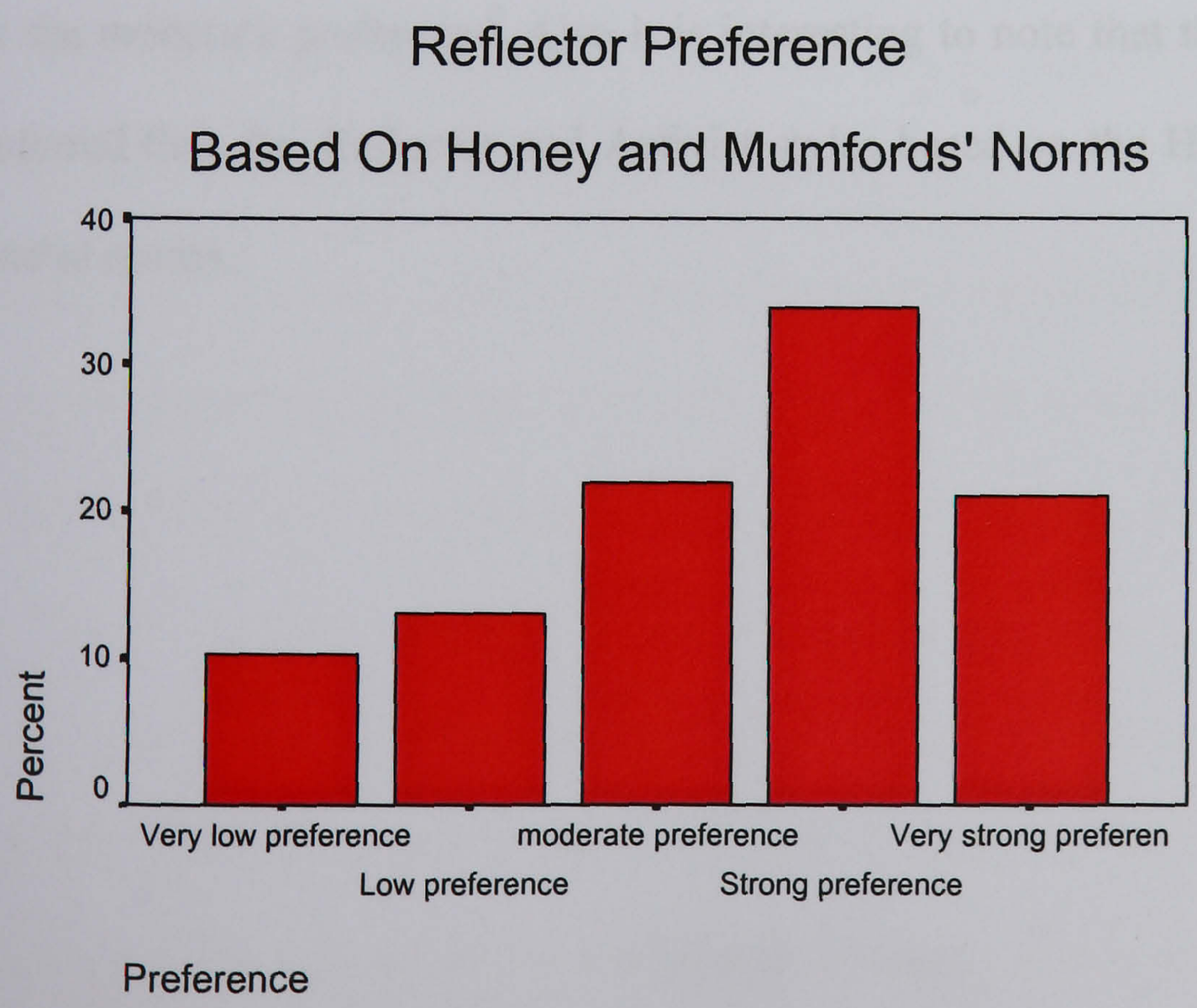
Figure 4.3: Activist Preferences Based on Honey and Mumford's Norms



Norms.

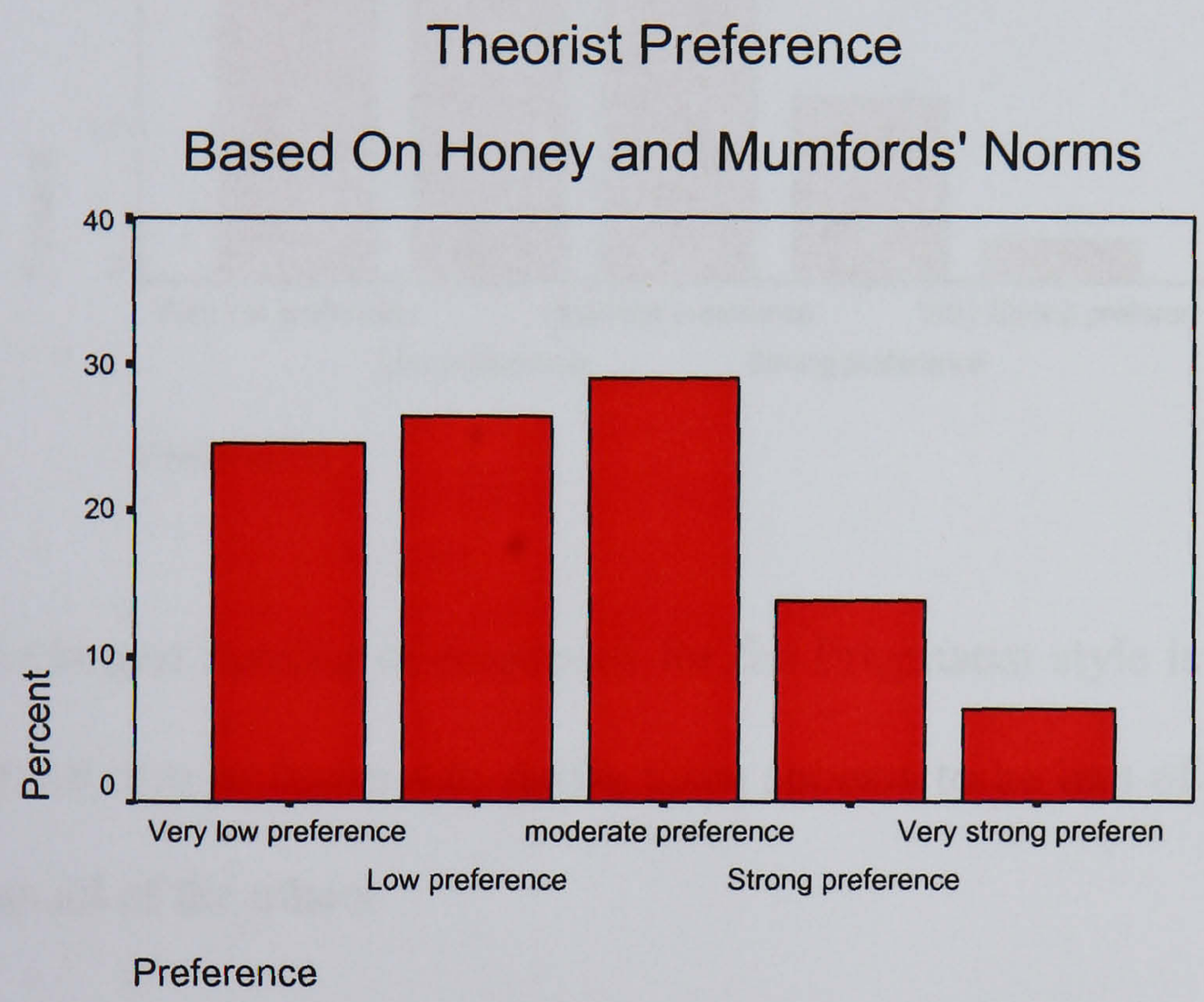
As can be seen from figure 4.3 the moderate preference has the largest number percentage of responses for the Activist style.

Figure 4.4: Reflector Preferences Based on Honey and Mumford's Norms



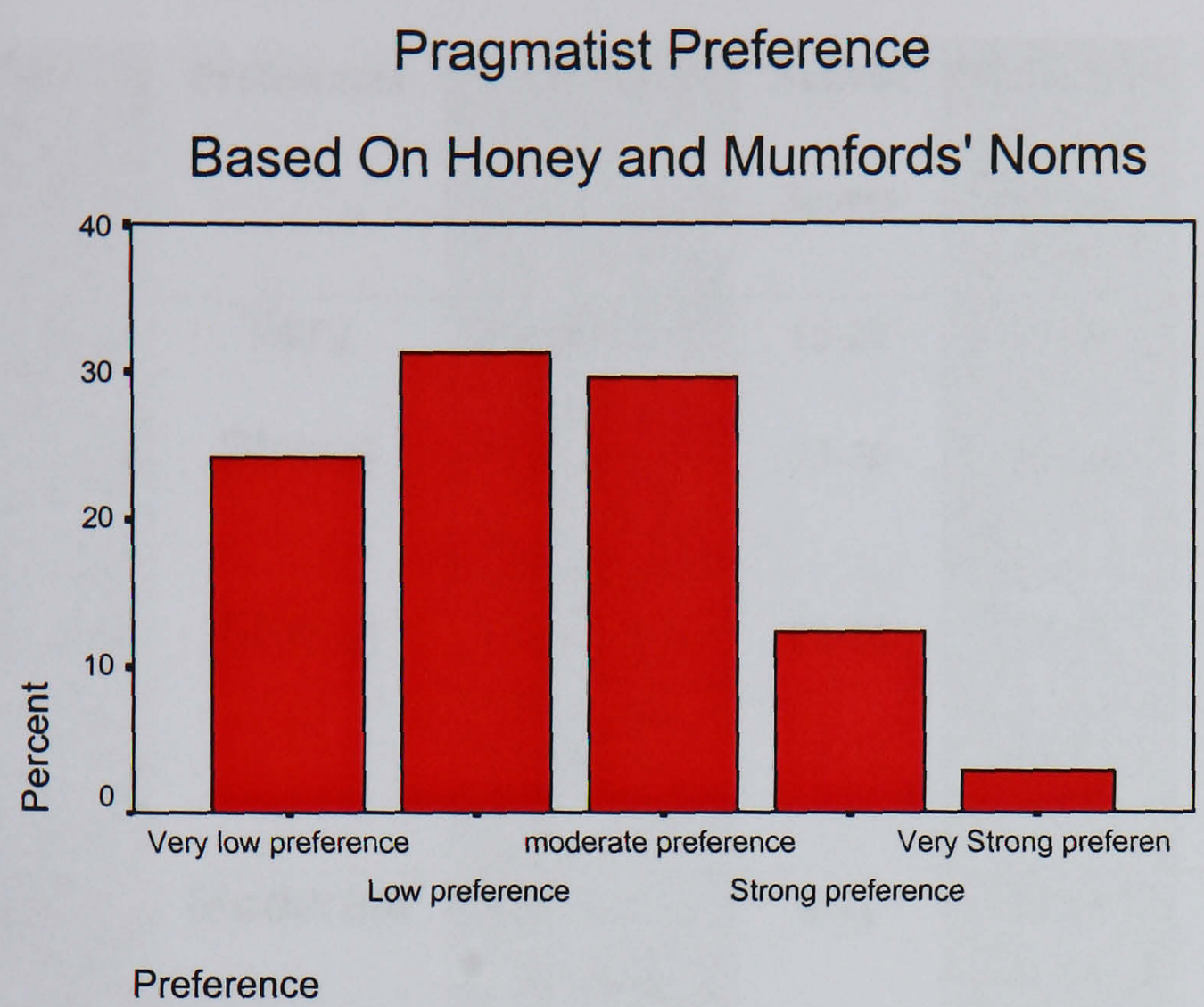
In Figure 4.4 it can be seen that the largest number of responses from the Reflector style is the strong preference, which could suggest that this is the preferred style. However it must be remembered that the mean score from the sample amounted to 14.16, which translates as an overall moderate preference for this style.

Figure 4.5: Theorist Preferences Based on Honey and Mumford's Norms



The largest number of responses for the Theorist style as can be seen in figure 4.5 is for the moderate preference. Also it is interesting to note that this appears to be less preferred than the Reflector and Activist styles based on the Honey and Mumford's general norms.

Figure 4.6: Pragmatist Preferences Based on Honey and Mumford's Norms



The largest number of responses for the Pragmatist style is for the low preference as can be seen in figure 4.6. Again there appears to be less of a preference for this style than all of the others.

The scores were then sorted into descending order for each learning style so that the norms based on the respondents' scores could also be calculated and used in order to obtain even more accuracy and truly reflect this sample. This was achieved by using Honey and Mumford's' (1992) formula of how they calculated the norms for differing groups and how they developed the general norms. This is accomplished by taking the first 10 percent, the next 20 percent, the middle 40 percent, the next 20 percent and the last 10 percent, of scores from the population thus giving a basic normal distribution across the scores. In relation to this the first 10 percent was the highest first 43 scores (10 percent 0f 433), the next 20 percent a further 86 and so on. The norms that were then arrived at can be seen and compared to Honey and Mumford's' norms in the table 4.4 below:

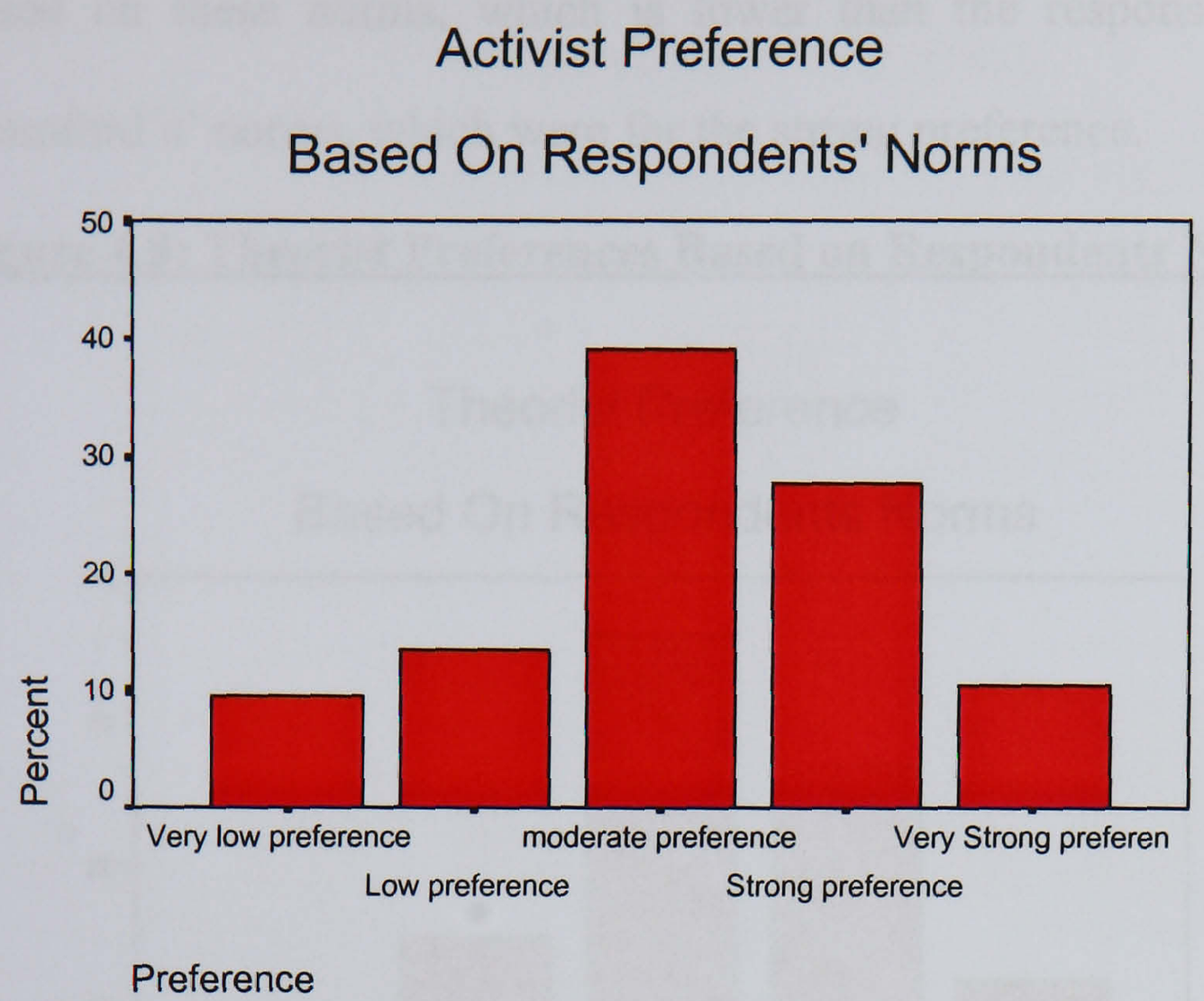
Table 4.4: Scores Translated Into Preference By Respondents' Norms

	Preferences	Norms	Activist Scores	Reflector Scores	Theorist Scores	Pragmatist Scores	Preference Score
Top 10%	Very Strong	Respondents	15-20	19-20	15-20	15-20	5
		Honey & Mumford's'	*13-20*	*18-20*	*16-20*	*17-20*	
Next 20%	Strong	Respondents	12-14	17-18	12-14	13-14	4
		Honey & Mumford's'	*11-12*	*15-17*	*14-15*	*15-16*	
Middle 40%	Moderate	Respondents	8-11	13-16	8-11	9-12	3
		Honey & Mumford's'	*7-10*	*12-14*	*11-13*	*12-14*	
Next 20%	Low	Respondents	6-7	8-12	6-7	7-8	2
		Honey & Mumford's'	*4-6*	*9-11*	*8-10*	*9-11*	
Bottom 10%	Very Low	Respondents	0-5	0-7	0-5	0-6	1
		Honey & Mumford's'	*0-3*	*0-8*	*0-7*	*0-8*	

4.4.2 Preferences Based on the Respondents Norms

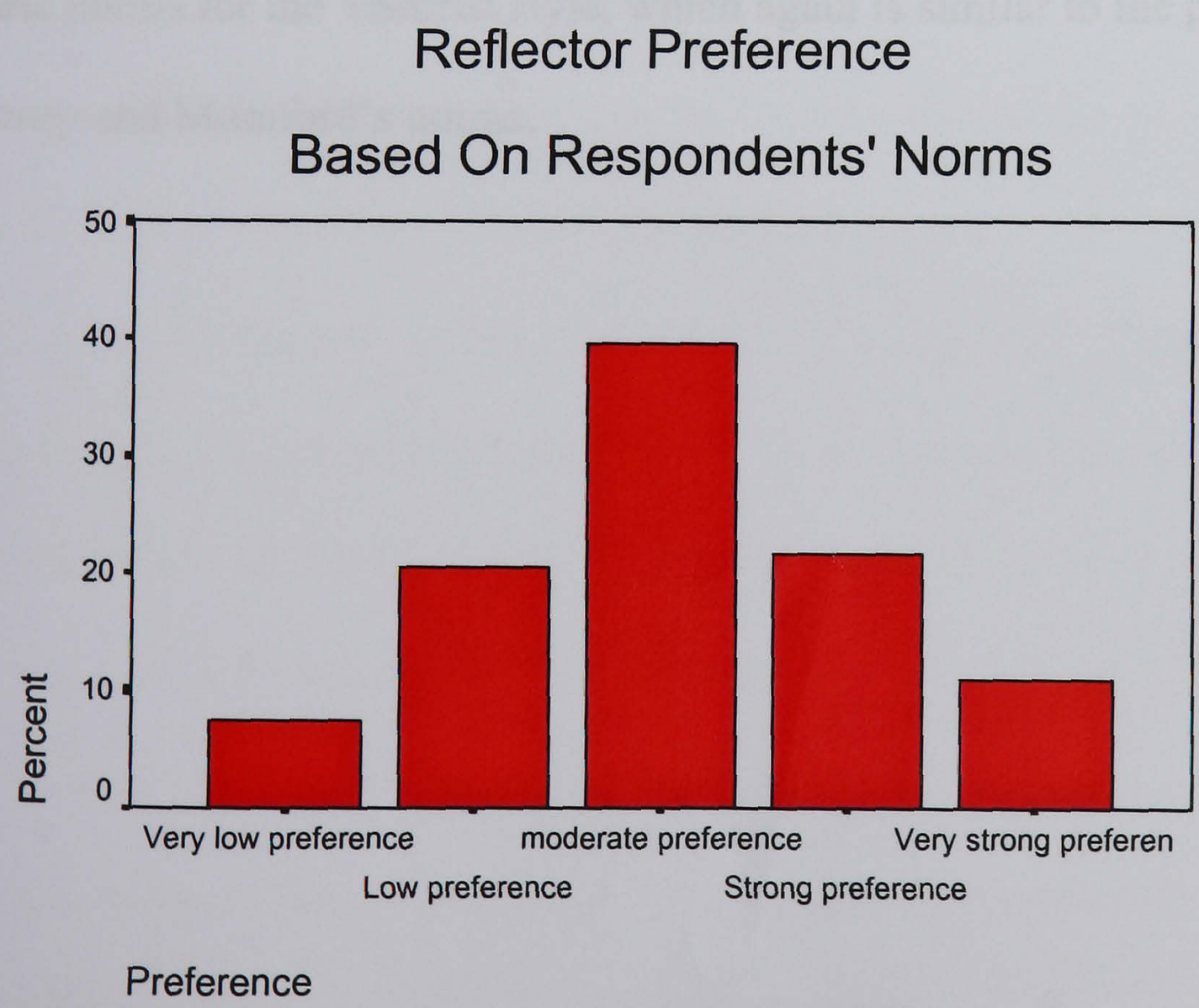
The preferences from these respondent generated norms were then added to the data and the preferences for each respondent were re-calculated. The results of the strength of the preferences based on the norms of the respondents can be seen in the figures below:

Figure 4.7: Activist Preferences Based on Respondents Norms



In figure 4.7 it is demonstrated that the moderate preference has the largest number of responses for the Activist style based on these norms. That is equivalent to the preferences based on Honey and Mumford's' norms.

Figure 4.8: Reflector Preferences Based on Respondents Norms



The moderate preference has the largest number of responses for the Reflector style based on these norms, which is lower than the responses based on Honey and Mumford's' norms, which were for the strong preference.

Figure 4.9: Theorist Preferences Based on Respondents Norms

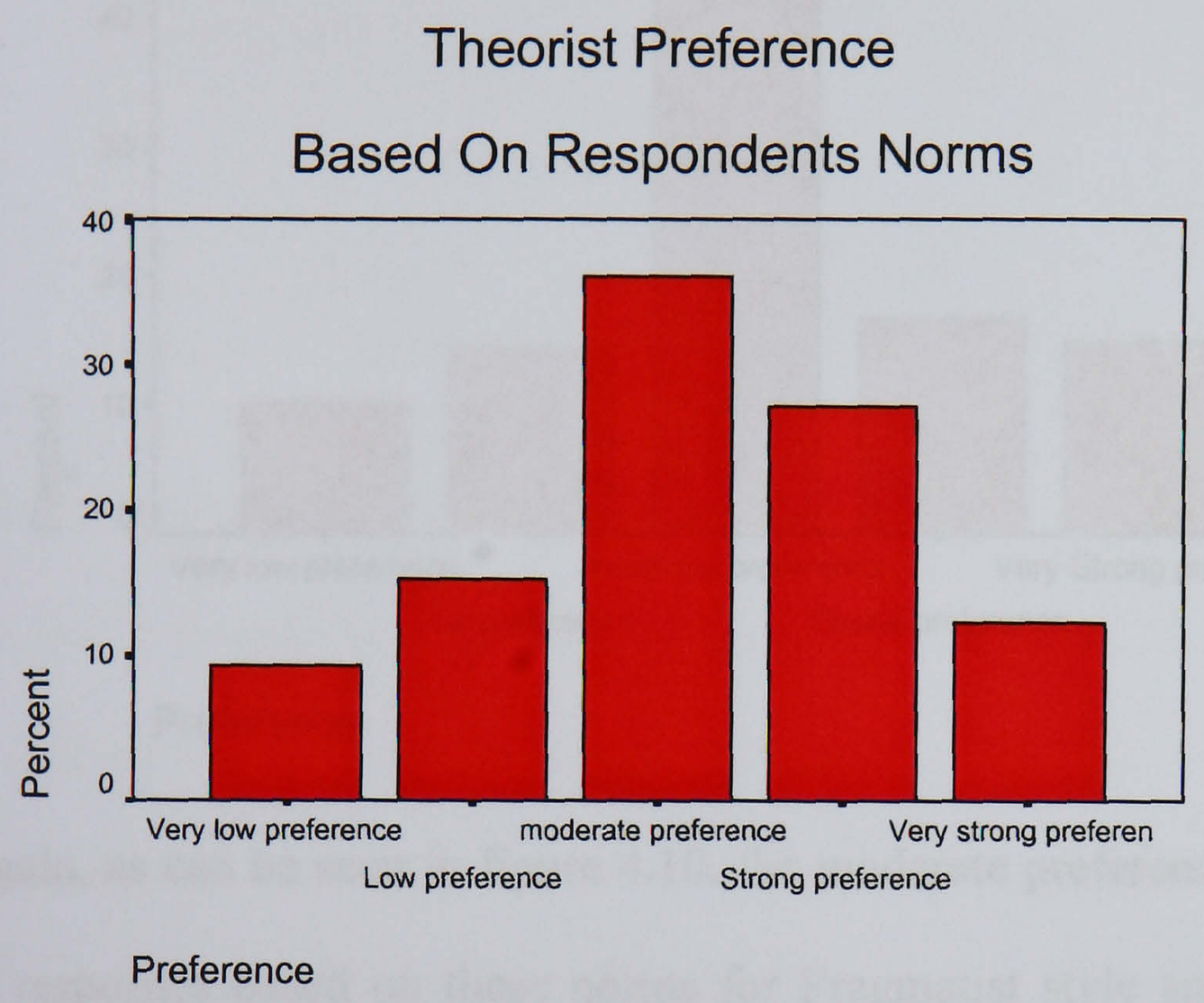
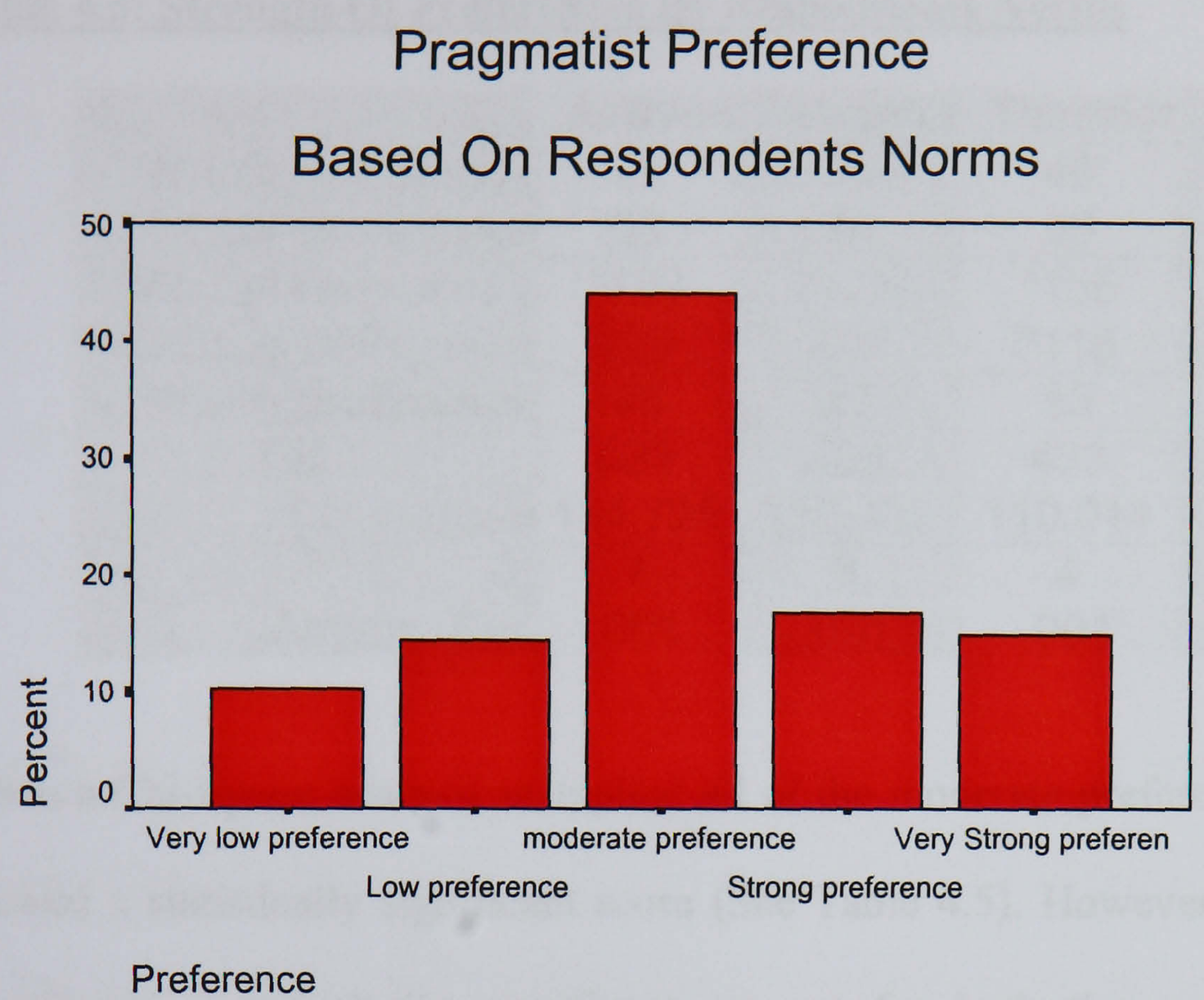


Figure 4.9 shows that the moderate preference has the largest responses based on these norms for the Theorist style, which again is similar to the preference found from Honey and Mumford's norms.

Figure 4.10: Pragmatist Preferences Based on Respondents Norms



Again, as can be seen in figure 4.10, the moderate preference has the largest number of responses based on these norms for Pragmatist style and is higher than the low preference gained from Honey and Mumford's' norms.

It can be seen that by applying descriptive statistics to the norms of the group there are changes in the strength of preference for the sample when compared to the results based on the general norms of Honey and Mumford. When compared with the general norms, the respondents' norms show that Activist and Theorist Styles are similar to Honey and Mumford, with moderate preferences, but that Reflector style is weaker, with moderate instead of strong preferences. The Pragmatist style is stronger with moderate instead of low preference. This gives a moderate preference for all the styles based on the norms, which are also similar to the results of the mean scores obtained.

Table 4.5: Strength Of Preferences By Respondents Norms

	Activist	Reflector	Theorist	Pragmatist
V low preference	41	32	40	44
Low preference	58	89	66	62
Mod preference	*169	*171	*156	*190
Strong preference	120	94	*118	73
V Strong preference	45	47	53	64
Total	433	433	433	433
Chi-Square	144.725	135.487	110.014	159.436
Df	4	4	4	4
Asymp. Sig.	.001	.001	.001	.001

When a Chi-square analysis is applied all of the moderate preferences for each style showed a statistically significant score (See Table 4.5). However the Theorist style contributed a statistically significant amount for both the moderate and strong preferences. However this does not necessarily indicate the most preferred learning style overall. To calculate this, the strength of preference for each style needed to be summated. This was again completed for both sets of norms. It was achieved by giving very strong preferences in each style a score of 5, strong preferences 4, moderate preferences 3, low preferences 2 and very low preferences 1. All of the scores were converted to the preference score and then these were added together to give the total indication of the strength of preference. This can be seen in table 4.6

Table 4.6: Strength Of Preferences for Each Style Based on Both Norms.

Preferences	N	Sum
Activist (H&M)	433	1530.00
Activist (Respondents)	433	1369.00
Reflector (H&M)	433	1484.00
Reflector (Respondents	433	1334.00
Theorist (H&M)	433	1087.00
Theorist (Respondents)	433	1377.00
Pragmatist (H&M)	433	1031.00
Pragmatist (Respondents)	433	1350.00

As can be seen in the table 4.6 above, when the scores of the strength of preference for each style are summated, an overall figure is given for the total strength of preference for that style. Based on Honey and Mumford's' norms the results indicate that overall preference is in the order of Activist, Reflector, Theorist and Pragmatist. Interesting changes occur when the results are analysed with the respondents' norms. In this case the highest scoring preferred style is Theorist, followed by Activist and Pragmatist, Reflector is surprisingly last.

Finally, the responses were submitted to Kendall's Tau-B Correlation co-efficient, which tests the level of association between the ranks of the scores. According to Cohen and Manion (1994) the purpose is to determine the degree of agreement for two sets of data ordinal in nature. These can be seen in the table 4.7 below, showing that there were significant levels of agreement. Therefore the respondents' norms could be accepted as a basis for the study and reliable for presenting the results and as the basis for discussion. So the Theorist style is accepted as being the preferred style with this group of students.

As there appeared to be a significant level of agreement between these two sets of norms it was decided that further analysis would be based on the norms ascertained from the respondents' data only.

Table 4.7: Level Of Association Between Norms

			Resp Activist Pref	Resp Reflector Pref	Resp Theorist Pref	Resp Pragmatist Pref
Kendall's tau_b	H&M Activist Pref	Correlation Coefficient	.861			
		Sig. (2-tailed)	.001			
	H&M Reflector Pref	Correlation Coefficient		.856		
		Sig. (2-tailed)		.001		
	H&M Theorist Pref	Correlation Coefficient			.891	
		Sig. (2-tailed)			.001	
	H&M Pragmatist Pref	Correlation Coefficient				.884
		Sig. (2-tailed)				.001
		N				433
		N	433	433	433	433

Correlation is significant at the .001 level (2-tailed).

The preferences were then cross-tabulated to investigate differences between gender, age and learning style preferences. Firstly the data for females and males were separated and then the strength of preferences for each style from both sets of norms was calculated and summated. This can be seen in the tables below:

Table 4.8: Females Preferences

	Activist Pref (Resp)	Reflector Pref Resp)	Theorist Pref (Resp)	Pragmatist Pref (Resp)
N	364	364	364	364
Sum	1131.00	1143.00	1158.00	1115.00

As can be seen from the table 4.8 above, the females' preferred learning style is Reflector, based on Honey and Mumford's norms, and Theorist, based on the respondents' norms.

Table 4.9: Males Preferences

	Activist Pref (Resp)	Reflector Pref (Resp)	Theorist Pref (Resp)	Pragmatist Pref (Resp)
N	69	69	69	69
Sum	238.00	191.00	219.00	235.00

It can be seen from the above table that the most preferred learning style is Activist for males. This was true from both sets of norms. This was also found to be a significant finding in previous Master's level research conducted by the author. The closest possible suggestion for this is that the 'here and now' nature of the Activist fits in with the here and now, 'aggressive nature' of males. Maccoby and Jacklin (1974) Cited in Gross (1993, p679) found that in most cultures, males (especially younger males) show more aggressive behaviours than females. Obviously the balance of the number of females and males in this study might account for the wider finding of Theorist being the most preferred style.

The next stage was to separate the age groups so that the preferences of each group could be ascertained, as with the gender. For each group the strength of preferences were summated to give an overall score for strength of preference. The results can be seen in table 4.10 below.

Table 4.10: Learning Style Preferences By Age Group

	N	Activist	Reflector	Theorist	Pragmatist
18-22	168	544	511	519	517
23-28	116	386	338	356	368
29-33	44	135	136	144	134
34-40	75	218	248	250	237
41-45	19	50	67	70	56
46-50	9	29	26	31	34
51-55	2	7	8	7	4
Total	433	1369	1334	1377	1350

As can be seen in this table the Activist style seems to be preferred by the younger groups. Students between the ages of 29-45 preferred Theorist learning style. The 46-50 year olds preferred Pragmatist. Finally, there were only two respondents in the 51-55 age set, with the Reflector learning style being preferred.

Correlations were also made of learning style preference by age. For this the ages were left in their original form between the range of 18-55 as well as being placed in groups. Spearman's correlation coefficient test was used for this, as this test applies to

ranked data that is not interval based, as preferences can be considered ordinal in nature (Hinton, 1995). This can be seen in table 4.11 below.

Table 4.11: Correlations of Learning Style Preferences and Age

Correlations of Learning Style Preference and Age				
	Activist	**Reflector**	**Theorist**	**Pragmatist**
Age	-.116*	.086	.115*	.025
	.016	.074	.017	.601
Age	-.116*	.091	.112*	.023
Group	.016	.060	.020	.632

**Correlation is significant at the .01 level (2-tailed).
*Correlation is significant at the .05 level (2-tailed).

As can be seen in the above table, there is a significant negative correlation between the Activist preference and age. This was found to be similar in both sets of norms This suggests that the older a person is the less likely they are to be an Activist and vice versa. This fits neatly with the next significant result that the Theorist preference is positively correlated with age. That is the older a person gets the more likely he or she is to have a preference for the Theorist learning style. Given that this style suggests a problem solving approach to learning, drawing conclusions and planning, this makes sense in taking into account a person's experiences and how they can draw upon them.

Each of the scores on the LSQ for Activist, Reflector, Theorist and Pragmatist were added together to give a total 'all round score', with a higher score towards 80. This suggested that the person who had scored highly in each style was more comfortable with differing modes of learning and vice versa with a score nearer 0 (Honey and Mumford, 1992). These results can be seen in table 4.12 below.

Table 4.12: All Rounder Style Scores

Total sum of Style scores

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
TOTAL	433	16.00	70.00	19711.00	45.5219	8.1046

This table shows that the lowest all round score was 16 and the highest 70, with a mean score of 45.5. The table 4.13 below shows the same results by the gender of the respondents. Although the minimum and maximum scores of the males are slightly higher than the females, the mean scores are very similar and there are no statistically significant differences between them.

Table 4.13: All Round Scores by Gender

	N	Minimum	Maximum	Mean	Std. Dev
Males	69	27.00	70.00	45.8841	9.2538
Females	364	16.00	68.00	45.4533	7.8803

Table 4.14 shows the all round results by age. There are no real differences in the mean scores although the last two groups, 45-50 and 51-55, have higher mean scores and a higher minimum score than the other groups. Perhaps this suggests that people develop a range of learning styles as they become older. When correlated there were no significant findings related to all round scores and age.

Table 4.14: All Round Scores by Age

	N	Minimum	Maximum	Mean	Std. Dev
18-22	168	25	63	45.3274	7.6952
23-28	116	16	64	45.2241	8.1348
29-33	44	27	70	45.2727	7.8485
34-40	75	25	60	46.2667	8.3283
41-45	19	21	68	45.6842	12.1749
46-50	9	36	54	47.3333	5.7009
51-55	2	41	53	47.0000	8.4853

Honey and Mumford (1992) suggest that there are preferred pairings of styles in the following order; Reflector/Theorist, Theorist/Pragmatist, Reflector/Pragmatist and finally Activist/Pragmatist. Correlations were again used to determine the favoured pairings for these respondents. These can be seen in table 4.15 below. The favoured pairings of learning style preference are: Reflector/Theorist, Theorist/Pragmatist, Activist/Pragmatist, Reflector/ Pragmatist. There are stronger negative correlations for Activist/Theorist and Activist/Reflector respectively.

Table 4.15: Favoured Pairings Correlations

	Activist Resp	Reflector Resp	Theorist Resp	Pragmatist Resp
Activist Resp		-.373** .000	-.198** .000	.214** .000
Reflector Resp			.439** .000	.020 .678
Theorist Resp				.427** .000

4.5 Presentation of Modality (Internal Representation) Findings

It is now necessary to discuss the findings related to the internal representational systems or preferred modalities of the respondents. Table 4.16 below shows the scores from both the 'Identify Your Preferred Thinking Pattern' (IPTP) (Knight, 1995), and the 'Primary Perceptual Modality Inventory' (PPMI) (McVoy and Markowski, 1998).

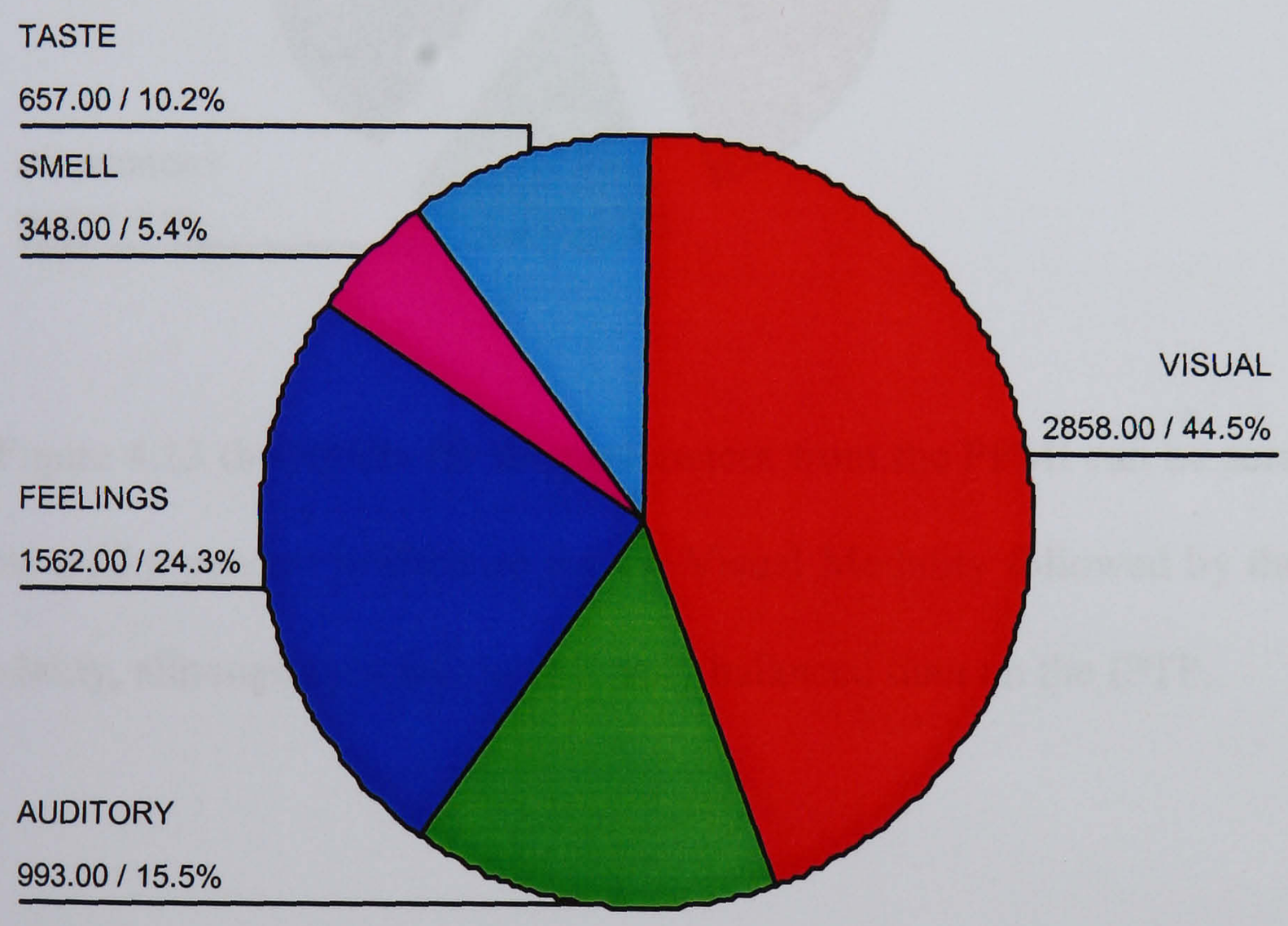
Table 4.16: Modality Preferences

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Visual IPTP	433	.00	12.00	*2858.00	6.6005	2.8536
Auditory IPTP	433	.00	10.00	993.00	2.2933	1.9777
Feelings IPTP	433	.00	11.00	1562.00	3.6074	2.4005
Smell IPTP	433	.00	4.00	348.00	.8037	.8198
Taste IPTP	433	.00	9.00	657.00	1.5173	1.3995
Kinaesthetic Total IPTP	433	.00	18.00	2567.00	5.9284	3.2535
Visual PPMI	433	46.00	100.00	*34777.00	80.3164	10.9371
Auditory PPMI	433	17.00	100.00	31119.00	71.8684	14.5748
Kinaesthetic PPMI	433	31.00	100.00	31861.00	73.5820	14.4441
Valid N (listwise)	433					

* Indicates Highest Scoring Preferred Modality on Each Scale.

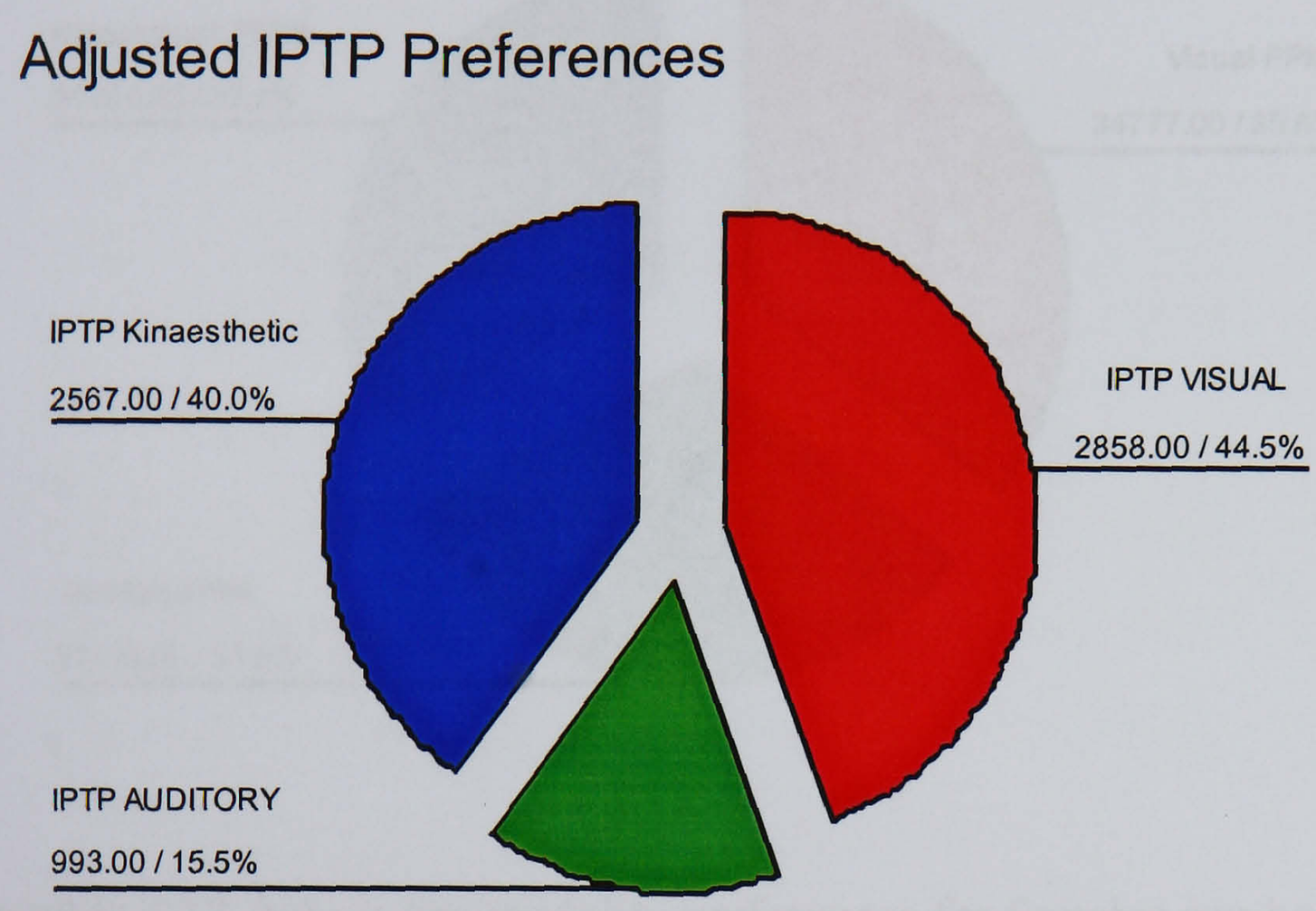
As can be seen from both questionnaires the results show that Visual is the favourite modality followed by Kinaesthetic and Auditory, when the IPTP scores for Smell and Taste are added to Feelings giving an overall Feelings/Kinaesthetic score. This means that there are three main categories for each questionnaire in terms of results for ease of analysis. However, Smell and Taste are not dismissed and shall be discussed at a later point in terms of relationships with particular learning styles. The figures below show the division of the modality preferences from the different questionnaires.

Figure 4.11: Results From The IPTP



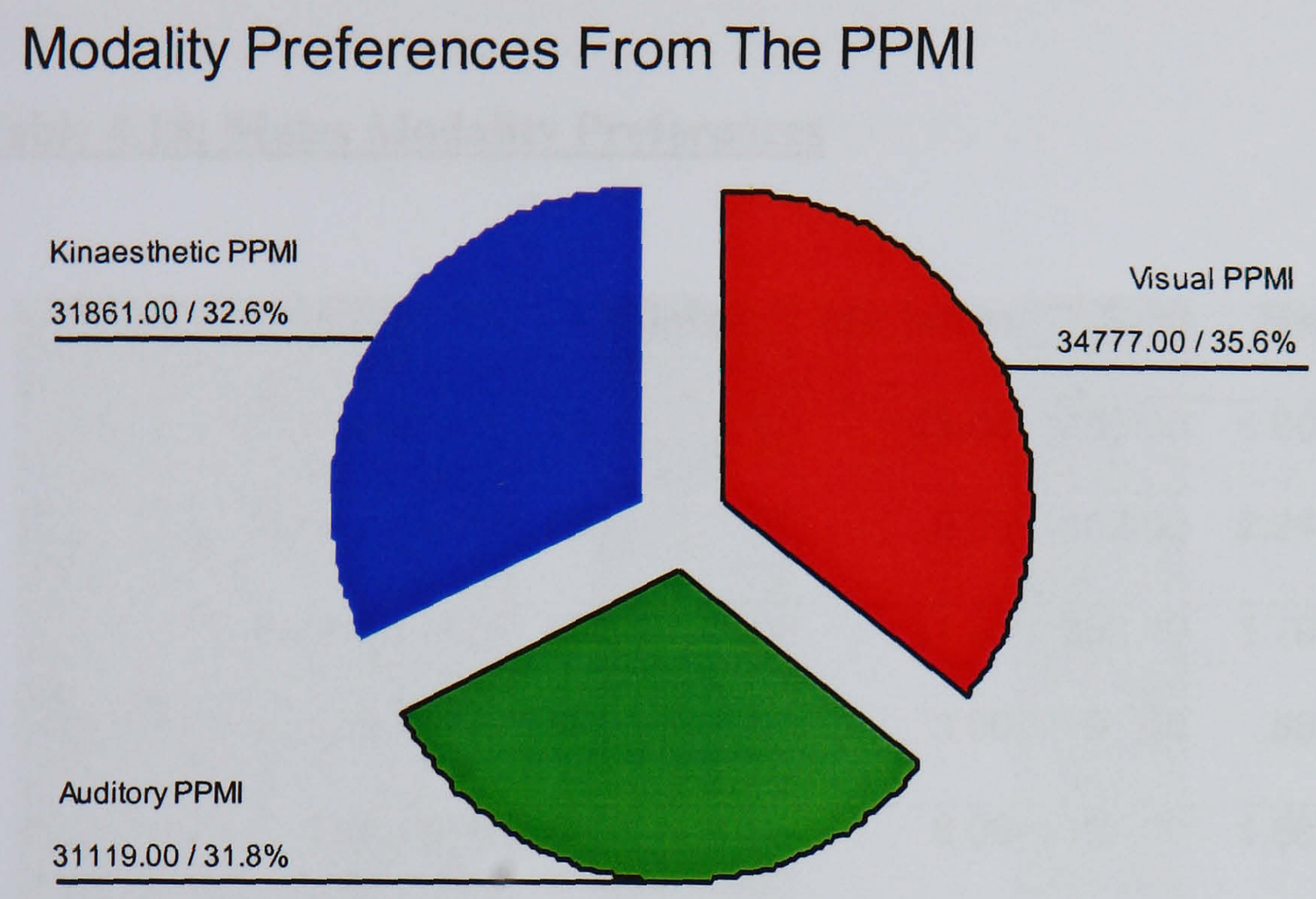
As can be clearly seen in figure 4.11 the Visual preference accounts for 44.5% of the preferred modality. Figure 4.12 below shows the adjusted preference with Smell and Taste included within the Kinaesthetic/ Feelings category.

Figure 4.12: Adjusted Results For The IPTP



In Figure 4.13 the results for the preferences from the PPMI can be seen. Again these show a 35.6 percent preference for the Visual Modality followed by the Kinaesthetic Modality, although they are more evenly balanced than on the IPTP.

Figure 4.13: Preferences From The PPMI



In table 4.17, below, the modality preferences for females can be seen:

Table 4.17: Females Modality Preferences

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Visual IPTP	364	.00	12.00	*2402.00	6.5989	2.8495
Auditory IPTP	364	.00	10.00	831.00	2.2830	1.9722
Feelings IPTP	364	.00	11.00	1300.00	3.5714	2.3863
Smell IPTP	364	.00	4.00	287.00	.7885	.8143
Taste IPTP	364	.00	9.00	553.00	1.5192	1.3855
Kinaesthetic IPTP	364	.00	18.00	2140.00	5.8791	3.2050
Visual PPMI	364	46.00	100.00	*29307.00	80.5137	10.9173
Auditory PPMI	364	17.00	100.00	26113.00	71.7390	14.6636
Kinaesthetic PPMI	364	31.00	100.00	26798.00	73.6209	14.7280

The Visual modality is the highest scoring by both the IPTP and the PPMI for females. The Kinaesthetic modality is the next preferred internal representational

system, with the Auditory modality being the least scoring preference. Table 4.18 shows males modality preferences. The pattern is exactly the same as for females.

Table 4.18: Males Modality Preferences

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Visual IPTP	69	1.00	12.00	*456.00	6.6087	2.8963
Auditory IPTP	69	.00	9.00	162.00	2.3478	2.0207
Feelings IPTP	69	.00	11.00	262.00	3.7971	2.4828
Smell IPTP	69	.00	3.00	61.00	.8841	.8495
Taste IPTP	69	.00	6.00	104.00	1.5072	1.4815
Kinaesthetic TOTAL IPTP	69	.00	18.00	427.00	6.1884	3.5116
Visual PPMI	69	53.00	100.00	*5470.00	79.2754	11.0625
Auditory PPMI	69	42.00	100.00	5006.00	72.5507	14.1822
Kinaesthetic PPMI	69	44.00	100.00	5063.00	73.3768	12.9400

The patterns for the different age groups follow exactly the same pattern except for the following: 41-45 year olds have a higher score in the Kinaesthetic total (including Smell and Taste) from the IPTP followed by the Visual modality. In the PPMI, although the Visual modality is the highest scoring preferred representational system, the Auditory modality scores higher than the Kinaesthetic. In 46-50 year olds the same pattern is repeated in the IPTP of a Kinaesthetic total followed by Visual and Auditory. The Kinaesthetic modality is preferred on the PPMI, followed by Visual and Auditory. Correlations were again made to find if there were any relationships between age and modality preference. The only significant finding was that there is a positive correlation: R=. 096, significance=0.45 of age group with the Kinaesthetic modality on the PPMI.

The next findings were related to the actual relationship between the preferred learning style and the preferred internal modality of the respondents. Only findings that are significant to the P>0.05 levels will be discussed.

Tabulations of the correlations can be seen in Appendix Seven. Table 4.20 shows correlations using Spearman's Rho based on the respondents' norms. There are significant positive correlations between Activist style and Smell (IPTP) and Theorist style with Visual (IPTP) and Kinaesthetic (PPMI). There is a negative correlation with Activist style and Visualisation. This is interesting because the Activist style negatively correlates with both age and the preference for the Visual modality. This suggests that those with an Activist preference are more likely to be younger, and that as the Activist style correlates negatively with the Visual modality, they are less likely to 'look before they leap'. The Theorist style has the opposite effect. It both correlates with age and with the Visual modality positively. This suggests a more considered approach in scrutinising the situation perhaps based on experience, which could be deemed to come with age.

Tables 4.21-4.38 in Appendix Seven, shows the correlations for females and males and the different age groups based on both sets of norms. However as there were lesser numbers in the final age groupings the statistics here may have little relevance due to too few cases. There are no statistically significant correlations in the female data.

There are however significant correlations in the data from the males only (See tables 4.23 and 4.24). Based on the norms from the respondents there are again positive correlations in the Theorist style/Visualisation relationship (IPTP), the Theorist style/ Kinaesthetic relationship (PPMI) and the Pragmatist style/ Kinaesthetic relationship (PPMI).

In the 18-22 ages group there is a positive correlation in the relationship between The Theorist style/Kinaesthetic modality preference (PPMI). In the 23-28 ages group, there are positive correlations in Reflector/ Visual (IPTP), Theorist/Visual (IPTP) Reflector/ Taste (IPTP), and Theorist/Taste (IPTP). There is a relationship of Theorist/Visual (PPMI) for the 29-33 ages group. There are positive correlations in the Activist/Auditory (IPTP) and Theorist/ Feelings (IPTP) relationships for the 34-40 ages group. For the 41-45 ages group the only positive relationship is the Activist / Kinaesthetic (PPMI). There are no significant results in relation to the remaining age groups, 46-50 and 51-55.

4.6 Summary

The data has shown through analysis that there are a significant amount of females within the sample group, however this is to be expected in nursing and is similar to the population of nurses within this institution and within nursing itself. The majority of students were aged between 18 and 28 although the oldest was 55 years of age.

Based on the norms calculated from the data of the respondents the preferred learning style from Honey and Mumford's (1986) LSQ was Theorist, followed by Activist,

Pragmatist and finally Reflector. Males showed a Preference for the Activist learning style and females a preference for the Theorist learning style.

The Preferred Modalities on both the IPTP and The PPMI was Visual, followed by Kinaesthetic and then Auditory.

When correlations were applied to investigate relationships it was found that the Theorist style positively correlated with age and that the Activist Style negatively correlated with age. However it was noted that those in the largest age group of 18-28 year olds preferred the Activist style. Those between 29-45 preferred the Theorist style. The strength of the Theorist style is evident throughout, however, as this is the most preferred style overall, even thought the majority of the younger students do show a preference for the Activist style.

Finally there are significant positive correlations between Activist style and Smell (IPTP) and Theorist style with Visual (IPTP) and also Kinaesthetic (PPMI) Modalities. There is a negative correlation with Activist style and Visualisation.

These findings will be discussed further in Chapter Six. It is now necessary to discuss the findings from the qualitative data collected by the interview method.

Chapter Five

Qualitative Findings

5.1 Introduction

In this chapter the findings obtained through the qualitative data collected from the videotaped interviews will be described in more detail. There will be explanation of the findings in relation to the notion of internal representation systems and learning. These interviews were conducted so that they could be utilised for analysis in terms of observations and interpretation of the respondents' body language (body position) aspects and also the investigation of the verbal language (predicates) used by them. These data were extrapolated from the transcripts of the interviews. This data could be deemed to be about the respondents' lived experience, (descriptions of how they experience learning in this case) and how they demonstrate their experience the world through language (Dowling, 2004). Whitehead (2004) argues the researcher's ability to describe and interpret their experience is an integral part of the research process. This was so in this study as the researcher was immersed in the whole research process undertook the data collection, management and analysis throughout the whole approach. There will also be included brief discussion of two particular cases to provide an overview of the process.

5.2 Main Findings From The Interview Data

The main findings to report in relation to the qualitative aspect of this research, investigating internal representational systems suggested within the field of NLP in terms of verbal language (predicates) and non-verbal language (body positions) are as follows: In terms of verbal language, the use of predicates related to ***Visual*** internal

representational systems were used to a greater extent by the participants in describing aspects of learning. This was followed by ***Kinaesthetic*** and finally ***Auditory*** modality preferences. The same order of preferred modality was also found to be the case in investigating the non-verbal (body position) aspects: ***Visual***, followed by ***Kinaesthetic*** and ***Auditory.***

It was initially intended that all of the videos (twenty four), would be cross-referenced with the questionnaires completed by the students. However, when it came to analysis, due to some of the questionnaires not being able to be identified with the relevant participant (either they had not completed it correctly or had not recorded the questionnaire number correctly), only a number of eighteen could actually be cross-referenced. It was decided therefore to complete the body position analysis on these eighteen only as there would still be plenty of data available for analysis (approximately four and a quarter hours worth of observations). All twenty-four transcripts were analysed for verbal language. The cross referencing can be seen in table 5.1 below:

Table 5.1: Students' Preferred Modalities

Students' Preferred Mode from all Methods					
Participant	Preferred Learning Style	IPTP	PPMI	Predicates	Body Positions
1	Activist	V/K	V	K	V
2	Activist	V	V/K	V	V
3	Activist	V/K	V/K	K	K
4	Activist/Reflector	V/K	V	V	V
5	Activist	V/K	V	V	V
9	Theorist	V	V	V	K
10	Activist	K	K	V	V
11	Activist	K	V/K	K	V
12	Activist	V	V	V	K
13	Activist	V	V	V	V
14	Reflector	V	V	V	V
15	Reflector	V	V	V	V
16	Activist	V/K	V	V	V
18	Reflector	V/K	V	V	V
19	Activist/Reflector	V	V	V	K
20	Reflector/Theorist	V	V	V	V
22	Reflector/Theorist/Pragmatist	V	V	K	K
24	Activist	V	V	V	V

V=Visual, K=Kinaesthetic

The table above may demonstrate some form of triangulation of the main themes. According to Wendler (2001) analysing qualitative and quantitative data into a coherent whole remains a challenge to the researcher. She advocates the use of a meta-matrix to manage the data. This is a secondary level of analysis where data is inputted into the matrix and therefore isolates patterns and processes. As can be seen above, albeit this being a simple form of meta-matrix, both the quantitative and the qualitative data indicate that the preferred modality is mainly consistent throughout all of the participants, with the Visual modality being preferred more than the Kinaesthetic on the whole. There are some cases, however, (10, 22) where the qualitative findings are a different modality entirely to the quantitative data. It is interesting to note that in all but two of the cases identified as purely having an Activist learning style preference (13,24) there is some preference for the Kinaesthetic modality from at least one of the tools used.

The Activist learning style actually negatively correlated with the Visual modality in the previously discussed quantitative findings. In those that showed a Reflector learning style preference the Visual modality was similarly evident. The above serves as an introductory glance at the findings as a whole but it is necessary to scrutinise the qualitative data in more detail.

5.3 Management Of The Data

In order to understand the nature of the qualitative findings it is first necessary to explain the nature of how the data was managed following collection and then analysed. According to Froggatt (2001) the specific focus of data analysis is data transformation. This includes the management of the data and then the interpretation and meaning developed from it. Whatever form the data takes there needs to be interaction between the researcher and the data. Burns and Grove (1993) stress the importance of the researcher 'dwelling' with the data and becoming familiar with it. This may include reading and re-reading notes, transcripts and documents over and over, reviewing and listening to audio and video recordings, to develop a sense of the phenomenon being explored and the subjects' responses to this. This will later aid in facilitating examination, as the researcher will already have gained ideas of what is relevant and irrelevant, and themes may have already begun to emerge. In this particular study the author personally conducted all of the video interviews, and in doing so started from the first interview in gaining insights into how to refine the questioning, having developed ideas of what was relevant or irrelevant, as the interviews progressed. Once the videos had been recorded by means of a mini DV digital video recorder, all of the videos were transferred onto VHS format, giving the author the first opportunity to observe the completed videos before analysis proper. Kleiman (2004) argues that,

> 'The person who does the interview gets the richest appreciation of the descriptions rendered in the interviews and thus should also do the analysis.' Kleiman, (2004,p14).

Therefore as the author and researcher this process of 'dwelling' with the data and gaining a rich appreciation had begun. Once this process was completed, the author began the process of transcribing the interviews. Having completed six transcriptions assistance was sought and gained, and an assistant, to whom the process was explained, transcribed the rest of the interviews and used the already completed transcripts used as exemplars, to ensure consistency. Once these were completed these were checked for accuracy and terminology by the author to ensure the content was appropriately recorded in written form. By reading and checking the transcripts, and using them as a basis for analysing the body position aspects on the videotaped interviews, the author was further able to maintain consistency and gain an overview of the material. McCann and Clark (2003a) state that this process of checking and reading helps to identify and rectify any errors in transcription, which could easily occur if the transcriber is not used to the language being used by the researcher or the interviewees in the interviews. This notion is supported by Duffy et al (2004) who also suggest that although a transcriber that is not involved in the research process, and does not understand the terminology, may need close scrutiny, reviewing and checking their work is less time consuming for the researcher than having to transcribe the interviews themselves. The main benefit however is in the researcher becoming increasingly familiar with the data.

In all, although an original notional figure of thirty-six interviews had been intended, and arranged with this number of potential participants, only a total of twenty-four respondents actually participated. This was a frustrating experience for the author on many occasions, as a great effort had been put into organising and arranging interviews.

This was a very time consuming process and disappointing when the respondents did not turn up as arranged. Woods and Roberts (2003) state that without planned, diplomatic arrangements, access to research sites can be denied having a catastrophic affect on research projects. In this case as the author was on leave of absence from the area during the video data collection period, contact with participants was difficult and had to be facilitated by colleagues, with messages being passed on by letter or notice, therefore affecting the smooth running and arrangement of interviews. The lesson from this is that the researcher does perhaps need to personally control the access to the participants once in contact, as using a gatekeeper or third party can effect communication, and perhaps the arrangements. Another argument is, however, that the participants were simply exercising the choice available to them, which is acceptable and accounts for the fact of interviewer bias. The volunteers that attended did so because they wished to and not because they were coerced. In conclusion the author was satisfied with a total of twenty-four interviews (approximately 5.5 percent of the whole sample) and was provided with useful amounts of data to meet the aims of the research.

5.3.1 Analysing the Data Related to Predicates

Firstly the transcripts were word processed and printed. The letter 'R' was included to indicate the words spoken by the researcher and 'P' for those of the participant with a number allocated to each document in order. Following this they were formatted both into Microsoft 'Word' format and text format. Within each transcript a space was left between each question and its subsequent answer to indicate a single interaction. The transcripts were also formatted into text only with line breaks for use with the analysis software. An example from a transcript is given below:

> ***R: What I want you to do now is to tell me how you would describe yourself as a learner?***

P: A doer.

R: A doer – what's that then?
P: Erm.....

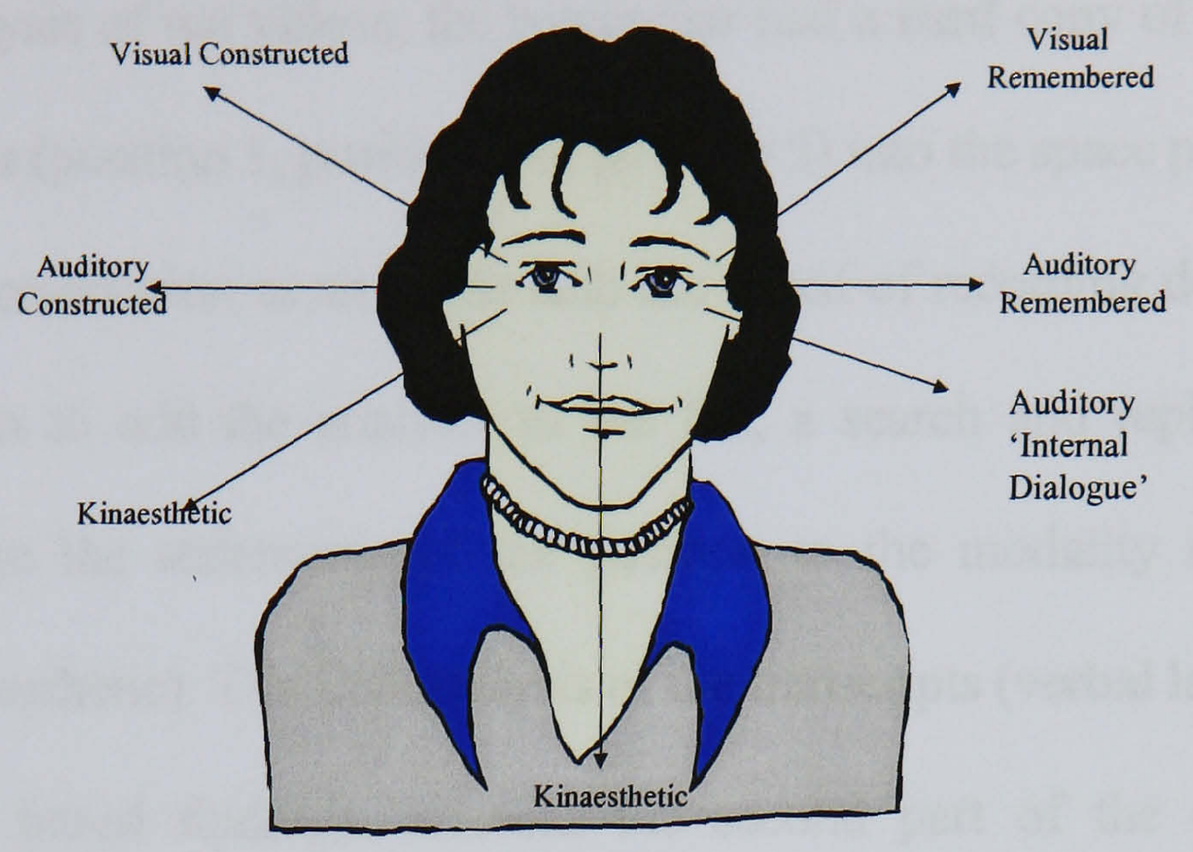
R: How would you describe that then?
P: I'm, I'm fairly practical. I like to see, I like to see that if someone wants something done then I like to see it done, then I know that necessarily do it that way I cannot do it that way that I can find my own way of doing it.

5.3.2 Analysing The Data Related To Body Positions

The transcripts were also further adapted with a space so that they could be used again in order to analyse the body language positions from the videos. i.e. the transcript would have the question, subsequent answer then a space for analysis /interpretation of the body language (position) aspect. A number of prototype formats had been used to analyse the body positions from the videos, however as it was soon obvious that this was to be a mammoth and impracticable task, and had to be reconsidered. Eventually the transcript itself, with the space between each subsequent question and answer was used, together with a selection of photographs based on Dilts et al (1980), (see Appendix Six) which identified typical postures related to Visual, Auditory and Kinaesthetic internal representations. In doing so the response could be classified in to one or more of the modalities by the researcher.

Many of the decisions of the body position representation also followed the eye movements of the participants, as sometimes actual body movements were hard to discern, whereas the eye movements were more obvious and vice versa. Eye movements were noticed in relation to the eye accessing cues used in NLP that can be seen in Figure 5.1 below:

Figure 5.1: Eye Accessing Cues



O'Connor and Seymour (1990).

Also as the researcher is trained in NLP and regularly works with clients, experience was also used in order to be aware of the subtle body position changes occurring. This could be considered as being similar to the notion of theoretical sensitivity. McCann and Clark (2003) describe theoretical sensitivity as entering the field with an awareness of the subtleties of the data. It relates to having insight, and understanding and being able to give meaning to the data, detaching relevant from irrelevant. An example of a typical transcript (following body position analysis) is given below:

> ***R: Right, ok, so your preferences for learning then, do you like lectures, or do you like to go off and read for yourself, or being in a group, what do you prefer?***
> ***P: A bit of a mixture actually. I like being in a group, what it throws out, that's quite good, as you pick up different points. Lectures, I find unless the actual tutors' captivating, I find them very, not boring, but hard to take anything in from the lecture unless it's active.***

Body Position Analysis
Visual---Auditory---Visual---Kinaesthetic---Auditory---Kinaesthetic

> ***R: Yeah?***
> ***P: And I much prefer to actually go back and actually read up in my own time about it.***

Body Position Analysis Auditory---Kinaesthetic

In the initial analysis of the videos, the researcher had a hard copy of the transcript and added the analysis (position 1, position 2 or position 3) into the space provided, using the photographic representation as an aid to help the speed of recording during observation. In re-transcription to add the analysis to the file, a search and replace function was utilised to change the statements of the position to the modality reference (Visual, Auditory or Kinaesthetic). The first analysis of the transcripts (verbal language) provided richer, language based findings, whereas the second part of the analysis basically provided a brief report of the body language positions and therefore supposed internal representations of the participants related to Visual, Auditory and Kinaesthetic modalities only. Therefore two types of data, pure transcripts and transcripts with recorded observation were utilised in data analysis.

5.4 Qualitative Data Analysis and Findings

The completed transcripts were transferred into QSR 'NUD*IST4', a qualitative analysis software. This stands for 'Non-numerical Unstructured Data Indexing Searching and Theorising' and is a computer package designed to aid users in handling such data in qualitative analysis by supporting processes of coding data in an index system, searching text, or patterns of codes to be able to develop theories from the data (QSR, NUD*IST4 user guide, 1997). Rouse and Dick (1994) argue that computerised software packages are useful as the purpose of qualitative research is to manage large amounts of data (from transcripts) into text segments, which are then de-contextualised and re-contextualised in different categories once appropriate codes have been applied and then developed into new narratives. Computer software helps by reducing the timeframe of

effort and management of data needed. They concluded from using it that NUD*IST not only accelerated the research process but also enabled greater understanding of the data. Once the data had been inputted to NUD*IST, the author also found similar benefits.

NUD*IST is a useful tool in that it enables the researcher to begin coding text in either a free and open fashion or by utilising pre-decided codes or categories. In this case the codes were attached to each of the units of interactions in the text (researcher question and participant answer). According to Basit (2003),

> 'Codes or categories are tags or labels for allocating units of meaning to the descriptive or inferential information compiled during a study. Codes are usually attached to chunks of varying sized words, phrases, sentences or whole paragraphs, connected or unconnected to a specific setting.'
> Basit, (2003, p144)

The exploration of the coding/ categorisation can be completed in NUD*IST via documents or by the indexing system itself. Priest et al (2002) state that within NUD*IST concepts can be explored and indexed and the software helps to facilitate the development of visual 'trees', which contain master codes or core nodes and subsequent sub-categories or branch nodes. The coding can then be manipulated and re-organised as appropriate. All files, memos and reports of the material can be managed within the software. However as beneficial as the electronic software is in managing the data, the author found that the comments of Basit (2003) were pertinent, in that computer software packages assist in the tagging and retrieval of data, therefore making the researcher's task simpler, yet coding is still an intellectual exercise to be completed by the researcher. The packages do not do the analysis for the researcher. Bowling (2002) argues that there is no match for the trained human brain in coding words and phrases and concept matching, however recognizes that computerised categorisation and analysis are becoming increasingly popular and help to make the process more systematic and

rigorous. Although a pure grounded theory approach was not utilised, aspects of coding and categorising for content analysis purposes was undertaken. Content analysis is one approach to the analysis of qualitative data, which is usually managed by the trawling of the data. Through this process themes may occur that are common. These can then be grouped together and re-investigated until there is a distinct development of categories. However a criticism highlighted by MacKenzie (1994) that although modern qualitative data analysis does take the researcher further away from the simple numbering of data and quantifying of words and towards the interpretation of data, there may still be some trappings of positivistic approaches by the grouping together of words by their frequency. The author found, however, that the frequency count of the modality references were useful as they identified the amount of the type of internal representations used by the participants in considering their learning, as well as giving examples of how this is demonstrated through language and behaviour

Firstly the documents were observed in order. All twenty-four of the transcripts were included for analysis of the predicates, beginning with the transcript of the first interview and a series of open codes were allocated to this. According to McCann and Clark (2003a) the intent of this type of coding is to conceptualise the data by analysing it and identifying patterns in the data. The sections on consent and calibration were coded in all documents in the first instance then further coding took place from the point of the first semi-structured question related to learning. By the time the third or fourth document was being analysed, further distinctions in the language predicates of the participants were becoming obvious. As the twelfth document was analysed the main codes (particularly in the Visual modality) appeared to be saturated. Therefore all the documents were revisited and recoded with more distinctive codes, which were now

identified within the index tree developed within the software. If fine distinctions could not be made then the main modality description was used (i.e. Visual, Auditory or Kinaesthetic). An overview of the codes used for each modality can be seen in Table 5.2 below.

Table 5.2: Codes Applied to The Data

Codes Developed for Each Modality		
Visual	**Auditory**	**Kinaesthetic**
Visual (Main node)	Auditory (Main node)	Kinaesthetic (Main node)
Visual 3D (Panoramic)	Auditory Internal Dialogue)	Kinaesthetic Internal
Visual Located	Auditory External	Kinaesthetic Temperature
Visual External	Auditory Tonal	Kinaesthetic Illness
Visual Internal	Auditory Loud	Kinaesthetic Movement
Visual Colour	Auditory quiet	Kinaesthetic Emotive
Visual B&W	Sounds	Kinaesthetic Located
Visual Still	Auditory located	Kinaesthetic Comfort
Visual Moving	No Auditory	Kinaesthetic Weight
Visual Borders		Kinaesthetic Pressure
Visual Borderless		Kinaesthetic External
Visual Associated		No Kinaesthetic
Visual Disassociated		
Visual Clear		
Visual Unclear		
Visual Separated (Multiple)		
Visual Sequence		
Visual Size		
Visual Brightness		
No Visual		

As mentioned earlier there is some debate about the value of using frequency (numerical data) obtained from qualitative research. However Gorard (2002) argues that,

> 'Most methods of analysis use some form of number, such as 'tend, most, some, all, none, few' and so on. This is what the patterns in qualitative analysis are based on (even where a claim is made that the case is 'unique' since uniqueness is, of course a numeric description). Words can be counted, and numbers can be descriptive. Patterns are, by definition, numbers, and the things that are numbered are qualities.'
> Gorard, (2002, p346-7).

Each of the codes and sub-codes were added together to give an overall figure for the appropriate modality. Therefore the numeric descriptions of the findings (in relation to the amount of text units coded for the predicates, and the actual amount of observations of body positions) can be seen as follows in table 5.3:

Table 5.3: Code Totals For Each Modality

Modality	Visual	Kinaesthetic	Auditory
Predicates	4186	3287	904
Body Positions	1604	1193	708
Totals	5790	4480	1612

It can be argued, therefore, that from these figures the Visual modality appears to be the internal representational system mostly utilised and demonstrated in both predicate and body position behaviours. A further interesting point is that when these figures were compared a significant positive correlation was found between the two sets of figures (Predicates and Body Position observations) suggesting that the non-verbal language is highly associated or congruent with the verbal language in outwardly indicating the internal representational modality being used.

Table 5.4: Correlations of Predicates and Body Position Analysis

Correlations of Predicates and Body Positions			Predicates	Body Positions
Spearman's rho	**Predicates**	Correlation Coefficient		1.000**
		Sig. (2-tailed)		.
		N		3
	Body Positions	Correlation Coefficient	1.000**	
		Sig. (2-tailed)	.	
		N	3	

** Correlation is significant at the .01 level (2-tailed).

It is interesting to note that these findings are different to those of Cross (1995) who video interviewed 100 students from a 'business/management course. Cross concluded that students did have a preference for one particular representational system but only within one communication channel (eye movements or predicates). However the differences could be explained as Cross utilised a questionnaire to investigate predicates and the video interview to observe the eye movements and verbal predicates. Cross (1995) also then explained the research to the students and asked them to re-access their internal representations only to find that these were different again, which he claims could be due to the 'Hawthorne' effect. In this study all modes of data collection have yielded a consistent pattern of external body positions, and predicates being similar. This could suggest a notion of congruence in the behavioural expression of internal representations. However in analysing the videos there are examples in places through out where the predicates and the body positions do mis-match. This could be because the participants are accessing the preferred representation via one modality, or representing in one modality and checking in another, basically accessing the 4tuple and strategy of the experience (Grinder, De Lozier and Bandler, 1977).

According to Savage (2000) a thematic analysis forms the basis of an approach where there is some fit between the outcome of the data analysis and some form of external reality. In the first instance the data provides a description, 'What is going on here?' The patterns that can be suggested from the above in terms of 'what is going on', is that according to these data, the Visual modality is preferred when accessing internal representations of learning (successful or unsuccessful) and that there is a correlation between both body position aspects and verbal language aspects to support this.

Secondly the analysis seeks meaning and context, 'What is to be made of it?' The notion of which was the preferred internal representational system used in learning provided the context and the external reality to which the data could be interpreted by. Therefore it is necessary to look at the form of some of the data and attempt to establish some meaning.

5.5 Case Studies

The case studies below provide examples of whole interviews and transcripts, with the body position analysis, in order to give an overview of the process and the resulting data. The first case is related to participant number 3. Details for this participant in relation to preferred learning style and modalities can be seen in table 5.1. As already mentioned the students were given a choice to complete both the questionnaire and attend the interview. The only requirement was that their questionnaire could be identified if they were interviewed in order to cross reference the data. Participant 3 was a third year student nurse. The preferred learning style was Activist and Visual/Kinaesthetic emerged as the preferred modality from the IPTP and the PPMI, The Kinaesthetic modality was prevalent in both the predicates and the body position analysis. Below is the entire transcript with body position analysis for this participant.

R: Ok, thanks for agreeing to do this, and you do give your consent to this?
P3: Yes.
Body Position Analysis: -
R: You're aware that it will be kept confidential and no one else will be able to access
the information and recognise it's you?
P3: Ok.
Body Position Analysis: KINAESTHETIC
R: I want you to think about if you would, the colour of your front door.
P3: Mm.
Body Position Analysis: VISUAL
R: What that looks like?

P3: Yes. (Laughs).
Body Position Analysis: KINAESTHETIC
R: That's how it makes you feel, hey?
P3: Yes. A horrible green. (Laughs).
Body Position Analysis: KINAESTHETIC
R: Ok, I want you to think about then, the colour of your previous front door.
P3: Mm Mm.
Body Position Analysis: VISUAL
R; Ok, I want you to think about what your front door would look like if it was white with yellow polka dots.
P3: Stupid. (Laughs).
Body Position Analysis: VISUAL
R: Can you see a picture of what it looks like?
P3: Aha.
Body Position Analysis: VISUAL eyes moving up & to side
R: Ok, now then, I want you to think about the sound of your best friend's voice.
P3: Aha.
Body Position Analysis: VISUAL---AUDITORY
R: Right and I want you to think about what the voice of someone in you group would
be like if they were speaking like Donald Duck.
P3: Aha. (Laughs).
Body Position Analysis: VISUAL---AUDITORY
R: That always makes a giggle. Right I'd like you to tell me now what the feeling of your coat is like to you?
P3: The feeling?
Body Position Analysis: AUDITORY
R: How you feel. Think about the feeling you have with the coat, or the trainers on your feet, what they, notice the feeling how they feel on you.
P3: Ok.
Body Position Analysis: VISUAL
R: I want you to think about what it felt like when you were wearing another jacket previous to this.
P3: Aha.
Body Position Analysis: KINAESTHETIC
R: Right, ok and I want you to think about what it would feel like if you were wearing a big, thick, woolly jumper.
P3: Right.
Body Position Analysis: KINAESTHETIC Head moving gradually downwards with nods
R: Can you do that?
P3: Yes.
Body Position Analysis: KINAESTHETIC

The above questions were used as the calibration phase. The intention was for the researcher to instigate specific modality questions and observe how the student responded to these in relation to body positions. In doing so if the student utilises

similar positions throughout, there is some indication of the modality they are accessing. This student displayed very clear body position signals for each modality, eyes up for visualising, head to one side in a telephone posture for Auditory and head down and body inwards for Kinaesthetic with plenty of gestures. The main predicates are highlighted in the text.

R: Right Ok, there's the silly questions out of the way. Now I want you to think about your approach to learning really and I want you to describe to me how you approach learning in general.
P3: I do want to learn all the time; it's difficult when you haven't used the skills{K} for a long time.
Body Position Analysis: AUDITORY---VISUAL
R: How would you say you learn best?
P3: Sometimes with a group, sometimes one to one. It depends on what it is.
Body Position Analysis: AUDITORY---KINAESTHETIC
R: Right.
P3: If it's something that I'm really interested in and the group's involved and the tutors, that's fine, you know {A}. Then it could be, I suppose it could be depending on the mood I'm feeling as well.{K}
Body Position Analysis: KINAESTHETIC Hand gestures AUDITORY

Here the participant accesses the Kinaesthetic modality easily. The body was moved forward and she used hand gestures to point inwards at her chest. It would appear that the Auditory aspect is almost a checking mechanism for the participant to check that what was said 'sounded right'. The phrase 'you know' would also be part of this as the participant could be checking that it also sounds right for the researcher.

R: So if it's in the group situation how do you learn best? What is it that you like best?
P3: Well, being around the group, the interactions with the group. Company, people.{K}
Body Position Analysis: VISUAL----KINAESTHETIC---KINAESTHETIC
R: So is it what they say or what they do that interests you?
P3: It could be either one. It could be what, you know...{A}
Body Position Analysis: KINAESTHETIC Gestures
R: What about one to one?
P3: Within the group?
Body Position Analysis: VISUAL
R: No, you said you like one to one.

P3: With a tutor? Again it depends on the tutor. If the tutor's actually explaining everything to me {A}, that's fine. And I get uncomfortable if it's a tutor that I'm (laughs) not quite following, because then I feel a bit silly.{K}
Body Position Analysis: AUDITORY---KINAESTHETIC Gestures towards self

At this point the participant is again using Kinaesthetic body positions, drawing her hands together to the chest, and laying the palm of the hand on the chest. Also the facial expression suggested discomfort at the same time.

R: What is it you're trying to follow?
P3: The understanding of say if there's something wrong with my assignment and I can talk about it{A} and find out. I feel happier going to some tutors {K} than I do to others.
Body Position Analysis: KINAESTHETIC---AUDITORY
R: Ok, so those that you're happy going to, how are they different? What's the difference?
P3: Because they're calm, and they go through the whole thing and it gives me a better understanding.{K}
Body Position Analysis: KINAESTHETIC
R: Ok, think back then to a situation where you've learned best. What comes first when you think about that? Is it a picture a sound or a feeling?
P3: A feeling.{K}
Body Position Analysis: KINAESTHETIC
R: A feeling?
P3: Yes.
Body Position Analysis: KINAESTHETIC

Here the participant uses Kinaesthetic predicates throughout, such as' I feel', 'calm' and 'going through'. These were emphasised by gestures pointing towards their body.

R: Is that what comes first?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: What kind of a feeling is it?
P3: Excited 'cos I've learned something new.{K}
Body Position Analysis: KINAESTHETIC gestures
R: Is that like, excitement, is there a physical sensation related to that?
P3: Hot. {K}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Hot?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: Are you hot all over or?
P3: No, here. (Points to stomach).
Body Position Analysis: KINAESTHETIC
R: In your stomach?

P3: Yes.
Body Position Analysis: KINAESTHETIC
R: Is there a weight with that or some pressure?
P3: A little bit, like a bit of tightness, yes. {K}
Body Position Analysis: KINAESTHETIC

Again the participant uses hand gestures to point at the chest and stomach , and clenches the fist just over the stomach area when talking about 'tightness'.

R: Is there any pictures that come with that, before or after? When you think about
that?
P3: As soon as you said that {A} I mean the actual work, I saw myself there.{V}
Body Position Analysis: KINAESTHETIC----VISUAL
R: What came first the picture or the feeling?
P3: Mm Mm? The feeling {K} I think and then the picture.{V}
Body Position Analysis: AUDITORY---KINAESTHETIC
R: Ok what happens if you intensify that feeling of warmth in your stomach?
P3: ... ... It makes me feel even stronger.{K}
Body Position Analysis: AUDITORY---KINAESTHETIC
R: Even stronger? Right.
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: So if it spreads then, does that make you feel as if you're learning more?
P3: Yes. It's boosting me, I'm feeling good about it.{K}
Body Position Analysis: KINAESTHETIC Gestures

At this point the student is moving her arms in front of her suggesting an upward movement of some object or energy and the facial expression appears more energised as she speaks about this situation.

R: And is that making any changes to the picture that you see?
P3: No, cos I'm concentrating on the feeling.{K}
Body Position Analysis: KINAESTHETIC
R: And that's doing enough?
P3: That's doing enough.{K}
Body Position Analysis: KINAESTHETIC
R: Are there any sounds or people talking, or voices?
P3: No, no, just my feelings. {K}
Body Position Analysis: KINAESTHETIC

This point seems to confirm the student's preference for the Kinaesthetic modality as she continually suggests it is all related to a feeling.

R: What about a time when you've been perhaps less successful?
P3: Erm...
Body Position Analysis: AUDITORY
R: You've not learned as successfully, something you found more difficult to learn?
P3: It was a challenge, I felt...{K}
Body Position Analysis: KINAESTHETIC
R: How would you describe a challenge?
P3: I'd been referred... ... ... I felt a bit...{K}
Body Position Analysis: KINAESTHETIC
R: Did you say that to yourself? 'I felt a bit', 'Id been referred'?
P3: I can't repeat what I said (laughs).{A}
Body Position Analysis: VISUAL---AUDITORY
R: Did the feeling come first?
P3: A sinking feeling.{K}
Body Position Analysis: KINAESTHETIC
R: A sinking feeling?
P3: 'Oh no',{A} a sinking feeling, totally down.{K}
Body Position Analysis: KINAESTHETIC
R: Did the sinking feeling come before the 'Oh no' ?
P3: Yes. The feeling was there {K} then I thought, 'no.'{A}
Body Position Analysis: AUDITORY---KINAESTHETIC

The participant gestures from the chest downwards with a clenched fist at this point and also uses both hands in a downward motion. Again the facial expressions suggest sadness at this experience. The predicates also suggest 'down'.

R: So that became your own voice talking to you?
P3: Aha.
Body Position Analysis: KINAESTHETIC
R: And not a picture?
P3: No.
Body Position Analysis: KINAESTHETIC
R: Ok. The sinking feeling, is it warmer or colder than the other feeling?
P3: Cold, just... ...{K}
Body Position Analysis: KINAESTHETIC shakes head
R: Cold?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: And heavier?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: Ok coming back to the more successful feeling, you can definitely tell the difference?
P3: Yes. Aha.
Body Position Analysis: KINAESTHETIC Nods
R: So what's that one like then?

P3: Really warm...{K}
Body Position Analysis: KINAESTHETIC hands moving upwards
R: Right, ok.
P3: Boosted.{K}
Body Position Analysis: KINAESTHETIC hands moving upwards
R: So there are things you've learned here that you're better at?
P3: Aha.
Body Position Analysis: VISUAL
R: Do you get that feeling associated either with group work or one to one? Is there a group work situation where you get that feeling? Or is there a picture with that?
P3: Erm, I get a feeling with the group, when it's nice, when we're all trying to have the same understanding. It's a nice feeling, it's a comfortable feeling, you know? {K}
Body Position Analysis: VISUAL---KINAESTHETIC gestures
R: Right, yes. Is that similar to being successful at learning?
P3: Yes. I think so yes.
Body Position Analysis: KINAESTHETIC
R: What about when the groups not so good, what's that one like?
P3: A bit low, feeling a bit low, yes.{K}
Body Position Analysis: VISUAL---KINAESTHETIC gestures
R: Ok what about when you're one to one?
P3: Erm... It depends... I mean like company, I like talking to people.{A} Sometimes if you're a little bit down somebody else can boost you and make you feel good, up and vice versa {K}you know? So it depends.
Body Position Analysis: VISUAL---AUDITORY---KINAESTHETIC---AUDITORY---KINAESTHETIC

When the participant talks about 'boosting' she uses hand movements that suggest an upward movement and circulates these movements around the chest area.

R: Right, OK. When you think about another assignment that's coming up or?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: How do you plan for that? About going about that?
P3: Erm it depends if it's a referral or not.
Body Position Analysis: AUDITORY---VISUAL
R: Let's imagine like this referral, or one that's coming up
P3: Easy, one that's coming up.{K}
Body Position Analysis: VISUAL
R: When you think about that what comes first?
P3: It's like 'oh god.'{A}
Body Position Analysis: VISUAL---AUDITORY
R: Is that a feeling then?

At this point although the indications were for other modalities the researcher checked on the Kinaesthetic as the participant's other earlier responses had suggested this

modality was preferred in both good and bad experiences. The gestures had also confirmed this by again hand movements in to the body and sad facial expression with a downward aspect.

P3: Oh god, yes.
Body Position Analysis: KINAESTHETIC
R: And then.....
P3: It doesn't make sense?
Body Position Analysis: KINAESTHETIC
R: A feeling before 'oh god' or 'oh god' and then the feeling?
P3: It's a feeling {K} and then oh god.'{A}
Body Position Analysis: KINAESTHETIC
R: What kind of feeling?
P3: Anxious, a little bit, a little bit{K}
Body Position Analysis: KINAESTHETIC
R: What if that feeling was changed to that excited feeling, that warm sort of feeling?
P3: Yes.
Body Position Analysis: AUDITORY
R: Yes, does that make a difference?
P3: Yes.
Body Position Analysis: VISUAL
R: Can you make that change to that how you think about learning?
P3: Yes.
Body Position Analysis: AUDITORY
R: what does that make you feel?
P3: Good, warm. {K}
Body Position Analysis: KINAESTHETIC
R: How does that make you feel about the learning you've been doing?
P3: Getting stronger with it, feel positive? {K}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Erm, what about learning in practice? Have you felt... There must be a time in the past when you've felt successful in practice? You've done something in practice that you learned well?
P3: Yes.
Body Position Analysis: AUDITORY
R: Describe that to me.
P3: A wonderful feeling really, I've done something, it feels good and I feel as though it's gone the right way and everything, and I feel really good. Warm, really boosted up. {K}
Body Position Analysis: VISUAL---KINAESTHETIC Gestures

The upward hand movements again emphasised this 'boosting' effect.

R: Where's the warm feeling?
P3: Stomach. {K}
Body Position Analysis: KINAESTHETIC

R: Stomach again?
P3: Yes.
Body Position Analysis: VISUAL---KINAESTHETIC
R: What about in the past when you've perhaps found it more difficult to learn a skill or to learn something in practice?
P3: Frustrated. {K}
Body Position Analysis: VISUAL—KINAESTHETIC
R: What's that like?
P3: Again a bit anxious, I feel anxious about it. {K}

The predicates here were analysed as Kinaesthetic as they represented emotive (moving) states.

Body Position Analysis: KINAESTHETIC Shakes head
R: Is it different to the other anxious?
P3: Erm yes, slightly.
Body Position Analysis: KINAESTHETIC
R: what's the difference?
P3: The difference is it's something that I have got to do in practice and if I can't find out what I'm supposed to do or whatever I get upset or anxious.{K}
Body Position Analysis: KINAESTHETIC

The participant Gestures downwards and in to body.

R: Ok, so when you think about doing your next placement, what?
P3: Very excited, I'm really boosted up.{K}
Body Position Analysis: KINAESTHETIC
R: So you're looking forward to it?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: Is that similar to the successful feeling?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: Right.
P3: It's improving all the time. My feelings are getting stronger each time I'm getting through something. The feelings are getting stronger and I'm getting boosted up. {K}
Body Position Analysis: KINAESTHETIC

The participant gestures in & around the body as if showing the direction of the 'boosting'.

R: So you're stronger now than you were before?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: And you feel more boosted?
P3: Yes. Yes, I've changed. I'm very changed.
Body Position Analysis: KINAESTHETIC
R: Yes?
P3: Definitely, yes.

Body Position Analysis: KINAESTHETIC
R: So how would you describe, how would you say you felt about your learning in general then? Your approaches to learning in general?
P3: From the beginning?
Body Position Analysis: AUDITORY
R: When I said to you think about your learning now.
P3: I'm still learning. I still need to improve in areas, you know, but I'm...
Body Position Analysis: AUDITORY
R: When I ask you to think about that, to consider your present position in relation to learning, as a whole in terms of the course if you like, what comes there?
P3: I've got a sort of warm feeling in my stomach and I'm very determined. That's what automatically...The warm feeling and the determination. {K}
Body Position Analysis: KINAESTHETIC
R: Is that different to the other warm feeling when you've already been successful?
P3: Yes it is.
Body Position Analysis: AUDITORY---KINAESTHETIC
R: In what way?
P3: More of a, if I can explain it {A}, an excited warmth. It's as if I'm getting further and further and faster, yes. {K}
Body Position Analysis: AUDITORY---KINAESTHETIC

The participant again gestures upwards in and around the chest area, with the hands emphasising increasing speed of movement.

R: What would you say about your learning in life in general?
P3: Mm.
Body Position Analysis: AUDITORY---VISUAL
R: Because there's a whole lot of life outside of this course and this job isn't there?
P3: Mm Mm.
Body Position Analysis: VISUAL
R: When you think about what you've learned about your life and where you are now, what comes there? When you think about it, is it a picture, a feeling or a sound?
P3: It's a feeling. {K}
Body Position Analysis: AUDITORY---KINAESTHETIC
R: Of?
P3: Of, 'oh god' {A} I feel a bit hot in my cheeks,{K} of sort of all my life's experiences of what I've had and what I'm going to do.
Body Position Analysis: AUDITORY---KINAESTHETIC
R: What's that feeling like? Is it warm?
P3: It feels good.{K}
Body Position Analysis: AUDITORY
R: Good?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: And is good warm? Is it in the same place as the other one?

P3: It's a different, it's a little bit warm, it's a nice feeling, it's good, but it's a little bit frightening as well. {K}
Body Position Analysis: AUDITORY---KINAESTHETIC
R: Describe how frightening feels.
P3: Frightening, describe it...{A} Erm it's the unknown, it's the unknown, it's a little bit of shakiness.{K}
Body Position Analysis: KINAESTHETIC

The student shakes as if shivering and then places the hand on her chin. These behaviours appear to be mimicking her actual response at the time.

R: Where's the shakiness, when you feel it?
P3: In my hands.{K}
Body Position Analysis: KINAESTHETIC
R: In your hands?
P3: Yes.
Body Position Analysis: KINAESTHETIC
R: Do you get that at the same time as the warm, or does it flick from one to the other?
P3: Flicks from one to the other. {K}
Body Position Analysis: KINAESTHETIC

The participant shakes her head in the direction of the flicking, from one hand to the other.

R: Right, so you feel a bit warm and then a bit shaky?
P3: Yes. Yes.
Body Position Analysis: KINAESTHETIC
R: All right, ok. You know when you did the questionnaire, what did you find you'd answered in relation to those questions at the back? What came out strongest?
P3: Trying to remember now. Erm I can't remember. I know that for a set of questions I got the 73 mark and a 70 or they were very similar. I think it was more the questions how I'm feeling round people. Which was depending on the situation, like I say, and how I'm feeling that day. {K}
Body Position Analysis: AUDITORY---VISUAL---KINAESTHETIC
R: And how are you feeling now?
P3: I feel fine. I feel drained (laughs) but I feel fine. {K}
Body Position Analysis: KINAESTHETIC
R: Do you have any questions you want to ask me?
P3: No, is there any rights or wrongs?
Body Position Analysis: AUDITORY
R: No.
P3: Ok.
R: Thankyou.

This participant clearly demonstrated Kinaesthetic predicates and body positions in relation to the questions posed. This was evident in both her experiences related to

successful and less successful experiences. There was evidence of times of her using other modalities such as moving eyes up for Visual (although this seemed to be the least utilised modality for this participant) and using telephone posture (a posture where the person leans a head as if speaking into a telephone) for Auditory, but these appear to be either leading in mechanisms to the experience which is then followed by the preferred Kinaesthetic experience; or as a checking mechanism to confirm that what she was saying is right.

The next case study highlights a different range of responses altogether. It is appropriate to start this study following the calibration phase for reasons of brevity. This participant's preferred learning style was Activist. She had a preference for the Visual and Kinaesthetic modality from the IPTP and Visual on the PPMI and from the predicates and body position analysis.

R: What I want to ask you now is how would you describe yourself as a learner?
P5: Proactive. {K}
Body Position Analysis: VISUAL
R: Proactive, What does that mean then, to you?
P5: To me? If I feel that erm there's something I don't understand I will go out and I will try to find the answer to the question. And if I can't find it I will find somebody who can find it or who knows it...{K}
Body Position Analysis: VISUAL---AUDITORY
R: Ok so you go off on your own, to the library or something like that?
P5: Erm maybe not in the first instance, maybe in the first instance, depending upon what the question is, I would ask friends, do you know what I mean?{A} I would maybe go round and have a look in the books or things like that, look in the library, internet,{V} still can't find the answer, go see the relevant tutor or somebody relevant at the hospital, it depends what the question is.
Body Position Analysis: VISUAL—AUDITORY---VISUAL---KINAESTHETIC

Here the participant tends to use upward eye movements. Her gestures mimic opening books and she looks at the 'imaginary' books in her hands. Her hand movements also suggest going to a succession of places, almost as if she is pointing to the places she is

going to on a map or selection of maps. This suggests she has visualised frames of places and placed them in a sequence.

R: We'll separate the two things practice and university; we'll call the university knowledge type learning and practice type learning. If it's your approach to knowledge how would you describe that? Your approach to learning?
P5: In the university setting?
Body Position Analysis: VISUAL---AUDITORY
R: Yes.
P5: OK Let's say for example a module, listen to what the tutor has to say, {A} if I've understood everything within that lecture, then go home and read a little bit more around it, just so that I'm backing up my understanding of it, {K} If I don't understand what's gone on in the lecture, go to the tutor, 'I'm not clear on this point, can you clarify?' Or at tea break grab one of the girls and say, 'did that go over your head as well, or is it just me that's thick today?' and work it out that way.{A}
Body Position Analysis: AUDITORY---KINAESTHETIC---AUDITORY---KINAESTHETIC---AUDITORY

Again hand gestures are used a lot to mimic the activities and point to visualised 'objects' that she is discussing in examples above and below.

R: Ok. What about practice then?
P5: In Practice dependant upon what it is, say a practical procedure, 'cannulation'. Ok So watch somebody do it,{V} ask them the reasons why they're doing it, go away, say read Royal Marsden upon 'Cannulation', {A} go back and watch someone do it again {V} and ask them, various questions,{A} If Royal Marsden's brought something up, 'Why're you choosing ante-cubital fossa?' For example 'What's the rationale behind that?' or 'Why're you choosing this gauge? What's the rationale? Just to clarify, to compartmentalise things in my own mind, this is because of a, b and c, are you with me? {A}
R: Yes
P5: and then if it was something that I was able to undertake myself, say 'Could I set up the tray for it?' so that, you know what I mean? You do it in stages. {A}
Body Position Analysis: VISUAL---AUDITORY—VISUAL—KINAESTHETIC---VISUAL---AUDITORY---KINAESTHETIC—AUDITORY
R: So you like to get involved and set up your own learning?
P5: Yes.
Body Position Analysis: VISUAL
R: Rather than waiting to be told?
P5: Yes.
Body Position Analysis: AUDITORY
R: Right is that a good description?
P5: Yes Proactive. Yes, aggressive. {K}
Body Position Analysis: VISUAL---AUDITORY
R: Aggressive?

P5: Yes. I can be. But not in a threatening, in a very non-threatening way. (Laughs).{K}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Right, non-threatening aggression? Erm what are your preferred learning methods; you said you liked to get off and do things, but what's your preferred mode of learning?
P5: Erm it depends on the subject. An awful lot of it depends on the subject. I think some subjects lend themselves very well to group discussion,{A} some subjects lend themselves very much to a basic teacher class scenario, some need you to be able to look at various different sources,{V} I think it depends on the subject. Erm me, personally, I prefer to be able to, as a tutor is going through something, to ask questions for clarity,{A}
Body Position Analysis: VISUAL---AUDITORY---VISUAL---AUDITORY---KINAESTHETIC—KINAESTHETIC Gestures---AUDITORY---AUDITORY
R: So like in a lecture situation, question and answer?
P5: Yes as they are going along as opposed to the lecturer delivering the lecture and then having questions at the end.
Body Position Analysis: AUDITORY---VISUAL---AUDITORY
R: Right and would you prefer that to group work, or?
P5: Erm, it's very difficult, it depends upon the actual session being taught, if it was anatomy and physiology I prefer very much a lecturer class scenario{V}, but to be open to questions throughout.{A} If it's groupwork I think I find things like law and ethics I find much easier in groupwork because people have different opinions and you tend to spark off each other{K}.
Body Position Analysis: KINAESTHETIC---AUDITORY---VISUAL---KINAESTHETIC---VISUAL---AUDITORY---KINAESTHETIC

The participant is reliant on gestures throughout and at this point tends to look up before answering the question then explain by using hand gestures to demonstrate movements or objects which she appears to be looking at as if she is holding them in her hands.

R: Ok So, You've talked about that and you've talked about practice, and you've talked about understanding things, or not?
P5: Yes.
Body Position Analysis: KINAESTHETIC
R: How do you know when you've understood something?
P5: Usually, Erm If I feel that I've got something, If I feel confident with something in my own mind, {K} Erm, maybe I would ask a question{A} around about what I feel confident with, and if they clarify my own knowledge I know I'm on the right track.{K}
Body Position Analysis: VISUAL---KINAESTHETIC---KINAESTHETIC---AUDITORY---KINAESTHETIC
R: Yes, so when you think back to being successful, you know that you've learned something, that you've understood something? If I were to ask you that, think about something that you know that you've learned.
P5: OK
Body Position Analysis: VISUAL

This question is designed to assist the participant to associate into the state needed; in this case being successful. Although the question is related to the past the phrase being successful suggests it is in the present so that she should be able to access the state as if now in order to provide the answer, which she does very clearly.

R: What comes first is it a sound, or a picture or a feeling? When I ask you to think about something that's, something that you've learned.
P5: A picture. {V}
Body Position Analysis: AUDITORY---VISUAL
R: A picture, what kind of a picture is it? A still picture like a photo or is it like a video?
P5: It's an event, it's a movie, it's a video.{V}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Ok is it colour or black and white?
P5: Colour. {V}
Body Position Analysis: VISUAL
R: How big is it?
P5: As if it was actually happening, I can visualise events happening.{V}
Body Position Analysis: VISUAL gestures from eyes
R: So it's panoramic, all around you?
P5: Yes.
Body Position Analysis: VISUAL
R: Are you seeing it through your own eyes? Or are you in the picture?
P5: I'm seeing it through my own eyes; I'm the observer, observing events.{V}
Body Position Analysis: VISUAL

At this point in answering these questions the participant's eyes appear to change focus as she looks up and forwards as though she is looking at something in the near distance. She then gestures from her eyes with her hands, to 'objects' in her visualised environment.

R: Right OK; Are there any sounds there?
P5: Yes.
Body Position Analysis: AUDITORY
R: Yes, sounds, what are the sounds?
P5: It's the actual event that was happening, the skills, within the skills lab, and watching the tutor, {V} giving the description {A}of how to undertake the procedure, showing us on the dummy and then carrying on.{V}
Body Position Analysis: KINAESTHETIC---VISUAL---KINAESTHETIC---VISUAL

R: Ok any feelings?
P5: No, because I was the observer, I was stood back watching, Nothing tactile, no tactile feelings. {V}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Ok, Think about something that you didn't find as easy to learn, something that you perhaps didn't understand as such.
P5: OK.
Body Position Analysis: AUDITORY
R: What do you get when you think about that?
P5: A very cold feeling [K}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Ah!
P5: A very erm anxious, anxiety, not anxiety to the point that it would affect things, but that mm, I don't feel comfortable. {K}
Body Position Analysis: VISUAL---KINAESTHETIC
R: So do you get a cold feeling?
P5: Yes.
Body Position Analysis: KINAESTHETIC
R: Where does that originate?
P5: Central (points to stomach) Do you know what I mean? It feels very uncomfortable, and it doesn't feel...{K}
Body Position Analysis: KINAESTHETIC gestures
R: Is it heavy or tight?
P5: Heavy yes and it doesn't feel comfortable. {K}
Body Position Analysis: KINAESTHETIC
R: Then you said 'this doesn't feel right' or something like that, are those the words?
P5: Yes.
Body Position Analysis: KINAESTHETIC
R: is that your voice, internal dialogue talking to yourself?
P5: Yes it's that 'Oh my God, I don't understand this, she's going way over my head, Stop!'{A}
Body Position Analysis: KINAESTHETIC—VISUAL—AUDITORY
R: So you've got a feeling and then your internal dialogue saying this?
P5: Yes.
Body Position Analysis: AUDITORY—KINAESTHETIC
R: Is there any picture occurring there?
P5: No.
R: No picture at all?

Here the participant demonstrates the 'telephone posture' with her head leaning towards her left side. When she repeats the phrases that she identifies as her internal dialogue, she repeats these words as if having a conversation with someone, demonstrating her head movements and postures as if in conversation (excluding the interviewer).

P5: If I think about it I can see the lecture, I can see the scenario, and whilst I wouldn't be able to see it as clearly as the event that I remembered quite well,{V} it's more the feeling that I've got from it.{K}
Body Position Analysis: VISUAL—AUDITORY—KINAESTHETIC
R: So the feeling comes first and it's definitely a physical sensation?
P5: Yes it's definitely; it's like a dread sensation. {K}
Body Position Analysis: KINAESTHETIC
R: So it's like is it pushing downwards, is it like a gravity pull?
P5: Mm Gosh, No it's just there, it's just there (points to stomach).{K}
Body Position Analysis: AUDITORY---KINAESTHETIC
R: A heavy, sort of sinking type feeling?
P5: Yes.
Body Position Analysis: KINAESTHETIC

As she discusses this point the participant uses a hand gesture of pushing something to one side as if the picture being discussed is off to one side (her right) so it can't be seen. She then points to the stomach and demonstrates a 'pushing down' motion.

R: Warm? No you said it was cold didn't you?
P5: Yes, it's not a nice, when you think of your children; you have warm embracing thoughts{K} don't you? It's like 'oh' {A} and they make you smile. This doesn't give me...
Body Position Analysis: KINAESTHETIC
R: But then you get the voice 'oh my god'.
P5: Yes.
Body Position Analysis: AUDITORY
R: And then you get a, what's the picture? You said you might get a little bit of a picture?
P5: The thing that I can see is the actual lecture scenario.{V}
Body Position Analysis: VISUAL
R: Is it colour or black and white?
P5: Black and white. {V}
Body Position Analysis: VISUAL
R: Right, is it still or a video?
P5: I'm having to think about it, so it is actually moving, because it's the lecture that I'm replaying. What I remember.{V}
Body Position Analysis: AUDITORY---VISUAL
R: And it's black and white. Can you see yourself in it or is it from your own eyes?
P5: It's from my own eyes. {V}
Body Position Analysis: VISUAL
R: Any sounds?
P5: No, not really.
Body Position Analysis: AUDITORY

An interesting point to note here is that when the participant related to successful learning the image was coloured and from her own eyes. In the unsuccessful image the picture was still from her own eyes as if in the environment but in black and white. This appears to be a definite difference between the representations of the two experiences.

R: OK Right now then, in practice, think of something where you were really successful in practice.
P5: OK
Body Position Analysis: VISUAL
R: What comes there when you think about it?
P5: Happiness. {K}
Body Position Analysis: KINAESTHETIC
R: Happiness, Is that a picture, or a sound, or a feeling?
P5: All.
Body Position Analysis: VISUAL
R: All? All at once?
P5: Yes.
Body Position Analysis: VISUAL
R: What comes first?
P5: A Picture. {V}
Body Position Analysis: VISUAL
R: A Picture? {V}
P5: Yes.
Body Position Analysis: VISUAL
R: Colour or moving?
P5: Colour, moving, I can see what she is saying to me,{VA} the feeling that I have inside, do you know what I mean? When you replay it you recall you feel like going {K}'Oh cheers, thanks.'{A}
Body Position Analysis: VISUAL---KINAESTHETIC
R: So you get a picture and then the feeling and then the sound of you saying 'Oh cheers'?
P5: Yes.
Body Position Analysis: VISUAL—KINAESTHETIC
P5: All in very, very quick succession.
Body Position Analysis: KINAESTHETIC
R: Right, Ok. So it's a moving picture, it's through your own eyes, you said that?
P5: Yes.
Body Position Analysis: AUDITORY
R: Ok, so you've got the sounds, your voice again?
P5: Mm Mm.
Body Position Analysis: AUDITORY

The element of colour and a much more vivid account including Kinaesthetic and Auditory aspects are brought into this successful experience. So it appears that the more vivid the representation for this participant the more success she has experienced.

R: Now what I want you to think about is something very simple again, that might not have been as emotional, something that's really simple that perhaps you found a little more difficult in practice.
P5: Ok
Body Position Analysis: VISUAL
R: What comes with that?
P5: Ok, Right, feelings first. {K}
Body Position Analysis: KINAESTHETIC---VISUAL---KINAESTHETIC
R: Ok, What kind of feelings?
P5: Unsure, not quite at peace with myself. {K}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Right, how does that feel physically?
P5: As though someone has asked you,{A} as though you've been put on the spot for something and you don't feel comfortable on how to answer the question.{K} Erm.
Body Position Analysis: AUDITORY---KINAESTHETIC
R: So are you getting sounds when you're thinking about that? Is somebody asking you a question?
P5: No, No, somebody's stood in front of me. {V}
Body Position Analysis: KINAESTHETIC---VISUAL
R: So you've got a picture?
P5: Yes, Yes.
Body Position Analysis: VISUAL
R: Colour or black and white?
P5: Black and white? {V}
Body Position Analysis: VISUAL
R: Seeing through your own eyes or are you in it?
P5: No seeing through my own eyes. {V}
Body Position Analysis: VISUAL
R: Moving or still?
P5: Moving, but only, it's not a natural movement.{V}
Body Position Analysis: VISUAL---KINAESTHETIC
R: Is it in a border or a frame?
P5: No.
Body Position Analysis: KINAESTHETIC
R: So is it 3D?
P5: Yes.
Body Position Analysis: VISUAL
R: Ok, What's the brightness like?
P5: Quite shady.
Body Position Analysis: VISUAL
R: Quite shady? {V}
P5: Yes.
Body Position Analysis: VISUAL

R: And then do you get a feeling?
P5: Yes, I feel an uneasiness. {K}
Body Position Analysis: KINAESTHETIC
R: What's that like? Is that like a tightening, or a pressure or a weight?
P5: No, it's just, erm.. When you feel uneasy about something you, your throat feels a little bit uncomfortable, your heart beats a little, you're more aware of your pulse going a little bit more, you feel a little bit warmer, When you're just a little bit unsure, you're not frightened, you don't feel in danger...{K}
Body Position Analysis: KINAESTHETIC---AUDITORY---KINAESTHETIC
R: So you're like feeling the bumping of your heart, and your throat feels a little bit tighter?
P5: Yes...
Body Position Analysis: KINAESTHETIC

Again the lack of colour and shadiness of this representation suggests a lack of success for this participant. The fact that it is less vivid and tangible could perhaps explain her feelings of discomfort or difficulty related to the experience.

R: Ok. What I want you to think about now, is if you're dealing with an everyday problem, something that might crop up at home, and you, think of something that you dealt with successfully, a problem, how do you go about problem solving?
P5: How do I go about it?
Body Position Analysis: AUDITORY
R: Yes.
P5: If it's something that hit's me (clicks fingers) like that,{K} say my husband rings me up and says 'this, this and this has happened.' {A} I would first look {V} and think right do I need to stop my day now to get on with this, so I'd prioritise it. Do I need to sort it out? {A}Erm if I do, reorganise what needs to be done. Re-Look at priorities.{V} Erm delegate what I can delegate. If I need to go home, get home. Get on the phone, get the problem sorted, get back on track. {K}
Body Position Analysis: KINAESTHETIC---VISUAL---KINAESTHETIC
R: Ok so when you think of something you dealt with well, again let's go through this procedure, what comes, what do you get?
P5: Right, in a home situation, it's very automated, it's not a question of feelings as such, it's more a question of 'this is the problem', 'this is the solution', 'this is what I have to deal with', 'lets get it straight'.{A}
Body Position Analysis: VISUAL---KINAESTHETIC---AUDITORY---KINAESTHETIC
R: Do you see a picture of the problem and the solution?
P5: Yes.
Body Position Analysis: VISUAL
R: Ok what are they like? Because you've pointed to two different areas, like still photographs?
P5: Yes. The picture yes it's actual physical, organise the builder, ring, you know what I mean? Ring it, sort out today's jobs, and it's as though I can actually see situations that then have to be amalgamated.{V}
Body Position Analysis: VISUAL points to 'pictures'
R: And do these have little boxes round?

P5: Yes they're very typical still things that need to be done.
Body Position Analysis: VISUAL

It appears that te student has an organised way of separating the problem into tasks which are each then represented in a framed visualisation. These are then sequenced seemingly from left to right so she can 'check' each one off as each is completed. She demonstrates the placing of these 'frames' by hand gestures pointing in front of her from left to right.

R: So you can look at them and then you say to yourself, 'I need to do that.' or something along those lines?
P5: Yes.
Body Position Analysis: KINAESTHETIC---AUDITORY
R: And is it your own voice that tells you that?
P5: Yes.
Body Position Analysis: AUDITORY
R: And how do you know at the moment you've solved it, how do you check, convince yourself that you've solved it?
P5: Erm, depends on the problem, sometimes the physicality of the problem being solved i.e. if I need to organise the bricky{K}, We're building a house at the moment, If I need to organise the bricky, If I see the bricky's on site, the bricky's happy,{V} the problem is solved and I can carry on with what I need to do. Erm If there's a problem with the business, staff have called in sick, ring round, get staff covered, they confirm they can do it, problem solved. It's natural, physical, tick it off the list. {V}

This last item was recorded as Visual as the participant was 'looking' at imaginary pictures and pointing to them one by one as she 'ticked them off'.

Body Position Analysis: VISUAL---AUDITORY---VISUAL---KINAESTHETIC
R: So it's almost like 'dealt with that picture, dealt with that picture'?
P5: Yes it's a confirmation of facts.
Body Position Analysis: VISUAL---KINAESTHETIC
R: What comes last? For you?
P5: The sigh of relief and the 'Hey I could have done without that.'{A}
Body Position Analysis: VISUAL---AUDITORY
R: Lastly, what would, how different is it if you've perhaps had something simple to deal with, or that's not necessarily been resolved that easily? What's the difference between that and your previous one?
P5: Thoughts, feelings, emotions, that kind of thing?
Body Position Analysis: VISUAL---KINAESTHETIC
R: Yes.
P5: It tends to be if it's not a high priority thing, then it gets put on the back burner.{K} I tend to look at it more in a moving picture type of thing.{V}

Body Position Analysis: KINAESTHETIC---VISUAL---KINAESTHETIC---VISUAL
R: Is that picture nearer to you or further away than the other one?
P5: Further away because it's not a priority. It's not something that I urgently have to deal with. So it tends to be further away, it doesn't tend to be as prominent, as loud. {V}
Body Position Analysis: VISUAL
R: So would that be like as if it's behind the other picture?
P5: Yes it's a priority, I work very much by prioritising things. {V}
Body Position Analysis: VISUAL

This participant showed very definite body positions in relation to her experiences. There is an apparent reliance on the Visual aspect within the representations used, perhaps with the Kinaesthetic element used as a checking mechanism. The difference in colour related to the successful and less successful experiences is interesting suggesting that the submodality of colour is a driving factor in the representation of the experience and its subsequent state and behaviours.

It is now necessary to look in more detail at the findings related to modalities, submodalities and predicates.

5.6 Findings Relating To Learning

Firstly the participants were asked about describing themselves as a learner. These questions often gave rise to answers with a rich set of data that immediately highlighted the predicates they were using. The predicates can be seen within the text as highlighted.

R: If you had to sum up your whole approach as a learner, how would you describe yourself, as a learner?
P1: As a learner? I'd rather do it practically than theoretically.
[Predicate(s): Kinaesthetic]
{Body Position Analysis: Visual--Kinaesthetic}
R: Right. So how do you gain the knowledge when you're doing?
P1: Doing? Seeing and watching other people and getting their knowledge off of them when they're doing things and asking them why they do that thing. **[Predicate(s) Kinaesthetic, Visual, Auditory].**
{Body Position Analysis: Visual--Auditory--Kinaesthetic}

R: So just to recap, you prefer learning by doing. So what's the opposite of that then? Things you don't like as approaches to learning? Things you don't like about learning?
P1: I'd say more the theory side of having to sit down and actually listen to somebody. **[Predicate(s): Auditory, Kinaesthetic].**
{Body Position Analysis: Visual--Kinaesthetic}
R: You don't like that?
P1: No. Simply because I don't feel as if I'm a confident person when it comes to, you know, being part of a larger group. Obviously the sort of work that I do is, you tend to work with only a few people. So I find it easier to work with just a few people and the hard bit of learning like the theory bit, is because it's in front of large groups of people. **[Predicate(s): Kinaesthetic].**
{Body Position Analysis: Kinaesthetic---Visual---Kinaesthetic}

In this example the participant demonstrates a full range of representation modalities, yet there is a strong suggestion that the Kinaesthetic modality is a preferred mode. This does not mean the person is a 'Kinaesthetic' person, just that at some stage in the process the representations tends to lead to the Kinaesthetic modality. Faulkner (2001) states that knowledge of changes in the aspects of representations within the range of human awareness is useful, but not for classifying people as one or the other mode. Instead they are easy to identify, and with more distinctions noted, the richer the intelligence of the experience is gained.

R: Right. How would you describe yourself as a learner?
P14: Erm, I'm quite intelligent but I'm not the best at motivating myself to do it. **[Predicate(s): Digital, Kinaesthetic]**
{Body Position Analysis: Visual---Auditory---Visual---Auditory}
R: So what approach do you take to learning then?
P14: I like being directed. I like being directed. I like being given tasks with a beginning and an end and a nice sort of scope to that. **[Predicate(s): Kinaesthetic, Visual]**
{Body Position Analysis: Visual}

In this statement the participant demonstrates through predicates that the Visual and Kinaesthetic modalities are entered into at some stage of accessing the experience, yet interestingly the body position aspect tend to be related mainly to the Visual modality with some Auditory. This could suggest that the 'picture' of the situation is accessed in the first instance and then the participant accesses the feelings related to it, which are

more evident in the predicates, 'Directed', 'tasks' and 'motivating'. The term 'scope' could be considered a Visual predicate therefore linking in again to the Visual accessing. Therefore the participant sees the experience (which may include some sounds or explanatory internal dialogue, hence the Auditory reference through body position), checks out the feelings related to it and perhaps modifies the 'picture' so that it is just right. This would account for the body positions. Once this has occurred it is then articulated through the predicates. The coding of 'Digital' was given to a number of text segments as in the above example, such as the term 'intelligent'. These are words used that appear to be sensory neutral, and not related to a specific sense, Lavan (2002). These types of words can often appear vague, ambiguous and lacking in sincerity. In the example below the participant is quite sure of their preferred approach (Visual) and congruent with both the predicates and body positions. The 'seeing' of something is an important aspect in this person's approach to learning.

R: Right how would you describe yourself as a learner?
P10: Visual. **[Predicate(s): Visual]**
{Body Position Analysis: Visual}
R: Visual? All right and what do you mean by that?
P10: Erm, like I very often, sort of pick things up quite quickly visually, sort of erm seeing something, I mean if I had to read an article, or read a book about it, I really struggle, but to do it and to visually see it..... **[Predicate(s): Visual, Kinaesthetic].**
{Body Position Analysis: Visual---Kinaesthetic----Visual}

There are examples of Kinaesthetic predicates within the above narrative, 'Pick things up' and 'Struggle', which could suggest the end result of the learning process, or a final check. So in this case the person would perhaps like to be able to 'see' the notions they are to learn. Even though reading from a book could be considered a form of visualising, the above suggests that this format does not necessarily fit the structures of this participant's Visual representational preference.

Below are examples of statements related to less successful learning experiences,

R: Ok. So I want you to now think about something that you learned perhaps not so well. I mean you mentioned about cfp becoming a bit blurry. Do you want to just tell me a bit about that? What comes first there? Is it a sound, a picture or a feeling? Think of something you didn't learn so well.
P2: That's an image really. **[Predicate(s): Visual]**
{Body Position Analysis: Auditory---Visual}
R: An image again?
P2: Yes.
{Body Position Analysis: Visual}
R: Ok, do you want to go through the same sort of things again? Is it colour?
P2: It's more like pictures really. I can see like two pictures at once to that.
[Predicate(s): Visual separated (multiple)]
{Body Position Analysis: Visual}
R: Ok, well explain that to me then.
P2: It's like the first assignment I did I can picture myself at home on the computer trying to do it... **[Predicate(s): Visual 3D (Panoramic)]**
{Body Position Analysis: Visual}
R: And do you see yourself in the picture?
P2: ...And I can picture the classroom as well. **[Predicate(s): Visual disassociated, Visual separated (Multiple)]**
{Body Position Analysis: Visual [gestures where pictures are]}
R: So there's two parts to this one then?
P2: Mm.
{Body Position Analysis: Visual}
R: Which picture is the strongest one? Which gets your attention the quickest?
P2: The one at home. **[Predicate(s): Visual (reference to picture)]**
{Body Position Analysis: Visual}

With the participant above a lot of information was gained from body positions as the participant actually often pointed to or looked at the pictures he was creating/ accessing, as they were located in space around him. Also the notion of separated and multiple pictures being accessed were evident. The nature of the learning experience was qualified by the difference in the qualities or submodalities of the pictures from the positive learning experience of the same participant as can be seen below:

R: When you think about that topic or whatever, what comes first, is it a picture, or is it a sound or…..?
P2: Picture. **[Predicate(s): Visual]**
{Body Position Analysis: Kinaesthetic---Visual}
R: What kind of picture?
P2: Classroom setting with people all around, and a lecturer. **[Predicate(s): Visual 3D Panoramic](describing the 'picture')**
{Body Position Analysis: Kinaesthetic---Auditory---Visual}
R: So are you seeing this through your own eyes, or are you seeing yourself in the picture?
P2: Through my own eyes. **[Predicate(s): Visual Associated]**
{Body Position Analysis: Auditory---Visual}

In the successful learning experience the participant was associated as if seeing the situation from his own eyes. This was different to the less successful learning experience as in that there was more than one picture and he was disassociated from it, i.e. he could see himself in the picture. The participant below also demonstrates elements of being disassociated on a Visual level when considering more difficult learning aspects:

R: More difficult to understand, right so I want you to think back to something like that. Can you do that?
P14: I can do. Yeah, I did a City and Guilds in Computer Programming not so long back in the last two years anyway. I found it really hard.
[Predicate(s): Kinaesthetic]
{Body Position Analysis: Auditory---Kinaesthetic}
R: Right, when you think about that, when you think about something that you've found really difficult, what comes first? Do you get a picture, a feeling or a sound?
P14: A picture, a picture first. **[Predicate(s): Visual]**
{Body Position Analysis: Visual}
R: Right, is that, how is that located in relation to yourself?
P14: It's a lot, erm, in terms of whether I'm in the picture or not?
[Predicate(s): Visual]
{Body Position Analysis: Visual----Kinaesthetic}
R: Yeah.
P: I'm in the picture. **[Predicate(s): Visual disassociated]**
{Body Position Analysis: Visual}
R: So you can see yourself?
P: Yeah, back of myself. I can see the back of myself. **[Predicate(s): Visual disassociated]**
{Body Position Analysis: Visual}
R: So you can see the back of yourself.
P: Yeah. It's a screen. **[Predicate(s): Visual located]**

{Body Position Analysis: Visual}
R: Right, is it colour or black and white?
P: Its colour but dingy **[Predicate(s): Visual colour, Visual unclear]**
{Body Position Analysis: Visual}
R: Right, so dingy as in dark, fuzzy?
P: It's pretty sharp really it's not bright, it's likely to be like most days here.
[Predicate(s): Visual brightness reference]
{Body Position Analysis: Visual}

The participant uses many Visual predicates throughout referring to the colour and brightness of the representation. Seeing himself on the screen in a disassociated fashion could suggest that the participant is reviewing this difficult learning situation as though it was happening to someone else, 'on a screen'. An interesting notion is that if the learning 'happened to someone else', then it could not be integrated by this person, therefore making it difficult to learn. According to Burton (2003), in order to determine the significance of information, a person must first think about their own existence, and bringing in external information and search for its relevance in maintaining our existence. If a person finds no relevance then less attention may be paid to it, therefore a disassociated state may occur and integration of the material is difficult. Burton (2003) suggests that we work towards or away from states according to value attached to them. Disassociation is described as having awareness of a state while not directly experiencing it. Therefore perhaps it is a form of moving away from a difficult learning experience for this student without any integration of it, and therefore any learning value is kept distant. Another example of this disassociation can be seen below:

R: Right and its not just through your own eyes, you can actually see, its not as if its through your own eyes you can actually see yourself in it as if you're watching a video of yourself?
P4: Yes. **Predicate(s): Visual Disassociated**
Body Position Analysis: Visual
R: Right, so what was one of the last things you had to deal with? Where you had to go through a sequence of…?
P4: It was about an assignment from here, I had a problem so…
Body Position Analysis: Visual

R: Ok then, go through the qualities of what you're thinking in that sense…
P4: Erm you mean like banging me head against a brick wall? **Predicate(s): Kinaesthetic**
Body Position Analysis: Visual---Kinaesthetic
R: Do you see yourself banging your head against a brick wall?
P4: Yes I do... I'm getting no answers and I'm getting different stories from everybody I approach. And its getting to the point where its frustrating and I could urrgh! **Predicate(s): Visual disassociated, Auditory external, kinaesthetic.**
Body Position Analysis: Visual---Kinaesthetic

Whole ranges of modalities are demonstrated above. Again the participant seems to be disassociated and can actually visualise themselves in the situation. It then appears that this leads to a Kinaesthetic representation, 'frustration', just as watching a film or video can rouse emotions in the audience.

5.7 Findings Related to Submodalities

It is now necessary to look at some of the submodalities in the coding in more detail to demonstrate examples of the qualities that the participants used to describe their modality of the experience. The Visual submodalities will be looked at first.

5.7.1 Visual Submodalities

Many examples are given of Visual association or seeing the situation as if reliving it through their own eyes at that particular time. The comments below are typical of this aspect.

R: It's all around you again? Or is it…?
P6: No, it's, this time, it's just sort of, I don't know, it's just through my own eyes. Yes I suppose it is all around me, there's no frame to it I can just see the whole thing.

R: Right is it panoramic, sort of?
P14: Yeah, sort of, it doesn't actually end anywhere if that's what you're asking. It goes off to the ceiling that way and then kind of goes that way but it's very clear.

Many of the respondents would scan around the room as if looking at the situation again and could actually point to where objects were in relation to themselves in the experience they were describing. This was a common phenomenon with this submodality.

There were some references to the visualisations being black and white but the majority (80 percent) related to the representations being colour.

> ***R: Right, so tell me about that picture.***
> ***P1: I can see the full glossy magazine picture type thing.***
>
> ***R: Yeah so teachers that use lots of like PowerPoint and things like that, do you like lecturers that use that type of thing?***
> ***P13: Yeah. I like that. I have to write it down myself and pinpoint certain things in different colours. I have coloured pens out all the time – black, red, blue, green different colours.***

The colour references were given on many occasions, and linked in with brightness references, as to the quality of the experience.

> ***R: So think of a skill you've learned successfully then, what's that like?***
> ***P2: Quite dark really.***
>
> ***R: Right, ok, is it dark or bright?***
> ***P23: Quite, light in the middle then going darker against the edges.***

In the latter case the participant is able to give a detailed account of the representation in relation to brightness. However this could also be following the pattern of normal vision as in focussing on everything that is directly in front of them. Bandler and MacDonald (1988) state that in most circumstances for most people, when they increase intensity such as brightness within an image, the intensity of their response changes with it. In the above example it could be suggested that what was on 'the edges' of the representation

was of little consequence as they were focussing attention to the 'middle' of the observation. Therefore the response was mainly related to that and hence brighter.

In terms of whether the image was moving (like a video), or still (like a photograph) the numbers of responses were very similar. Many participants suggested moving representations, usually in an associated manner when discussing various aspects of learning, particularly past situations.

> ***R: Right, so you see a picture then?***
> ***P20: Yeah.***
> ***R: Again, is it a video or a photograph?***
> ***P20: No it's like the real time.***
> ***R: Right, so it's moving?***
> ***P20: Moving.***

However there were also many descriptions of representation as still pictures.

> ***R: Right, I see, so is it like a photograph of the assessment document or is it like a video of the assessment?***
> ***P23: Yeah, I'd say, yeah, like a, yeah, like a photocopy of it.***
>
> ***R: What kind of picture?***
> ***P13: Assignment title.***
> ***R: Right, is that a still photograph?***
> ***P13: Yeah.***
> ***R: Do you get a sequence of pictures there? What do you get?***
> ***P13: Erm,***
> ***R: Or is it just the one picture?***
> ***P13: It's the one picture, which I carry all the way through the assignment until it's finished and done.***

It was an interesting factor that the notion of the representation being still or moving was one of the factors that was very differential throughout each interview, in as much as the participants would have both submodalities within their responses regarding different aspects, which were individual to them. There were no patterns particularly evident related to this factor.

Other Visual submodalities that were noted was whether there was one 'picture' or several, and it appeared that some students used sequenced, multiple pictures as a representation particularly in relation to problem solving. E.g. a series of pictures relating to the event, with the successful one at the end, almost as if there were a tick box of procedures to go through to complete the task.

R: Ok what are they like? Because you've pointed to two different areas, like still photographs?
P5: Yes. The picture, yes it's actual physically organise the builder, ring, you know what I mean? Ring it, sort out today's jobs, and it's as though I can actually see situations that then have to be amalgamated.

R: Like a slide?
P14: Yeah, yeah like a rotary slide projector something like that yeah. I can see the task at different stages of completion.
R: So it's almost like 'dealt with that picture, dealt with that picture'?
P14: Yes it's a confirmation of facts.

5.7.2 Auditory Submodalities

As the main Visual submodalities have been discussed it is now necessary to investigate some of the aspects related to the Auditory modality. It must be noted that this modality was least evident, particularly through the predicates within the transcripts (approximately 10 percent), although there was more evidence of it being utilised in the body position analysis (approximately 20 percent).

R: Right. Ok. That's good. Right so I want to think now then about any sort of situation at home where you have had a problem to deal with and you've done it really well. How would you go about solving the problem?
P8: Umm. Depends what the problem was. Erm I like to talk problems through.
R: You talk problems through?
P8: Mmm

R: If it were your approach to knowledge, how would you describe that, your approach to learning?
P5: In the university setting?

R: Yes.
P5: OK Let's say for example a module, listen to what the tutor has to say, if I've understood everything within that lecture, then go home and read a little bit more around it, just so that I'm backing up my understanding of it, If I don't understand what's gone on in the lecture, go to the tutor, 'I'm not clear on this point, can you clarify?' Or at tea break grab one of the girls and say, 'did that go over your head as well, or is it just me that's thick today?' and work it out that way.

In this latter example of the Auditory modality, the participant gives many examples of internal and external dialogue; actually quoting the words that might be spoken. This particular participant also delivered these 'quotations' in the tone of voice that would be used.

Hall (2000) states that the Auditory modality leads people to be able to hear in detail, therefore be able to repeat words verbatim. It also leads people to hear in a contextual way, whereby the emotional impression or sounds of the words can be delivered, as in the above example.

As mentioned above one of the main submodalities found is that of internal dialogue. This was by far the biggest contribution to the Auditory modality data.

R: So you hear your own voice?
P: Yes.
R: Your internal dialogue?
P: Yes
R: Do you get any feelings with that?
P5: No not really, it's just something that's got to be sorted.
R: Is that what you say? 'Its got to be sorted'?
P5: Yes 'you've got to sort it'.
R: In that tone of voice, 'You've got to sort it'?
P5: Yes.

R: Right, what's is it that's in your head? Is it a warm feeling or a cold feeling or is it an internal voice sort of telling you?

P15: Telling me.
R: It's your voice then?
P15: Yeah.
R: What you're saying to yourself?
P15: Saying that 'she annoys me.'
R: Oh, the voice says, 'she annoys me?'
P15: Yeah.

In these cases the actual spoken words and emotional feeling attached are evident. Below are more examples of self-talk. Hall (2000) describes this as making sense by giving meaning in terms of words and language. He continues, suggesting that this type of representation codes and carries our words, language, statements and therefore our beliefs and understandings. However, in doing so there is a danger of over identifying with this system and for the person to link it to identity. So, to actually believe or respond to the internal dialogue may not always serve the person well. A very powerful idea, particularly if the internal dialogue is negative in nature. Most examples of internal dialogue were in relation to difficulties, although some were used by the participants to encourage themselves to complete the task.

R: No, do you get any feeling?
P17: I get like an inner voice.
R: An inner voice?
P17: Me saying 'why?'
R: Yeah, so it's your voice and your saying 'why?'?
P17: Yeah.
R: Right, is it loud or quiet?
P17: It's like what I'm thinking.
R: Yeah, so as if you're just talking to yourself?
P17: Yeah.

A kind of internal conflict can be seen in the example below, as the internal dialogue suggests the person is unable to achieve, yet they then provide encouraging comments, and a debate of the person's own internal dialogue ensues.

R: So it that like your own voice saying that?
P22: That's my own voice saying 'you're never going to get this'.
R: And then you get your voice saying 'I'm never going to get this'.
P22: Yeah.
R: Right, so what happens when you get that voice?

P22: I dismiss it then.
R: Right.
P22: I think 'stop it because you're going to do it.'
R: Right, so you're like having a conversation with yourself?
P22: I do, yeah.

5.7.3 Kinaesthetic Submodalities

It is now necessary to discuss findings related to the Kinaesthetic modality. In the first instance there were many references to the Kinaesthetic modality which crosses over with both the Visual and Auditory modalities as can be seen throughout this chapter so far. When recorded the main modality heading of Kinaesthetic was used as a coding as there appeared to be many distinctions. When completed these Kinaesthetic codes were looked at again and collapsed in to the codes seen in table 5.2 above. Many of these answers came from direct prompts or questions from the researcher, as in the first instance the participants tended to relate to the broader heading of feelings. Some examples of Kinaesthetic findings can be seen below:

R: Ok, so when you think about doing your next placement, what?
P3: Very excited, I'm really boosted up.
R: So you're looking forward to it?
P3: Yes.
R: Is that similar to the successful feeling?
P3: Yes.
R: Right.
P3: It's improving all the time. My feelings are getting stronger each time I'm getting through something. The feelings are getting stronger and I'm getting boosted up.

With this particular participant the body positions were also highly Kinaesthetic dominant, as she would often gesture inwards towards her self particularly her stomach and chest in identifying where the feelings were as she spoke.

R: So how would you describe that approach? What you say it is if you were using a word?
P4: I'm not very good theory or written, I'm more practical. More hands on.

R: OK that's fair enough. You mentioned practice and you like hands on, what is it about that? How do you find you learn in practice?
P4: You learn more from doing. And it's more experience. Like from experience you learn from experience don't you whereas a lecture you are not doing you are just sitting there trying to take it in. Whereas, hands on is better, because you are actually doing something. Understanding the process behind it.

R: Do you prefer that to groupwork or?
P6: No I don't dislike groupwork in fact I like groupwork, probably equally, I like to be able to interact, like transferring, bounce my ideas back off, and check that my understandings correct.
R: but practice, how would you describe yourself as a learner in practice?
P6: I learn practically. If you explain it to me and then show me how to do it then reinforces it for me and I'm much easier with that. I need to actually go and do it.

Both of the above examples give good examples of Kinaesthetic predicates and in particular the concept of learning by doing, or through practical approaches. This is an important modality, as mentioned above it appears that it is often used as a checking mechanism following other modalities. Bandler and MacDonald (1988) suggest that as the intensity of one modality is increased or changed so is the response and the Kinaesthetic modality is a useful way of checking this, 'Does it feel more pleasant or less pleasant?' This can be demonstrated by looking at examples where the participants discussed Kinaesthetic comfort.

R: Is it better or worse?
P2: Probably better, I feel a bit more comfortable actually.
R: Ok, right. So if you think about a topic that you're going to be learning soon, you know if you've got an assignment to do or something, what do you think about them? Are you having feelings associated with these? You said you felt more comfortable?
P2: I don't get feelings really, no.
R: When you said you felt more comfortable, is there a feeling you get with 'more comfortable?' How do you know you're more comfortable?
P2: Just more relaxed and more familiar with it, with the situation.

As well as expressing comfort in response to certain situations the opposite or different feeling of discomfort was also evident in places,

> ***R: Do you get a feeling, or a picture or a sound?***
> ***P5: A feeling, but it's.... I feel quite proud that I was able to handle the situation, but then there's this little part of me that doesn't feel comfortable feeling proud because of the type of situation it was. It's like feeling happy about somebody else's loss. So maybe it's the wrong scenario to take.***

In this situation although learning the participant checks and still does not feel one hundred percent happy about the situation, as there was a conflict of emotions related to the learning experience.

Once the data had been re-coded it was noticed that there were references to many submodalities such as weight, temperature, pressure, and movement. However there were some terms that were perhaps more difficult to code, yet which did not necessarily fall into the digital mode. These were recoded as Kinaesthetic emotive terms and included such predicates as, nervous, anxious, frustrated. However when these words are scrutinised they actually have Kinaesthetic roots. An example of such statements can be seen below:

> ***R: It feels dark. What does that feeling dark? What's that like?***
> ***P19: I feel unsure and anxious.***
>
> ***R: So when you think about then, what do you get, a picture, a feeling, or a, you know, when you approach that? You know if I said to you, 'you've got an assignment to do?'***
> ***P18: A little bit anxious at the beginning.***
> ***R: Right, so a feeling before a picture?***
> ***P18: Yeah, yeah, but then, Its one thing actually looking deeper at it and getting anxiety or whatever.***

According to McDermott and O'Connor (2001), the emotions are classified as a Kinaesthetic submodality as they are usually a cluster of different proprioceptive feelings

in the body. This statement fits well with the examples given above. Also as well as being negative the Kinaesthetic emotive coded aspects showed positive feelings too.

> ***R: Yeah ok. Are there any feelings associated at all? Do you get any feelings?***
> ***P12: Quite happy.***
> ***R: Happy. What's that like?***
> ***P12: Relaxed.***

> ***R: Right, any feelings?***
> ***P22: Just one of achievement, it's done.***

From the examples given above it can be seen that there is a great deal of detail that can be provided in both language and in body positions related to internal representational systems. According to Grinder and Bandler (1976) these should both be taken into account. They describe the body positions as paramessages stating that the internal mode of processing will be demonstrated through these body movements. By asking someone to articulate what they are experiencing, it is equivalent to asking them to access a different modality in order to reform it into words. Therefore both are important. On many occasions in the analysis there were examples of incongruence between the predicates and the body language. However some of the body position changes were so fleeting it is hard to distinguish at which point it would be relevant to 'compare' them with the language being used at that time. By scrutinising the transcripts and counting the times a rudimentary pattern only can be established, yet it is one that provides substantive material. The main finding of the Visual modality being preferred is one to be investigated, however care must be taken to recognise that although this is the case the other modalities were still evident to some degree throughout each individual's interview. This would concur with Faulkner (1994) that a person should not be labelled 'Visual', 'Auditory' or Kinaesthetic'.

However the findings do suggest the Visual mode is used most, from both sets of qualitative data and is a reasonable starting point for discussion.

Chapter Six

Discussion And Considerations From The Study

6.1 Introduction

This chapter sets out to discuss the findings from both sets of data, the questionnaire package, and the video interviews. Firstly the answers to the research questions will be addressed. Links to aspects in the literature review will then follow. Following this, the implications for practice or development and specific suggestions for further research will be discussed. The lessons to be learned from the conduct of the study will then be included (Robson, 2002). This study investigated the relationship of learning styles and internal representations from Neuro-Linguistic Programming (NLP), with the intention of developing learning approaches for nursing students within the Higher Education setting. It was thought that in determining the structure of learning styles, in how students internally represented their approaches, more effective activities and applications to their learning could be considered. Issues related to how the learning of student nurses can be enhanced will be included, based on the findings of the study.

6.2 Preferred Learning Styles and Modalities

It is firstly necessary to summarise the findings against the research questions.

6.2.1 Discussion Related to The Main Research Question

'What are the relationships between the Honey and Mumford (1986) Learning Style preferences with the NLP internal representational systems (modalities) of pre-registration student nurses?'

Despite the amount of data collected, no major conclusions can be drawn about student nurses having a preferred modality preference for *each* learning style. However there are many interesting findings, including some positive correlations between some learning styles and specific modalities. The main finding is that there are overall positive relationships between Theorist learning style and the Visual modality based on correlations with the 'Identify your Preferred Thinking Pattern,' 'IPTP' questionnaire (Knight, 1995). There is also a significant finding of a positive relationship between the Theorist learning style preference and the Kinaesthetic modality with the 'Primary Perceptual Modality Inventory', PPMI, (McVoy and Markowski, 1998), although this is not as significant as the Visual modality correlation with the IPTP. The relationship with Theorist style and the Visual modality is a useful finding in light of the fact that the Theorist style was the most preferred, based on the norms derived and developed from the respondents' data. This link is interesting, as the derivation of the word 'Theorist' which from its Greek roots actually means 'to view', 'to speculate' or to gaze (Hanks, 1979). Therefore in order to have a Theorist learning style preference this research suggests that the student nurses are utilising the Visual modality and submodalities in situations in order to gain learning from it. The Visual modality also appeared strongly in the findings from both the questionnaire packages and the video interviews (including analysis of the predicates used and body positions findings). This does not necessarily mean that these respondents should be labelled as 'Visual' (Grinder and Bandler, 1981), just that it appears that this is the mode that student nurses prefer when learning and with that particular learning style. This therefore might suggest that utilising an approach whereby the learner accesses the Visual modality is useful for those students that have a preferred Theorist learning style. The Theorist learning style preference suggests

that students draw conclusions from experiences. By using situations that utilise the Visual mode this process should be made more effective. By being able to visualise conclusions, or demonstrate them, in a visual manner, this type of learning could be enhanced and problem solving made more efficient. This could help reduce the theory/practice gap if students are able to draw relevant conclusions about the real world. The real world of the student nurse is, in essence, that of practice, and hopefully these findings should improve the integration of theory to practice, by using it in context.

A Venn diagram (differential Visual tool, Caviglioli et al, 2002) can be seen in figure 6.1 to give a diagrammatic explanation of the main finding.

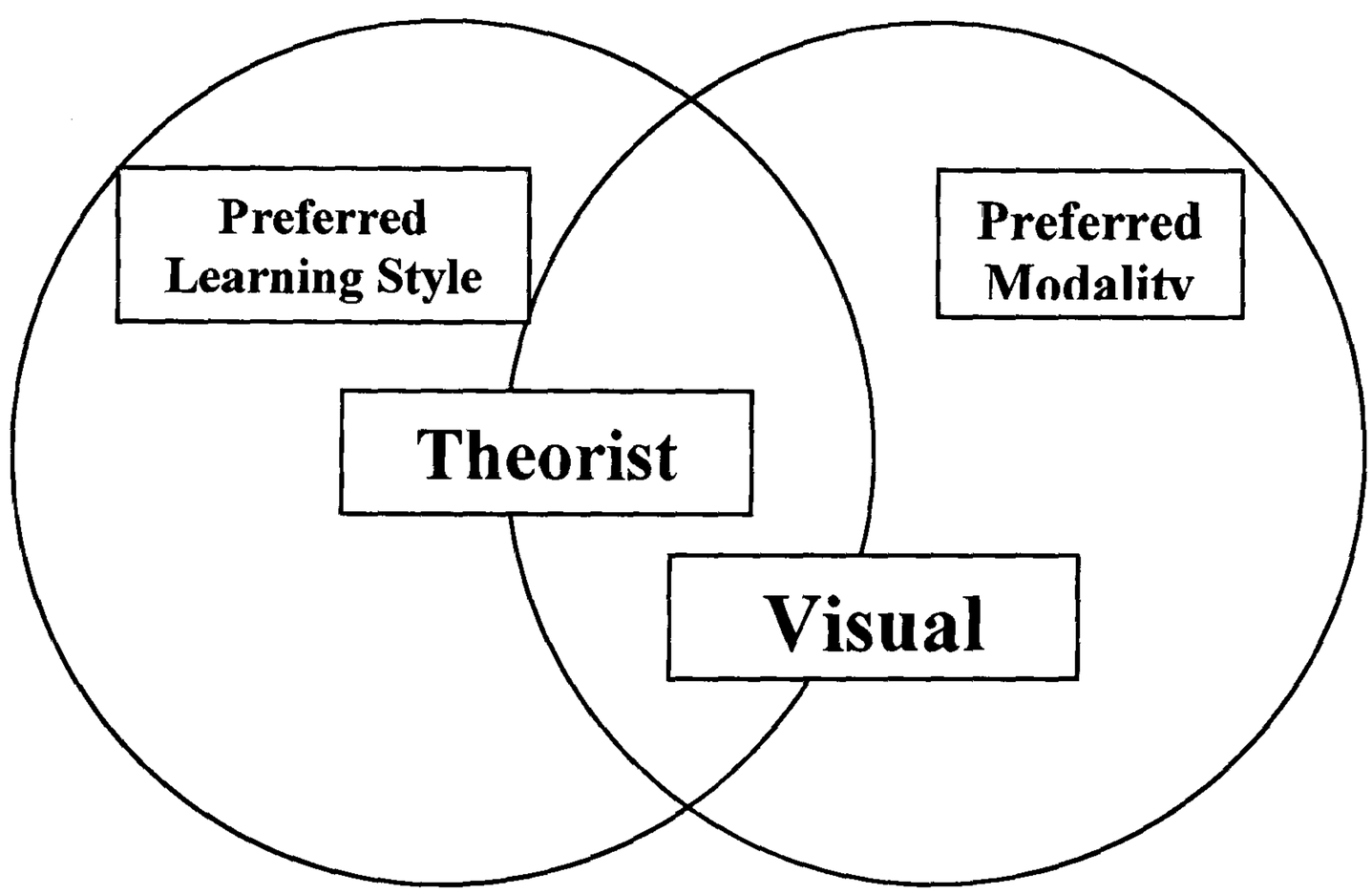


Figure 6.1: A Diagrammatic Explanation Of The Link Between Learning Styles And Modality Findings

As mentioned above, there is also a positive relationship between the Theorist learning style preference and the Kinaesthetic modality. This is an interesting finding and could raise questions in relation to the fact that there is no significant correlation between the Visual modality (From the IPTP) and The Kinaesthetic Modality (From the PPMI).

However the Kinaesthetic modality was the second most preferred after the Visual in both findings from the questionnaire packages and the interviews. According to Caviglioli et al (2002), human beings use visualisation to learn because they have evolved to do so; as they became finely tuned to detect what wants to eat them and what they want to eat, this correlated with life span. The Visual sense appears to be a necessary one for human survival. As the Kinaesthetic modality is also recognised in these findings, this could simply suggest that this modality is used as a checking mechanism of an internal strategy, following the use of other modalities. A person could therefore visualise a solution to a problem, and check on this Kinaesthetically, for example, 'lets see if this feels right'. As discussed in Chapter Five, Bandler and MacDonald (1988) suggest that responses change throughout as differences occur in one modality, and the Kinaesthetic modality is a useful way of checking the effect of these changes, 'Does it feel more pleasant or less pleasant?' Or quite simply 'Does this feel right?' This can particularly apply in problem solving or in developing ideas as a person with a Theorist learning style preference would. Shaw and Marlow (1999) point out that a 'Theorist' considers all alternatives and then make conclusions from their experiences. They attempt to fit their observations into some form of logical model and learn best when required to understand complex problems. Therefore when the solution 'feels right' the strategy can be ended and the solution to the issue or problem accepted by the individual. Another explanation for this finding could be that of 'synaesthesias', (as discussed in Chapter Two) with the Visual modality and the Kinaesthetic modality overlapping together as part of the learning strategy. Synaesthesias occur when the representation combines different modalities. Therefore an internal representation of an experience might include all of the Visual, Auditory and Kinaesthetic modalities. The move from the person's lead system to preferred systems is an example of a strong

synaesthesia. According to Dilts et al (1980) synaesthesias constitute a large portion of the human meaning-making process and are the root of knowledge, choice and communication and can be used to secure any behavioural outcome. Therefore the close relationship of the two modalities is suggested within the learning strategy, but with no significant correlative relationship found other than with the preferred learning style of Theorist from these data. However during the analysis of the body positions it was apparent that students rarely demonstrated positions associated with one representational system only, and would often appear to access Visual, Kinaesthetic and Auditory representations internally in response to specific questions. The language they used and the predicates within it would not necessarily demonstrate as many modalities in articulating the answer to the question. It could be suggested, however, that they were perhaps accessing and running through a number of modalities internally in response to the questions posed in relation to their approaches to learning and problem solving, before providing the answer to the question. For example in considering the question posed and therefore the experience considered, a student might visualise a situation, have internal dialogue related to this, check this out with a feeling, add a more refined visualisation, check again with the internal dialogue or feelings (all which are evident through body positions) and then articulate verbally that the situation 'looks' a certain way to them. In this way the body positions include more modalities than the language does, yet the Visual predicate in the above example might suggest their preferred system.

Another significant finding is that the Activist learning style also has a positive correlation with the Smell modality (IPTP), yet interestingly has a negative relationship with the Visual modality (IPTP). This appears much different from the finding above related to the Theorist style and is equally interesting. As an Activist

has a tendency to launch themselves into activities, the phrase 'look before you leap' does not seem to be considered by them. They have a cavalier approach to new situations in that they will try anything and think about the consequences later. The Activist approach is a very busy one. New experiences are relished but long-term implementation and consolidation loses its interest for them (Keal, 1998, Goodman-Brown, 2003). Therefore the considered approach of the person with a Theorist learning style preference would actually demonstrate more realistically the concept of looking before they leap. Visualisation is more important to those 'considering' the situation in relation to learning or the bigger picture, as the LSQ asks in one of the 'Theorist' questions, which goes towards determining learning style from the LSQ. Some students would instead tend to want to jump in without gaining an overview of the situation, a very Activist trait. This could explain the suggestion that Honey and Mumford (1992) make, that the Activist quickly gets bored once the initial challenge is over and explanations need to be found. It would also suggest a more superficial or surface approach to learning as suggested by Marton and Säljö (1976). Its relationship to the smell modality (usually compartmentalised within the Kinaesthetic modality, as it is not a widely used modality generally, O'Connor and Lages, 2004) is also interesting. If the notion proposed by Rose and Nicholl (1997, p28) is accepted, that the human brain is a 'Triune Brain', and that the first and second parts of the human brain (the brain stem and the limbic system) remain similar to the brain structures of other mammals, then the notion of smell playing an important part becomes more relevant. Mammals often use the sense of smell as a primary sense in relating to their environments. It is used to seek out food, seek other fellow species members to reproduce with, and also to be alerted about the presence of threats (another survival ability). This includes the necessity of emotional arousal, such as aggression.

According to Baggaley (2001), the limbic system controls instinctive behaviour such as fight or flight stress responses. The system plays a complex and important role in the expression of drives and emotion. There is a strong link between the limbic system and the olfactory system. It is suggested that the sense of smell is a powerful sense because of its potential for evoking emotional responses and memories. As discussed in Chapter Four the 'here and now' nature of the Activist fits in with the here and now, 'aggressive nature' of males which Maccoby and Jacklin (1974) found was evident across many cultures (Gross, 1993). Therefore if sense of smell were linked to emotions and reactions to the very present moment, this would explain its prominence within the Activist learning style preference.

Therefore the most important finding is the link between Theorist learning style and Visualisation/Kinaesthetic modalities. This suggests that if an individual or group prefer Honey and Mumford's (1992) Theorist learning style, then if the teacher facilitates a state whereby the students use the Visual modality, this should enhance their approach to the learning as this modality is preferred and closely related with this style according to the findings of this study. Observations from the interviews add support to this suggestion, with the Visual modality appearing predominant throughout. Taking account of the Kinaesthetic system also could further enhance learning. Another suggestion is that the Activist learning style negatively correlates with the Visual modality, which does align with the definitions of an Activist as learning best from engaging quickly in situations. As this is closely related to the Smell modality according to the findings from the questionnaire package, use of Olfactory mechanisms (such as use aromatherapy oils) may enhance the learning for those identified as having Activist learning style preferences whilst engaged in

practical 'here and now' activities. Care needs to be taken, however, as individuals are complex, and dynamics are affected by group situations, so even though these findings show particular preferences, an approach that accounts for all modalities should still be considered. Extrapolating individual information into group data provides a majority view , which is relevant, but care needs to be taken to ensure individual needs are still being met within that, therefore a multi modal approach is still important.

Significant correlations are only made between the learning style preference and the IPTP or the PPMI but not both. There does not seem to be any significant correlation between the Visual and Kinaesthetic modalities, nor with any modality and the Reflector/Pragmatist styles. This could benefit from further investigation. Stewart (2004) highlights the need to be careful in stereotyping people into particular styles as a form of crude reductionism. In doing so other forms of learning may be neglected. Therefore even though some learning styles do not appear to be significant within this study they should not necessarily be totally dismissed. It is important to recognise that although these findings do indicate more specific preferences for student nurses, it is accepted that varied, multi-sensory learning approaches and environments, including differing activities, which meet all learning style preferences, should be encouraged.

An interesting finding is the relationships between the learning styles mentioned above and the particular modalities. The emphasis on the Visual Modality linked to the Theorist style is interesting because of its linguistic derivation and the notion of the development of theories literally meaning having a particular point of view. For example, Einstein is reported to have developed his theory of relativity by visualising

himself riding on a photon of light (Buzan 1995; Porter and Porter, 1997). McDermott and Shircore (1999) state that Einstein would often have 'thought experiments' where he visualised what may happen in certain circumstances. The Visual modality appears prominent in this study and needs to be looked at in more detail in order to establish how students can be facilitated to utilise it effectively in order to enhance their learning. However as mentioned already, it should always be remembered that a multi-modal approach should be considered, therefore ensuring any preference is accounted for in the learning environment. O'Connor and Seymour (1994) state that excellent teachers consistently teach in pictures, sounds and feelings. Also the Activist style and its relationship to the Smell modality is a useful notion. If smell can clearly evoke memories then learning can take place if olfactory means are used in a learning environment utilised by the Activist. Jensen (1995) suggests that the use of various and specific aromas can enhance learning and creative ability. Memories can be invoked simply by smelling an aroma similar to one that was familiar to an individual in the past, such as the smell of candy floss reminding people of funfairs and so on.

In addition to the main research question discussed above, this study posed a number of sub-research questions. These are discussed in the next section.

6.2.2 What Are The Preferred Learning Styles Of Student Nurses?

It is recognised that there are criticisms of Honey and Mumfords' learning styles (Coffield et al 2004) yet there is still value in utilising the styles in developing students' self awareness and metacognition in their understanding of how they learn. Duff (1997) was critical of the predictive validity of the Honey and Mumford tool,

but suggests some internal consistency with it, supporting the notion of its use with particular samples and suggests that it does provide useful descriptors of how a broad category of learner operates. Based on the norms generated from the respondents, 'Theorist' is the preferred learning style. 'Activist' and 'Pragmatist' followed this, and 'Reflector' was least commonly preferred. This is noted as a surprise as these results differ from previous research undertaken by the author (Burton, 1997), which found the Reflector style to be the most favoured, followed by Activist, Pragmatist and Theorist, amongst pre-registration nurse students undertaking the project 2000 training. This could be due to the fact of changing emphasis within Nurse Education courses or the type of student nurse entering the courses. It would suggest a change in approach is needed in order to reflect this change, such as approaches that utilise the conclusion making abilities of the student with a Theorist learning style preference. The differences could be accounted for by the fact that in the 1997 study the sample was mainly taken from the common foundation programme (CFP) students, whereas, this current study sample was from a variety of stages in the course. Secondly the CFP students had an emphasis placed on the nature of reflection within their course (which the current students also do), however the current sample undertaking both types of training, project 2000 and the curriculum derived from the MADEP (DOH, 1999) recommendations, includes more emphasis on evidence and problem-based approaches than their predecessors. A previous informal study by the author prior to the 1997 study also produced similar results from pre-registration nursing students, with Reflector being the preferred style. The previous sets of results seemed to show some consistency with Honey and Mumford's (1992) findings with student nurses and a very similar piece of research carried out by Cavanagh, Hogan and Ramgopal (1994), the results of which show the preferred learning style was Reflector, followed

by 'Activist', 'Pragmatist' and 'Theorist'. A study by Mcleod et al (1995) showed the learning styles preferences of speech pathology students as predominantly Reflector and Activist, with few Theorist and Pragmatist preferences, however the preference for Activist style increased as the course went on. A study by Dux (1989) on general (now Adult branch) nursing students also showed preferences for Reflector and Activist styles with few preferring Theorist and Pragmatist styles. Shaw and Marlow (1999) investigated science students and also found the Reflector learning style to be most preferred. According to Broad et al (2004), the preferred learning style of accounting students using a virtual learning environment was Reflector, with a strong showing of Theorist and Pragmatist styles. They suggest that the Reflector or Theorist preference is associated with academic life where a student is expected to think more carefully and question the subject area, where Activist/ Pragmatist is preferred where the subject is applied in practice. This aspect creates a difficulty in considering learning styles for student nurses therefore, as nurse education is a straightforward fifty-fifty percent split between theory and practice, although there is now a more academic emphasis on the theory aspect. This could explain why the Activist style preference was a close second, as the environment where student nurses operate for half of their course requires them to be active within the workplace and with the people they are caring for.

The above findings from the literature suggest therefore that the Theorist style as a group preference is rare. However this could be down to the fact that many of the above studies calculated the strength of preference based on the mean score of the population. Although this was also calculated with this particular sample, based on the norms developed from the sample, all styles showed a moderate preference, other than

the Theorist learning style where the moderate *and* strong preference were both statistically significant. To get a more accurate indication of actual preference the strength of preferences were summated to give an overall score for each style, whereby the Theorist style was highest scoring. A possible explanation for this style being preferred with this particular sample is that of the environmental effects to which the students are exposed. As the approaches and philosophies to Nurse Education have changed, so have the environmental situations (in terms of where they learn theory). Thompson (2003) argues that factors such as attitudes, values, beliefs and orientations to learning are developed in differing academic environments. He argues that the evidence from his study suggests that different academic disciplines create distinctly different environments as a consequence of their preference for alternative goals for undergraduates/postgraduates. Also emphasis on different teaching goals and reliance on differing instructional approaches have an effect. The result of this is that the different academic environments have a socializing influence on the abilities, interests and learning of the students. Thompson (2003) concludes that students learn what they study, such as the repertoire of perceptions, skills and values that are rewarded and reinforced by the academic discipline within which they belong. Nursing is now based in an academic setting where there is an emphasis on academic approaches to their learning. Therefore the effect of the environment in changing learning style preference needs to be taken into account. As Cavanagh et al (1994) state, the possibility must exist that an individual's approach to learning is influenced by the environment in which the learning occurs. This is also supported by Vermetten et al (1999), who suggest that the learner adapts style to changing environments. Duff (1997) suggests that there is a possibility that learning style categories should be made more sophisticated to 'fit in' to Higher Education

environments. It must be remembered that Honey and Mumford's styles were first developed in relation to managers. However the broad descriptors do appear to be useful in demonstrating differing approaches to learning by individuals and groups.

The favoured learning style of Theorist shown to be the most preferred in this study suggests that the learners' are able to adapt observations into complex logical arguments and think through problems step by step (Valley, 1996). Care needs to be taken however, because it must be remembered that learning style is a factor that is applied to an individual, whereas all of the above results, including this study, discuss the results in terms of collective issues. Learning style trends are able to be identified and do give a good indication of group preferences, however the emphasis on learning style should mainly be used to assist individuals in developing their approaches to learning. Cavanagh et al (1994) support this, stating that group data are likely to produce information about the 'normal' student, yet the focus should be directed to the individual student. The suggestion from the questionnaire package findings in this study are that the 'normal' student prefers the Theorist learning style, although it must be accepted that individual factors might be very different with individuals preferring different styles. Therefore although some recommendations towards the approaches to Nurse Education will be proposed in light of the findings, it is important to remember that a variety of teaching and learning approaches should be used to meet the needs of individuals within groups of student nurses. There is a danger in focussing on one learning style that some individuals could miss out on beneficial learning experiences.

Thus it appears with this sample that the preferred learning style of pre-registration students is changing and moving towards that of 'Theorist' style. This is also

positively related to the Visual Modality as discussed above. This therefore suggests the idea of assisting students to learn by utilising the Visual modality would be beneficial, as it is both the preferred modality and relates well to the preferred style from this sample, although the tension between individual and group data should be recognised and an attempt to incorporate all modalities considered. Activities can be developed to take advantage of this finding, or as a basic awareness of the need to develop a wider range of learning styles within students. Student nurses are now firmly established in Higher Education yet also have to operate practically in physical settings working with real people and problems. The question is what means can be used to enable students to access the Visual modality and align this with problem solving and developing ideas and conclusions.

A note of caution must be expressed in that these differ from previous research findings, and the fact that Duff (1997) actually questions some of the validity of the LSQ, (although argues that it has internal consistency), which is also highlighted by Coffield et al (2004). Duff and Duffy (2002) noted differences between business and health studies students in relation to the use of learning styles as a predictor of academic performance, again suggesting an environmental effect on the results and raising questions over the value of the tool in HE. It is important to remember that although nursing is in the Higher Education arena, just as much learning takes place in practical setting environments. Sutcliffe (1993) points out that there may be a discrepancy between the learning styles of nurses due to the dual nature of their learning. However the tool is used widely in education and, as already mentioned, Cavanagh et al (1994) state that the Honey and Mumford LSQ is a tool that has been used with some success with nursing students. Valley (1996) states that Honey and

Mumford's LSQ classifications are well known among commercial trainers and seem to be given a significant amount of attention in education. Hayes and Allinson (1988) also suggest care should be taken when using the LSQ but point out that it may be more reliable than the LSI of Kolb (1976), has better face validity and that the behavioural statements at least look as though they measure what they are supposed to be measuring. Peter Honey, in an interview with DelahoUssaye (2002) argues that learning styles can be predicted by behaviours yet their preference is harder to measure in a predictable way. This is because preferences are about likes and dislikes and are more subjective. However the behaviours typical of styles can be observed. Therefore on the basis of these findings the students having being identified as having a preference for the Theorist style are more aligned to being involved in activities where they utilise concepts, models and systems and need to develop ideas (Mumford, 1995). Again, it appears that the main value of discovering a learning style preference is in developing self -awareness for individuals and groups about how they learn, and care needs to be taken in adopting purely specialised approaches based on 'group' preferences

An interesting aspect is that the Theorist style seems to reflect the type of learning environments in which student nurses education is now being delivered. Cunningham (1994) argued that there is a dichotomy for students between theory and practice, where the classroom aspects deliver subject knowledge, and practice where most of the learning is actually applied. Cope et al (2000) pointed out that students often had difficulties in making connections between theory and practice. This was also recognised by Kapborg and Fischbein (1998), who found that students noticed vast differences between classroom taught subjects and the reality of practice. Therefore, as Corlett (2000) suggests, students should be provided with experiential learning,

including problem based learning and reflection. These approaches could seem to fit with the concept of what works best for an individual or a group with a preference for a Theorist learning style where conclusions from reality are drawn and also for students with a preference for the other learning styles as the characteristics of each align to some stage in a problem based learning approach. According to Honey and Mumford (1995) the Theorist learning style is related to drawing conclusions from experiences, as part of the learning cycle. They describe this as an ability of having insights, which is an extra dimension to knowledge or skill, as it is the wisdom to express conclusions and to generalise from particular experiences. Therefore problem based learning approaches, which are becoming more popular as a method in Nurse Education curricula (Darvill, 2003) yet are still in their infancy, may be of some value to the student(s) with a preference for the Theorist learning style and indeed those with a preference for the other styles. Darvill's (2003) study found that using a problem based learning approach helped students use their previous experiences and develop their knowledge through the process. This enhanced their problem solving skills, although the facilitators found some difficulties in using this approach due to lack of clarity and direction within the process. The point that Vermunt (1998) makes, that instructional designs usually take little account of the learner and dictates how the learner needs to behave, is important. Accepting the fact that environments may change, all learning styles need to be recognised. An awareness of the process where the learner is actively involved in building representations and making interpretations about it from their knowledge is necessary in the current educational climate for nurses. Durgahee (1998) found that students sometimes did not respond well to such approaches as they had expectations of being passive recipients of knowledge from the professional academic expert in the field. This leads to problems as students

believe that the educator is responsible for their learning, and should 'spoon feed' the required knowledge to them. However it may be argued that someone with a preference for a Theorist learning style may enjoy the drawing conclusions and problem solving aspect, those with Activist preference may enjoy getting to grips with identifying and formulating problems, the Reflector might gain learning from observing the process and gathering data, and the Pragmatist in providing and testing solutions.

6.2.3 What Are The Preferred Internal Representational Systems Of Student Nurses?

The Visual modality is the preferred internal representational system based on both questionnaires of the 'Identify your Preferred Thinking Pattern' (IPTP), Knight (1995) and 'The 'Preferred Perceptual Modality Inventory' (PPMI), McVoy and Markowski (1998). The Kinaesthetic modality is the second favourite; with Auditory least preferred using both tools. Smell and Taste were included, but were collapsed into the Kinaesthetic category as they are less frequently used as ways of gaining information about the world (Grinder and Bandler, 1976). Also the qualitative data analysis showed the Visual modality to be predominant in both the predicates (verbal language) used by the participants and the body positions (non-verbal language) they demonstrated whilst being interviewed, again followed by the Kinaesthetic and Auditory modalities. The participants in this study used very 'rich' language to describe their visualisations. This included vivid descriptions of the actual content of the internally seen pictures, such as colours, size, location and brightness etc. An important factor highlighted was whether or not they were associated within the picture, as if seeing it through their own eyes, or whether they were disassociated from the picture, as if looking at themselves within the picture. Watching the students

describing these experiences was almost at times like watching them perform an action replay of them, as they were so specific. The Kinaesthetic aspects were equally as interesting. The body language aspects of where students indicated they were having feelings and how these 'moved' etc were quite amazing to observe. Kinaesthetic language such as *'Banging my head against a brick wall'*, sometimes vividly described how frustrating their learning experiences could be. Therefore this suggests that this modality is a powerful factor and one that reinforces, or discounts the learning experience. The predicates used demonstrate this well and do give an indication of how students are coping with their learning experience. For example this might indicate that the students may verify the success of their learning by their feelings. Therefore the teacher should assist students to access the Kinaesthetic modality to reinforce any learning, by asking them to notice their feelings in relation to the learning issue. It must be remembered however, that just as learning styles are a very individual concept, so is the preferred internal modality. Therefore the main benefit for the individual is in gaining awareness of how they respond to, or operate in certain circumstances. Although some conclusions can apply to groups based on these findings it is important to remember that the data is extrapolated from individuals and presented as group majority preferences, and care still needs to be taken in ensuring that all individuals within groups do find themselves in learning environments where all modalities (internal and external) are stimulated in some form.

It may seem 'obvious' that the Visual modality should be preferred, as Rose and Nicholl (1997) point out that 70 percent of the body's sensory receptors are located in the eyes. They state that according to some studies the Visual preference dominates when people reach adulthood. Marieb (1991) states that the largest of all the brain's

cortical areas are related to receiving and processing Visual information. Hobson (1999) states that vision is a biological process with some stable formal properties that are independent of culture or personal history. He states that vision is sensitivity to light, which might be more or less vivid and detailed. However the concept forwarded by Hobson is that visualising occurs whether awake or asleep, linking to the aspect of visualising being an external or internal ability. Jensen (1995) states that the brain stem (or reptilian brain) and the mid brain (limbic system) are wired up to respond to archetypes and partial representations, and this occurs instantaneously. There are a greater number of neural fibres extending from the mid brain into the neo-cortex than from the neo-cortex to the mid brain. Again, when considering the concept of survival it makes sense to have a system such as the Visual modality available. When the brain sees a threat it can activate the area of the brain needed to respond to it very quickly. However the Visual system does much more than merely store and input Visual data. Buzan (1995) discusses the difference between how light reflects from an object, travels through a lens, and is for all intents and purposes copied onto a plate or film and how the human brain can process the same information holographically. The human brain is able to change the colour of the image, spin it around, move it and make it larger or smaller at will. Another aspect discussed by Grinder and Bandler (1976) is that humans can turn Visual imagery into language (describing the images represented internally) or language into Visual imagery (picturing what an experience looked like or may look like). A simple example of this is by asking an individual to visualise the face of someone they like, and then asking them to describe it in detail.

The strongest aspect to be gained from this finding is that as the Visual modality is so prominent, then it should be easily accessed to promote learning. Just by the very fact that humans have their eyes open gives us the means to help them learn from what

they see, externally or internally. Beddoes-Jones (1999) suggests that Visual external thinking involves the need to see something physically, such as a diagram or picture. Visual internal thinking involves creating pictures 'in your mind's eye'. The participants interviewed tended to describe their experiences visually and with great detail. However care must be taken to make sure that the Visual information is stimulating. Race (2001) states that students do not seem to benefit from copying things from a screen or board as they do not actually engage or think about the material being presented. This therefore results in a very superficial level of learning. Hobson (1999) also points out that the eyelid is a famously objective judge of subjective experience, as anyone addressing a lecture theatre of half-asleep students would know. Therefore great thought is needed as to what type of Visual information is presented to the students externally, so that they can make best use of it and how best to assist them to access the Visual modality internally. Jensen (1995) suggests that 90 percent of all information that comes to the brain is Visual in form. The brain responds to colour, lightness and darkness, motion, form and depth (all submodalities). Therefore if we carefully consider these formats then Visual tools to enhance learning can be developed. Again it must be reiterated that these preferences were highlighted at an individual level and extrapolated on a collective level, so even though the Visual modality was preferred it must be remembered that individuals utilise different modalities, for different purposes and in different situations, so to accept these findings without caution and not including consideration of the other modalities would be perilous. However, the use of Visual tools for learning and the use of metaphor to promote use of the Visual (and other) sensory submodalities will be further discussed later.

From these findings consideration should be given to the aspect that, although it is a sense utilised by human beings, visualising could vary widely between individuals, so care needs to be taken in the presentation of material. Buzan (1995) states that as we have become (mistakenly) comfortable with normal sentence structure, we assume the written version of this is the best way to remember verbal images and ideas. This leads to students being expected to take notes from the lecturer or the board/screen. The individual differences in students can easily be disregarded within this process. According to Jensen (1995) if the survival aspect is accepted, this suggests that individuals are programmed to learn in order to get the 'edge'. Therefore traditional teaching is incompatible to the brain's natural design. The five senses are taken in and each individually prioritised. Cohen (1996) suggests that this individualisation of perception is an important factor. Perception of Visual stimuli such as a red rose is possible by more than one individual but it is impossible to know how another experiences such stimuli, i.e. no one could ever know whether someone else's direct experience of 'red' is the same as theirs. Buzan (1988) states that two individuals may experience the processing of light vibration through the eye but it is impossible to tell if the light vibration is perceived similarly, even if they recognise the object from which the light is reflecting. It is not the purpose of this study to discuss the concept of perception to great depth, nor the biological basis of the Visual modality in too much detail, only to accept the fact that this modality is preferred within this population. In any case, other sensory modalities should also be included to further enhance the experience of learning for individuals or groups of student nurses.

What is interesting about this finding is the variety of methods that can be utilised to include the Visual modality as a mode of learning. A representation of a leaf,

visualised in the minds eye, is a metaphor for the actual object itself (Harland, 2001). This helps to make sense of what the symbolic representation is. Therefore the Visual modality can be invoked through metaphor. Battino (2002) describes a metaphor as a word or phrase that denotes an object or idea in place of another, by suggesting a likeness or analogy between them. Another description he gives is that it may be regarded as a compressed simile, i.e. a shortened version or account of an object, issue or situation representing something else. Owen (2001) describes a metaphor as a powerful device for shaping, perception and experience. Concepts can be introduced and changed through the use of metaphor making it possible for them to be understood differently, therefore changing a person's perception of the world and their ideas about it. De Lozier (2001) states that stories close the gap between experience as a human being and the theories created to explain experience. This concept is pertinent in light of the findings in this study in relation to the preferred Theorist learning style, where individuals 'make conclusions from reality'. In response to the interviews the students were delivering very clear stories of their learning experiences, or how they would approach certain things. Some students would imagine very real situations and how they would approach them and be able to give very clear explanations of these. As experiences can quite easily be demonstrated as stories, both teachers and students can make use of them to explain theories, or indeed to highlight conclusions drawn from real world experiences. These stories or metaphors need to be more closely scrutinised as they provide rich sensory information about how individuals interpret the world, and therefore this is a valuable tool. With more rich stories to work from a more accurate 'picture' of the learning aspects can be created and demonstrated.

6.2.4 What Are The Relationships Between The Learning Style Preferences And Specific Internal Representational Preferences Of Student Nurses?

These have already been discussed in section 6.2.1. Although there are not significant relationships between all learning styles and all modalities, the significant findings do however provide a basis on which considerations can be made for developments in Nurse Education.

6.2.5 What Are The Differences In Learning Style Preferences By Age?

There is a positive correlation between the Theorist style and age and a negative correlation with Activist and age. Therefore this suggests the older a student is they are less likely to prefer Activist style and more likely to prefer Theorist style and vice versa. In this study 18-28 year olds were found to prefer the Activist learning style. Older students, 29-45 year olds, prefer Theorist learning style. The 46-50 year olds group were found to prefer Pragmatist learning style. Finally the 51-55 year olds preferred Reflector learning style. Honey and Mumford (1992) do not give an indication of age differences in their accounts of their learning styles, although they do present data related to occupational groups, cultural differences and gender. Cavanagh et al (1994) did attempt to investigate age and learning style, yet found no significant relationship for particular learning styles and age. Many other studies (Honey and Mumford, 1992; Duff, 1997, Duff and Duffy, 2002) did not investigate age as an aspect of learning style influence. Shaw and Marlow (1999) did include which year of study students were in; yet found no significant results in relation to learning styles. Even though the mean age of students was calculated in this particular study it was not investigated in relation to learning style. However the findings from this study are consistent with a study by Furnham et al (1999) who found significant positive correlations with the Theorist and Reflector Styles and age and similarly a

negative correlation between Activist learning style and age. In looking at these results the adages of youth being impetuous and older being wiser appear to take shape. The Activists are more likely to be younger, jumping in to experiences, with the older (already experienced) students drawing more conclusions related to their experiences, in their approaches to learning. The age aspect in relation to learning styles could perhaps be investigated further in order to enhance the learning needs of student nurses of all ages.

Although the Theorist learning style is predominant in this study the largest age group (36 percent) is under 22 years of age. This should suggest that the Activist learning style should be predominant, but this was a close second preference overall. This may be related to the fact that environment shapes learning style preference as already discussed. Jarvis et al (2003) suggest that learning is about making sense of experiences and that social contexts influence learning therefore if this is accepted it could be argued that the current approach to Nurse Education is shaping this particular learning style preference amongst students.

6.2.6 What Are The Differences In Learning Style Preferences By Gender?

According to these data based on the respondents' norms females prefer Theorist learning style and the males in the sample prefer Activist learning style. This is almost the opposite of what Honey and Mumford (1992) in the Manual of Learning Styles state are the norms for the different genders, where females were found to be more Activist than males and males had a slightly stronger preference for Theorist and Pragmatist. However Honey and Mumford state that these were not statistically significant findings. Shaw and Marlow (1999) found that there were no real

significant differences in gender preferences for style, although males did tend towards the Theorist style. The findings from this study were similar to those found in a previous study (Burton, 1997). An explanation could perhaps be found in the research mentioned earlier of Maccoby and Jacklin (1974) who found that in most cultures males (especially younger males) show more aggressive behaviours than females. The possible suggestion for this is that the 'here and now' nature of the Activist fits in with the here and now, 'aggressive nature' of males. Aggression is seen as an aspect of the Extravert personality trait of Eysenck (Furnham et al, 2001). Furnham et al (1999) also found that the Activist learning style correlated significantly with the Eysenck personality inventory categorisation of Extravert and suggest that this is highly linked to impulsivity, a characteristic of the Activist learning style. Both of these studies, although critical of Honey and Mumfords' LSQ still produced results to discuss in relation to the styles themselves, and provided an indication of personality characteristics, therefore on some level accepting their value in relation to raising awareness about learning.

6.2.7 What Are The Differences In Internal Representational Preferences By Age?

The Visual modality is preferred in age groups from 18- 40 on both the IPTP and the PPMI. The 41-45 year olds have a higher score in the Kinaesthetic total (including smell and taste) from the IPTP followed by the Visual modality. In the PPMI, although the Visual modality is the highest scoring preferred representational system, the Auditory modality scores higher than the Kinaesthetic. In 46-50 year olds the Kinaesthetic modality is preferred, followed by Visual and Auditory. The only significant finding is that there is a positive correlation, (R=. 096, significance=0.45)

of age group with the Kinaesthetic modality on the PPMI, suggesting that the older the person is the more likely they are to score highly on the Kinaesthetic modality. A suggestion for this is that the older person is perhaps likely to rely on the 'checking' mechanism of the Kinaesthetic system before responding to situations, whereas the younger person may not consider or 'check the' consequences via this system. If more experiences give rise to more knowledge, then the older person has more situations to visualise and check against, whereas the younger person may only be speculating through their visualisation, as they have not as yet built up a wide enough range of experiences to check against. However, again it is unwise to generalise such findings and explain why this should be so. It is difficult to explain these data particularly in relation to the fact that the majority of students are under 22. However general processes of ageing might also account for this yet this is not a fact or a claim here. Marieb (1991) states that although age brings some cognitive decline in spatial ability, speed of perception, decision-making, reaction time and memory, these are not significant until a healthy person reaches seventy years of age. Gross (1993) points out that increasing age processes bring about changes whereby the individual demonstrates the following principles: Smaller, slower, weaker, lesser and fewer throughout a number of the human physiological systems. Therefore such changes as eyesight deterioration for example could give rise to these changes in modality preference if the person needs to rely on differing modalities. It is important again to emphasise here the aspect of individual differences, in different situations at different times and how it is difficult to generalise across populations with sweeping factual statements.

6.2.8 What Are The Differences In Internal Representational Preferences By Gender?

From these data both males and females prefer the Visual modality on both the IPTP and the PPMI. This was followed by the Kinaesthetic modality and finally the Auditory modality. The use of methods whereby students are primarily encouraged to access the Visual modality should be encouraged, whilst still remembering that this should not be at the cost of the other modalities. It is recognised that this may be difficult, particularly if the teacher relies on one particular modality. An awareness of the use of all modalities should be encouraged in educational settings for student nurses.

Therefore although these findings do give an indication of preferred learning styles and preferred internal representational systems these should only be considered as useful in raising awareness in relation to learning, as they are dynamic and complex concepts. To follow one route only in relation to these findings may exclude learners with different styles and preferences for different internal representational systems, at different times and situations of their learning process.

6.3 Use of The Findings in Developing Approaches Within Nurse Education

It is now necessary to discuss how these findings relate to the development of approaches in Nurse Education. In reflecting on the findings from these data it is firstly necessary to organise the developing ideas in relation to the overarching themes used as a framework, that is Nurse Education, cognitive psychology and NLP. Finally how these findings should be applied on the curricular level, classroom level and when working with individual students will form a final framework for the discussion.

6.3.1 Findings In Relation to Nurse Education

6.3.1.1 Accepting the Findings

It is appreciated that there are a number of factors that can affect the acceptance of these findings in relation to Nurse Education. Firstly it is recognised that there are criticisms in relation to the validity of Honey and Mumford's learning styles by Coffield et al (2004). It is accepted that the main value in understanding them is for student nurses to raise their awareness of theirs and others' learning styles. Also, care needs to be taken in generalising these findings to whole groups as the very nature of the study was based on very individual, internal aspects from the population and sample studied. The findings related to the internal representational systems, discussed as an aspect of NLP, is a particular example of this.

Whatever the learning style that is presented individually or as a strong preference within a group, Student Nurses need to understand the theory behind the use of various techniques and approaches related to various styles and therefore be able to consider when it is appropriate for them to employ such techniques (Price, 2003). There needs to be engagement, reflection and evidence gathering, ideas generating and problem solving followed by implementation in practice. Bradshaw (2001) also proposes that the idea of wisdom is an important factor, stating that nurses need wisdom as well as knowledge and skills. Developing wisdom could be argued to be aligned to the Theorist learning style trait (preferred from these findings within this sample), as rational, intellectual and objective approaches to situations are developed (Furnham et al, 1999). As the Visual modality was found to be preferred in all

findings from the various methods used in this study (the IPTP, PPMI, predicates and body position analysis), the use of methods to stimulate this modality should be encouraged. This would include the use of Visual tools (Caviglioli et al, 2002) to enhance stimulation externally and the use of metaphor to enhance internal Visual stimulation. However, care must be taken in quickly generalising these findings as modality preferences are dynamic, changeable and highly individual so all internal representational systems still need to be considered and stimulated. There is a danger that to follow the purely Visual approach alone, some students would be disadvantaged.

6.3.1.2 The Context of Nurse Education

In relation to Nurse Education, the literature discussed in Chapter Two revealed concerns related to the placing of Nurse Education within the Higher Education setting and the theory-practice gap. The suggestion by Cunningham (1994) that there are two different worlds: the classroom and practice (where most of what is needed to be learned by nurses is learned) is an important one. If emphasis is placed on one or the other then the learning for the student is not a complete whole and does not provide integration. Watson and Thompson (2004) argue that universities are not the ideal environments for Nurse Education; although a return to the NHS is out of the question, university education is offering them nothing more than an enhanced further education qualification. Students' unease with the academic aspect of their training was apparent in this research. One student in this study suggested that they had a sickly feeling every time they walked into the university in relation to their learning, and another actually stated that they hated the university setting. Watson and Thompson (2004) suggest that university should be left for post qualifying,

postgraduate Nurse Education and research. However, although this is a valid argument, as exemplified by the difficulties faced by student nurses, these differences could be challenged if the level of approaches to learning and its place within the relevant context is recognised and rewarded. Kenny (2004) argues that the current placement of Nurse Education faces conditions where political, economic and service priorities shape it for its own ends. Nurse Education should strive to focus on holism and humanism whilst developing nursing skills and competencies. In doing so the challenges of placement in Higher Education and the theory practice gap could be addressed.

6.3.1.3 Problem Based Learning

Fowler and Mayes (2000) discuss the notion of 'situativity' where the learner finds meaning from the situation. Learning should be authentic to the social context where the skills are actually embedded. Problem based-learning (PBL) is an example of how this could be achieved and would perhaps suit all learning style preferences within its various stages. However PBL is not without criticism and this is discussed later in this section. This may need a change in approach to teaching and learning or the structure of nursing curricula within the Higher Education system. However current methods and structures are well established so making some changes could prove problematic. Fowler and Mayes (2000) point out that to belong to a community of practice the students need imagination gained through orientation and exploration, engagement through participation, and alignment in connecting ideas and frameworks. This supports the arguments of Cope et al (2000) and Vermetten et al (1999) regarding the tensions between demonstrating higher order knowledge and practical competency in differing environments. There are examples in findings from the interview data where

students express their preference for the practice settings as areas for learning, almost to the point where the academic/ theory aspect of their training appears as an irritation, keeping them from what they feel they are there to learn, i.e. how to operate in practice. This does provide some cause for perplexity if the Theorist learning style is found to be the most preferred and does raise questions on the usefulness of the characteristic types associated with particular learning styles. Curricula built upon problem based learning approaches should help students utilise fact-finding skills and apply them to contextual based scenarios that truly reflect the areas, situations and people where they will be practising. Wilkie (2000) points out that PBL is presented *in the context* in which students are likely to encounter the situation in real life. This may satisfy the students' concerns over learning about practice yet may be problematic due to the students 'beliefs' of relying on knowledge being provided by the educator in the academic setting. This contextualisation could be a useful strategy for Nurse Education. The situation is provided first, problem solving and clinical reasoning are developed and applied, and learning is summarised and reflected upon (stages which reflect characteristics from all of the learning style preferences). Rather than theory being given then applied to practical situations, students can find and develop the relevant theory necessary arising from the situation, which at some stage of the process would suit those with particular learning style preferences, and be beneficial for those with the Theorist learning style preference as they can utilise their conclusion drawing traits. Secondly the students can learn both *about* the content, and more importantly *from* the process. Gallagher (2004) points out that developments with innovation in teaching and learning based on process initiatives, are useful in bridging the theory practice gap, including looking at the nature of the educators, their backgrounds and methods of assessment (such as the use of reflection). Boychuk-

Duchscher (2000) argues that current approaches to Nurse Education actually oppress students by dictating what is needed to be learned and how. She suggests that a more humanistic approach within curricula would give students more autonomy and social responsibility. In doing so, emphasis can be shifted from the product to the process. However the use of problem based learning is not straightforward, and is quite a difficult approach to manage, as compared to straight forward lecturing or demonstrating in practice. There is a need for strong facilitation and guidance, tolerance with ambiguity and flexibility, all of which are labour intensive, particularly if we also need to consider the learning styles of the students involved and deciding how the activities would be best delivered to suit their preferences throughout the process. Obviously it is provides new challenges for nurse educators to consider. Herreid (2003) suggests that authentic PBL is expensive and that there is no published quantitative data supporting its success. Ansari (2002) also found some dissatisfaction in pre-registration students, who cited concerns about the utility and relevance to their learning in many cases. Using PBL could also result in student dissatisfaction if the facilitation, guidance and direction do not meet their expectations of being taught relevant content to fit their practice, or if they feel it is a 'do it yourself' course. Herreid (2003) points out that some teachers believe PBL to be 'anything that is not a lecture' Therefore a confusion over what PBL actually is can add difficulties and limitations in its utility. If Problem-Based Learning is to be used it could be argued that the context needs to be the starting point for student nurses, together with appropriate support to facilitate learning. Removing the modular framework, and placing the focus in a context from which the students would find and develop relevant theory (as opposed to the context being suited to fit the theory), although a brave step, could herald a move to creating socially responsible, competent

autonomous nurses. This may be problematic however; as there are many contexts and it could be difficult in such an approach to ensure that all the students demonstrated the right level of understanding at the right time about the right things related to the contexts provided.

6.3.1.4 Modularisation

Camiah (1998) found that after the initial move to Higher Education, nurse teachers had a limited ability to deal with modularised programmes, and to convert modular content into curricular hours of theory and practice. Nurse teachers were found to be perpetuating traditional approaches to teaching instead of encouraging more student-centred approaches. This could be because traditional lecturing and demonstrating approaches might be more straightforward and easily manageable for nurse teachers. From the interview data, students tended to dislike pure lecture methods and pure self-direction. This suggests they would prefer some 'middle ground' where they do work themselves and still have direction. It appeared that students did prefer working in groups with some direction from tutors who have an understanding of the topics, or a subject specialist.

Modularisation could also be a barrier to using a problem based learning approach because of its relatively short-term nature and compartmentalisation of subject matter. Gass, Banks and Wilson (2004) suggest that modularisation within nursing courses (Mental Health nursing in this case) is actually a limiting factor in relation to learning and the professional development of nurses. They raise the question as to whether modular frameworks should be abolished as they compartmentalise and dilute the knowledge and skills actually required by the qualifying nurse through sharing with

other professional groups or subjects, and create difficulties in the support of students, particularly in relation to the need for reflection Although Clarke (2003) recognises the benefits of modules, in being small credit-worthy packages, that once completed are owned by the student, he also supports the argument against modularisation. As he points out, modules are standardised and produce pre-packaged teaching approaches, creating barriers between meaningful engagement of tutors, students and learning.

An approach with a start point (entry) and end point (qualification) based on recognised outcomes that nurses require to operate in the real world could be developed. Therefore each group could develop its own identity and approaches, yet still meet the required criteria. Biley and Smith (1999) suggest it is a move away from teacher controlled 'sage on the stage' approaches to a more student centered philosophy. However some teachers may find it difficult to change from this role and adapt new approaches to assisting their students to learn.

Carland et al (1994) argued that educators should understand how students think and react to situations and develop methodologies to support this. Vermunt (1998) argues that in instructional designs, the designer dictates how the learners need to behave in order to realise the objectives with little account taken of the learning processes Therefore teachers could be encouraged to develop methods to reduce the tensions between theory and practice and understand the representations that student nurses may utilise. However care must be taken in the development of such approaches. Pirrie (2001) argues that evidenced based practice is a reaction to attacks on quality and as such is also politically and economically driven. As she points out, learning methods should not be a hostage to these values of the moment, yet obviously all

factors need to be taken into account. Kenny and Kendall (2001), suggest that there are pressures on staff to devise ways of educating with reduced classroom contact to save costs, yet with increasing expectations of quality. However it has already been pointed out that if PBL is selected as one of the approaches, it is not necessarily cheap or easy to manage and can be work intensive for the educator. Perhaps organisational expectations should be challenged, if positive beneficial changes that are not just about making the best-fit approach to align with current structures are to be proposed. This could then lead to approaches that *develop* rules, as opposed to adhering to rules that do not fit, as appears to be the case in Nurse Education and its uneasy academic/practical situation. This would address the point made by Hayes and Allinson (1998) that rules do not change if they are not challenged, that organisations have implicit and explicit rules that prescribe the way that members behave, and these will not change as long as desired results continue to be accorded.

One way that PBL might be used to advantage is in helping to avoid the 'reality shock' for qualifying students entering the workforce, as suggested in the study by Kapborg and Fischbein (1998). Corlett (2000) suggests that students see little relevance in the theory taught at the time of their experiences in practice yet on reflection and with retrospection eventually see the value of it. Using PBL may assist students to integrate the theory in to their practice because they are seeking out, utilising and developing the relevant theory themselves. Cooke and Moyle (2002) found that students appreciated a PBL approach, finding it an experience that develops deep learning, was enjoyable, and integrated theory to practice. In this study, it appeared that students did still feel the need to be able to approach their educators and fellow students in finding out information and checking approaches. Many

anxieties were expressed regarding the passing of an assignment as a necessary 'hoop' to get through as opposed to considering the value of the learning itself. It may not be so easy however to change students' expectations of 'receiving' education to prepare them for practice rather than help them in developing skills whereby they can solve problems in practice.

6.3.2 Findings Related to Cognitive Psychology

It is now necessary to review the findings in relation to the framework of cognitive psychology developed within the literature review in Chapter Two. One of the main relationships to this field is the aspect of the Visual modality in terms of internal representational systems being preferred in all data from this study. This concurs with the notion of internal representations or 'Cognitive Maps' as discussed by Parkin, (2000). The students in this study described their experiences, giving specific examples, suggestions and the effects of any changes made to their representations internally. This relates well to the factors discussed by Colcombe and Wyer (2002) of representations used as generalisations (schema, scripts or prototypes) and those used to represent specific events (exemplars). It was evident that the students utilised representations from memory and could demonstrate planning for the future, or novel situations, quite easily through such representations. It is at this point where pertinent links between the data (emphasis on Visual modality), cognitive psychology and Neuro-Linguistic Programming (NLP) converge. The uses of this information within the classroom setting and with individuals can be aligned here. Again it must be reiterated that even though the Visual modality was preferred as an internal representational system, other modalities should not be ignored in the classroom setting or within the students ' learning experience. Caviglioli et al (2002) state that

we all have schemas formed by our external and internal experiences. An interesting factor, however, is that by using Visual tools (see Appendix Eight) a person is able to recreate such schema and maps from their internal representations in the public domain and compare and contrast them with others. By representing schema externally they can be added to adapted and changed. Particular aspects can be scrutinised in detail and exploded for further analysis. The Visual tool can be used to develop maps that students can absorb and understand and also for the students to utilise to identify and externalise their models of understanding. In doing so problem-solving approaches can be used and the Visual tool used as a method of drawing together conclusions. This would fit very neatly for students with any learning style whilst meeting the requirements of those with preferences of the Theorist learning style, by their being able to clearly externalise their internal representations of abstract concepts and their conclusions about the situation. Internal representations of the outside world are made use of by providing information that cognitive systems use to manipulate and draw conclusions about the environment before responding (Groome et al, 1999).

Dimopoulos et al (2003) state that although messages and meanings reside in language, a Visual illustration is a relatively transparent and unproblematic window to reality. They argue that they are autonomous systems of communication that produce images of reality bound up in the interests of social institutions. Visual images can be assessed in an independent way from written text. They suggest that the function of Visual images can be analytical and not merely descriptive of the situation. In their study they found that Visual imagery became more abstract and removed from pure pictorial representations of reality, suggesting that as higher order thinking was

developed students were able to respond to increasingly complex Visual images to explain theories. This alludes to what Best (1999) suggests that people use constructs to create a coherent 'story' about their experiences. This almost suggests a 'storyboard' approach to learning; with each frame becoming more complex and abstract as higher order learning is developed. This could be accounted for in the experiential learning cycle of experience, reflection, concluding, experimenting which reflects the learning styles of Honey and Mumford. The storyboard analogy is evident in the findings when the students were discussing their problem solving representations as a series of pictures of the problem in various stages. It is also a link between the use of Visual tools as an external reference to describe the stories or 'metaphors' of their internal experience. Another similar aspect is highlighted by Jewitt et al (2001) who looked at a multi-modal approach to learning in the classroom (seeing, doing and writing) where the teacher used Visual tools and demonstration to teach the particular concept. They found that Verbal realisation is an important factor and should not be ruled out of use in a classroom but that Visual realisation is very important and should definitely be included. The students' learning was transferred from verbal analogy to Visual analogy. They state that learning can no longer be considered a purely linguistic accomplishment. It is at this point where there appears to be disagreement with NLP, where linguistic aspects are a central element. Nancarrow et al (1996) state that operating (through the use of language) in the same representational system, as the respondent is important. The central tenet of NLP is that sensory specific language should be used that reflects how people store and retrieve information. Jewitt et al (2001) suggest that image, action and speech should be used together, but that care should be taken to ensure they reinforce each other. That is that the same message is delivered by each mode. Here the importance of 'covering' all modalities so that

individual representational preferences are still met within the group setting cannot be highlighted enough, as there is a danger that some individual students may not benefit from single modality approaches, even though it is evident that the Visual modality is preferred.

An important aspect which is crucial in facilitating students to utilise the Visual modality and one which does support the linguistic factor, is that speech should be used to assist students 'how to see' and Visual aspects used for students to be enabled 'what to see'. This also supports the concept proposed by Hartley (1998), in relation to cognitive psychology. Learning develops from inferences, expectations and making connections. The environmental influence is important, as a large amount of cognitive processing is related to the perceptual features of the learner and the task within the learning context. The aspect of submodalities in shaping these perceptions is important. A simple factor such as whether the student is associated or disassociated into the experience, as recognised in the findings from this study, can affect whether the student perceives it as a useful or limiting learning experience. Therefore consideration needs to be given to how these stimuli are delivered in group or classroom settings. Akinsaya and Williams (2004) found that the use of concepts maps in the classroom setting were beneficial in assisting students to learn at the conceptual level and provided a schematic summary of learning. In this way it is a format for explaining rules, concepts and their relationships and the intricacies of theories to the learner and vice versa, and also a way in which they can externalise their thoughts, values and understandings.

It appears that Visual tools can be used at differing levels of learning, from simplistic to abstract (abstract conceptualisation being the part of Kolb's 1976 learning cycle that the Theorist learning style preference is based upon). Cohen (2000) argues that hierarchical structures of representation have cognitive functions that operate on four principles, control, access, analogy and economy. The control functions include planning, monitoring and decision taking. In this study students did discuss experiences as if looking at sequences of pictures, and either checking them Kinaesthetically or through internal dialogue before making problem-solving decisions. Memory stores representations economically and includes methods of effective access to them. Students were able to give specific and vivid accounts of situations, that moments before they had not being thinking of, and that had been beyond awareness. Finally representation of knowledge facilitates the identification of useful analogies in order to make sense of it. Some students described their Visual representations as photographs, or as if on a TV screen or even like a rotary slide projector. In order to create an analogy, the person has to create an 'As If' frame. Hall and Bodenhamer (2000) describe an 'As If' frame as a useful tool for problem solving as it involves acting or pretending 'as if' a certain proposition or situation were true. Again this shows the holographic nature of the brain (Buzan, 1995) whereby any situation can be represented, changed and adapted on a purely internal cognitive level via the manipulation of the submodalities of the representation (colour, size, position etc). These factors can then be explained, leading to the externalisation of the internal representations of the learnings. These notions within the cognitive psychology domain relate to the representation of information suggested by Burton and Bodenhamer (2000), that humans represent in the form of nominal (sorted into categories), ordinal (compared or ranked against the qualities of other

representations), interval (comparison with even more detail) and ratio data (highlighting interrelationships and meaning between representations). Students quite easily identified the difference between successful and unsuccessful learning experiences, with such differences related to the colour, brightness and size of the Visual representations, at least suggesting the ability of ordinal and interval levels of representing. It should be noted however that these aspects may not be stable, but changeable with time, as Vermunt (1998) suggests, whereby learning is an active process based on interpretation, and these representations can change based on meanings that individuals attach to them.

Care must be taken to acknowledge that although these findings suggest the use of Visual methods to enhance learning this should not be at the expense of other modes. Markham (1989) suggests that all senses are important in imagination yet visualisation is a most precious possession of the individual. Tosey & Mathison (2003) argue that internal representations are unique to each individual and NLP recognises that there are not universal regularities in the content and structure of representations. Therefore there is a need to gather information about each individual's 'map of the world'. Although advocating the use of Visual tools in the classroom, it is clear that further use of NLP at an individual level is necessary to discover how students use their representations for their own learning. Students in this study, although demonstrating high usage of the Visual modality, had very different experiences at the submodality level. Some students had 'moving pictures' whilst others had 'stills' and vice versa in relation to successful and unsuccessful learning experiences. Therefore it is dangerous to assume that all students process information similarly. Although on a collective level these findings are relevant, it is necessary

that on an individual level, more information gathering be used to both elicit students' best individual approach to learning, and reinforce any learning they have been exposed to on a collective level.

6.3.3 Findings Related to Neuro-Linguistic Programming

In this section the findings in relation to NLP and its possible benefits in Nurse Education will be discussed. As discussed in Chapter Two, NLP is often criticised as it lacks empirical findings to substantiate the claims. Herbert et al (2000) suggest it is a 'pseudo-science' as it is based on largely unvalidated interventions, which are not empirically sound.

However, according to Hall (1999), NLP accepts the cognitive behavioural model and mental processing, and enhances this by focussing on the five sensory modalities. It is in relation to this point that these findings are relevant. The findings showed how the Visual modality was favoured, and also that the students were able to give specific descriptions of how these actual modalities were structured. According to Mc Dermott and O'Connor (2001), submodalities are the qualities of the inner world, the smallest building blocks of our experience. More examples of submodalities can be found in Appendix One. The main submodality related to the Visual modality in this study was colour, followed by being associated within the images they were using to represent the experience. There were similar findings in relation to whether the image was moving or still. The findings related to the Kinaesthetic modality showed submodalities mainly relating to internal experiences, particularly emotive aspects. Temperature and location of feelings were also easily identified within this mode. Within the Auditory modality the main submodality by far was internal dialogue,

followed by background sounds. However there were many situations in which these students stated they could not recognise any Auditory features to their representations. This could suggest the order of the impact of the modalities that students were exposed to, yet it must be remembered that individuals have internal representation preferences that act as a lead into a mode of thinking or state, or as a preferred mode of operation.

These findings were mainly related to the language used by the respondents or their responses to specific questions from the interviewer. The type of language or predicates became quite obvious when the transcripts were looked at. This relates to the description given by Hall (1998) which shows that using words enables individuals to comment on the things they see, hear and feel, giving precision about their modality referents. According to O'Connor and Seymour (1990), habitual use of one kind of predicate will indicate a person's preferred representational system. Georges (1996) points out that NLP relates to internal processes (how people do what they do), internal states (that explain why people act as they do) and explains adaptive responses. This is an interesting point, because if states explain how people do what they do, then learning states are important. This perhaps moves away from the concept of a style or simply suggests that certain learning styles are related to the learning states that a student enters. The findings provide indications of rich internal processes. Students were able to give clear accounts of what steps they took first in relation to learning situations, and when prompted gave indication of the submodalities related to that. Craft (2001) suggests that NLP is a strategy as opposed to a theory; although she points out that it does draw on constructivist theories. Craft (2001) criticises NLP's application for lacking awareness of learning and performance

styles. However, what this study demonstrates is the fact that the students showed awareness to a very detailed level of the modality, submodalities and strategies which worked best, or less well, for them in approaches to learning. That is the state that they needed to be in to learn best at the submodality level. The fact that this is a unique and individual aspect can be accepted, yet there were commonalities being demonstrated of preferred modality and learning style. Craft (2001) suggests that Honey and Mumford's 'Pragmatist' style is aligned to NLP as a whole. However these findings (through the basic aspect of modalities as internal representations) align with other learning styles (Theorist and Activist), and show that a scrutiny of internal representations can provide suggestions for approaches to learning. These findings can be applied on a collective level and reinforced for the individual by finding out their own structure of learning. By using language in a classroom that is primarily Visual modality predicated, backed up by Visual tools, or that creates a state where the individual accesses their Visual modalities (use of metaphor, 'how to see'), and ensuring the other modalities are included, a useful learning environment should be created. Use of NLP approaches should then be used with the individual (such as eliciting submodalities as used within the interviews in this study) to assist them in finding their own most effective learning strategy. According to Bandler and MacDonald (1988), when NLP was first used to study subjective experiences, the structure of meaning was found to occur in the specific sequence of representational systems that the person used to process information. In discovering these, individuals can be assisted in finding relevant, elegant learning strategies. It must be remembered that at whatever level of learning, individual or collective, the use of language is important. Hall (1998) describes language, or the use of words, as a meta-representation system, that is 'representations of representations'. Therefore, in the

light of these findings care is needed with language; and its use in establishing effective learning must be recognised. Dilts et al (1980) state that as the representational systems form a three-part network, input, processing and output, appropriate language related to the modalities should be utilised at each of these stages. Therefore clean language related to each modality is needed in the classroom when giving instruction or facilitating learning. The sensory grounding of information as richly as possible through language should be used to ensure that the right message is delivered to the students. Jargon and words that are digital in nature should be avoided, even in higher order thinking. Visual tools and metaphor can be used to create vivid representations for the students so that learning experiences can be enhanced from the simplistic to the complex.

The language used to elicit the processing strategies, as Dilts et al (1980) point out, fits with the notion of meta-cognition discussed by Antionetti et al (2000), in that it concerns not only control over thinking processes and awareness of various aspects of mental work but also includes the beliefs and knowledge used to carry out a task. Looking at the sequencing and structuring of an individual's representations can enhance learning and identify detailed experiences of learning states. According to Grinder, De Lozier and Bandler (1977), the '4-tuple' model is useful in considering representational system strategies. Although students in this study tended to describe the Visual modality in the main, there were many examples where, when asked, they could describe qualities from all of the modalities within their learning approaches. One student actually said he had a 'fuzzy' picture of children (as he had not yet met them) yet clearly hearing the sounds of children playing in his representation. When working with individuals the externalising of these experiences as formulae (a visual expression of the strategy) can be useful in

identifying elegant learning approaches. This is therefore related to the output of the strategy highlighted by Dilts et al (1980) and discussed in Chapter Two, that a 4-Tuple can be used to represent an individual's total experience, whether it originates in the world external to the person or not. The differences between individuals can be explained by the argument of Bandler and Grinder (1975), that individuals who, in sharing the same experience, will often recount it differently, because these differences are due to neurological, social and individual constraints. Hall (2000) states that this is because of the person's sensory awareness of the real world, their abstractions of it (neurological, social, individual) and the linguistics used to describe it. These factors act as filters and reinforce the cultural maps received and therefore each person's representation of reality. However as Bandler and Grinder (1975) point out, the social constraint is most easily changed as humans can experience different social systems, learn new languages and add to their repertoire of social experiences. Through engaging in new learnings the individual can add to their own model of the world and their understandings of it. PBL, Visual tools and metaphor can help in this process. A vehicle for this therefore is NLP, in gathering information about the individual's world, and identifying for them their most effective approaches. The importance of language in this, as a central NLP concept, should be reinforced. Dowlen (1996) suggests that NLP allows individuals to model effective strategies used by others, and that as it is content-free it is not concerned with 'what', but 'how to'. This is another indication of the importance of recognising how learning occurs, as opposed to recognising 'what' is learned. Although Dowlen (1996) posits that the evidence for NLP is inconclusive and lacks research-based support, he also suggests that the use of language patterns to enhance effective communication receives more support and evidence from research.

There are some factors that are useful to consider for educators. Firstly it is important to consider two questions:

1.'Does my way of expressing match your way of sensing?'

2.'Does your way of expressing match my way of sensing?'

This suggests a dynamic cyclical loop and not just the conveying of information from one individual to another (Tosey and Mathison, 2003a). Trickey (1997) suggests that the information gathering process that is utilised by a NLP practitioner can often appear effortless and magical to the client/ student, as it is not apparent what the practitioner is doing. He suggests from his findings that, through NLP, the information gathering approach and use of the information was effective and beneficial for the individual. As discussed earlier, there can be a danger in generalizing some findings to whole groups without considering a fully integrated sensory modality approach. According to O'Connor and Seymour (1990) the meta-model (of NLP) uses language to clarify language. It acts as a way of reconnecting the language with experience. In this study the students were able to give vivid accounts of their learning situations down to such detail as where books and computers were placed in relation to themselves whilst learning.

The meta-model of NLP provides a way of finding out specific meanings and reframing them so that generalisations, deletions and distortions can be refined and used as resources. Bandler and Grinder (1976) state that the Meta-model is therefore useful because it helps to:

1. Gather information
2. Identify the limitations of the individual's model
3. Specify techniques that can be used for change.

Aspects of the meta-model can be seen in Appendix Four. One of the linguistic aspects that the meta-model can assist in identifying is a complex equivalence. This is a situation where an individual has taken two situations and linked them together, therefore attributing them with meaning. Basically people create expectations through complex equivalences, and certain behaviours have meaning linked to expectations (Grinder et al, 1977). The educator therefore needs to ensure that the student is facilitated to explain their meanings, and that meanings can be more elegantly explained to students. Millrood (2004) suggests that NLP is a useful tool within the classroom if the discourse reflects NLP techniques. Such techniques as rapport, calibration, pacing and leading, and reframing were suggested by teachers as potentially useful for ensuring engagement between teachers, students and learning.

McDermott and O'Connor (1996) describe 'rapport' as the quality of trust and responsiveness which forms the basis of good relationships. Rapport can be gained by pacing the other person's experience (verbally and non-verbally matching them). Therefore if someone is indicating that they are relating to or operating from particular modalities and submodalities then it is more elegant to utilise that modality to respond to them. In this study, once the students had identified the modalities and submodalities of their experiences, they were comfortable in providing further detail and were also comfortable with the procedure. One student actually stated how they had expected the experience of the interview to be difficult but they found it enjoyable. An explanation for this could quite simply be they were operating from their own frame of reference and explaining things within that. No external constraints were placed upon them and they were able to give information and meaning easily. Calibration of these factors is also another aspect to be considered. This is basically by understanding the cues given

by the person or persons so that they can be appropriately responded to. Bandler (1993) describes any behavioural cue that indicates processing of a certain sensory system as an accessing cue. Grinder et al (1977) state that when a person is accessing their representational systems, this occurs at the unconscious level. By using the meta-model (with rapport and calibration) people typically use some body movement or eye-scanning pattern to access the information when this is made conscious. Rapport, calibration and use of the meta-model were important aspects in carrying out the qualitative aspects of this study. These skills had been gained by the researcher through training and education in NLP. These did serve the purpose well and should be recommended as a technique for research interviewing, yet it is important that these skills are more widely used in education if they are to be developed and used correctly. In a study by Thompson et al (2002), who utilised NLP as a part of five different training courses, found that there was initially a positive impact but that after six months the evidence was more mixed. Explanation for this was given as a waning influence of NLP as it had not been reinforced. Tosey and Mathison (2003) suggest that teaching is about the 'languaging' of the content of the lesson, and the influence of ways in which knowledge is constructed, another indication that process is as important, if not more so than content.

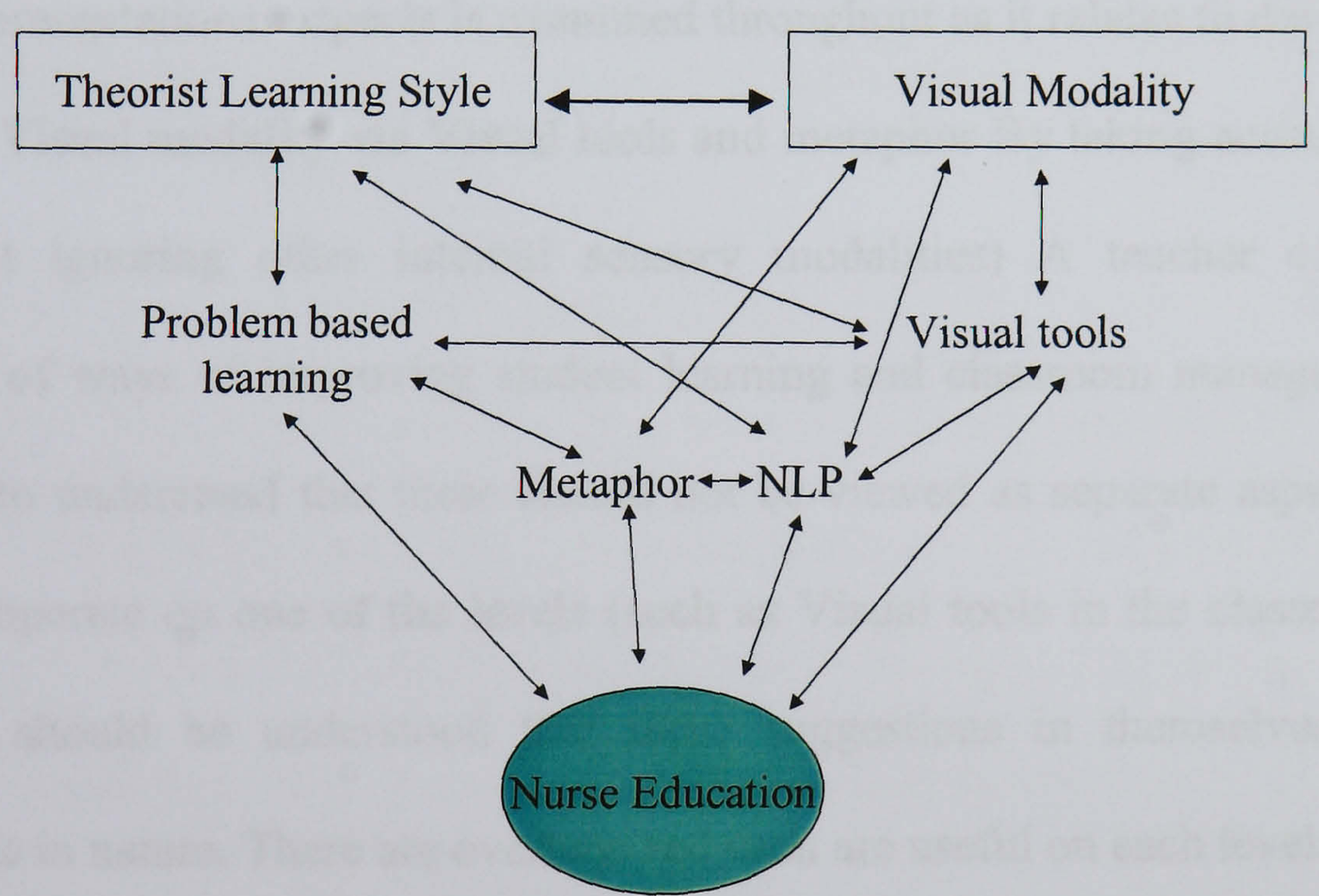
During the interviews the factors that Dilts and Epstein (1995) discussed as the B.A.G.E.L. model, (Body posture, Accessing Cues, Gestures, Eye movements and Language) were used to assist in identifying preferred modalities. At times the students were almost 'acting out' a replay of situations they were thinking of, and when scrutinised, very important reinforcing aspects were evident in their body language, such as pointing to where they experienced the feelings, where they moved to, and where

pictures were located. Again the use of calibration is necessary in identifying these factors, and is a useful skill in qualitative research approaches.

NLP is significant in Nurse Education because of the factors discussed above. NLP takes account of learning through behaviour and process. If the NLP is scrutinised the 'Neuro' relates to internal experience, 'Linguistic' to language and 'Programming' to patterns of behaviour (Tosey and Mathison, 2003). If the biological basis/survival aspect (Jensen, 1995) is accepted then a truer reflection should actually be 'Neuro-Programming,' that is having a sensory experience that leads directly to a pattern of behaviour. In this way there is no separation between humans and animal learning. In this study the sensory experience that the students related to was mainly the Visual modality. This then leads to patterns of responses related to successful or unsuccessful approaches to learning. Therefore in relation to these findings on a collective level, the Visual modality is important and should definitely be included in educational approaches. Other modalities should be included also and the individual internal processes of students needs to be ascertained to find effective strategies for them as individuals. All of this becomes apparent through the language (and non-verbal behaviour) of the students. The patterns of responses can be quickly and consciously or unconsciously refined to provide elegant approaches. This can be achieved through anchoring, a pattern that links experiences into neurology that can then be used to trigger experiences (Hall, 1999, p51) and pattern changes through information processing facilitated by the use of appropriate sensory-based language (linguistics). With the above evidence, it is hoped that the use of NLP can be developed by recognising the modality aspects of student nurses in the current context of Nurse Education. Its relationship to cognitive psychology now appears well grounded and its use in personal development and learning is gathering pace. The beauty

of NLP is more than a set of techniques, principles, presuppositions and patterns, rather, it is in the notion proposed by Bandler and Grinder (1979) that the formal patterns of communication are content-free, they can be used in any context of human communication and behaviour. Therefore this study would recommend the use of NLP in Nurse Education. Figure 6.2 summarises the relationships between the main findings and the proposals from the study for use in Nurse Education.

Figure 6.2: The Relationships From The Findings With Proposals For Nurse Education



The final Chapter will discuss the main implications of the findings of this study for Nurse Education.

Chapter Seven

Implications For Nurse Education

7.1 Implications From The Study For Nurse Education

The main aspects to be proposed from this study that impact on Nurse Education are to be discussed in relation to three levels; the curriculum, the classroom, and the individual. The factors that will be addressed will be the potential use of Problem based learning, Visual tools, and metaphor. The potential use of NLP, particularly internal representational aspects is examined throughout as it relates to developing the use of the Visual modality via Visual tools and metaphor By taking account of these (whilst not ignoring other internal sensory modalities) A teacher can develop awareness of ways of improving student learning and classroom management. It is important to understand that these should not be viewed as separate aspects, or that they only operate on one of the levels (such as Visual tools in the classroom only). Instead it should be understood that these suggestions in themselves could be holographic in nature. There are overlaps and each are useful on each level. The levels themselves cannot truly be separated either as suggested by Hall (2000) that all structures are dynamic and not fixed.

7.2 Implications For The Curriculum

The suggestion for the curriculum to be based on Problem-Based Learning (PBL) approaches is based on the notion that this approach can accommodate most learning styles at differing stages, formulating ideas (Activist), gathering information (Reflector), drawing conclusions (Theorist) and taking action based on findings (Pragmatist) therefore making learning accessible to all in some way. It must be

remembered though that there is still a need for PBL to be critically evaluated as there is no real defined PBL approach and it could be deemed to be more of a philosophy than a method (Biley and Smith, 1999). Also care is needed in ensuring that all learners whatever their style are supported in achieving the relevant learning outcomes in a satisfactory way. This can create tensions for nurse educators who may either still want to be directive and therefore foster dependency from students, or who may be more laissez faire leaving students with little direction, appearing as avoidance of responsibility in support (Savin-Baden, 2003). This could lead to problems within groups and cohorts, as some students may feel they are missing ,or who may actually miss out on relevant learning opportunities.

In this study, the most strongly preferred learning style found was the Theorist learning style. The characteristics of this Style suggest the individual likes to draw conclusions from reality and make appropriate plans, an approach espoused in some stages of Problem-Based Learning. Another reason for suggesting the potential use of PBL is the need to provide contextual based situations that reflect the true nature of nursing, rather than providing theoretical knowledge that has to be applied. This then gives an emphasis of process over content. That is not to say that content is unimportant, rather that the process of learning, finding out and developing contextual based theory and approaches would serve nursing better than students having to reproduce content in formats that have been developed to 'fit' university systems. This may therefore need modular systems to be re-considered as a contextual, process based approach may not necessarily neatly fit into small packages. Instead, the concept of a journey with a start and end point, where the route is not planned, but is developed through the process, may suit this type of learning. Case based materials

reflecting situations nurses might face could be useful in Nurse education within a PBL approach. It also provides the link with the use of metaphor to be discussed later, where the 'story' of the person provides the basis for learning. This is not necessarily such a new idea, as according to Herreid (2003), PBL is simply a version of case based learning and that using stories to teach has been around for thousands of years.

The tensions in Nurse Education, due its relatively new placement in Higher Education, need to be scrutinised closely. This is necessary as it is important that nurses are prepared for the workplace and what is expected of them DOH (1999), and for the professional identity of its educators. Nursing is moving away from its association with the medical model (Doctors' assistants), yet, in moving to Higher Education seems to be placed in a situation where it is the 'new kid on the block' and still has to find a niche in, and respect from, the system. Even though there have been alliances with Higher Education in the past there are still difficulties faced by Nurse Educators recently placed within the Higher Education setting. Deans et al (2003) suggest that there is a need to integrate the academic activities of nurses, as Nurse Academics experience difficulties in attempting to balance and prioritise conflicting role obligations. There is also a perceived lack of academic status for nurse educators because of their lack of research output. This is a pertinent point. However it would be difficult for nurse teachers to reduce these tensions when there is a professional body that sets the required hours of theory and practice, which roughly equate to one third extra in an academic year (compared to most other courses). This is needed to support students throughout their courses both in the theory and practice settings. In doing so, opportunities for producing the amount of research necessary to be perceived as equal to their fellow academics are restricted, immediately putting nurse

educators in a disadvantaged and difficult position. The findings of Deans et al (2003) showed potential role conflict if nurse educators weren't able to embrace the research role. Teachers would prefer to be recognised for their input in relation to teaching and learning as a valid academic activity. Conversely Griffin (2002) argues that there has been a much weaker tradition of teacher training for university lecturers because of this emphasis on research and development of knowledge. Yet, Gibbs and Coffey (2004) found that by training university teachers, student focus was increased, improvements were made in their teaching skills (as judged by students) and it improved students' learning. Therefore it appears paramount that Nurse Educators are given relevant input within the HE sector that they now operate in. If these issues are ignored then the above mentioned role conflict for Nurse Educators between, research output and quality of teaching will remain.

One of the difficulties highlighted in implementing PBL is the fact that teachers need to be trained well in order to develop relevant attitudes and skills in facilitation. Wood (2004) suggests that some teachers may feel devalued as their 'expert knowledge' is no longer needed and that it is difficult to 'convert' staff to accept the value of utilising PBL as a teaching method. However the use of the NLP 'meta-model' would be particularly useful for the Nurse teacher in facilitating such approaches as they can assist the students to effectively highlight and explain their learning issues. Miers (2002) is more hopeful, pointing out that the widening of entry pathways to Higher Education and the need to closely link education to professional working roles should suit Nurse Education, having already worked with such issues. With this in mind the development of problem based learning approaches could signify relevant context based learning for nursing. A study by Last and Fulbrook (2003) suggests that 97

percent of their student nurse sample agreed that there was too much of an academic emphasis on their courses and felt there was not enough of a clinical emphasis. The quantity of academic work also added pressures for third year nurses preparing for practice. Finally they found that for 78 percent of their students the course did not meet their expectations of more practical and less academic teaching. Gass et al (2004) suggests that modularisation in nursing programmes leads to nursing students going through a process of ticking off modules as they are passed and then forgetting about them. They argue that this leads to connections between modules being lost and a disparate student experience. Problem-Based Learning could be a way of addressing these issues if an approach is taken whereby learning outcomes are clearly expressed as an end point and there is structured facilitation to assist students to find a route towards meeting them.

PBL is described by Cooke and Moyle (2002), as a situation where real clinical situations are used to develop learning packages that generate clinical reasoning responses in students. Price (2003) suggests that explanatory theory does not helpfully precede situations when working with patients, or come attached to problems arising in the practical contexts. He states that as practitioners we have to develop a sense of the situation, understand what is happening and what might be needed in the future. Therefore nursing work could actually be considered to be investigative in nature. This does seem to fit with the learning cycle that Honey and Mumford (1992) based on Kolb (1976) of having an experience, reviewing, concluding and planning. The Theorist learning style is aligned mainly to the concluding stage, yet does reflect a problem solving approach. Theorists learn from being offered or developing interesting ideas and concepts. However, the problem based learning approach should

actually be beneficial as there are stages within it that should relate to any of the learning styles of Activist, Reflector, Theorist and Pragmatist. Cooke and Moyle (2002) found that students responded favourably to a PBL approach and state that it promotes the integration and synthesis of knowledge areas through students' active participation in the clinical reasoning process. Critical thinking was an aspect valued by the students in their study. Schlesinger (1996) asserts however, that there is a weakness in accepting the learning cycle. He suggests that the concept of thinking and doing can be one activity. He highlights that the pairing of Theorist and Activist styles is rare. He argues that there is a need to seriously consider the implications of thinking as a concept involved in learning. However Lee et al (2004) suggest that PBL does transfer across different learning styles from their study with Chinese students, who traditionally have a receptive style of learning. Barrow et al (2002) suggest that PBL can assist in facilitating conceptual understanding, developing reasoning and interpersonal skills. Williams (2000) suggests that critical thinking and reflection can be developed through properly implemented problem based learning approaches. Therefore it seems that the range of learning styles can be addressed throughout this process.

Whilst it is not the intention of this study to discuss PBL in depth, the main approaches need to be outlined. Wilkie (2000) outlines the 7-step approach, known as the Maastricht approach. In this students are asked to:

1. Clarify terms and concepts not readily understood
2. Define the problem
3. Analyse the problem (brainstorm)
4. Discuss and organise ideas
5. Generate learning issues
6. Collect information outside the tutorial group
7. Report on and synthesise newly acquired information.

Wilkie, (2000,p14).

A number of the above stages can be seen as characteristics of differing learning style preference and some such as the problem definition, analysis and synthesis similar to the Theorist learning style characteristics. However the implementation of the PBL approach has a number of differences from traditional teaching approaches. Preparation of material, facilitation of groups and assessment methods need to be considered. This is a labour intensive activity, particularly where there are large groups of nursing students, perhaps commencing on more than one intake, and with different branch pathway needs, which is a particular limitation faced in developing such an approach. This could be deemed to be costly in terms of time and resources. Also the need for staff to be trained (and in some cases convinced) about PBL approaches could also be costly and may prove difficult, whilst maintaining and developing current Nursing curricula and approaches. Price (2003) suggests that the material used is context based and often taken from real life nursing situations and scenarios. This can take the form of case notes, video clips, flow charts and a variety of other flexible formats. These can then be used as trigger materials at the beginning of the process, or as developmental aspects throughout it. Developing such materials to cover all the required outcomes of a nursing programme could be difficult.

The main difference for the teacher is to take on the role of the facilitator, to assist the students through the process. According to Sharp and Primrose (2003) the facilitator is an important role, as it involves extending, enriching and transforming meaning for students. The facilitator can be an education 'specialist' or a subject 'specialist' depending on the nature of the process and assistance required by students (Price 2003). Here the use of the NLP Meta-model would be useful in identifying and

refining the students' generalisations, deletions and distortions related to the material. Wilkie (2000) suggests that the facilitator does not give answers to the students but will assist them in focussing on their learning requirements. As this is related to process, again NLP is a useful approach for the facilitator to utilise. The preparation of facilitators obviously may have financial, time and consistency implications, yet should be considered if this is to assist students in becoming lifelong learners.

Assessment also needs to be carefully considered, as students may not be given a straightforward prescribed diet of content. As it is process driven alternatives need to be chosen to ensure students are accurately and fairly assessed in how they have met their learning outcomes. Gibbon (2000) in Glen and Wilkie (2000) state that assessment methods such as written assignments can still be used, but the work needs to more accurately reflect what is contained in the module (if a modular approach is still favoured). Aspects of reflection and use of up to date evidence and practice developments should be expected to be more overt within the work. Hargreaves (2004) findings suggest that when reflection is used within professional education it is a medium for developing the affective professional and personal attributes associated with being a competent practitioner. However, as portfolios tend to contain qualitative rather than quantitative data, care must be taken to ensure the criteria involved are rigorous and systematically applied. One way for students to develop a portfolio of small units of assessment is by producing their learnings in the format of Visual tools, which is a way for them to externalise their internal representations of the situations they are learning about. By using NLP the facilitator could assist the students in this process by helping them identify how they represent the problem and guiding them to representing the resolution of the problem. Students in this study showed how they

particularly utilised the Visual internal representational system, so a good facilitator would be able to help them use this (and other recognised NLP modalities) effectively for their benefit. As students will be developing ideas and teachers closely facilitating this, the opportunity for developing new evidence may also arise. Rust (2000) provides a link with the earlier argument about de-modularising courses and assessment by proposing that assessment could be disaggregated from modules (as modular systems are criticised for having too much summative assessment). Students should collect evidence of their learning and then produce this as a portfolio when they believe they have the relevant amount of information (which is presented in a form where academic rigour is evident) to meet the course outcomes. This avoids students choosing modules that provide the easiest way through the course for them in terms of assessment or content. It is recognised that barriers such as time, finances, motivation and a lack of popularity of the methods with students, could cause problems in adopting such approaches.

It is now necessary to discuss aspects for a classroom setting and the individual in Nurse Education. The use of Visual tools is the main recommendation, facilitated via NLP, although again it should be remembered that this is to be used in conjunction with the other proposals.

7.3 Implications for the Classroom and the Individual

The main suggestions in this section are related to how teachers can engage more effectively with their students in the classroom setting. These suggestions relate to the learning styles of the students, accepting the fact that although the Theorist learning style was preferred overall, all styles still need to be accounted for, and that the

preferred NLP internal representational system was that of the Visual modality. It is proposed that as students in this study demonstrated a preference for the NLP internal representational system of the Visual modality and if the brain's biological basis of utilising the Visual sense as a main aspect of survival is accepted, then assisting students to use the Visual modality should naturally be encouraged. This can be achieved in two ways and be related to two types of use of the Visual modality namely, developing internal representations and external expression. The two ways of achieving this are through the use of Visual tools that will draw mainly on the suggestions of Caviglioli (2002), and the use of metaphor. As Gibbs and Coffey (2004) suggest that training of teachers in HE is beneficial, perhaps inclusion of use of Visual tools and the ability to deliver metaphor effectively such as is highlighted in NLP training should be included in teacher training courses. The lack of empirical research into the effectiveness of NLP however, has been recognised in this study as a limitation to be carefully considered.

As suggested earlier by Jewitt et al (2003), a multi-modal approach in the classroom is beneficial and should actively be promoted, but also that Visual ways of presenting meaning is essential. The Visual modality is very powerful and links to the other modality systems easily. For example, Kamachi et al (2003) found that students were able to match voices to faces (when played forward) suggesting an ability to develop representations from the voice quality of what a person with such aspects should look like. Turatto et al (2004) investigated the spatial attention of students via different modes, and found that although there was selective attention paid by the system in which the stimulus was presented (Visual stimulus-Visual modality) there was some cross modality attention occurring, suggesting that attention to stimuli can occur in a

different modality to how it is presented, e.g. Auditory to Visual, Visual to Auditory. This would suggest that the main modality of presentation would lead to attention in that modality and that words, sounds or tactile experiences can also be used to invoke the Visual modality. Another study by Sadato et al (2004) shows that tactile stimulation (via the use of Braille) activates the Visual cortex. Therefore people who have become blind are still able to visualise internally. NLP advocates using the persons' lead system, identifying their preferred system and developing a multi-modal experience to increase positive responses. The findings in this study suggest the Visual internal representational system is a useful starting point for most teachers. What must be remembered is that NLP has been suggested to work well on an individual level, yet collectively it may still be necessary to utilise all modalities, and generalise more in group approaches, as opposed to using specific sensory language to develop representations.

In emergency departments simple Visual tools are found to be effective in assisting patients to identify their level of pain using Visual analogue scales (Thomas and Andruszkiewicz, 2004), leading to physicians being able to provide more effective treatments. It is with this in mind, providing a clearer way of presenting material that meets the students' preference for the Visual modality, yet that assists effective understanding, that Visual tools are suggested. Again it must be emphasised that this should not be at the cost of facilitating students using other modalities yet that the Visual element should definitely be included.

According to Caviglioli and Harris (2004) Visual tools transform the normally invisible, abstract act of thought into a concrete and public media. They enable

teachers to reveal to the student how their thoughts are structured and vice versa. Buzan (1995) states that, traditionally, education has been built on the structural patterns of speech, which are in the main linear in nature. However he argues that the human brain does not simply think in a linear fashion. What was not accounted for was the multi-modal nature of the human 'holographic' brain. Vision is a symbolic process and as images are inputted into the brain any number of representations of it can be formed. Language however is the function that gives human consciousness its unique character (Hobson, 1999). Buzan therefore developed the idea of using mind maps as explanatory diagrams of ways of thinking or of experiences and facts. Akinsaya and Williams (2004) state that concept maps have long provided Visual languages and have been widely used in many different disciplines as formal knowledge representational systems. Concept maps can be used within PBL in order to assist students to assimilate their findings/conclusions and provide explanations of these. NLP is recognised as the study of subjectivity by finding out how people represent experiences. Visual tools are another method to externalise these.

According to Caviglioli et al (2002) thoughts are organised as objects in as much as we can manipulate them, move them about, and even forget about them. Visual tools provide the media to make thinking (i.e. thoughts as objects) visible. Visual tools are not new. Humans have used diagrams, maps, charts, matrices, icons and pictures for centuries, yet to use all of these within a single tool box to promote thinking is relatively new. They state that Visual tools are important as they operate in the domain where the Visual and verbal overlap. Caviglioli et al (2002) argue that there are different types of Visual tools that can be used for different purposes. There are seven main Visual tools as can be seen in the Table 7.1 below:

Table 7.1: Types Of Visual Tools and Their Purpose

Visual Tool	Purpose
Structural Visual Tool (SVT)	To Start Thinking About A Topic Reveal The Structure Of A Topic To Create Hierarchies In Content To See Relationships Between Whole And Parts
Differential Visual Tool (DVT)	Identify Similarities And Differences Between Topics Compare And Contrast Elements Related To Items Or Topics
Representational Visual Tool (RVT)	Illustrates Key Features Reveals Hidden Structures Highlights Details Gives A Variety Of Perspectives Represents Simplified Version Of Reality
Temporal Visual Tool (TVT)	Captures The Chronology Of Events Represents Sequence Of Events
Causal Visual Tool (CVT)	Identify The Causes Of Events Identify Possible Alternative Causes Creates Baseline For Action Planning
Numerical Visual Tool (NVT)	Components (Size Or %) Items (Ranks) Trends (Changes Over Time) Frequency Correlation.
Organisational Visual Tool (OVT)	Direct Content Of Focus Direct Sequence Of Thoughts Direct What, Where, How Much Is Written

The table above, although quite simple, is actually a Visual tool in itself. It is a basic structural visual tool (SVT), described as an affinity diagram. It is used to organise ideas into categories or concepts. Within each of the categories of Visual tool there are a number of others that serve particular functions and these can be seen in Appendix Eight. These tools would provide a useful aid in a problem based learning approach. It must be remembered that this is not an exhaustive list of tools, as any form of idea that can be visualised and represented visually can be used as a Visual tool. Marks (1999) suggests that mental imagery assists in facilitating the performance of a wide range of perceptual motor and cognitive tasks and concludes that the greater

the vividness of the imagery, the more perfect the performance of skilled perceptual motor tasks. What could perhaps be added to this definition is the fact that the inclusion of other sensory modes should also enhance the experience and therefore memory/ learning. The figure 7.1 below shows the differing tools within each category.

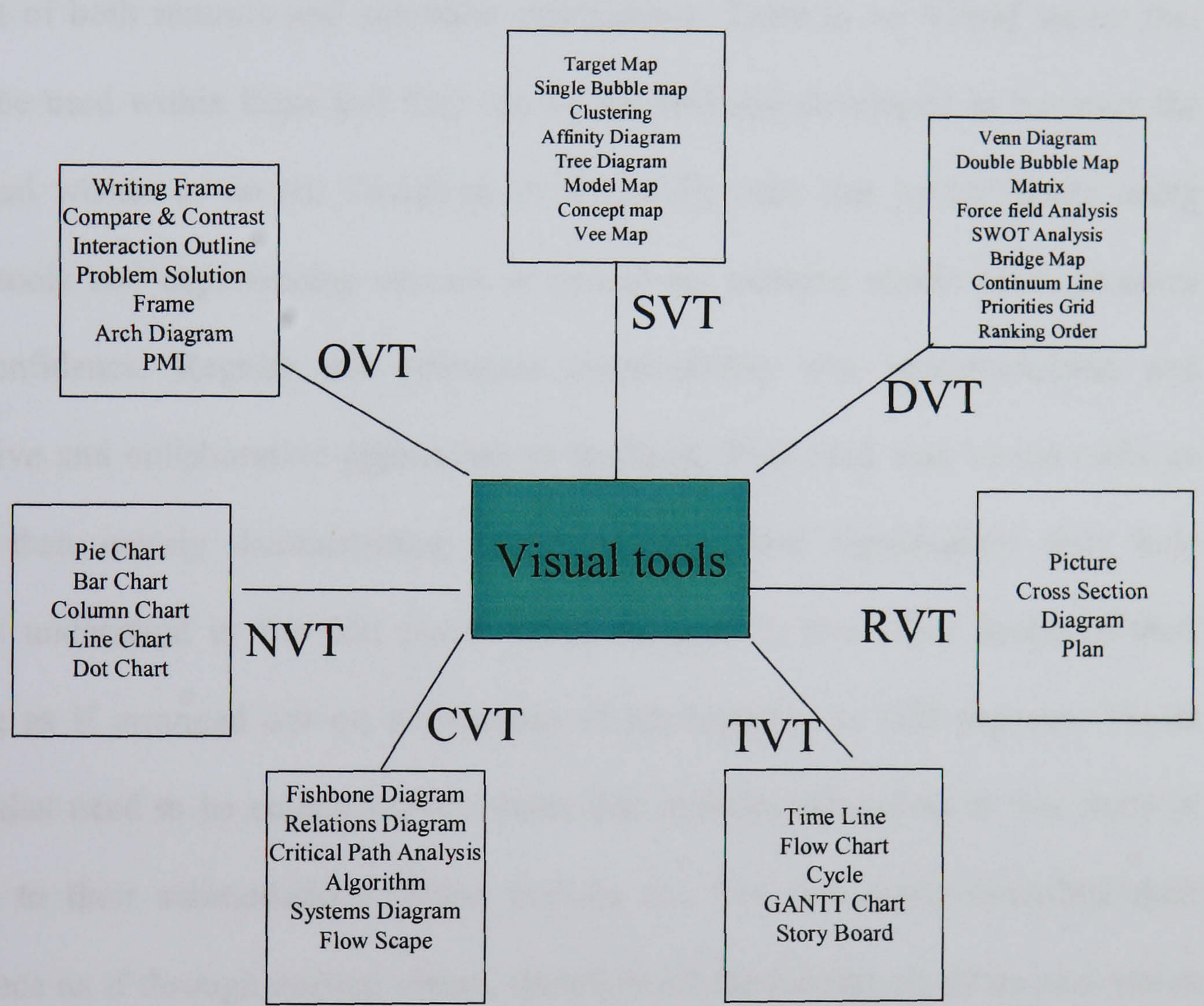


Figure 7.1: Different Types Of Visual Tools (Adapted from Caviglioli et al, 2002).

Although many of these are easily recognisable (indeed many forms of these have been used throughout this document, particularly in Chapter Four), to actually bring them together as a format for addressing learning is very useful. These tools can be

used for higher-level thinking and not just the merely descriptive. In using them, analytical thinking, where a subject is rigorously examined in a logical step-by-step manner (Rose and Nicholl, 1997), can be made easier, hence the suggestion for their use to provide portfolio evidence of information and reflections related to a problem based learning approach. This would fit the notion of Williamon and Valentine (2002) of hierarchical organisation as a cognitive principle that applies to the encoding and retrieval of both motoric and symbolic information. There is no Visual aspect that cannot be used within these and they can be adapted and developed in however the individual wishes to do so. Caviglioli et al (2002), state that by habitually using Visual tools and experiencing success at perceiving patterns within texts, students gain confidence. Regular use promotes responsibility and resourcefulness and interactive and collaborative approaches to learning. They find that Visual tools go further than merely demonstrating understanding, more significantly they help students understand in the first place. Often students in this study spoke of their learning as if arranged out on a sequence of photographs or still pictures. Visual factors that need to be considered are those that students alluded to in this study in relation to their submodalities. These include the fact that many described their experience as if through normal vision, therefore all the conditions of normal vision should be used in developing the tools. This would include colour, size brightness, shape and being panoramic or located in specific positions. An interesting idea is that instead of expecting students to focus on a screen in front of them all the time, to access Visual material, this could be placed all around the students so that they can remember it by location in relation to themselves. Making them move to access the material would fit in with the concept of introducing novel stimuli suggested by Solso (1998) describing abstraction of patterns. New information is checked against

previous material and either recognised or rejected. In rejection the information may be checked against other prototypes or new ones created. Experiences tend to be noted consciously when there is an element of difference or change to the ongoing experience (Grinder et al, 1977). This concept is described by Silvester (2003, p.16) as 'recurrent inhibition' whereby the individual/organism seeks to notice only that which has changed in its environment as opposed to that which stays the same, therefore leading to a quicker, more effective way of perceiving potential dangers. In a learning context it could be argued that the changing environment helps the individual notice new aspects more effectively and therefore they can integrate these changes into their awareness/cognition and increase learning. Again this relates to NLP, in how people structure their experience. Comparisons are made with previous internal representations of the experience. Solutions and responses can also be checked using internal representations for their effectiveness.

As mentioned earlier it is important to ensure that students are in the appropriate state for learning so that they can utilise the Visual modality effectively. A Study by Nava et al (2004) showed that students' long term Visual memory improved through the use of relaxation (an example of state) whilst being shown Visual stimuli. Jensen (1995) discusses the mind-body link and suggests that relaxation is useful. In this study there were examples of students often moving attention from external events to internal reflections to check on the material, similar to the concept of the NLP Visual modality leading strategies and the Kinaesthetic modality acting as a checking mechanism for the solution. Therefore Jensen (1995) suggests that a learning state between boredom and anxiety, where the student is relaxed, is one that needs to be fostered. The link between the Visual external information, Visual internal information, checking

mechanisms and state need to be finely balanced. It is difficult to expect students to go from one state to another efficiently so therefore they need to be led in, by an engaging approach where they are happy to move attention freely from external to the internal and vice versa. This would perhaps need the utilisation of all modalities and not just the Visual, to be effective. The method for doing this could be by use of metaphor. As mentioned earlier if Visual tools are 'what to see', then metaphor could be considered 'how to see'. Relaxation is often described by many terms 'guided imagery' being one, whereby the facilitator guides the person to relaxation through suggestion and instructions of visualisations. NLP incorporates the use of metaphor and the concept of facilitating resourceful 'states'.

According to Marieb (1991) the pre-frontal cortex of the brain is used for making sense of experiences. Stories therefore have appeal in all cultures because storytelling is part of our anatomical and physiological 'hardware'. The brain is designed to process differing kinds of sensory material and through the use of memory, associate it and make comparisons with what is already known. O'Hanlon (1987) describes Metaphor as a literary device that includes simile (like something else) and analogy (two things sharing relationships). Overdurf and Silverthorn (1995) suggest that it would perhaps be easier to describe what is 'not' a metaphor. They are 'slices of life' (a metaphor itself) to which we can all relate. Battino and South (1999) suggest that metaphor belongs in the constructionist theory of learning. Metaphors and analogies help people to make connections and bridges between information. The use of Visual tools, as mentioned above, does exactly the same. Owen (2001) proposes that metaphor accepts that there is always more to discover and always more than one way to achieve outcomes. It is a form of sharing knowledge and empowering others. Every

metaphor is complete in its own context, therefore is simply a representation of the world. As such, it is useful for those with any learning style as a checking system and perhaps particularly useful for those with the Theorist learning style preference who can test theories against their own knowledge structures. However the Theorist does tend to dislike anything that is too abstract for theoretical scrutiny, which may provide limitations for them unless there is something that they can identify as a basis for conceptual development Gersie (1997) states that humans have a capacity to name things, experiences, places, objects, animals or people. In NLP literature it is recognised that language helps us to create an image of the surrounding world. Therefore if we can create an accurate image of the surrounding world this should help us in our operations within it. However, this research has shown that different individuals, although in the main preferring the same modality, have very different ways of organising information in relation to learning. Therefore the purpose of the metaphor needs to be considered. Is it used so that the students can create an image of the world from which to develop their own ideas, or to accurately reflect the real world as it is? There are dangers in the teacher assuming that everyone is receiving the same learning from a particular metaphor, so it is important that the teacher develops effective ways of checking what the students perceive. Using Visual tools could be an effective way of achieving this.

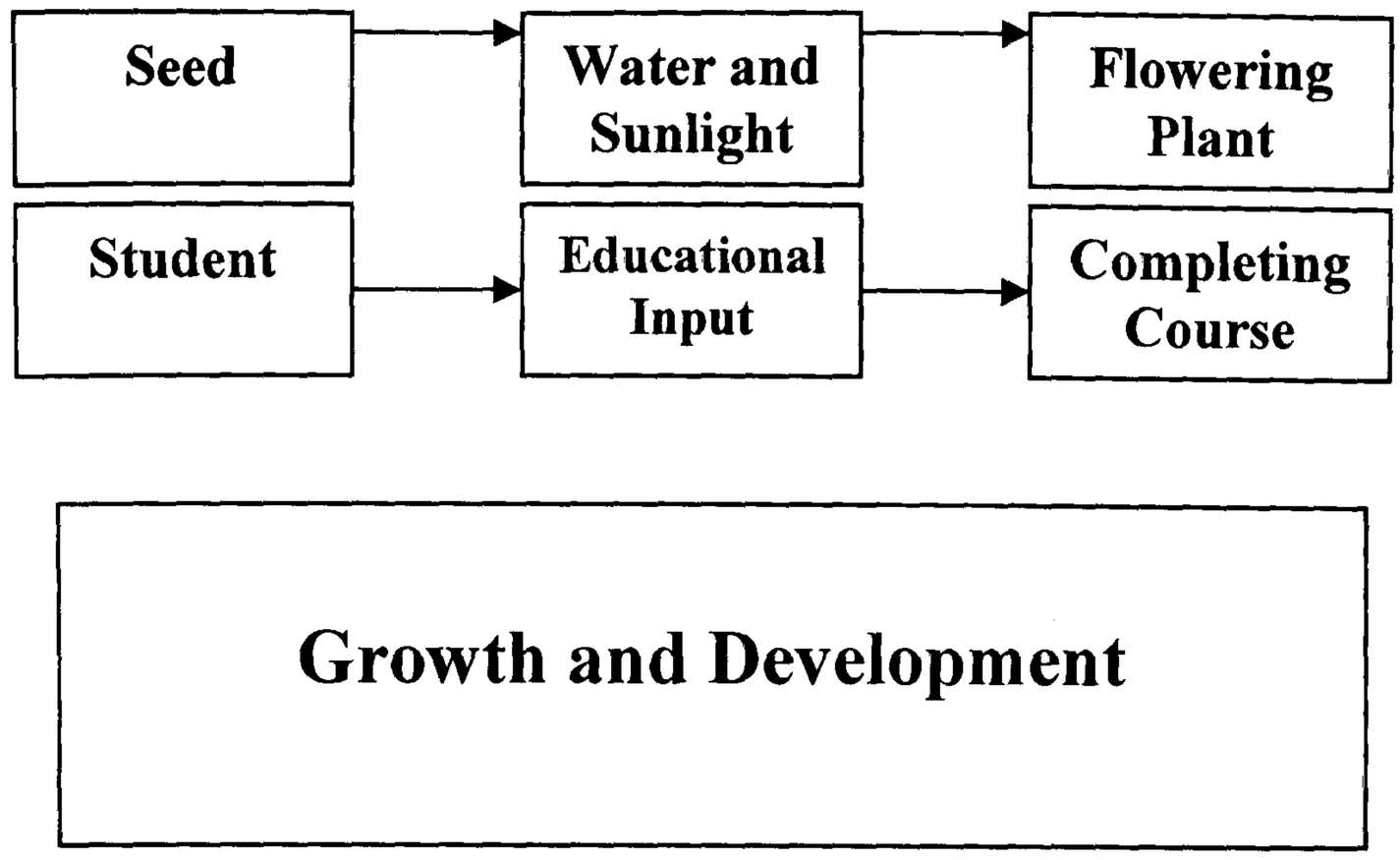
Lennon and Wollin (2001) highlight that metaphor is a transfer of attributes from a domain of familiarity to one that is less familiar. They suggest its use as analogy has great value in expanding, exploring, and systematically examining phenomena and theories. Battino (2002) argues that minimal use of precise words can evoke images or feelings, again highlighting the multi-modal effects. The making of connections

within the respondents' mind is achievable through metaphor. A metaphor opens up the possibility of alternate responses that can be appropriate and helpful. Again it is not the intention of this study to investigate metaphor in depth, but its use in assisting learners to make connections by evoking internal imagery and feelings is important. Linked to the context base of PBL and aligned with the use of NLP and Visual tools, a powerful approach to learning can be achieved.

An outline of how to use, structure and develop metaphor will be briefly discussed. Grinder and Bandler (1981) suggest two types of metaphor, isomorphic and universal. An isomorphic metaphor is a story or analogy that represents or is similar to another situation. e.g. a flower growing from a seed is an isomorphic metaphor for growth and development. This can also be quite easily be visually represented. A universal metaphor is when a more vague example is given but is one where the respondent may have had an experience of the subject matter. 'Think of a time when you learned well', was a question, or metaphor used within this study as a questioning technique. No specific situation was asked for or required. Each respondent was able to clearly provide his or her accounts of learning yet each was specifically different. Extrapolating these similarities and differences to Visual tools is a way of externalising meaning from metaphor. For example if the flower metaphor is used, the seed could represent the person. Giving it water and sunlight could represent educational input and when it flowers this could represent achievement and potential.

This can be seen in figure 7.2 below in the form of a Visual tool.

Figure 7.2: A Flow Chart Explaining Metaphor (Temporal Visual Tool)



Battino (2002) points out that metaphors allow safe exploration of new ideas, new feelings and new connections. As the mind finds it hard to distinguish reality from fantasy (a pictorial representation can occur in the mind with eyes open or closed, dreaming or awake, Hobson, 1999), whatever form the metaphor is creates its own reality. It provides us with opportunities to imagine situations out of our own mind/ body boundaries (such as Einstein and his ride on a beam of light) and gain new perspectives on situations. O'Connor and Seymour (1994), in relation to NLP, state that metaphor is any story, joke or anecdote that refers directly or indirectly to the material you are presenting. Therefore this can be isomorphic or universal as discussed above. It could be used as an opening theme in a course, module, or lesson and be revisited and developed throughout. Imagine the opening metaphor of a nursing module related to anatomy being 'blood is thicker than water'. The number of metaphors that this could be used for as an analogy is endless. It provides a trigger for looking at aspects of genetics, blood transfusion, the structure of blood, cross infection, blood pressure, systems of the body, and so on. It can be left open ended so that it is added to as understanding develops. This once again highlights the potential

benefits of the use of problem-based learning (as a developmental approach), NLP and Visual tools to explain, explore, analyse and develop ideas.

The indirect benefit of the metaphor is that of a tool to create states (interest, intrigue, excitement, motivation, relaxation) in students, thus leading them to a state that is useful for learning. Overdurf and Silverthorn (1995) describe how metaphor is used to firstly create perceptual change. This is a change of state, as individuals have to visit their internal representations to discover meaning, changing their attention from the outside to the inside. Secondly, Overdurf and Silverthorn argue that it provides affective change by evoking representations leading to changing emotions, thoughts and feelings. Care does need to be taken with this however, as not all people respond in the same way to specific situations, therefore each persons experience of a given phenomena or suggestion may not entirely be consistent. Thirdly it creates behavioural change, as steps towards outcomes can be identified and developed. Finally it develops cognitive change as ideas and differing points of view are developed. O'Connor and Seymour (1994) discuss the notion of 'nesting' metaphors. That is structuring the metaphor so that a story is opened, but left un-ended, and another opened within it. This reflects a change of the material presented. This continues to a number of levels and then each metaphor is closed drawing with it the closure of all ideas with each stage of the material. This is known as nested loops, a sort of 'Russian doll' effect of story telling.

This can be seen in Figure 7.3 below:

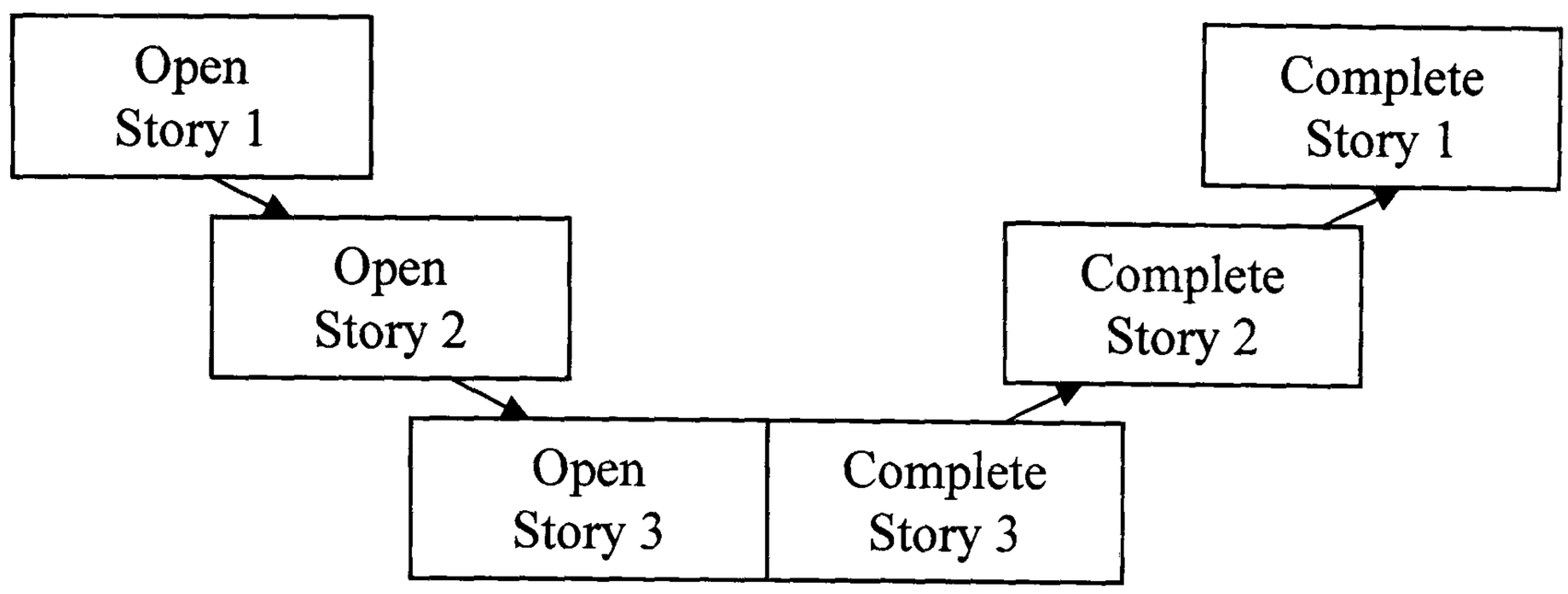


Figure 7.3: Nested Loops in Metaphor

As metaphors (particularly context, and reality based) are easy to construct, they are a tool that is readily available to any teacher. Getting stuck in a traffic jam on the way to work, for example, is a useful metaphor to introduce for students to explore a number of issues (problem solving, occupation, responsibility, communication, emotions, observation, finding new routes etc) related to any topics they may be studying. Just as the story could be recounted in the staff room, so could it be in the classroom. However a final note of warning needs to be considered. De Vita (2000) points out that, in the educational world today as in the real world, we are often faced with people from differing cultural backgrounds. Therefore the colloquialisms and idiomatic phrases and expressions may need explaining. However in doing so the essence of the metaphor may be lost. The teacher should utilise the students themselves to develop metaphors that are meaningful to them. It should be remembered that all modalities and rich sensory, brain based environments need to be created by the teacher for effective learning environments. This is an important NLP concept.

In terms of the individual, all of the above factors apply in working with students on their educational journey. The use of NLP on an individual level is proposed as an elegant way of supporting students within Higher Education. Finally, this research, although showing that the Visual modality is preferred, suggests the interview method used in this study as a method in itself of enhancing student learning. By following the principles of NLP, individuals can be assisted in developing their most effective strategies for learning. These main principles are developing rapport, using calibration, developing outcomes and identifying effective strategies of learning to meet them. Ledochowski (2003) describes rapport as the quality of trust and responsiveness, in making connections with others. The principles of matching the predicates and non-verbal behaviour of the students (therefore matching their preferred modality preferences) assists in this rapport-developing process from which other NLP principles of learning can be used. Noting the B.A.G.E.L. (Body posture, Accessing Cues, Gestures, Eye movements and Language) aspects (Dilts and Epstein, 1995) are useful for calibrating these aspects. Calibration is the ability to notice responses from others and reading people (Ledochowski, 2003). Finding out the students 4-Tuples which, according to Grinder et al (1977), are useful in considering representational system strategies, adds to understanding the individuals' best approaches to learning. Identifying their TOTE (chunks of representations in sequences) strategies can help them work towards well-formed outcomes Dilts et al (1980). Burton (2003) describes a well-formed outcome as naturally prescribing states and behaviours consistent with its successful completion. Throughout all of these process the use of the meta-model, Milton model and metaphor as linguistic tools (Bandler and Grinder, 1976) are necessary to ensure each individual student

identifies elegant learning approaches for themselves. Again identifying their learning style and using Visual tools would also help.

Below in figure 7.4, a differential Visual tool (matrix diagram, Caviglioli et al, 2002) is used to identify the emergent themes and their relationships in this study.

	Curriculum	Classroom	Individual
PBL	✓	✓	
Visual Tools		✓	✓
Metaphor	✓	✓	✓
NLP		✓	✓

Figure 7.4: A Matrix Diagram Of The Emergent Themes From The Study

7.4 Reflecting on Lessons From the Conduct Of The Study

In this section aspects related to the process of the research conducted will be discussed. It is important to recognise that some of this discussion may be reflective in nature. Pillow (2003) states that there is increased attention to researcher subjectivity in the research process and reflexivity can be used to explore the data. This therefore recognises the fact that the researcher and who they are as an individual does have an effect on data collection and analysis and the making of claims.

Firstly, it is important to mention that the process has yielded very interesting data that can be used within this study and which is available for further analysis and study. However, from a researcher's point of view it must be suggested that the

approach to this study could have perhaps been conducted in a number of stages as opposed to being one major study, combining approaches, as the data analysis proved to yield a large amount of relevant findings needing to be organised and presented. There were strengths and difficulties in the process in both aspects of the study from data collection through to analysis. Froggatt (2001) states that there is no right way to work with data it is a process best learnt by doing. One of the main lessons learnt is the amount of work that data creates through its collection, management, analysis and presentation. Therefore both data collection and analysis methods will be looked at and what has been learnt will be highlighted.

One of the major priorities was to ensure the questionnaire packages were effectively delivered to students and returned by them. However, care was needed in ensuring the students understood it was a voluntary process. By giving the questionnaire package out in a pilot study, changes were made to the completion instructions which led to only 30 out of 463 questionnaires been incorrectly completed. This is a strength that led to a reasonable amount of data to be analysed. The main negative factor however was that the students had been advised to leave the scoring sections blank to ease speed of completion and so they could focus on the actual questions (leaving this for the researcher to complete). This was a time-consuming and frustrating task that hampered speedy progress with the data inputting to the SPSS statistical package. On reflection however it assisted the researcher in beginning to live with and become familiarised with the data. Once inputted however, the main analysis was more easily undertaken. As Norusis (1993) suggests SPSS is a comprehensive and flexible statistical analysis and data management system and once saved in the package it is quite easy to carry out the relevant statistical analyses. One main difficulty, however,

was in managing the data in relation to answering the research questions, and different sets of data (gender, age) had to be extrapolated and re-inputted in order to find answers to the research questions. The difficulties arose out of the fact that most of this data was categorical or ordinal in nature and therefore only really suitable to the actual statistical tests undertaken. As many of the tests available within SPSS do relate to continuous numerical data, this had to be carefully thought through. Anthony (2004) states that the computerised package has many advantages over manual calculation of data. However as the software computes automatically it cannot tell if what the researcher is doing is right or wrong. As Crichton (2001) points out, that statistical analysis is about organising data so that patterns between variables can be uncovered. This points to a proposal that for future research, these aspects need to be carefully considered well before the data collection stage, so that the method of data collection and its management within the statistical package can be streamlined and dynamic. By extrapolating these data as mentioned, although time consuming and requiring a lot of thought, this could be achieved. In future more consideration of the statistical tests to be completed should be thought out before-hand therefore the data can be inputted in such a way that these can then be uniformly completed, as opposed to working out how best to organise the data whilst analysing it, and therefore having to make appropriate changes so that the tests completed were accurate.

Many lessons were learned from conducting the qualitative aspect of the research, again from collection of the interview data to analysis of it. However the main aspect is that the use of NLP as an interviewing method is beneficial particularly using the meta-model, Bandler and Grinder (1979). Mitchell (2000) highlights that with practice, recognition of generalisations, deletions and distortions becomes fairly easy

and effortless, and there is great potential for use of the Meta-model in the research interview. However care needs to be taken because with this ability to gain very specific information from the client, sometimes the amount of narrative they produce is lessened. This is evident within the latter cases interviewed in this study. Therefore, if undertaking qualitative interviewing in order to gain great depth of narrative, careful consideration of the use of the meta-model is necessary. In this study, as interviews progressed the researcher was able to gain more specific information regarding submodalities more quickly, through observation of the respondents' body positions and their use of predicates. This meant that for later interviews there were more specific closed answers and less narrative data available for analysis. However it would be necessary for the researcher to have undertaken some form of NLP training or have a deep understanding of NLP processes in order to utilise the meta-model adequately. It should be remembered that to use this method is only one potential tool out of a wide range of qualitative interviewing methods.

One of the main lessons was in ensuring that firm arrangements are made with the respondents who volunteer for interview. The researcher found that on many occasions time, effort and cost were wasted on preparing for an interview, only to find that the respondent did not turn up. This was their prerogative, but if firmer agreement had been made these situations needn't have happened. Lessons also needed to be learned in ensuring all technical equipment is prepared and in working order. This includes ensuring there is enough space left on the tape (video or audio) to actually complete the interview. The less distractions there are the better for building rapport and responsiveness. It was frustrating at times to find that some really interesting data had been lost due to tapes ending or batteries running out!

In terms of transcription it was useful to be able to enrol an assistant to transcribe the latter interviews. However this was a time consuming and painful process for both the researcher and the assistant, as rewinding and replaying video tape whilst attempting to type the interviews discussions was a difficult task. A suggestion if conducting similar research in the future is to ensure that sound is recorded separately to video. This would ease the transcription of the words spoken by the respondents, as there is technical equipment available to assist with this. However the value of the researcher interacting with this process is high. Observing the respondents on video and comparing this with their transcripts assisted in the analysis of the body movements and gave a richer picture of their internal representations and their external demonstration of these. When reviewing certain anonymous transcripts, the researcher is able to actually remember who stated that, because just as the respondents demonstrated their ability to replay situations as if running a movie, so could the researcher after being triggered by words on a page. This is the result of living with the data. The researcher could probably read a segment of text and link it directly to a specific student video, just as Kamachi et al (2003) found that students were able to match voices to faces.

The use of NUDIST computerised qualitative analysis software was invaluable. Coding and categorising, revisiting and amending transcripts were all made easier by its use. The development of the submodalities became obvious and easy to manipulate into coherent concepts, and the ability to observe frequencies of codes and categories, or use text searches was very useful in this study.

Finally the researcher would recommend that NLP is useful in qualitative research, as that is how it originated with Bandler and Grinder (1975), modelling experts in communication by enquiring about how they structure their approaches. The use of rapport, calibration and the Meta-model are skills invaluable to the researcher. Nancarrow et al (1996) support this, saying that NLP is useful for qualitative research as the Meta model is useful for probing open-ended answers and in checking on submodalities and therefore getting a detailed description of the interviewees' models of the world. In Figure 7.5 below a fishbone diagram (CVT) is used to demonstrate the lessons learned from the study.

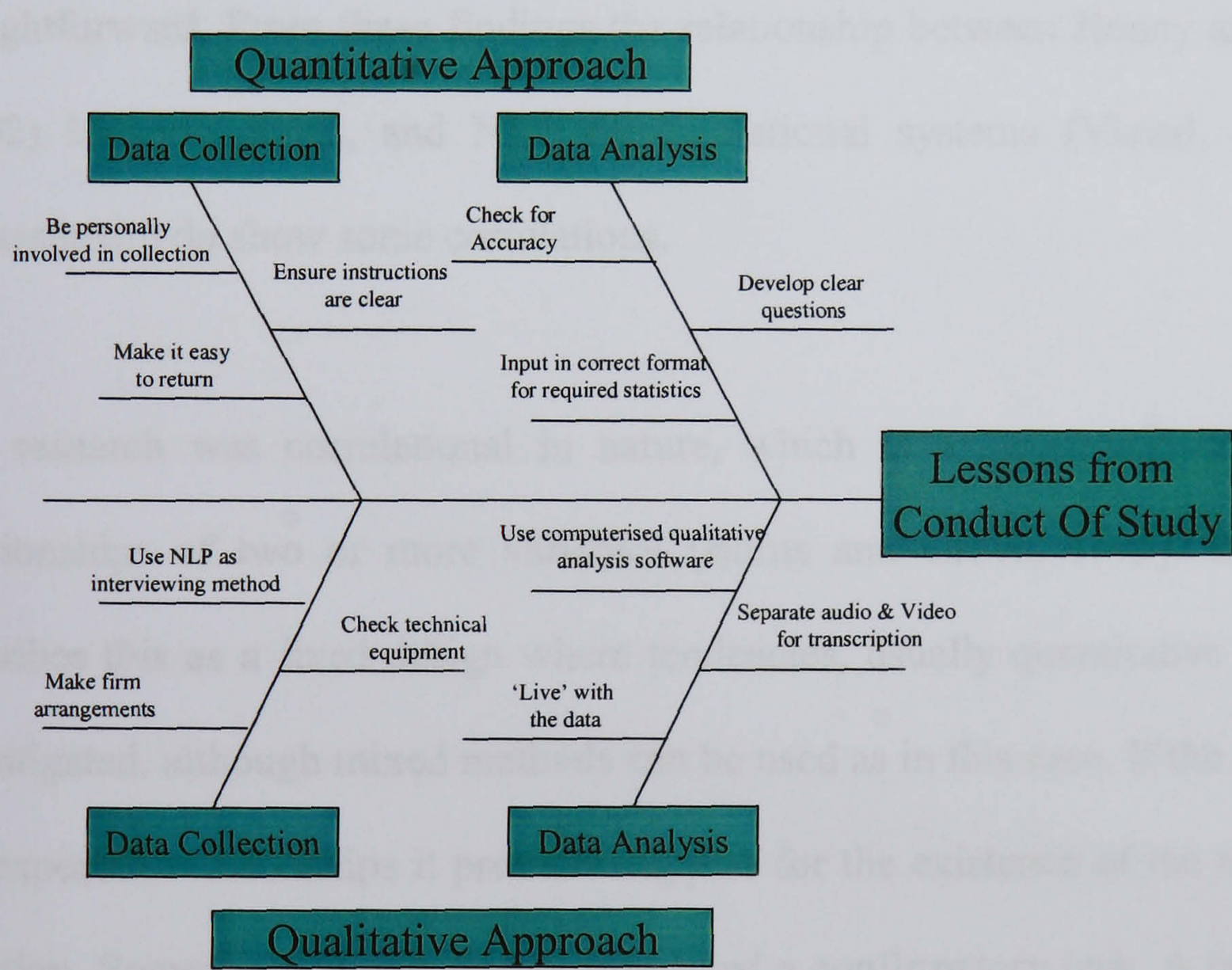


Figure 7. 5: Lessons From The Conduct Of The Study

It is now necessary to summarise the discussion of the findings and make the conclusions drawn from this study.

7.5 Conclusions

The purpose of this study was to investigate the relationship between learning styles and NLP representational systems within Nurse Education and to explore the use of NLP as a teaching and learning tool in Nurse Education. In exploring the above, the over-arching aim of the study was to increase understanding of the learning potential of students, particularly student nurses, by an exploration of how learning styles and their relationship with NLP representational systems might be utilised to maximise student learning. This section sets out to summarise and conclude these questions. The contribution to knowledge from this study in terms of the above questions is quite straightforward. From these findings the relationship between Honey and Mumford's (1992) learning styles, and NLP representational systems (Visual, Auditory and Kinaesthetic) do show some correlations.

The research was correlational in nature, which is a systematic investigation of relationships of two or more variables (Burns and Grove, 1995). Robson (2002) describes this as a fixed design where tendencies, usually quantitative in nature, are investigated, although mixed methods can be used as in this case. If the study delivers the expected relationships it provides support for the existence of the mechanisms in question. Sometimes this could be considered a confirmatory task. A pre-supposition of NLP is 'there is no failure only feedback' (Alder, 1992). As previously discussed, this could be seen as a doctrine of the scientific approach in that it develops generalisations from observed particulars, and looks at a process of *agreement* and *difference*. The agreement would occur in discovering relationships, and the difference would occur in discovering those relationships that could be discarded or eliminated (Brown et al, 1981), leaving room for developing further ideas about the phenomena.

There are elements found within this study where the relationship exists between learning style preferences and NLP's representational systems, suggesting some agreement, yet equally there are indications that there is no significant agreement suggesting some difference. It is recognised that limitations have been identified with the validity of Learning Styles (particularly Honey and Mumford) and supporting evidence of NLP. However, if the pre-supposition of 'no failure only feedback' is accepted then there is scope to utilise these findings within Nurse Education. The findings, are still worth presenting and analysing. Caution is needed in considering these results due to the criticisms of the validity of learning styles concepts and tools, especially highlighted by Coffield et al (2004). However, many researchers highlighted previously still endeavour to study learning styles using these tools and present research findings based on them.

There is a relationship between the Theorist learning style preference with the Visual and Kinaesthetic modalities. The Theorist style is also found to be preferred amongst this sample of student nurses. Although different from previous research, this could be accepted as being representative of nursing students, as learning styles can be shaped by the environments that students are exposed to (Thompson, 2003). This may explain why the preferred style is different from previous studies, as nursing is becoming more established within the Higher Education setting. The Activist learning style preference was also found to have a significant relationship with the smell modality (usually considered part of the Kinaesthetic modality). This could be considered to set it apart from other learning style preferences, especially the Theorist learning style. This is further supported by the fact that this study shows a reverse of preferences for these two styles related to age. Activist preferences negatively correlate, and Theorist

preferences positively correlate with age. The interesting factor related to this point hinges around the aspect of experience. Activists like to have lots of new experiences, and it could be argued that the more considered approach of the Theorist could be because as they are more likely to be older, therefore they may have already had many experiences. Honey and Mumford (1992) argue that learning is based on a cycle, and that the whole cycle should be completed to ensure full learning. They propose that learning style preference is related to which stage of the cycle is most preferred, yet all stages are usually included in the learning process. Firstly, by being aware of the preferred learning styles of student nurses, relevant experiences can be developed in order to either develop efforts to match this learning style therefore enhancing the experience for student nurses, or to widen the repertoire of experiences in order to broaden students preference for other learning styles. It is suggested that problem based learning could be a suitable vehicle within Nurse Education to address the issue of students having different styles related to which part of the learning cycle they prefer, as the problem based learning approach appears to reflect this cycle. As Theorists like to develop ideas and draw conclusions a problem solving approach would be deemed relevant to reflect this style preference as well as the other styles.. The 7 steps Maastricht approach mentioned above in section 7.2 highlights the differing stages of the problem based learning approach. Within this a variety of teaching approaches could be utilised depending on the dynamics, needs and wishes of the group. This approach also covers the stages that would appeal to various individuals with particular learning style preferences, with the problem solving and concluding aspects appealing to those with Theorist style preferences. The main contribution can be seen in the figure 7.6 below.

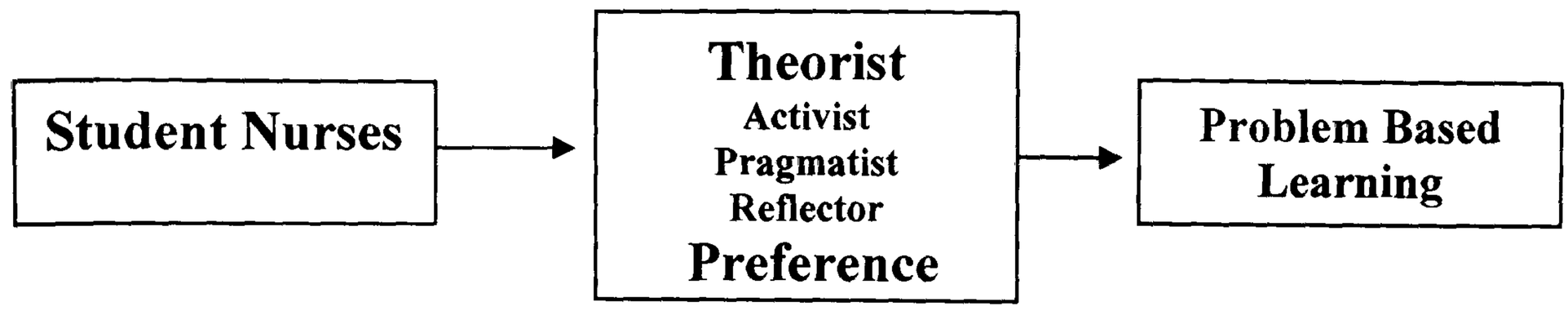


Figure 7.6: Addressing the Learning Style Preference

In terms of NLP internal representation modality preference, all sets of data indicated that the Visual modality is preferred both in relation to identifying positive learning situations and in explaining poor learning situations. The Kinaesthetic modality was the next most popular with the Auditory modality being least preferred. If brain-based (Jensen, 1995) and ethological aspects are accepted this could be explained by the Visual sense in humans being highly developed, and a major factor in survival. If survival is equated to learning (particularly from experience) then using and developing the Visual modality in learning is beneficial for human beings. As the Kinaesthetic modality is also highly valued it is suggested that this is used as a checking mechanism, following a person visualising the learning situation. That is visualising an initial situation, and checking whether it feels right or not via the Kinaesthetic modality. If not, then a solution can be visualised and re-checked. The visualising of a situation is related to the notion of schemas (Colcombe and Wyer, 2002). Within a schema a person develops prototypes (generalisations of situations) or exemplars (specific examples of situations). These schemas are in the form of internal representations; however if it is accepted that thoughts can be considered to be objects (and therefore manipulated in much the same way as an object (Caviglioli et al, 2002), these can then be externalised and shared with others. It can be accepted that visualisation relates to seeing things internally and externally, in terms of internal representations that relate meaning to real or abstract situations. This relates to

recreating maps, or symbols that can be used to represent the situation. As the NLP internal representational Visual modality is preferred it is suggested that there are two main approaches that can be used to stimulate this, to meet the need to visualise externally and internally. One suggestion is that Visual tools are utilised with student nurses (Caviglioli et al, 2002), since they are useful as an external reference, either to be produced for the students or by them to demonstrate their ideas. Another proposal is that the use of metaphor be used to promote internal accessing of the Visual modality. The two can be used in conjunction as Visual tools can be used as a reference of what a metaphor represents. Figure 7.7 below demonstrates this relationship.

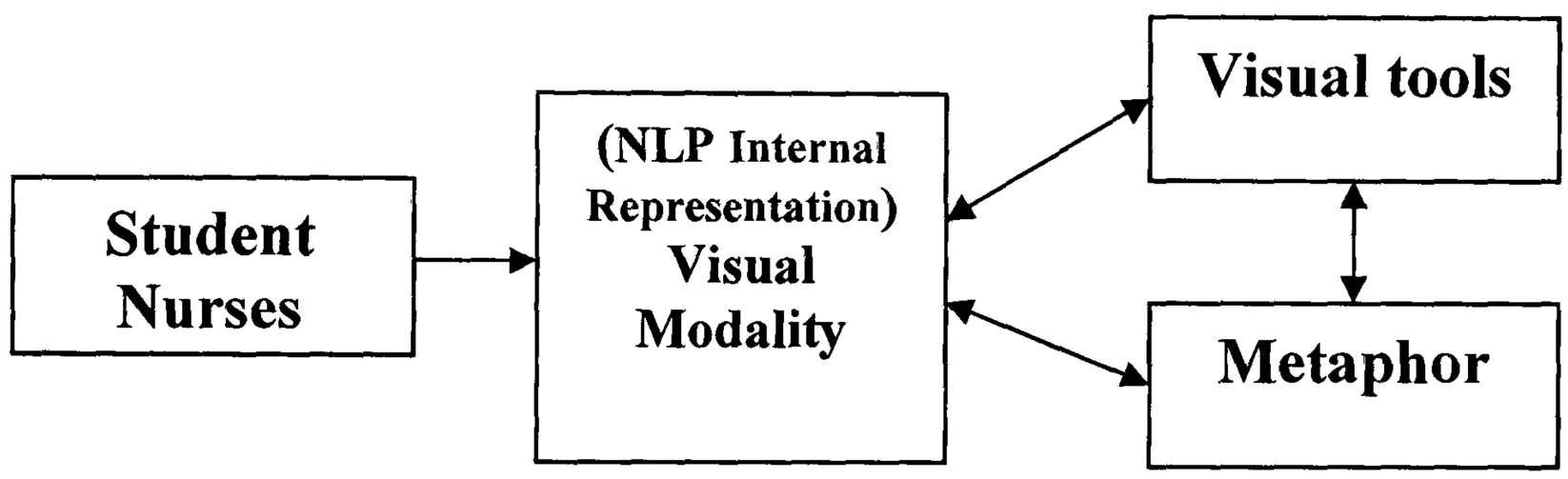


Figure 7.7: Addressing The Modality Preference

As the main aspect of investigation was the relationship of learning styles with NLP internal representational systems, relationships for the Reflector style and for the Pragmatist style showed no significant relationships with the internal representational systems. Therefore, the feedback from this (as opposed to any notion of failure) is that this perhaps needs to be further investigated. However the relationship with Theorist style and The Visual/ Kinaesthetic modality and the Activist with Smell are positive findings. However as the Activist preference was not the most preferred style in this sample and also the smell modality is classed as a sub-sense of the Kinaesthetic modality which was not as highly preferred as the Visual modality, the Theorist style

and its relationship with the Visual modality will remain the focus. This Relationship can be seen in figure 7.8 below.

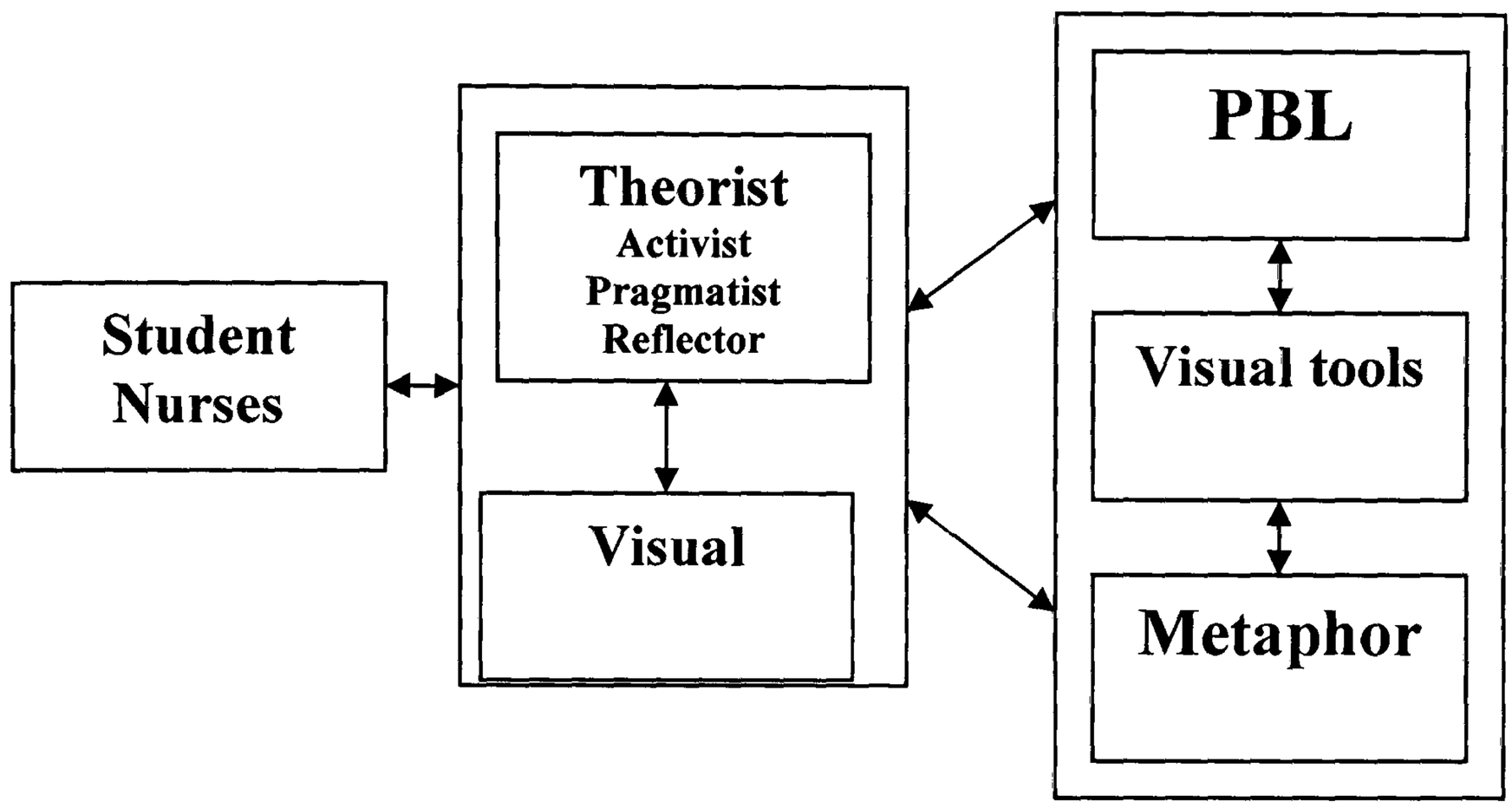


Figure 7.8: Addressing The Relationship Between Learning Style Preference And Preferred Internal Representational System

As can be seen by using problem-based learning, Visual tools and metaphor, the needs of the student nurses can be met, as these approaches would fit both learning style preferences and favoured internal representational system. As these are closely related these methods in combination should enhance learning for student nurses.

The use of NLP, (rapport, calibration, meta-model, Milton model, setting outcomes and identifying strategies) can be used as a basis for the above. As the eliciting of submodalities is an important aspect in assisting individuals to make changes (Bandler and Macdonald, 1988) and the awareness of the preferred internal representational system has its place in learning. Another aspect related to NLP

(particularly, rapport, calibration and use of the meta-model) is its use as a research method in interviewing (Nancarrow et al, 1996; Mitchell, 2000). It was particularly useful in this study at the point of interviewing the students, and in analysing the body positions and predicates whilst reviewing the videos for analysis. However the main value of NLP is in its application in the field of learning and change. If we accept that 'neuro' and 'programming' are about responding to life situations by developing patterns of response, and that these can be shaped by the linguistic element in human beings, then it would be a valuable tool for all teachers to possess as a skill. The relationship of NLP within this study and its suggested application can be seen in figure 7.9 below.

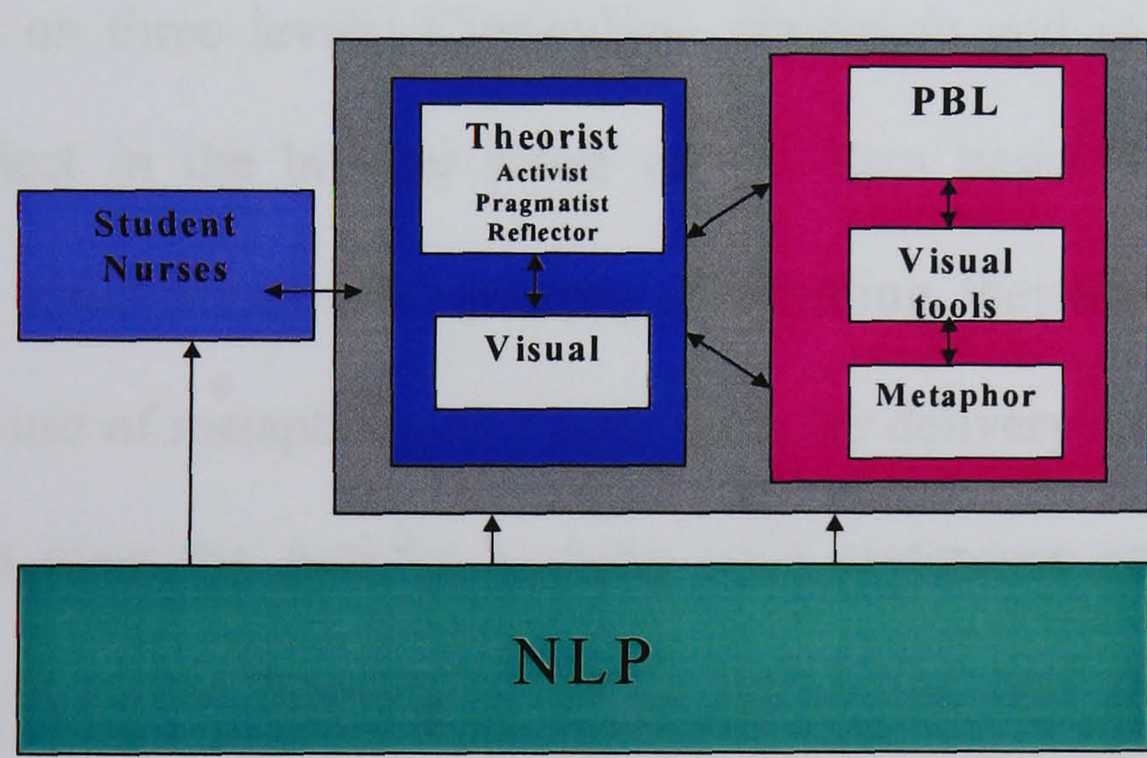


Figure 7.9: The Application Of NLP In Relation To Learning Style, Modality Preference And Student Nurses

As discussed previously, the use of problem based learning, Visual tools and metaphor, delivered with the application of NLP could enhance Nurse Education. Firstly this is because student approaches to learning would be enhanced, and secondly because it provides an opportunity through these factors to focus on context-based situations that truly reflect the world in which student nurses will be operating.

Smythe (2004) highlights that students need to be provided with the opportunity to develop thinking skills. Currently in Nurse Education content is getting squashed into fewer and fewer hours. Smythe suggests that students become 'slaves' to teachers passing over ready-made knowledge. By placing learning within a context, even with the possibility of de-modularising courses to enable a pure problem based learning approach, students could further develop skills that would be beneficial for them whilst in their professional roles. This would also reflect on their preferred learning style and could be augmented via their use of the preferred modality: Visual. The students could be facilitated through the whole of this process by teachers skilled in NLP, able to provide them with understandings of their own most effective strategies towards meeting outcomes. Therefore it is suggested that these findings need to be considered on three levels: Curriculum, classroom and individual. The curriculum should reflect in the broader sense the problem based learning approach. In the classroom, whilst the students' journey is unfolding, they should be facilitated through it with the use of metaphor and Visual tools for delivery and assessment of learning. In order to meet the Activist learning style preference aspect, perhaps the use of aromas to stimulate learning could be introduced into the environment therefore assisting them to link the experience, via their preferred modality. In terms of learning environment it should be remembered that a multi-modal approach is preferred, yet based on these findings the Visual mode should definitely be predominantly included in the classroom. Visual tools should not necessarily be placed on a screen at the front of the class where students are required to look. This creates habituation and therefore has a de-sensitising effect of new material. By changing types of Visual tools, and ensuring they reflect internal representations that students regularly access such as colour, movement, size and location, attention should be maintained because of the

introduction of novel stimuli, and the students' necessity to account for the changes. If a 'survival' aspect were considered the person would need to be constantly aware of the environment in order to maintain safety. If nothing changes then there is no need to pay attention to it. Therefore learning may not have the same impact because the environment remains the same. In this study students explicitly gave rich, detailed information of the environments in which they were situated in recalling successful learning experiences. The use of metaphor is valuable as it is a way for the teacher to give explanations that students can draw conclusions from and build models of the world, thus again appealing to the preferred learning style and modality from these findings. Metaphors are easily developed and can also be used by students to explain their thoughts. Then the Visual tool can be used to explain the metaphor in terms of their understanding of the contexts and situations they may face as nurses.

The above factors apply in working with the student on an individual level. The use of NLP is particularly pertinent here as it can be used to assist the student to gather information about the structure of their experiences and to identify limitations or elegant approaches and to assist them in developing more effective strategies for change (Bandler and Grinder, 1975). The uses of these proposals are shown in figure 7.10 below.

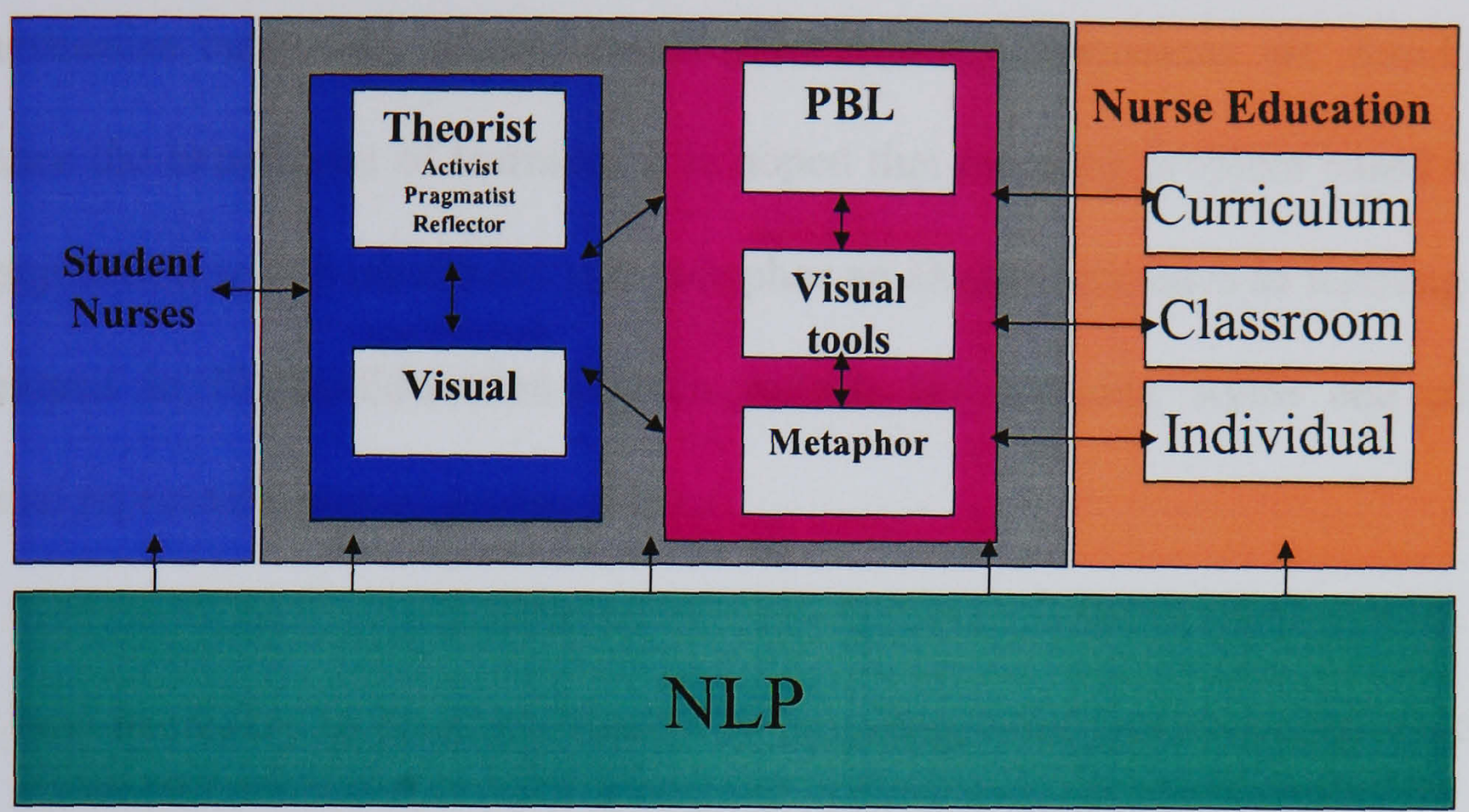


Figure 7.10: Applications Of NLP Within Nurse Education.

In discussing these proposals it should be noted that these are derived from the findings of this study. The whole issue of learning styles relates to the idea that individuals should either be facilitated towards identifying their learning style and therefore seeking situations that best serve it, or by finding ways of enhancing those learning style behaviours that they have not yet developed, so to enhance their all round learning abilities. It would be wrong to suggest that other learning styles should be ruled out; but that they all should be considered. The approaches suggested should assist in the development of all learning styles whilst appealing to those with a Theorist style. A multi sensory environment could also be promoted. Therefore the Visual modality, although suggested, should not be used at the cost of other modalities. It should however take prominence, particularly in classroom settings, in

the form of external Visual aspects, and the use of metaphor to assist students to readily access their Visual internal representations. By including the other modalities, synaesthesias can occur where powerful internal representations are developed to enhance the experience of learning. It is hoped that by using problem based learning in conjunction with Visual tools and metaphor an elegant approach to learning can be developed in Nurse Education, which reflects the learning styles and preferred internal representations of student nurses.

It is now necessary to conclude finally by providing brief recommendations on how the findings in this study could be developed.

7.6 Recommendations

The recommendations will cover two aspects: recommendations for Nurse Education and recommendations for further research. As one of the recommendations is to utilise metaphor, this section will begin with one. The reader is invited to imagine that the findings in this study are already found to be relevant, pertinent and true and therefore to be accepted into Nurse Education per se. Therefore these recommendations will be made 'As If' that is true. Hall and Bodenhamer (2000) describe an 'As If' frame as

> 'Pretending or acting as if something was true, had occurred; A creative problem-solving process.'
> Hall and Bodenhamer, (2000, p266).

This may need a suspension or change of belief, in order to accept such concepts. In doing so changes can be instigated, as behaviours are usually consistent with beliefs (Burton and Bodenhamer, 2000) therefore changes to the former can result in changes to the latter. This also aligns to the concept of fuzzy predictions (Bassey, 2001) where

proposed events and consequences are considered. If considered to be true then strengths and weaknesses can be highlighted and appropriate approaches developed. It is on this basis that these recommendations are made.

Firstly the educational aspects and recommendations will be given. It should be remembered that these recommendations are aimed at the aspect of Nurse Education carried out in the university setting. Issues related to practice should align with these. However as students often related to the theory side of their learning as the one with which they have difficulty, it is this that will be focussed on within the recommendations.

1. Nurse Education should consider developing courses that accurately develop learning outcomes reflecting the knowledge, skills and attitudes that an individual needs on entering the profession as a qualified nurse. These should be developed into a contextual journey that the nurse embarks on, whereby they learn the skills needed to operate in real life, where situations do not present themselves as neat packages such as in stand alone modules. Context-based situations need to be presented where theories are investigated for their value in the contextual situations, as opposed to finding situations to fit theories. Learning then develops through seeking ways of solving problems. Human beings bring with them holistic needs that need holistic responses. Therefore developing the skills of learning and developing ways of solving problems are crucial for nurses. This should reduce the metaphorical theory-practice gap in nursing. Problem based learning could be developed as

a feature of nursing courses within the curriculum and within the classroom setting to assist in such changes.

2. Using Visual tools and metaphor as tools to assist understanding should be a prominent feature of the skills teachers and students develop as part of the learning process. These should also be utilised by teachers with students on an individual level. Nurse teachers should be given instruction in how to develop and use Visual tools as a medium within Nurse Education. Development of metaphor as a tool and how to utilise it should also form part of teacher education. More importantly Nurse teachers should be given instruction in how to use NLP as an effective tool in highlighting and interpreting individual and collective internal representations and for its application for learning and development within Nurse Education.

3. Learning environments should be diverse and stimulating so as to provide students with brain based settings to enhance their learning and avoid habituation to settings where they are unable to distinguish between lessons and lecturers. This does need a change of emphasis on how Visual aids are used and presented.

4. All students should be profiled in relation to their learning styles so they can develop an awareness of them and advice can be given on how best to approach and develop their learning whilst in Nurse Education.

In terms of research this study has highlighted areas of interest that perhaps need further scrutiny, including further replication of this study itself in order to investigate whether there are similarities with other groups or whether there are changes and developments of the preferences over time. The main recommendations for further research are:

1. To continue investigation of the use of Honey and Mumford's Learning Style Questionnaire (1992).

2. To investigate the aspect of Learning Style and age.

3. To investigate the use of the NLP meta-model as a research method

4. To investigate the use of Visual tools in Nurse Education.

5. To investigate the uses of metaphor within Nurse Education.

6. To carry out a longitudinal Study, investigating changes over time.

Finally it must be remembered that an environment that is conducive to all learning style preferences of students, in terms of activities and experiences provided, that is multi modal in nature, that makes use of Visual, Auditory, Kinaesthetic, Olfactory and Gustatory situations both internally and externally should be considered for all.

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Appendices

Appendix One

Modalities and Submodalities in NLP

Modality	Submodalities
Visual	Colour/ Black and White Associated/Disassociated Brightness Movement (of the image/ within the image) Contrast Focus (Sharp/fuzzy) Texture of Image (smooth or rough) Detail Size Distance Shape Border Location Orientation Perspective Proportion Dimension (2D /3D) Singular/Plural
Auditory	Location (Internal/External) Internal Dialogue Background Sounds Pitch Tonality Melody Inflection Volume Tempo Rhythm Duration Mono/Stereo
Kinaesthetic	Location (where in the body) Internal/ External Quality (type of sensation) Intensity Movement Direction Speed Duration Temperature (warm/ hot/ cold) Smells (aromatic/noxious) Taste (Bitter/ Sweet)

Bandler and MacDonald (1988).

Appendix Two

Letter Of Permission

University of
HUDDERSFIELD

School of Human and Health Sciences

Dewsbury Education Centre, Dewsbury and District Hospital NHS Trust,
Healds Road, Dewsbury WF13 4HS Tel: 01924 512000 Fax: 01924 450839

Our Ref: CD/KC

5 February 1999

Mr R Burton
School of Human & Health Sciences
University of Huddersfield
West Cottage
Pinderfields Hospital NHS Trust
Aberford Road
WAKEFIELD
WF1 4DG

Dear Rob

Re: Phd Research

As far as I am aware, provided that you follow normal protocols in carrying out your research activity with students I can see no reason why you should not pursue this.

Yours sincerely

Head of Department of Nursing

School of Human and Health Sciences
Queensgate Huddersfield HD1 3DH UK Telephone 01484 422288 Fax 01484 516151
Direct Fax 01484 472794

Vice-Chancellor and Principal: Professor John R Tarrant BSc PhD

centre of excellence for vocational education and research

Appendix Three

Predicates

Visual	**Seeing things in a different light** **Getting a perspective on things** **From my point of view** **It looks like** **I see a bright future** **Let's focus** **I can picture it** **Have you seen the latest**
Auditory	**Music to my ears** **I hear what you're saying** **I say it should be different** **Being in harmony with** **That sounds right** **Sounds like it to me** **Have you heard the news** **Rings a bell**
Kinaesthetic	**I have a grasp of things** **Things feel right** **I feel stuck** **Get things moving** **Get the feel of what someone is saying** **I'm under pressure** **I feel high** **I have a mental block**
Olfactory	**Smelling a rat** **The sweet smell of success**
Gustatory	**A taste of things to come** **It was a sweet moment**

Mitchell (2000).

Appendix Four

The Meta Model Of NLP.

Category	Linguistic Pattern	Description	Example	Challenge
Deletions	Unspecified Verb	Verbs which remove specifics about how when where	He helped me	How specifically did he help?
	Lack of Referential Index	Unidentified Pronoun	They don't understand	Who doesn't understand?
	Comparative Deletion	Missing standard of evaluation	I handled the situation badly	In comparison to what?
	Simple Deletion	Missing or deficient information	I feel angry	About what?
Generalisations	Presuppositions	Beliefs which a sentence implicitly requires in order to be understood	Why don't you understand me	What makes you think that I don't?
	Modal Operators of possibility	Words which require particular action or imply no choice	I can't do this kind of thing?	How do you know that?
	Modal Operators of necessity	Words which require particular action or imply no choice	I must do this	What would happen if you didn't?
	Universal Quantifiers	Expressions precluding exceptions	Nurses are really caring	All of them?
Distortions	Nominalisations	Verbs transformed into nouns	My indecision is my biggest fault	How & when are you indecisive?
	Cause & Effect	A specific stimulus causes a specific response A causes B	My boss only has to speak to me and I'm afraid.	How does he/she do that?
	Mind Reading	Assuming knowledge of what another person thinks/feels	He doesn't like me	How do you know that?
	Complex Equivalence	Conclusion based on the belief that the outcome will always be the same	You're not smiling, you must be bored	How does one mean the other?
	Lost Performative	Value judgements in which the source is missing	People are generally caring	What leads you to that conclusion?

Mitchell (2000).

Appendix Five

Questionnaire Package

Learning Styles and Representational Systems Questionnaire.

Thank you for agreeing to complete this questionnaire.

There are three sections:

1. Honey and Mumford's (1986) learning style questionnaire

2. Your preferred thinking pattern (Knight 1995)

3. The primary preceptual modality inventory (Markowski and McVoy 1998)

In order to answer the questions simply follow the instructions given at the beginning of each section. It should take about ten minutes to complete.

Please answer the following demographic questions before going on to the rest of the questionnaire:

Are you Male..... or Female..... (Please tick)

What is your age? .....

Thank you.

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 yo : 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.

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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.

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ific 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.

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Your Preferred Thinking Pattern

For each of the following questions, think about the item, person or place described and circle the letter of the element (s) that come to mind. Check your answers on the analysis sheet provided at the end.

1. Petrol.

a. An image of some sort, e.g. a car, a petrol station?
b. A sound, e.g. the sound of petrol pouring into a tank, the sound of an explosion?
c. A touch, e.g. the feel of the pump handle?
d. A smell, e.g. the smell of the petrol?
e. A taste, e.g. the taste of petrol (assuming you know!)?

2. Your best friend.

a. A sound, e.g. the sound of their voice?
b. An emotion, e.g. your feelings towards them?
c. A smell, e.g. the smell of their perfume?
d. A taste, e.g. the taste of a meal you ate with them?
e. An image, e.g. what they look like or a place you have been to with them?

3. The way you most like to spend your time.

a. The sounds associated with doing this, e.g. the sound of peoples voices or the sounds of the environment?
b. A taste, e.g. the taste of a particular food?
c. A smell, e.g. the aroma of the environment?
d. An image, e.g. where you would be or who you would be with?
e. A touch or an emotion, e.g. how you feel when you think of spending your time this way?

4. What you did yesterday.

a. A taste of some sort, e.g. what you ate?
b. An image or a picture, e.g. the scene of where you were?
c. A sound or maybe a conversation?
d. A touch, sensation or emotion?
e. A smell, e.g. of your environment?

5. A time you didn't enjoy very much.

a. A smell, e.g. an aroma?
b. A sound, e.g. what you heard or what you were saying to yourself?
c. A taste?
d. An image, e.g. of what was happening or what you could imagine?
e. A touch, e.g. the feel of something, or an emotion, e.g. how you felt at the time?

6. Your favourite restaurant.

a. A touch or emotion, e.g. how you felt being there?
b. What you see, e.g. the people you are with, your surroundings?
c. What you hear, e.g. the conversation, the music?
d. A taste, e.g. of the food?
e. A smell, e.g. the aroma from the kitchen?

7. Something from your early childhood.

a. A smell, an aroma, a perfume?
b. A touch or an emotion?
c. An image?
d. Sounds or voices?
e. A taste?

8. Your work.

a. A sound, e.g. of equipment or voices?
b. An image, e.g. the picture of what you do?
c. A taste?
d. A smell, e.g. of your surroundings?
e. A touch or an emotion, e.g. the texture of what you can feel or how you feel about your work?

9. Where you might be tomorrow.

a. An image or picture?
b. An emotion or touch?
c. A taste?
d. A smell or aroma?
e. A sound?

10.Something you find difficult to do.

a. An image or picture?
b. A taste?
c. A sound or inner conversation?
d. An associated emotion or touch?
e. A smell?

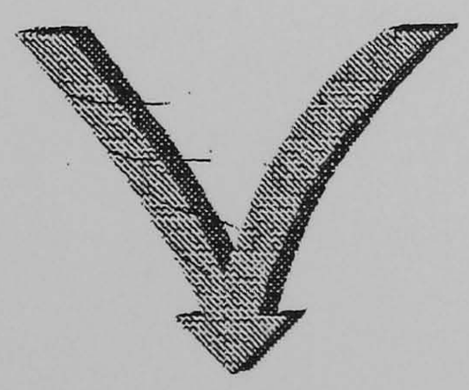
11.Something you find rewarding.

a. An emotion, e.g. feeling of satisfaction, or a touch, e.g. the physical sensation of a sport?
b. A taste?
c. A smell?
d. A sound, e.g. what you say to yourself or the sound of voices of your environment?
e. An image, e.g. of what it looks like?

12.Something you find amusing.

a. A sound, e.g. what someone says or what you hear?
b. An image, e.g. something or someone you see?
c. An emotion, e.g. the sensation of amusement, or a physical touch, e.g. the feel of something?
d. A taste?
e. A smell?

Thank you, for answering these questions. Now please complete the analysis overleaf and discover your preferred thinking pattern.



Analysis

Circle the letters you answered for each question.

Question	Visual	Auditory	Feelings	Taste	Smell
1	a	b	c	e	d
2	e	a	b	d	c
3	d	a	e	b	c
4	b	c	d	a	e
5	d	b	e	c	a
6	b	c	a	d	e
7	c	d	b	e	a
8	b	a	e	c	d
9	a	e	b	c	d
10	a	c	d	b	e
11	e	d	a	b	c
12	b	a	c	d	e
Totals					

Now add up the number of letters circled in each column. These scores indicate your preferences in thinking patterns, i.e. the higher the score, the more likely you are to use this sense as a way of processing information. There are no right answers!

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Thank you.

Please complete the primary perceptual modality inventory overleaf, of visual, auditory and kinesthetic items.

The Primary Perceptual Modality Inventory

Read the following items and relate them to specific experiences from your memory. Attempt to reexperience each item as a specific sight. In other words see how well you can visually recreate the exact color and physical details of the items. Then rate how well you were able to mentally recreate the item by circling the number under the response that is most appropriate.

	UNABLE	VAGUELY	FAIRLY WELL	VERY WELL	EXTREMELY WELL
1. See a red sunset.	1	2	3	4	5
2. See a decorated Christmas tree.	1	2	3	4	5
3. See a red rose.	1	2	3	4	5
4. See a McDonald's restaurant.	1	2	3	4	5
5. See a slice of watermelon.	1	2	3	4	5
6. See your bedroom.	1	2	3	4	5
7. See waves rolling onto a beach.	1	2	3	4	5
8. See writing on a chalkboard.	1	2	3	4	5
9. See a fire in a fireplace.	1	2	3	4	5
10. See a dollar bill.	1	2	3	4	5
11. See a toothbrush.	1	2	3	4	5
12. See a high school.	1	2	3	4	5
13. See a heavy rain falling.	1	2	3	4	5
14. See a famous person.	1	2	3	4	5
15. See your own face in a mirror.	1	2	3	4	5
16. See your best friend.	1	2	3	4	5
17. See the scene outside your front door.	1	2	3	4	5
18. See a black bird.	1	2	3	4	5
19. See your signature.	1	2	3	4	5
20. See the face of someone special looking at you.	1	2	3	4	5

To score: Add all circled numbers together. Visual Total _____

Read the following items and relate them to specific experiences from your memory. Attempt to reexperience each item as a specific sound. In other words tune into your ability to recreate the exact tones, timbers and sound levels of the items. Then rate how well you were able to mentally recreate the item by circling the number under the response that is most appropriate.

	UNABLE	VAGUELY	FAIRLY WELL	VERY WELL	EXTREMELY WELL
1. Hear the voice of a famous person.	1	2	3	4	5
2. Hear a band playing the National Anthem.	1	2	3	4	5
3. Hear the wind whistle in the trees.	1	2	3	4	5
4. Hear a musical instrument playing.	1	2	3	4	5
5. Hear waves rolling onto the beach.	1	2	3	4	5
6. Hear birds singing.	1	2	3	4	5
7. Hear your favorite song.	1	2	3	4	5
8. Hear crickets chirping.	1	2	3	4	5
9. Hear the voice of someone special whispering in your ear.	1	2	3	4	5
10. Hear a doorbell ring.	1	2	3	4	5
11. Hear the door of a car slamming.	1	2	3	4	5
12. Hear a crackling fire.	1	2	3	4	5
13. Hear a heavy rain falling.	1	2	3	4	5
14. Hear a dog barking.	1	2	3	4	5
15. Hear someone writing on a chalkboard.	1	2	3	4	5
16. Hear a cat purring.	1	2	3	4	5
17. Hear a choir singing.	1	2	3	4	5
18. Hear a baby crying.	1	2	3	4	5
19. Hear a glass shattering into pieces.	1	2	3	4	5
20. Hear yourself talking.	1	2	3	4	5

To score: Add all circled numbers together. Auditory Total _____

Read the following items and relate them to specific experiences from your memory. Attempt to reexperience each item as a specific physical feeling. In other words get in touch with your ability to recreate the exact textures and sensation of the items. Then rate how well you were able to mentally recreate the item by circling the number under the response that is most appropriate.

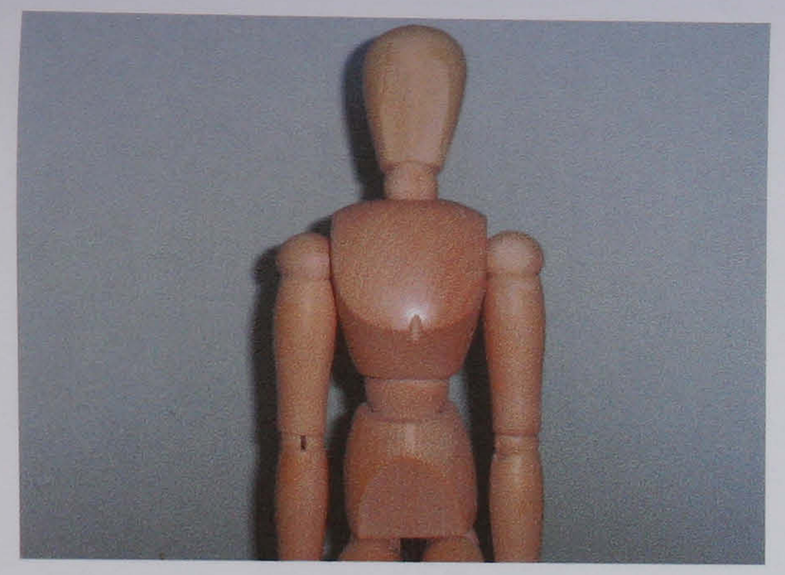
	UNABLE	VAGUELY	FAIRLY WELL	VERY WELL	EXTREMELY WELL
1. Feel your feet in warm sand.	1	2	3	4	5
2. Feel a throbbing headache.	1	2	3	4	5
3. Feel yourself in a swing.	1	2	3	4	5
4. Feel a splinter in your finger.	1	2	3	4	5
5. Feel someone's hand in yours.	1	2	3	4	5
6. Feel the warmth of someone special hugging you.	1	2	3	4	5
7. Feel the soft petal of a flower.	1	2	3	4	5
8. Feel a heavy rain falling.	1	2	3	4	5
9. Feel soap burning your eyes.	1	2	3	4	5
10. Feel someone tickling you.	1	2	3	4	5
11. Feel yourself biting a crisp apple.	1	2	3	4	5
12. Feel an animal's fur as you pet it.	1	2	3	4	5
13. Feel rocks under your bare feet.	1	2	3	4	5
14. Feel the nervousness in your stomach when you are anxious.	1	2	3	4	5
15. Feel your body sensation as someone runs fingernails across a chalkboard.	1	2	3	4	5
16. Feel the cut of a sharp object.	1	2	3	4	5
17. Feel your hands digging in mud.	1	2	3	4	5
18. Feel your chest pounding after exercising.	1	2	3	4	5
19. Feel a hot object.	1	2	3	4	5
20. Feel your skin itching.	1	2	3	4	5

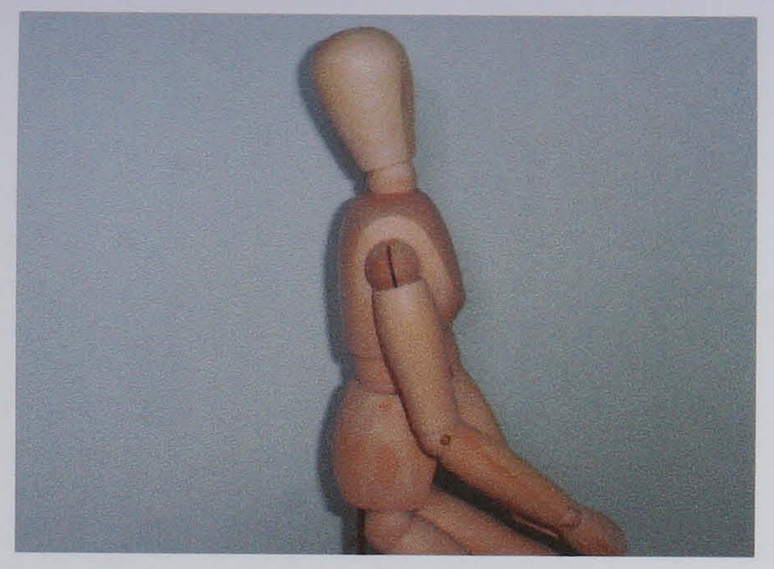
To score: Add all circled numbers together. Kinesthetic Total _____

Note: One's primary perceptual modality is identified when the highest score is more than three points greater than the next highest score.

Appendix Six

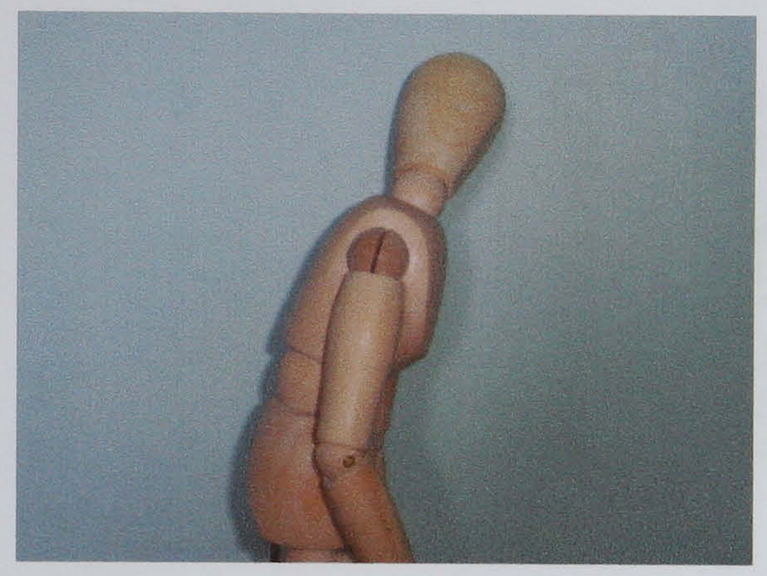
Body Positions





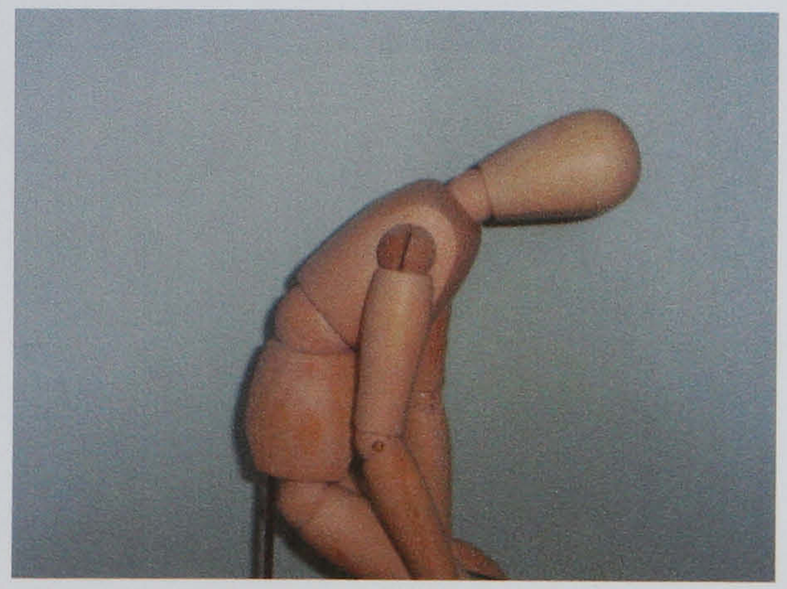
Position 1
'Visual'

Gestures generally upwards and outwards,
might point from and to eyes



Position 2
'Auditory'

Gestures towards side of face, temple or ears,
'telephone posture'



Position 3
'Kinaesthetic'

Gestures towards body,
or motions around body

(Dilts et al 1980)

Appendix Seven

Tables Of Results

Appendix Seven

Table 4.19: Modality Preference and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.099*	.032	.033	.102*	.043	.063	.018	-.021	.016
		.040	.508	.500	.033	.372	.189	.703	.661	.740
		433	433	433	433	433	433	433	433	433
	Reflector	.038	-.015	-.070	-.011	.028	-.057	.049	.082	.076
		.431	.762	.147	.816	.566	.238	.304	.088	.113
		433	433	433	433	433	433	433	433	433
	Theorist	.143**	-.082	-.057	-.077	-.031	-.068	.075	.103*	.101*
		.003	.090	.237	.111	.516	.158	.118	.032	.035
		433	433	433	433	433	433	433	433	433
	Pragmatist	.054	-.020	-.020	.001	-.064	-.029	.035	.029	.047
		.265	.677	.677	.983	.185	.544	.472	.548	.325
		433	433	433	433	433	433	433	433	433

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.20: Modality Preference and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.094*	.047	.044	.098*	.032	.068	.017	-.036	.010
		.050	.332	.362	.042	.503	.160	.725	.457	.841
		433	433	433	433	433	433	433	433	433
	Reflector	-.007	-.032	-.054	-.051	.004	-.062	.044	.069	.045
		.885	.512	.264	.289	.933	.201	.358	.151	.349
		433	433	433	433	433	433	433	433	433
	Theorist	.127**	-.052	-.079	-.065	-.031	-.082	.077	.090	.097*
		.008	.278	.102	.180	.518	.089	.108	.063	.044
		433	433	433	433	433	433	433	433	433
	Pragmatist	.047	-.033	-.022	-.009	-.047	-.030	.027	.025	.050
		.334	.499	.642	.852	.330	.534	.576	.608	.296
		433	433	433	433	433	433	433	433	433

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 4.21: Females Modality Preference and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.072	.017	.028	.090	.033	.054	.013	-.048	.002
		.173	.748	.596	.087	.530	.306	.811	.359	.963
		364	364	364	364	364	364	364	364	364
	Reflector	.008	-.019	-.051	.014	.045	-.042	.046	.084	.047
		.882	.718	.335	.784	.393	.427	.378	.110	.367
		364	364	364	364	364	364	364	364	364
	Theorist	.076	-.099	-.031	-.072	-.021	-.051	.089	.100	.071
		.148	.058	.554	.168	.696	.329	.091	.057	.179
		364	364	364	364	364	364	364	364	364
	Pragmatist	.052	-.028	-.002	-.026	-.067	-.029	.048	-.006	.003
		.321	.595	.972	.623	.202	.579	.363	.904	.955
		364	364	364	364	364	364	364	364	364

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 4.22: Females Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.071	.030	.039	.090	.033	.064	.014	-.067	-.006
		.179	.563	.462	.088	.530	.224	.793	.201	.907
		364	364	364	364	364	364	364	364	364
	Reflector	-.047	-.046	-.043	-.020	.016	-.047	.036	.078	.023
		.370	.381	.410	.701	.754	.367	.488	.138	.657
		364	364	364	364	364	364	364	364	364
	Theorist	.059	-.075	-.064	-.067	-.022	-.076	.086	.080	.057
		.261	.152	.221	.200	.679	.146	.102	.126	.274
		364	364	364	364	364	364	364	364	364
	Pragmatist	.038	-.038	-.007	-.033	-.054	-.033	.031	-.011	.006
		.472	.465	.898	.526	.302	.532	.553	.828	.903
		364	364	364	364	364	364	364	364	364

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.23: Males Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.249	.082	.009	.112	.096	.067	.080	.115	.142
		.039*	.504	.940	.358	.431	.587	.511	.347	.243
		69	69	69	69	69	69	69	69	69
	Reflector	.202	.027	-.111	-.084	-.069	-.084	.034	.102	.213
		.096	.826	.363	.492	.572	.493	.781	.406	.079
		69	69	69	69	69	69	69	69	69
	Theorist	.422	.005	-.166	-.063	-.099	-.136	.004	.124	.249
		.000**	.966	.173	.606	.417	.266	.976	.309	.039**
		69	69	69	69	69	69	69	69	69
	Pragmatist	.058	.022	-.154	.117	-.019	-.049	-.027	.213	.334
		.634	.860	.206	.340	.874	.689	.823	.079	.005**
		69	69	69	69	69	69	69	69	69

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.24: Males Modality Preference and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.221	.120	.047	.099	.024	.050	.078	.142	.154
		.068	.328	.701	.418	.845	.682	.523	.244	.205
		69	69	69	69	69	69	69	69	69
	Reflector	.184	.068	-.058	-.131	-.048	-.073	.038	.057	.133
		.129	.578	.634	.283	.696	.550	.759	.640	.275
		69	69	69	69	69	69	69	69	69
	Theorist	.407	.059	-.132	-.029	-.087	-.093	.042	.134	.288
		.001**	.631	.281	.814	.476	.447	.732	.271	.017*
		69	69	69	69	69	69	69	69	69
	Pragmatist	.088	-.003	-.138	.117	.022	-.026	.025	.235	.353
		.472	.982	.259	.339	.860	.833	.838	.052	.003**
		69	69	69	69	69	69	69	69	69

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.25: 18-22 Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.076	.016	.075	.124	.058	.123	.000	-.142	-.037
		.326	.833	.335	.110	.456	.112	.997	.067	.630
		168	168	168	168	168	168	168	168	168
	Reflector	-.052	-.013	-.149	-.012	.142	-.092	.082	.133	.079
		.502	.872	.055	.882	.066	.237	.288	.085	.307
		168	168	168	168	168	168	168	168	168
	Theorist	.060	.001	-.027	.075	.097	.044	.029	.130	.193
		.436	.991	.731	.332	.210	.574	.708	.094	.012*
		168	168	168	168	168	168	168	168	168
	Pragmatist	-.005	.059	-.013	.096	-.002	.041	.112	.080	.090
		.944	.449	.863	.216	.976	.601	.147	.301	.247
		168	168	168	168	168	168	168	168	168

** Correlation is significant at the .01 level (2-tailed).
*Correlation is significant at the .05 level (2-tailed).

Table 4.26: 18-22 Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	Activist	-.058	.018	.082	.153	.011	.117	.011	-.126	-.025
		.457	.816	.293	.047*	.891	.132	.883	.103	.749
		168	168	168	168	168	168	168	168	168
	Reflector	-.091	-.006	-.099	-.063	.120	-.060	.056	.117	.045
		.240	.935	.202	.418	.122	.437	.474	.132	.560
		168	168	168	168	168	168	168	168	168
	Theorist	.073	.025	-.052	.076	.084	.021	.041	.148	.174
		.346	.747	.500	.326	.278	.786	.601	.055	.024*
		168	168	168	168	168	168	168	168	168
	Pragmatist	.001	.056	-.014	.059	.046	.043	.091	.061	.095
		.985	.471	.853	.449	.557	.582	.239	.432	.222
		168	168	168	168	168	168	168	168	168

** Correlation is significant at the .01 level (2-tailed).

- Correlation is significant at the .05 level (2-tailed).

Table 4.27: 23-28 Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.115	-.003	-.016	.154	.095	.066	-.072	-.032	-.054
		.221	.972	.868	.099	.309	.483	.440	.737	.564
		116	116	116	116	116	116	116	116	116
	Reflector	.215	.036	.072	-.043	-.129	-.011	-.034	.030	.118
		.021*	.700	.445	.645	.167	.909	.714	.749	.207
		116	116	116	116	116	116	116	116	116
	Theorist	.326	-.139	-.050	-.133	-.199	-.150	.063	.168	.109
		.000**	.138	.593	.155	.032*	.108	.501	.072	.243
		116	116	116	116	116	116	116	116	116
	Pragmatist	.077	-.062	-.027	.020	-.106	-.059	-.121	-.083	-.045
		.411	.511	.771	.832	.258	.528	.194	.379	.633
		116	116	116	116	116	116	116	116	116

** Correlation is significant at the .01 level (2-tailed).

- Correlation is significant at the .05 level (2-tailed).

Table 4.28: 23-28 Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.128	.050	.074	.120	.142	.150	-.020	-.010	-.008
		.172	.591	.428	.200	.128	.109	.832	.917	.931
		116	116	116	116	116	116	116	116	116
	Reflector	.204	-.019	.091	-.037	-.186	-.025	-.061	.026	.061
		.028*	.836	.333	.691	.046*	.787	.518	.780	.516
		116	116	116	116	116	116	116	116	116
	Theorist	.256	-.107	-.064	-.093	-.193	-.154	.083	.161	.140
		.006**	.254	.497	.319	.038*	.098	.374	.084	.135
		116	116	116	116	116	116	116	116	116
	Pragmatist	.042	-.081	-.045	.070	-.109	-.069	-.092	-.013	-.009
		.652	.388	.632	.457	.243	.464	.326	.892	.922
		116	116	116	116	116	116	116	116	116

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.29: 29-33 Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.171	-.255	.084	.104	.059	.133	.022	.039	.072
		.267	.095	.589	.503	.701	.390	.886	.802	.642
		44	44	44	44	44	44	44	44	44
	Reflector	-.002	.104	-.228	-.055	.059	-.134	.029	-.013	-.119
		.991	.500	.136	.721	.704	.386	.851	.933	.442
		44	44	44	44	44	44	44	44	44
	Theorist	.057	-.037	-.165	-.263	-.036	-.186	.301	.197	.064
		.715	.813	.285	.084	.818	.228	.047*	.200	.679
		44	44	44	44	44	44	44	44	44
	Pragmatist	-.117	-.070	-.124	.045	-.070	-.043	.286	.158	.108
		.449	.652	.422	.772	.650	.780	.060	.306	.485
		44	44	44	44	44	44	44	44	44

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.30: 29-33 Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.169	-.330	.073	.054	.082	.126	.022	.009	.008
		.273	.029*	.636	.728	.595	.416	.886	.952	.959
		44	44	44	44	44	44	44	44	44
	Reflector	-.075	.150	-.247	-.055	.047	-.185	-.004	-.118	-.095
		.629	.332	.106	.721	.760	.230	.982	.446	.540
		44	44	44	44	44	44	44	44	44
	Theorist	.036	.032	-.133	-.225	.020	-.132	.377	.212	.105
		.815	.835	.388	.142	.895	.393	.012**	.168	.497
		44	44	44	44	44	44	44	44	44
	Pragmatist	-.129	-.046	-.127	.083	-.026	-.029	.255	.143	.164
		.403	.767	.410	.592	.867	.851	.094	.353	.287
		44	44	44	44	44	44	44	44	44

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).

Table 4.31: 34-40 Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.189	.239	-.013	.028	.064	-.009	.097	.103	.075
		.104	.039*	.915	.810	.588	.937	.405	.377	.524
		75	75	75	75	75	75	75	75	75
	Reflector	.053	-.028	-.129	-.050	.057	-.083	.125	.065	.086
		.653	.810	.269	.671	.629	.481	.285	.582	.462
		75	75	75	75	75	75	75	75	75
	Theorist	.278	-.150	-.239	-.192	-.039	-.200	.014	-.131	-.061
		.016*	.198	.039*	.099	.737	.085	.904	.261	.600
		75	75	75	75	75	75	75	75	75
	Pragmatist	.182	-.051	-.206	-.159	-.093	-.203	-.081	-.034	.050
		.119	.663	.076	.173	.426	.080	.489	.772	.673
		75	75	75	75	75	75	75	75	75

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.32: 34-40 Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.158	.246	-.050	-.008	.013	-.064	.043	.037	.019
		.177	.033*	.672	.946	.910	.587	.711	.752	.873
		75	75	75	75	75	75	75	75	75
	Reflector	-.003	-.099	-.163	-.099	.055	-.119	.192	.073	.050
		.977	.400	.163	.396	.637	.309	.099	.535	.673
		75	75	75	75	75	75	75	75	75
	Theorist	.265	-.134	-.236	-.190	-.066	-.201	-.048	-.203	-.077
		.022*	.252	.041*	.103	.572	.083	.680	.081	.514
		75	75	75	75	75	75	75	75	75
	Pragmatist	.200	-.064	-.184	-.220	-.120	-.212	-.112	-.108	-.033
		.085	.583	.113	.058	.304	.068	.341	.356	.776
		75	75	75	75	75	75	75	75	75

** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Table 4.33: 41-45 Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	.094	.152	.129	.099	-.274	-.098	.312	.454	.577
		.701	.534	.598	.686	.256	.689	.193	.051	.010**
		19	19	19	19	19	19	19	19	19
	Reflector	.058	-.332	.132	.329	-.218	.048	.426	.379	.299
		.813	.165	.589	.170	.369	.847	.069	.109	.214
		19	19	19	19	19	19	19	19	19
	Theorist	.021	-.071	.399	.166	-.269	.233	.144	.132	.135
		.931	.772	.091	.497	.265	.336	.557	.589	.582
		19	19	19	19	19	19	19	19	19
	Pragmatist	.252	-.257	.440	-.279	-.322	.125	.099	.165	.060
		.298	.289	.060	.247	.179	.611	.686	.500	.807
		19	19	19	19	19	19	19	19	19

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 4.34: 41-45 Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.058	.442	.134	.284	-.106	.053	.221	.262	.468
		.814	.058	.585	.239	.665	.828	.363	.279	.043*
		19	19	19	19	19	19	19	19	19
	Reflector	-.041	-.155	.192	.178	-.222	.052	.444	.452	.403
		.868	.526	.432	.465	.361	.833	.057	.052	.087
		19	19	19	19	19	19	19	19	19
	Theorist	.022	-.072	.244	.253	-.185	.123	.112	-.014	-.031
		.928	.770	.314	.296	.448	.615	.647	.955	.900
		19	19	19	19	19	19	19	19	19
	Pragmatist	.215	-.369	.409	-.239	-.292	.142	-.007	.061	-.045
		.377	.120	.082	.325	.224	.561	.976	.805	.856
		19	19	19	19	19	19	19	19	19

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 4.35: 46-50 Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	.135	-.005	.019	-.325	-.160	-.132	.139	.005	-.172
		.728	.990	.961	.393	.681	.735	.722	.991	.658
		9	9	9	9	9	9	9	9	9
	Reflector	-.208	-.231	-.390	.327	.445	.118	-.554	-.052	-.039
		.592	.549	.299	.390	.230	.763	.122	.895	.921
		9	9	9	9	9	9	9	9	9
	Theorist	-.289	-.494	-.599	-.110	-.018	-.368	-.335	-.018	-.053
		.451	.177	.088	.778	.963	.330	.378	.964	.892
		9	9	9	9	9	9	9	9	9
	Pragmatist	-.018	-.058	.155	-.052	-.177	-.018	-.239	-.400	.031
		.964	.883	.691	.895	.649	.964	.535	.286	.938
		9	9	9	9	9	9	9	9	9

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 4.36: 46-50 Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-.340	-.381	-.391	-.635	-.162	-.457	.019	.075	-.160
		.371	.312	.298	.066	.678	.216	.962	.848	.681
		9	9	9	9	9	9	9	9	9
	Reflector	-.310	-.380	-.468	.178	.268	-.089	-.487	-.057	-.119
		.417	.314	.204	.647	.486	.819	.183	.884	.760
		9	9	9	9	9	9	9	9	9
	Theorist	-.390	-.506	-.491	-.296	-.253	-.492	-.401	-.249	.042
		.299	.164	.180	.439	.511	.178	.285	.519	.915
		9	9	9	9	9	9	9	9	9
	Pragmatist	-.018	-.058	.155	-.052	-.177	-.018	-.239	-.400	.031
		.964	.883	.691	.895	.649	.964	.535	.286	.938
		9	9	9	9	9	9	9	9	9

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Table 4.37: 51-55 Modality Preferences and Learning Style (H&M)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-1.000	1.000	1.000	-1.000	1.000	1.000	1.000	1.000	-1.000
		1.000	.	.	1.000	.	.	.	.	1.000
		2	2	2	2	2	2	2	2	2
	Reflector	.	.	.	.	.	.	.	.	.
		.	.	.	.	.	.	.	.	.
		2	2	2	2	2	2	2	2	2
	Theorist	-1.000	1.000	1.000	-1.000	1.000	1.000	1.000	1.000	-1.000
		1.000	.	.	1.000	.	.	.	.	1.000
		2	2	2	2	2	2	2	2	2
	Pragmatist	1.000	-1.000	-1.000	1.000	-1.000	-1.000	-1.000	-1.000	1.000
		.	1.000	1.000	.	1.000	1.000	1.000	1.000	.
		2	2	2	2	2	2	2	2	2

** Correlation is significant at the .01 level (2-tailed).

Table 4.38: 51-55 Modality Preferences and Learning Style (Respondents)

		Visual IPTP	Auditory IPTP	Feelings IPTP	Smell IPTP	Taste IPTP	Kinaesthetic Total IPTP	Visual PPMI	Auditory PPMI	Kinaesthetic PPMI
Spearman's rho	**Activist**	-1.000	1.000	1.000	-1.000	1.000	1.000	1.000	1.000	-1.000
		1.000	.	.	1.000	.	.	.	.	1.000
		2	2	2	2	2	2	2	2	2
	Reflector	.	.	.	.	.	.	.	.	.
		.	.	.	.	.	.	.	.	.
		2	2	2	2	2	2	2	2	2
	Theorist	-1.000	1.000	1.000	-1.000	1.000	1.000	1.000	1.000	-1.000
		1.000	.	.	1.000	.	.	.	.	1.000
		2	2	2	2	2	2	2	2	2
	Pragmatist	.	.	.	.	.	.	.	.	.
		.	.	.	.	.	.	.	.	.
		2	2	2	2	2	2	2	2	2

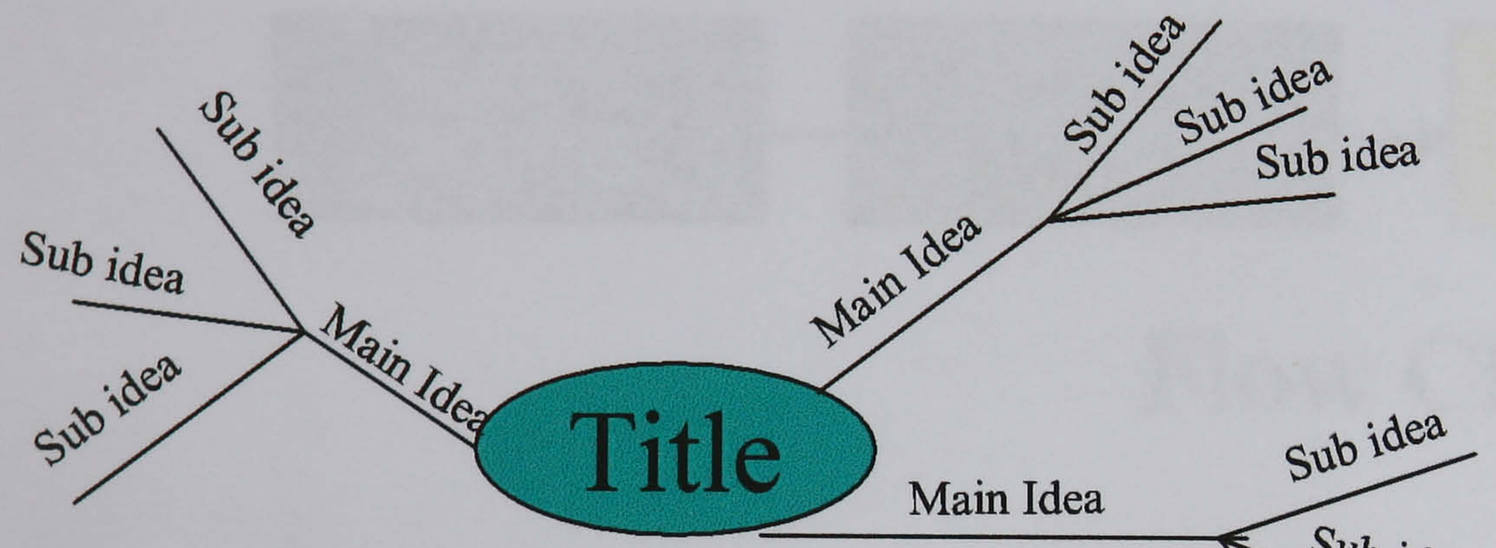
** Correlation is significant at the .01 level (2-tailed).

Appendix Eight

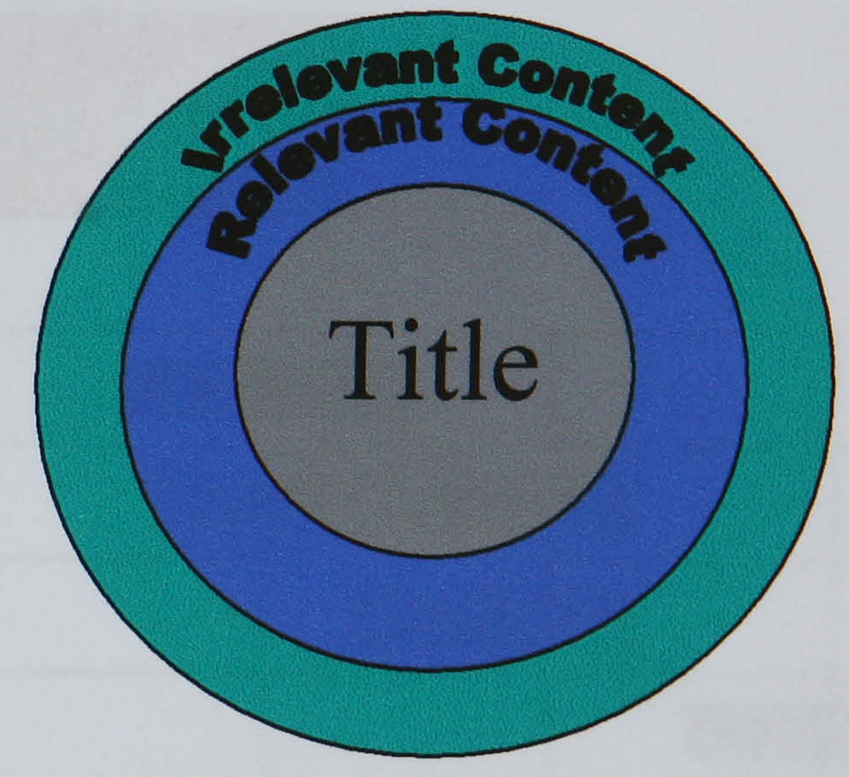
Visual Tools

Visual Tool	Purpose
Structural Visual Tool (SVT)	To Start Thinking About A Topic Reveal The Structure Of A Topic To Create Hierarchies In Content To See Relationships Between Whole And Parts
Differential Visual Tool (DVT)	Identify Similarities And Differences Between Topics Compare And Contrast Elements Related To Items Or Topics
Representational Visual Tool (RVT)	Illustrates Key Features Reveals Hidden Structures Highlights Details Gives A Variety Of Perspectives Represents Simplified Version Of Reality
Temporal Visual Tool (TVT)	Captures The Chronology Of Events Represents Sequence Of Events
Causal Visual Tool (CVT)	Identify The Causes Of Events Identify Possible Alternative Causes Creates Baseline For Action Planning
Numerical Visual Tool (NVT)	Components (Size Or %) Items (Ranks) Trends (Changes Over Time) Frequency Correlation.
Organisational Visual Tool (OVT)	Direct Content Of Focus Direct Sequence Of Thoughts Direct What, Where, How Much Is Written

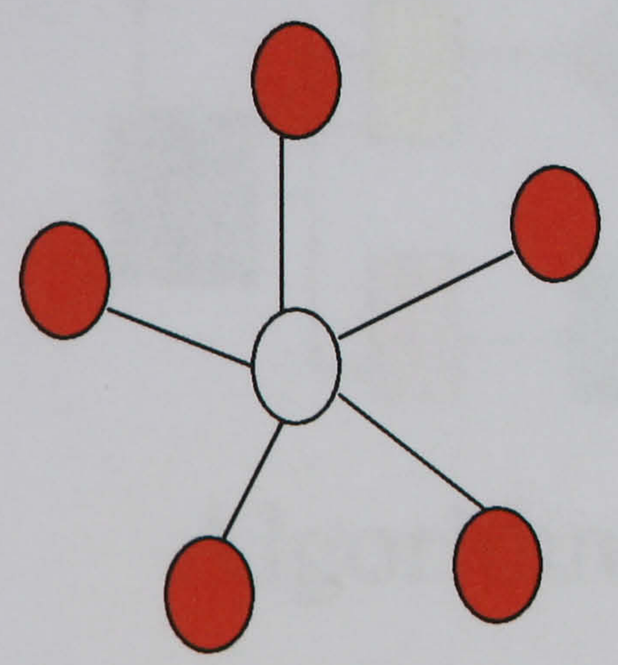
Structural Visual tools



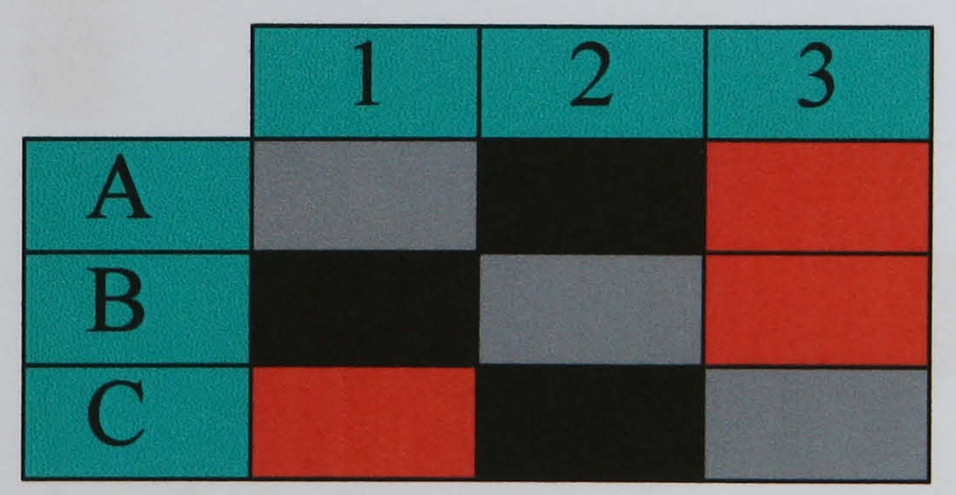
Model/Concept/Mind Map



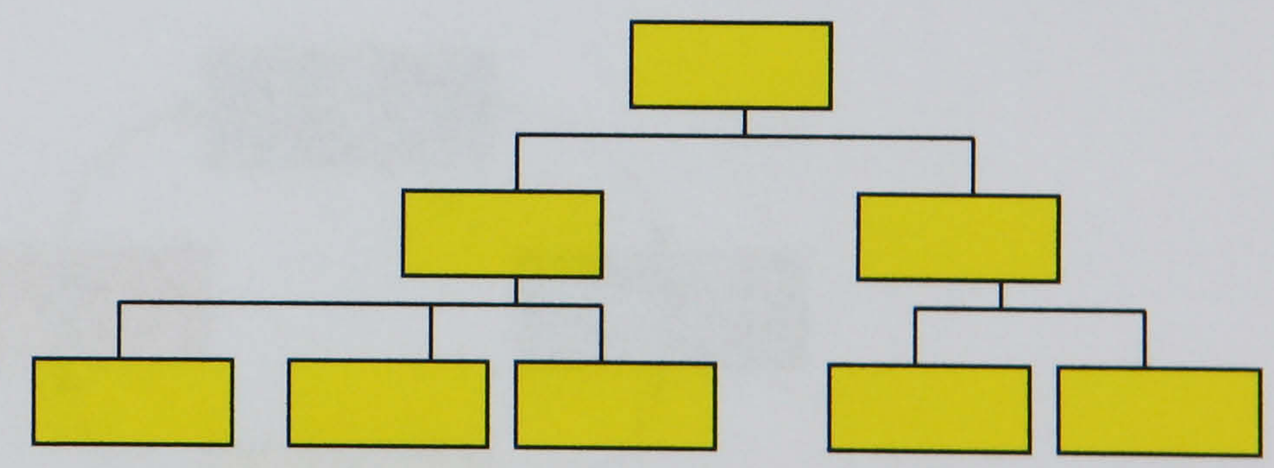
Target Map



Cluster Map

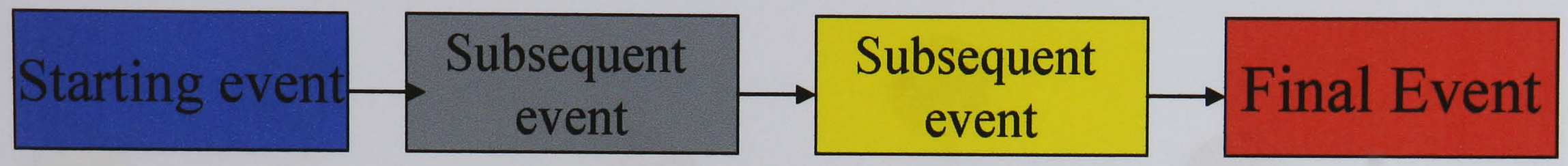


Affinity Diagram/Matrix

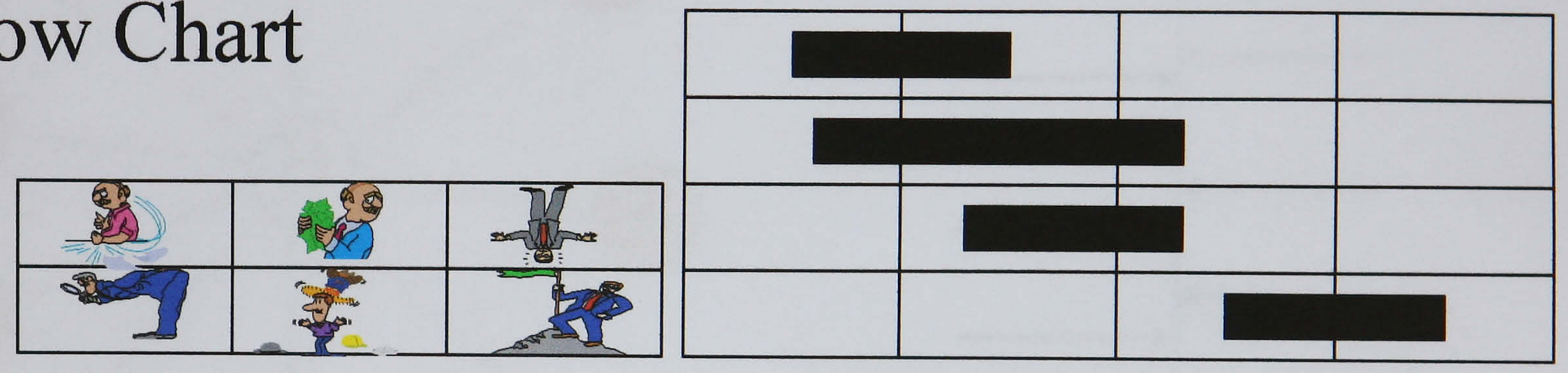


Tree Diagram

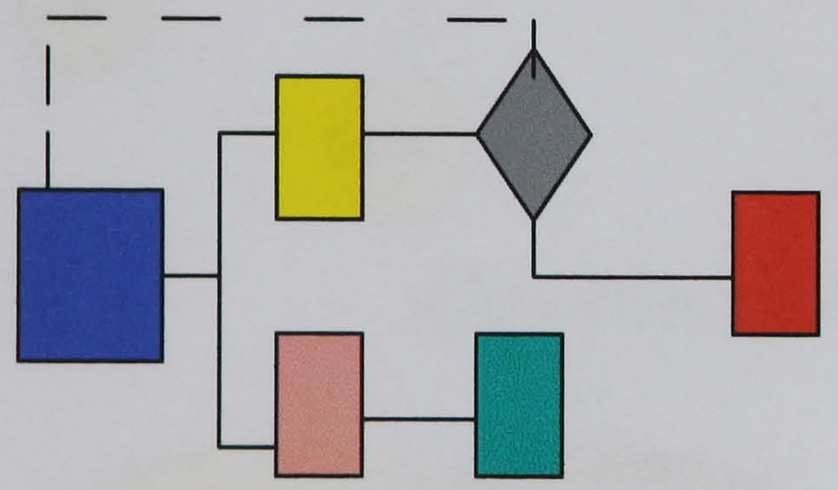
Temporal Visual Tools



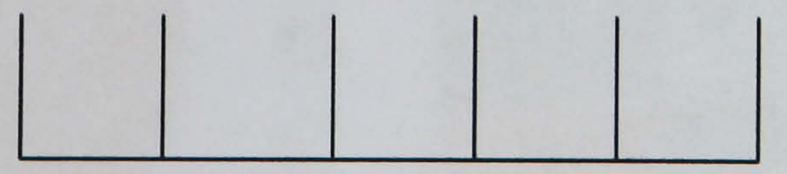
Flow Chart



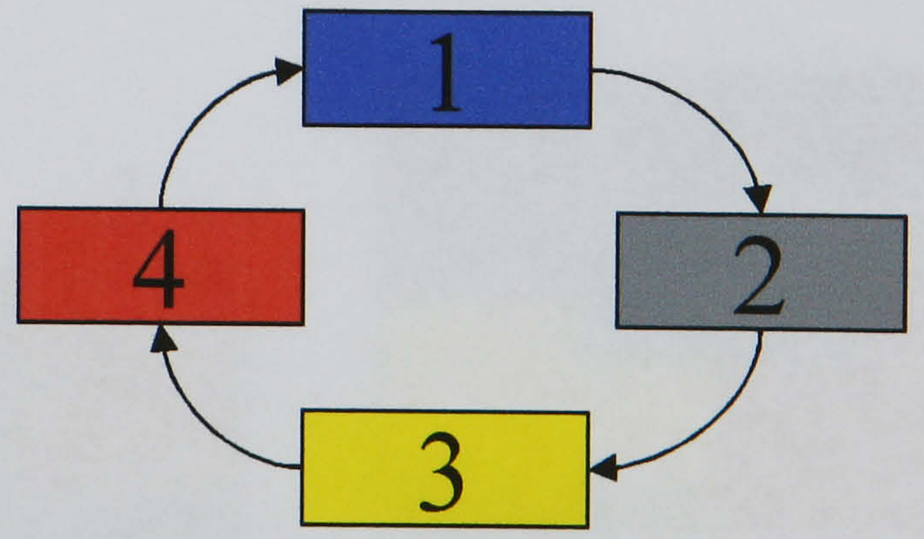
Story Board



Algorithm

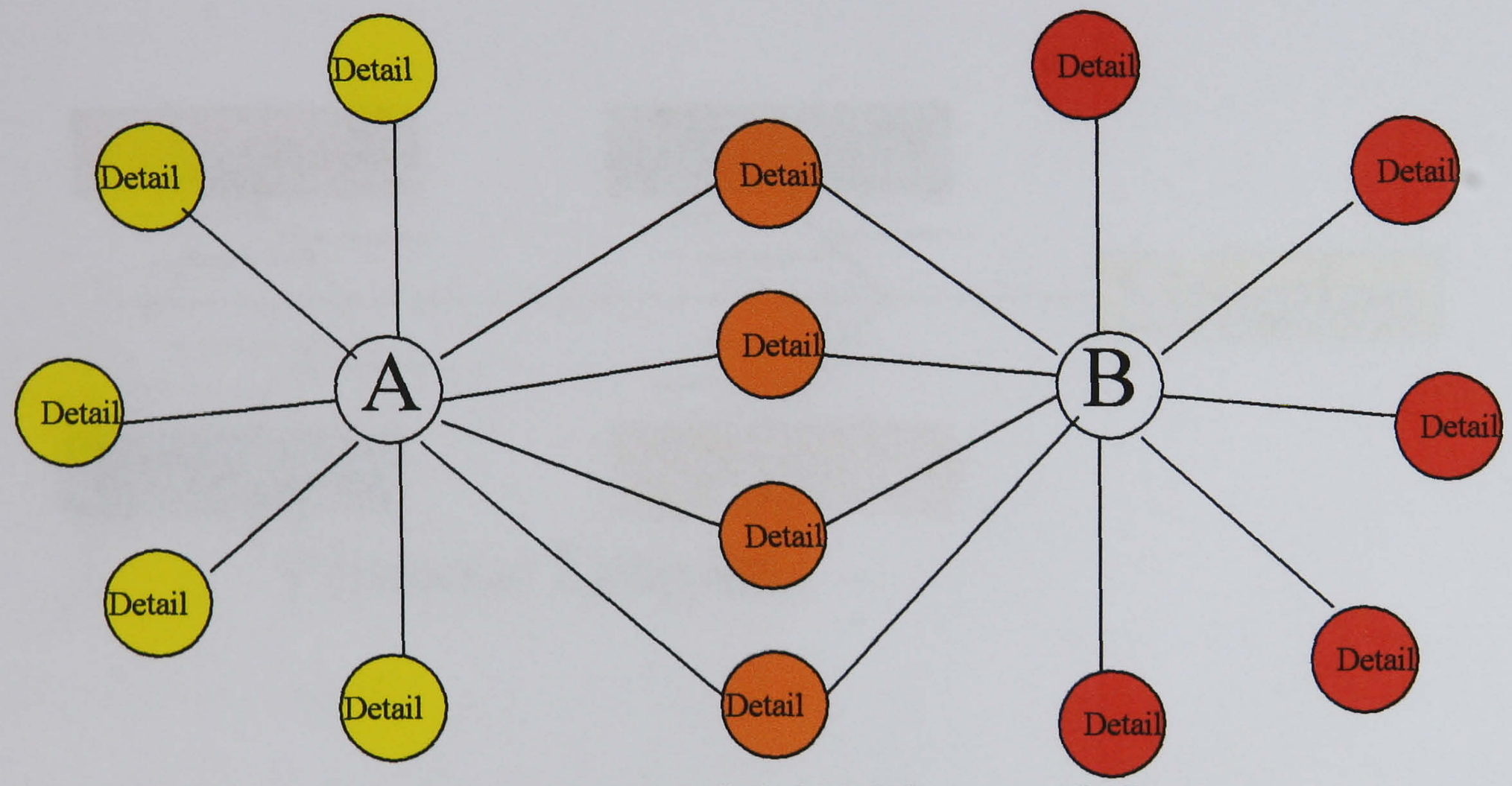


Timeline

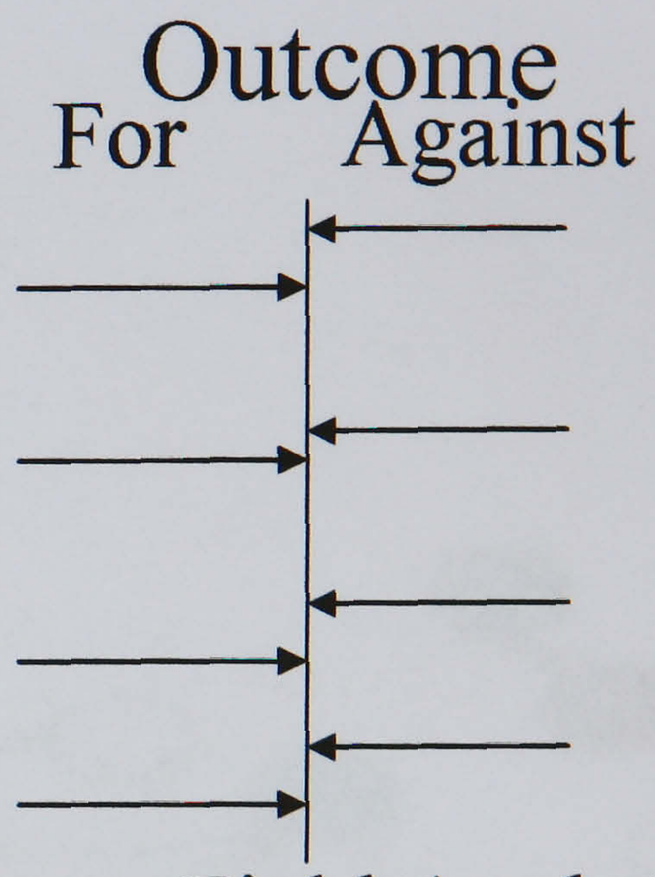


Cycle

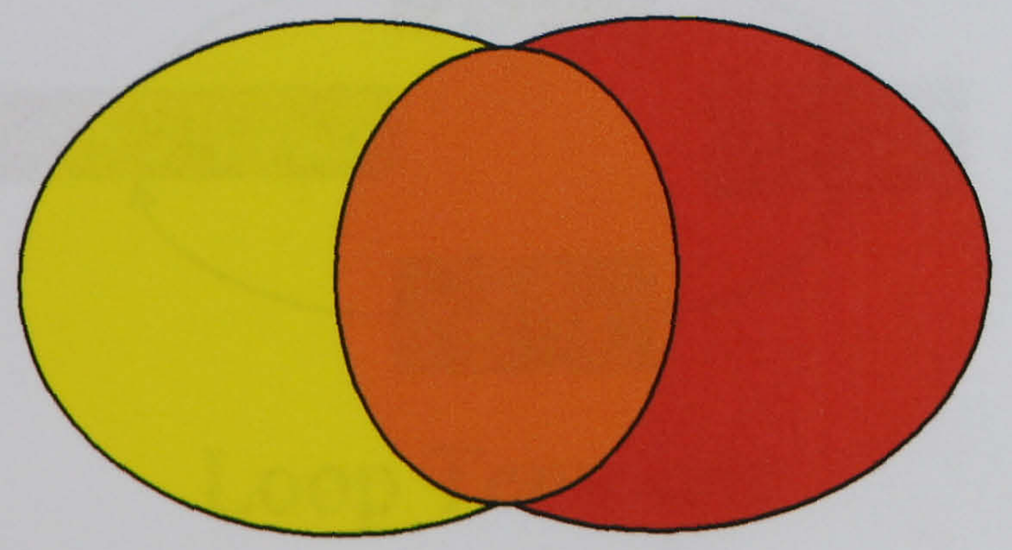
Differential Visual Tools



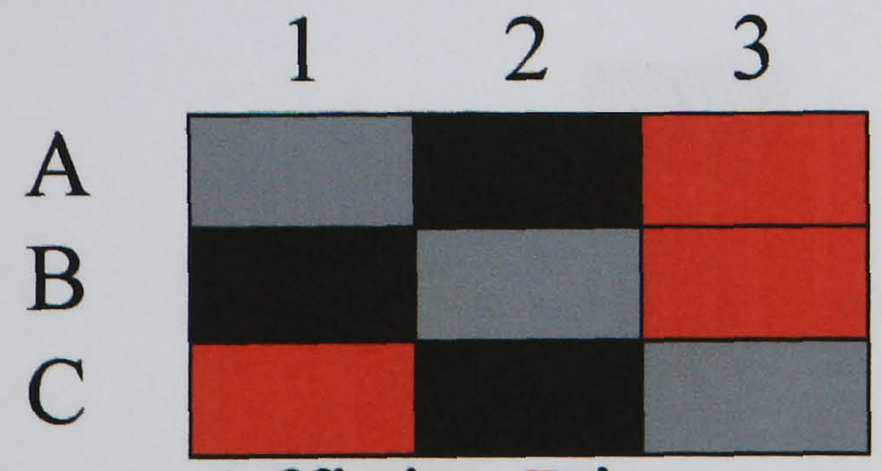
Double Bubble Cluster Map



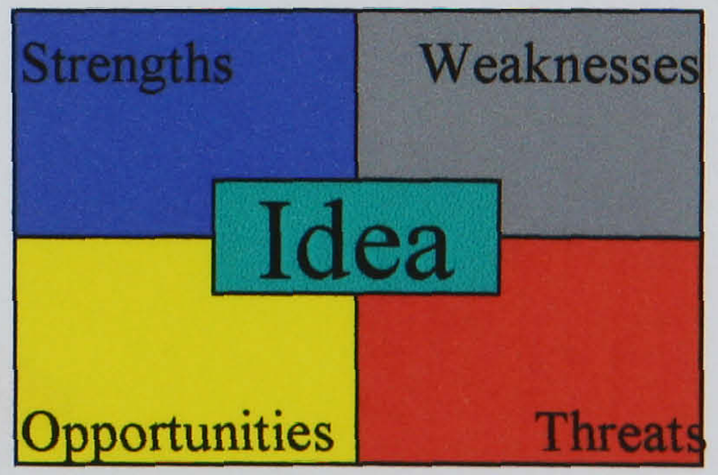
Force Field Analysis



Venn Diagram

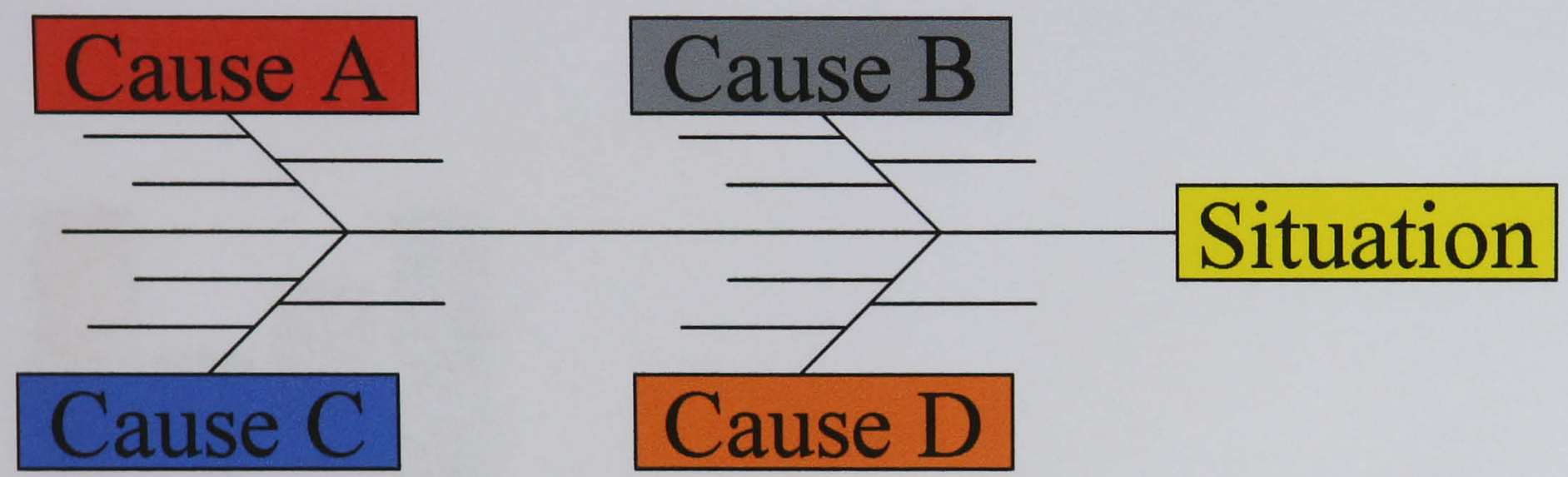


Affinity Diagram

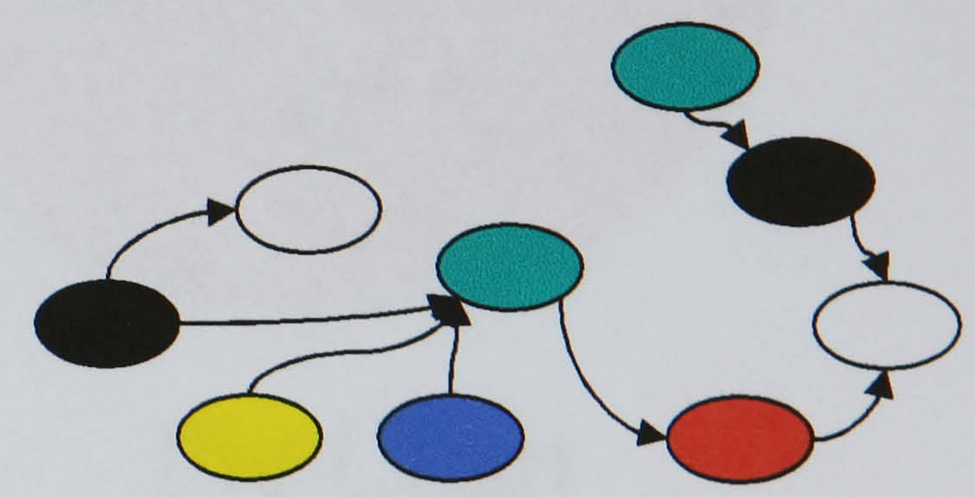


SWOT Analysis

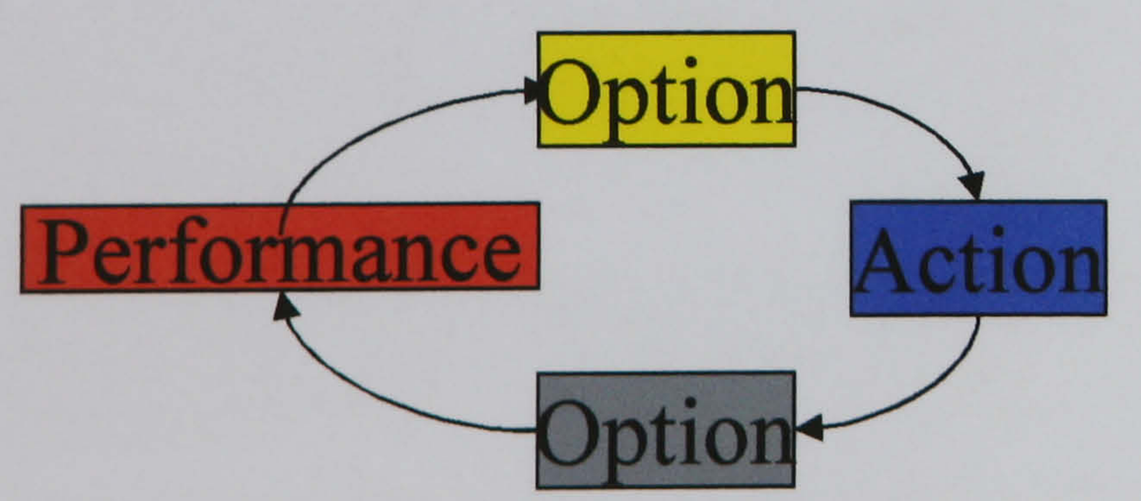
Causal Visual Tools



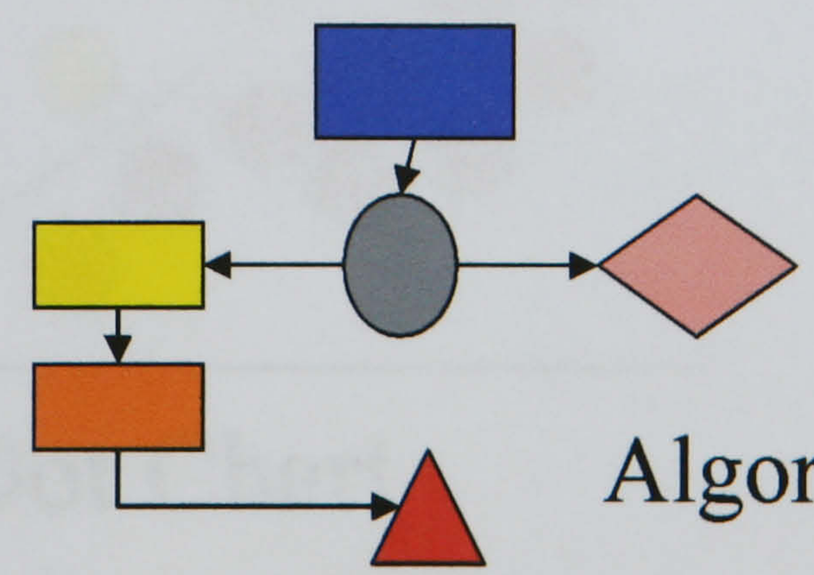
Fishbone Diagram



Relations Diagram

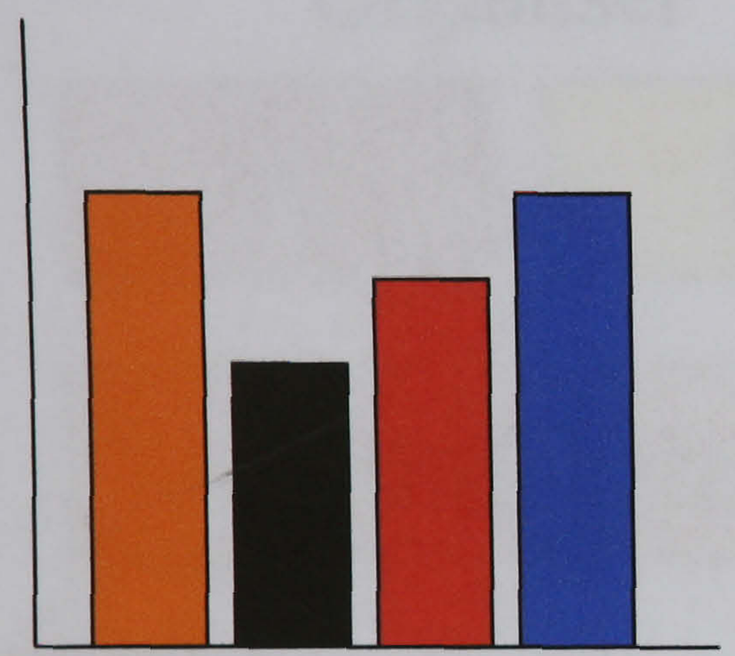


Loop Template

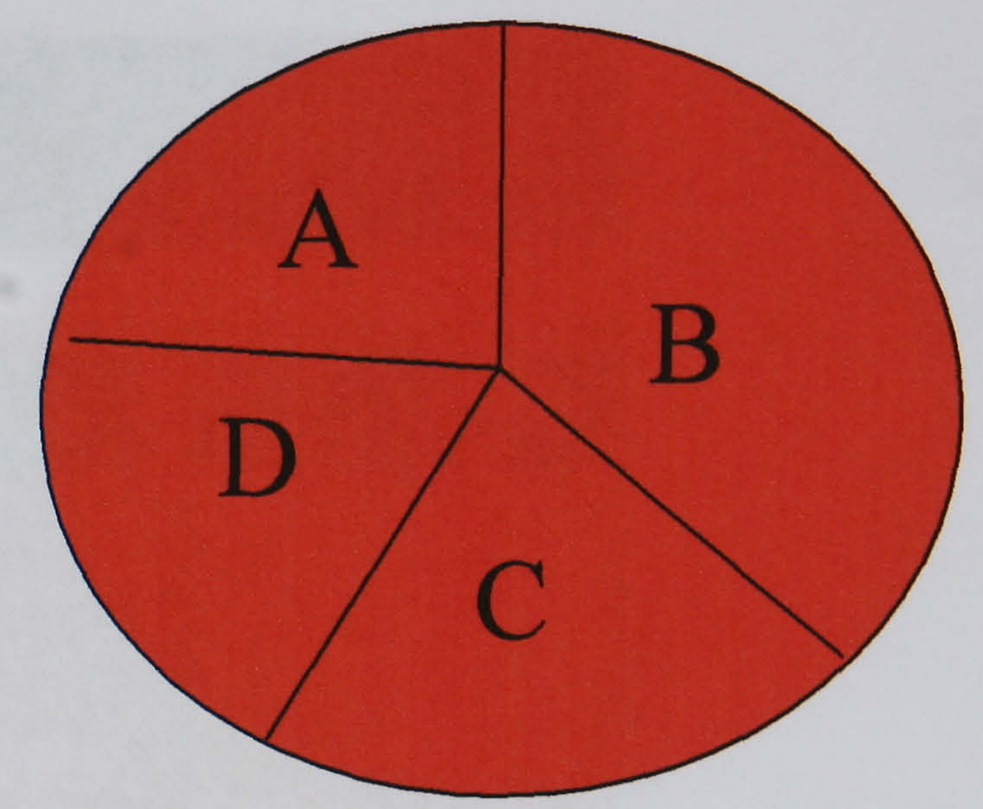


Algorithm

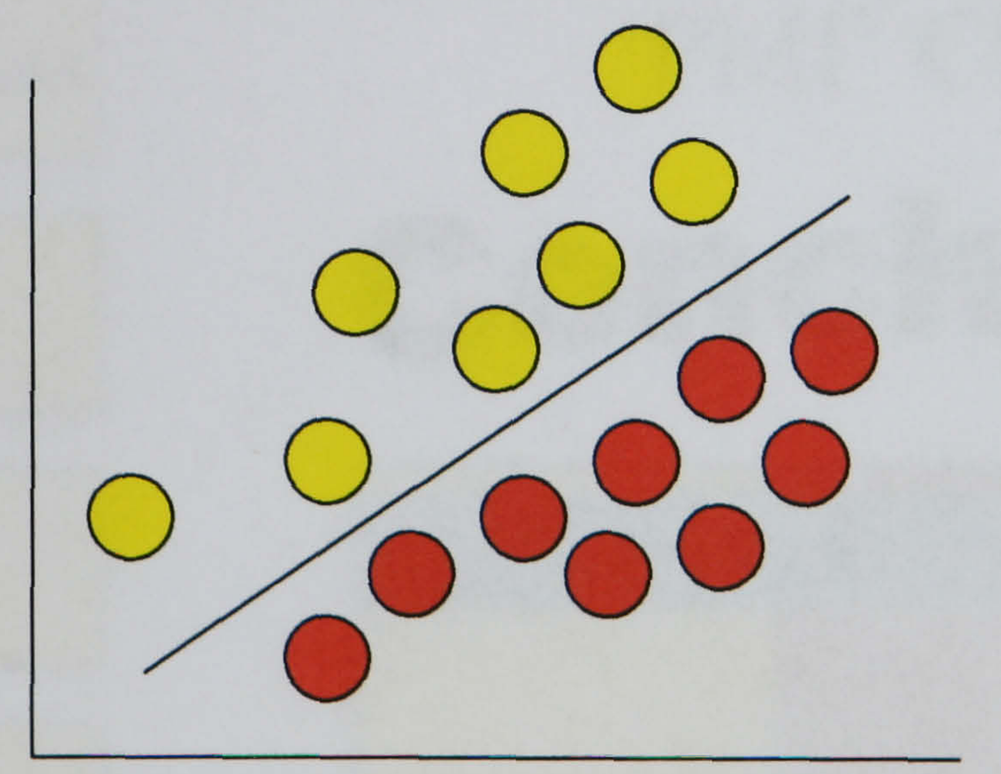
Numerical Visual tools



Bar Chart



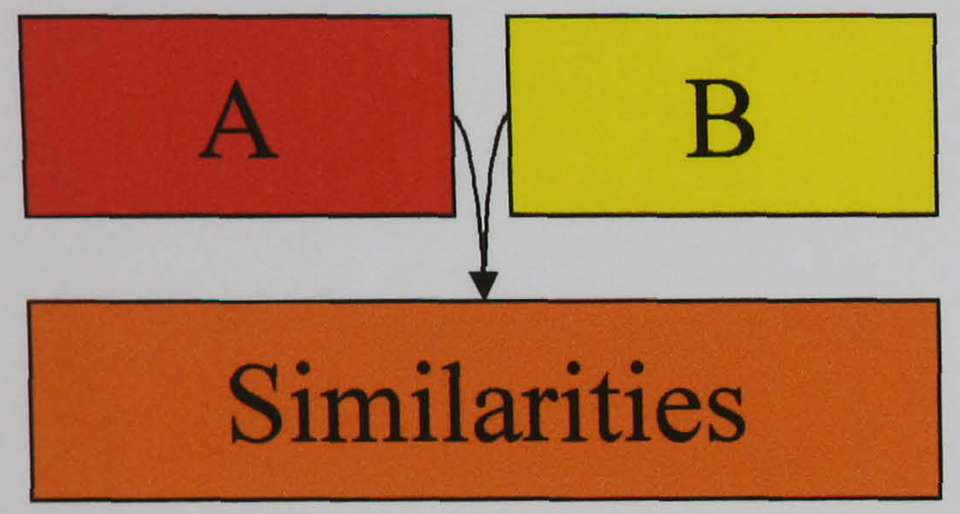
Pie Chart

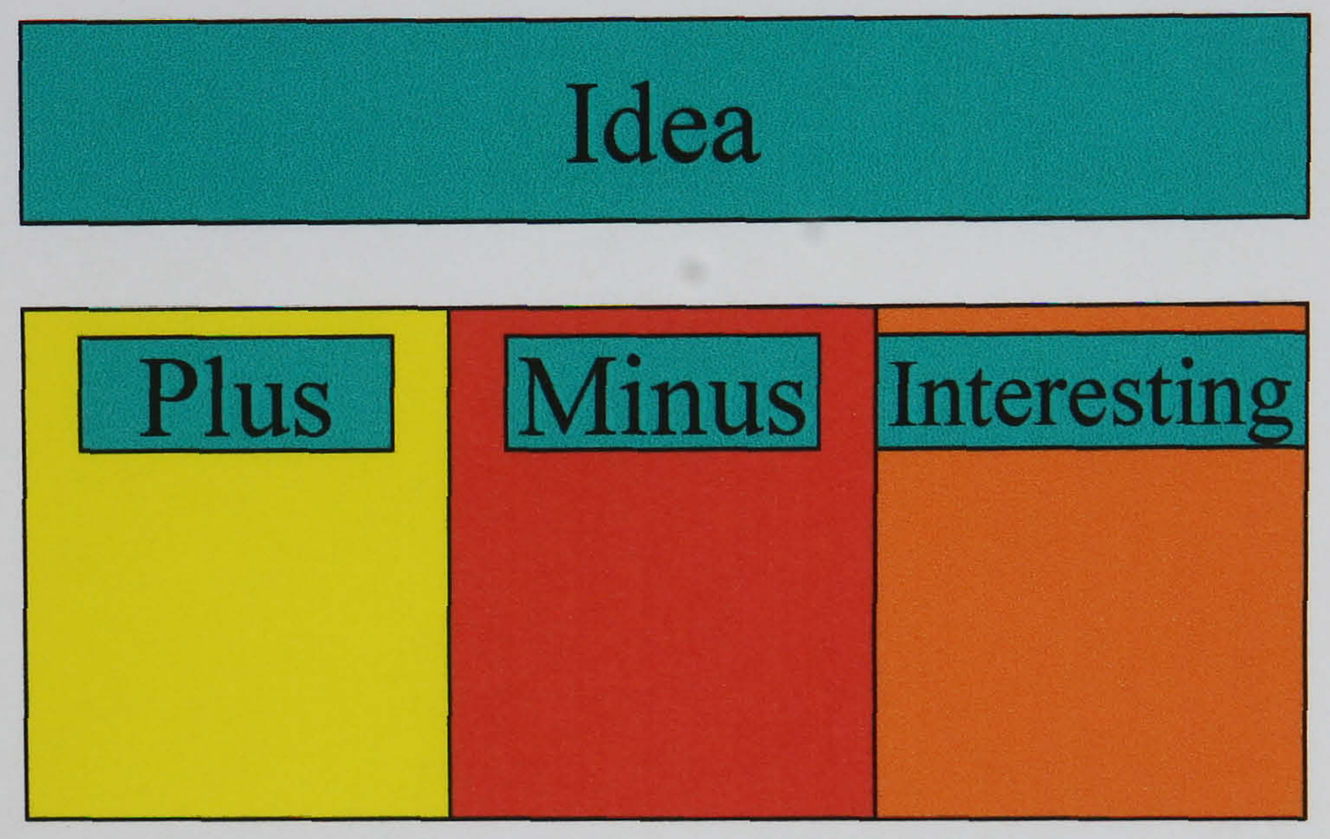


Dot Chart

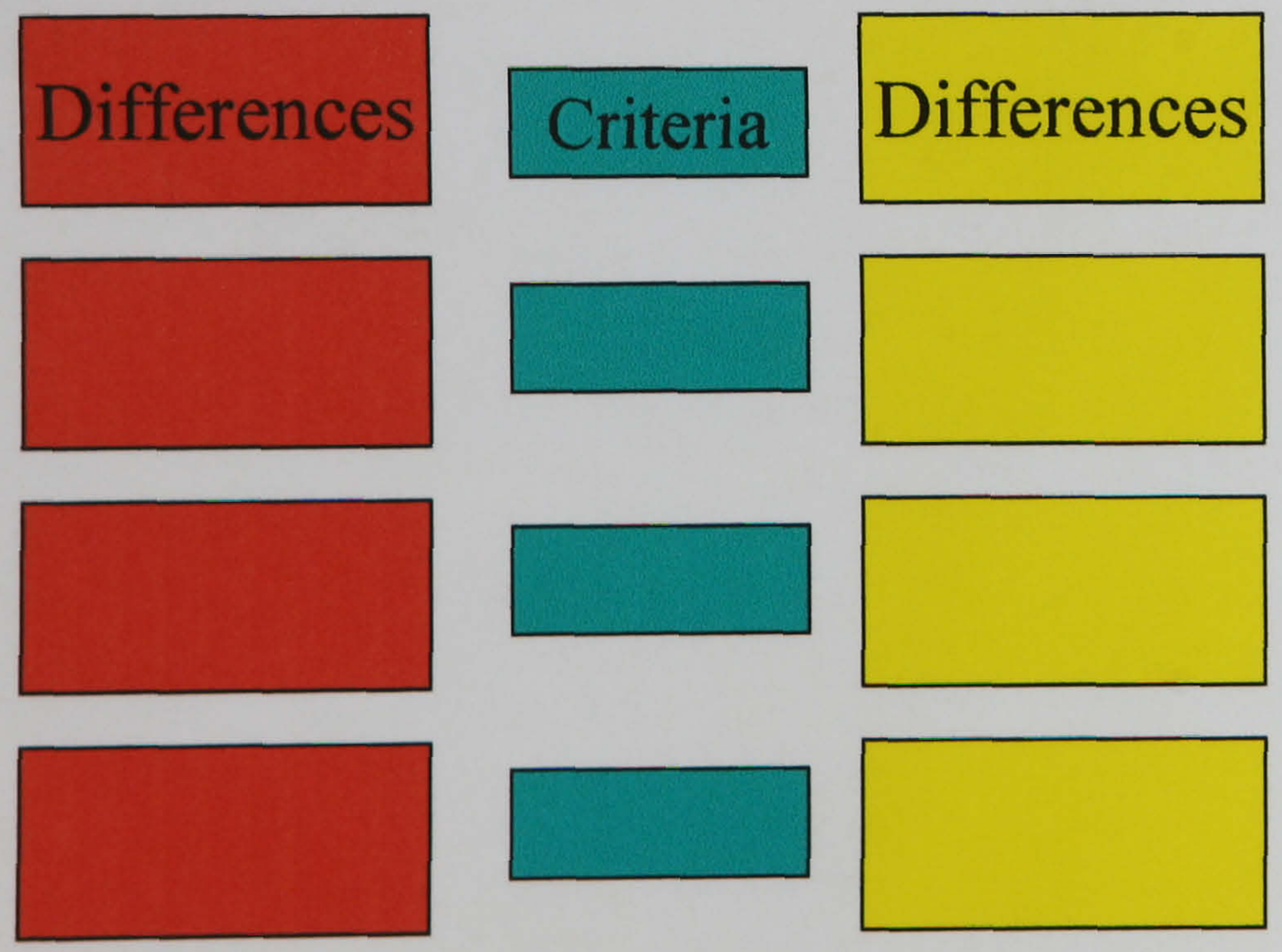
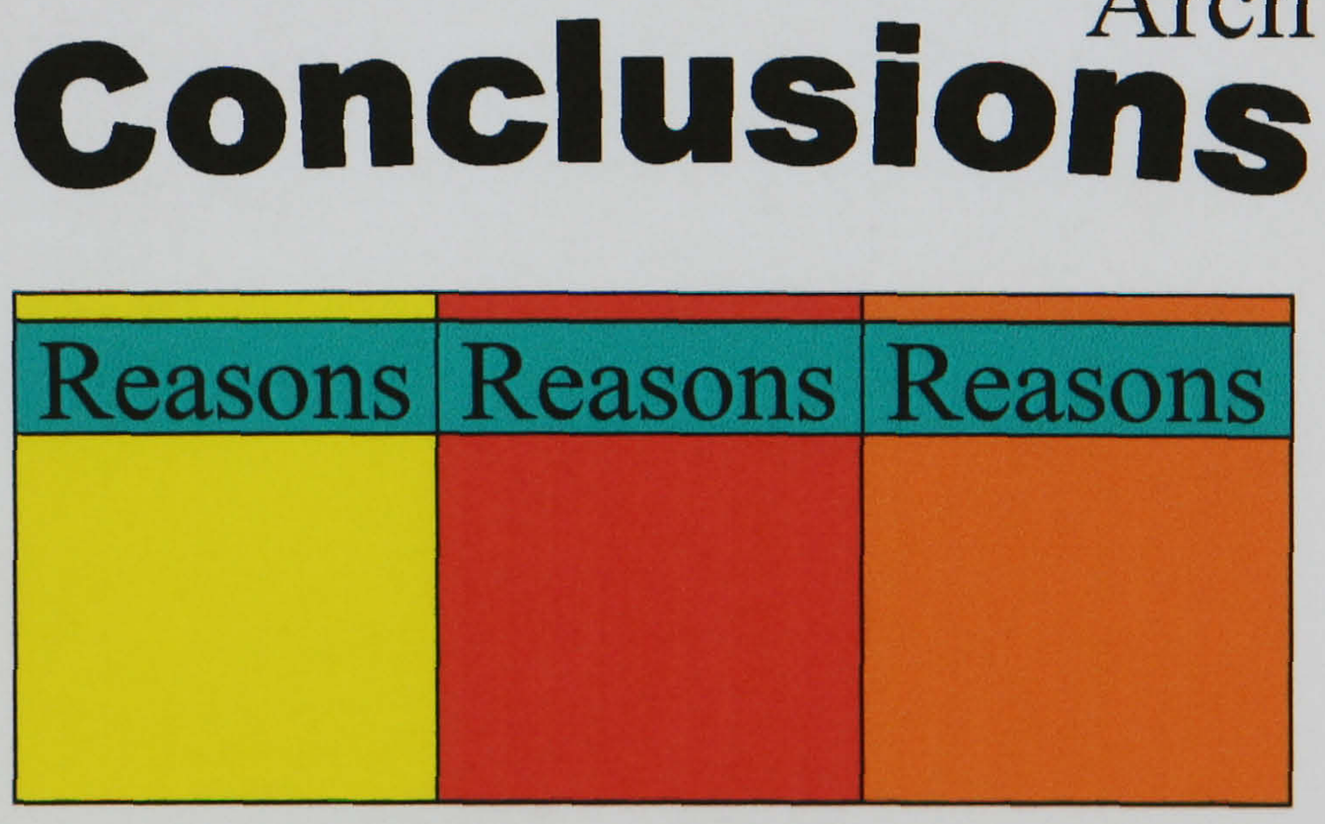
Organisational Visual tools

Compare and Contrast Organiser





'PMI' Chart



Arch Diagram