INTERNAL REPRESENTATION IN NURSE EDUCATION:

IMAGERY AND IDENTITY

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ABSTRACT

The main aim of this thesis was to examine internal representation in the context of nurse education using two main output variables – namely imagery and identity. The initial basic argument for the thesis was that procedures to facilitate the acquisition of psychomotor skills that have been developed in sports science could fruitfully be applied to the development of skills in other areas, such as nurse education. Study one approached this through the use of an imagery training programme – PETTLEP (Holmes & Collins, 2001) on an undergraduate nursing curriculum. PETTLEP served as the independent variable with the dependent variable – performance - being measured through Objective Structured Clinical Examinations (OSCEs). Unexpected results revealed no significant differences between the control and experimental groups, with the control group actually performing better overall. Given this, the explicit choice was made to pursue investigation into the other plausible factors affecting behaviour, in order to explicate and underpin the results obtained. Study two investigated students' perceptions of and preparation for the OSCEs using a skills training questionnaire. Results revealed common concerns, specifically related to skills practice. Furthermore these concerned the amount of practice time provided; the practice environment; and the amount of support and training during teaching. In light of these findings, study three pursued a contrasting and comparative investigation from the professionals' perspective on the curriculum. This specifically examined perceptions of the assessment structure and expectations within the curriculum; the content of the curriculum; levels of support and provision for training; and the application of theory and practice. This aimed to identify any coherent or conflicting views between the students' receiving the curriculum and the staff delivering the curriculum. Results revealed coherency in the professional view that theory and practice were equally as important for nurse education. However, students commonly perceived practice as the most important aspect. Also, some students often struggled to apply theory to practice and vice versa. In light of this it became apparent that students may in fact identify differently with the content of the curriculum. Therefore, appraisal of the content may have different significance for students and affect behaviour differently both internally and/or externally. Study four investigated this using Identity Structure Analysis (ISA)/Ipseus (Weinreich & Saunderson, 2003).This explored how students applied themselves to the various aspects of nursing in the contexts of healthcare and broader affiliations, and how these fitted into students' broader sense of identity. It also looked at typologies within nursing and whether identity fitted into three distinct categories depending on construals. Study five followed this up using two individual case studies. The purpose of this was to encapsulate meaning behind individual construals and typologies and explicate the findings of ISA/Ipseus and the implications for nurse education. Results found that construals are grounded in experiences which can affect development, behaviour and identity towards nursing and the broader affiliations in individuals' lives. In conclusion identity in nursing should be investigated further in order to provide stronger evidence in regards to typologies and how these may be influencing students' behaviour and development in nurse education. Such research could have important implications for the future of nurse education and be a positive step towards future curriculum revisions.

<u>DEDICATION</u>

To Emma for her positive outlook even during challenging times - wherever you go, whatever the weather, you always bring your own sunshine ☺

ACKNOWLEDGEMENTS

<u>CONTENTS</u>

Page No.

Appendices

LIST OF TABLES

x

Table	Page no.

LIST OF FIGURES

Figure   **Page no.**

CHAPTER 1.0 - INTRODUCTION

This thesis is concerned centrally with the notion of internal representation and the relationship between internal representation and behaviour. Internal representation can range from objectively observable neuro-physiological events through internal processes accessible to reflection and verbal report to hypothetical structures assumed to underlie behaviour but not themselves observable. The thesis approaches internal representation in two contrasting ways firstly, through studying the effects of interventions aimed at promoting imagery and secondly, through investigations of the elusive but important notion of identity and students internal development.

The practical focus of the thesis is nurse education and particularly the acquisition of skills in Nursing. This is approached first through the experimental use of an imagery training programme-PETTLEP- which serves as the independent variable with the dependent variable-performance-being measured through Objective Structured Clinical Examinations-OSCEs. The study brings into play notions of internal representation and imagery and assesses the extent to which explicit training in imagery improves performance in clinical psycho-motor skills.

Undertaking the first study with its emphasis on an intervention to develop imagery and improve performance highlighted that other variables were influencing performance. In particular the results were suggestive of

underlying problems within the curriculum that concerned its structure, assessment, and the levels of support available.

Study two investigated this further using a skills training questionnaire, which investigated students' preparation for the OSCEs assessment. This revealed that students had mixed views about the OSCEs as an assessment method, and more particularly about the role the curriculum played in preparation for them. Common concerns were expressed in regards to the amount of practice time provided during curriculum teaching time. This was considered to not be substantial enough in comparison to the amount of theoretical content time provided. Therefore, the common view was that there was too much theory and not enough practice.

Study three followed this up by exploring the professional's perspective on the curriculum and its content, to assess whether beliefs were consistent between the staff and students. This looked at their opinions on the importance of theory and practice, their definitive nature, and also the roles within the curriculum. Results revealed that theory and practice were perceived to be equally as important in the curriculum, as they inform each other for competent skilled performance. However, it was felt that students tended to favour the practical element and dismiss the importance of the theoretical component, leading to a theory-practice gap. Collectively, the findings pointed to the importance of the way in which student nurses constructed their identity and the world of nursing and nurse education. These constructions and

identity formulations were hypothesised as affecting skilled performance and masking the expected effects of imagery training.

In the study four a novel investigative instrument was therefore developed to explore the ways in which students identified with values, concepts and aspirations in nursing in relation to professional competence and skills. The instrument was constructed using the distinctive ISA/Ipseus method which had not hithertofore been employed in the context of professional training. The results from the survey using this instrument pointed to distinctive ways of constructing the world of nursing which in their turn affected the extent to which imagery training was effective in improving performance. Study five then followed up individual construals for two cases, in order to gather meaning to the data gathered by the ISA/Ipseus and substantiate the findings.

Given the wide ranging perspectives employed in this thesis the literature review covers three main areas. The first concerns psychomotor skills, their internal representation, imagery and functional equivalence and PETTLEP – a particular programme for the enhancement of imagery. The second looked at nursing skills and their development. The experimental work of the thesis involved training nurses using PETTLEP-imagery for a selection of nursing skills. Two outcome measures were be used for this training; Objective Structured Clinical Examinations (OSCEs), a behavioural measure, and Identity Structure Analysis (ISA/Ipseus) a cognitive measure of identity structure and change. So the background to these measures was also reviewed. Qualitative case studies were also used. In these a sample of

participants reflected at length on their orientations and construals of behaviour relating to the profession of nursing, and broader affiliations of their lives. Therefore, reference was made to this in the prospective sections of the literature review.

In general, behaviour is determined by both internal and external processes. Internal behavioural processes consist of cognitions such as objects of thought, feeling and emotion, as well as internal neurophysiology, biochemistry and psychophysiological responses (e.g., changes in heart rate, body temperature and galvanic skin responses), which work in conjunction with the former. External processes on the other hand can consist of behaviour in the form of motor actions. These may be represented by verbal, visual, and physical means. Physical means might include motor movements, actions and responses. The occurrence of any form of behaviour, whether internal or external, is centrally controlled by higher order functions primarily located in the brain. The brain manifests its commands by internal representations which are complex in their nature and involve a number of internal underpinning processes. These processes then aid production of behavioural outputs. This is explored in depth in the following chapters.

Behavioural outputs can vary greatly as a function of a variety of factors. Such factors may concern the nature of the behaviour itself (internal/external), the environment in which they occur, and also individual characteristics (e.g., the frame of mind an individual may be in). The environment, in particular, plays a key role in behaviours and can often influence how individuals react and

respond in certain contexts. These reactions and responses are mediated through internal processes some of which can be observed using sophisticated equipment others of which have to be inferred or hypothesised. For example, when a person is anxious about a given thing, their cognitions and behaviour (internal; thoughts, feelings, mood state and/or external; body language, tone of voice, performance of a task) can be affected.

As humans, we become accustomed to experiences which we store and use as a basis to ground our behaviour. However, the complicated nature of life often finds us faced with unexpected situations, events and requirements. We are then expected to respond and therefore behave according to these circumstances, which may indeed be unfamiliar. Thus, whilst nurses are trained within the parameters of a certain curriculum, they still may find themselves faced with unexpected or unfamiliar circumstances to attend to when in practice.

In certain arenas behaviour is measurable. Measurements are made through objective measures in controlled environments or contexts. Precision of measurements varies according to the behaviour concerned, the validity and reliability of the measures and the feasibility of using the measures. Examples of behaviour that might be measured include competitive sporting performance; examination performance in both academic and real life; and also career related activities, such as job interviews. These are all real examples that represent situations where behaviour is produced, observed, measured and then used to give a final outcome. However, it is important to

recognise that such measures are not directly of the phenomena in question but involve inference from behaviour. For example 'motivation' might be measured from behaviour or verbal statements but cannot be measured directly. As a result, assumptions are generally made that associate behavioural outputs with some entity that is not directly observable.

As previously acknowledged, circumstances can directly affect behaviour. For example, one's behaviour in stressful circumstances is likely to be different to that in relaxed circumstances. Therefore, at times, behaviour can be hard to predict or control. In the light of this, additional methods are often employed for individuals to use, in order to condition and determine behaviour regardless of the environment they are in. This is commonly seen in sport, where athletic behaviour is measured in a high pressure environment. As a result, additional strategies are often employed which involve conditioning behaviour using psychological initiatives. This has fast become a compulsory part of modern day sports science support initiatives for athletes, with the psychological component being recognised as a key contributor to successful performance. A form of this preparation – PETTLEP – was a key variable in this thesis.

Psychological initiatives have been widely used and researched, producing very positive results for individuals using them (this will be explored further in the succeeding chapters). Sporting performance is one example, which arguably is representative of a small and specialist population within wider society. Taking this in consideration, additional initiatives could serve to be

extremely beneficial to other areas, and become applicable and of central concern to society and the 'real world'. Thus, in this thesis the application of a method usually used in sport was applied to the area of nursing skills.

In keeping up to speed with current and ongoing affairs, it is safe to say that issues surrounding the quality of education and healthcare are always at the forefront of discussion in today's economy and society. As humans we all rely on these services and their provision, in order to facilitate our own lives in some shape or form. In looking at the bigger picture, our national health and education services are very much involved with each other. The two feed into each other for training purposes, in order to produce competent professionals and trainers of professionals, in the pursuit of quality assurance for care. Thus, this thesis focuses on the area of nurse education. Therefore, taking the former into consideration, the initial basic argument for this thesis is that procedures to facilitate the acquisition of psychomotor skills that have been developed in sports science could fruitfully be applied to the development of skills in other areas, such as nursing education.

The co-ordination of a number of internal processes underpins the planning, performance and execution of psychomotor skills. Specific strategies aimed at improving the performance of psychomotor skills have been researched in cognitive, behavioural and sports psychology, in order to help optimise motor performance. Motor imagery is one such strategy and has been extensively used as an adjunct to physical practice, particularly in sport. Motor imagery can be described as, "a force-generating representation of the self in action from a first person (internal) perspective" (Jeannerod, 1997. p 74).

However, despite its common use, imagery interventions that have previously been used have been criticised, as they are often provided with little theoretical justification or empirical support (Holmes & Collins, 2001). Such interventions appear to be based on anecdotal evidence, which include an eclectic selection of activities, for example the use of relaxation techniques. Many sports psychologists advocate the use of relaxation in combination with imagery. This often requires an athlete to be contained in a quiet room whilst adopting a comfortable position and then visualising with their eyes closed (Miller, 1991). However, such methods are largely underpinned by guess work and have no theoretical or research basis.

In light of these concerns, Holmes and Collins (2001) developed the PETTLEP model, which is a theoretical model of motor imagery based on fundamental cognitive neuroscience findings and also findings from sport psychology and cognitive psychology. PETTLEP is a seven point acronym, which aims to promote the inclusion of *P*hysical; *E*nvironmental; *T*ask; *T*iming; *L*earning; *E*motional; and *P*erspective specific components of a task into imagery interventions. Therefore, it represents a framework for practitioners to follow when designing and implementing meaningful imagery interventions.

Previously, imagery has being described using a large number of terms. Some of these that have been used as synonyms to imagery include cognitive and symbolic rehearsal, mental rehearsal, visualisation and mental or covert practice (Cox, 2000). Such terms promote the notion that imagery is primarily

a visual experience (Perry & Morris, 1995). However, cognitive neuroscience evidence suggests otherwise. Cognitive neuroscience literature describes motor imagery as "the representation of the self in action, with the subject feeling himself executing a given action" (Jeannerod, 1994, p.189). Therefore, this implies that imagery is a dynamic and multisensory experience and is not just concerned with visualisation alone.

In this thesis, the term 'motor imagery' will be used, as in Holmes and Collins (2001), in support of this approach. This is so, as motor imagery and motor preparation and execution are related to the same motor representation system (Decety & Grezes, 1999). Therefore, the fundamental point for applied work is that, if physical and mental practice are equivalent, then procedures shown to be effective in physical practice should also be applied in mental practice as well – hence the term motor imagery.

1.1 Statement of problem

Imagery has been advocated, for example, as an aid to examination performance (Fleet, Goodchild & Zajchowsky, 1999). Practical examinations can be extremely anxious and trying times. Therefore, feelings of nerves and apprehension that are induced by the examination situation can prove extremely detrimental to performance. Advice on how to combat such feelings in order to optimise performance can often consist of 'putting yourself into a positive frame of mind by imagining how you would like things to go and picturing it in as much detail as possible' (Acres, 1998). PETTLEP, aimed as it

is at the imagery of motor tasks, therefore may be particularly helpful when the examination in question is one that involves psychomotor skills.

One form of examination that is taken by many thousands of UK nursing students every year is the OSCE. To date, only one published study (Wright, Hogard, Ellis, Smith & Kelly, 2008) has linked imagery with clinical nursing skills or OSCE performance and the results were highly positive. This was a pilot conducted at the University of Chester, which acted as the foundation for this programme of research. One of the prime aims of this thesis, therefore, was to further test PETTLEP in the arena of clinical nursing skills and extend its use to all five OSCE assessed skills (clinical hand washing; blood pressure measurement; temperature, pulse and respiration; analysis of urine; oral medication administration). The application of a structured approach to motor imagery, namely PETTLEP, as a preparation for OSCEs, was therefore novel and innovative.

Since its development, the PETTLEP model has undergone extensive testing in the sporting field and the findings to date have been extremely supportive of the tenets of the model for improving performance (Smith & Collins, 2004; Smith & Holmes, 2004). However, it was yet to be tested outside of sports settings for enhancing skilled performance. The educational value of the model and its meaning and worth to its users was also yet to be investigated. Holmes and Collins advised that the model would certainly benefit from comprehensive testing in a variety of settings. Therefore, the rationale for this programme of research was primarily centred on this proposition.

Study one examined the effect of PETTLEP-imagery on the performance of clinical nursing psychomotor skills, namely the OSCEs. PETTLEP was applied as an adjunct to an undergraduate nursing curriculum over a 12-month period. PETTLEP was delivered as an educational tool to assist nursing students with their practice learning and aid them in preparing for their OSCEs. This took place in curriculum teaching time and was not optional for attendance. Performance in the OSCEs was used as the dependent measure to monitor the effectiveness of PETTLEP for improving clinical psychomotor skill performance. The study was therefore novel in the sense that it applied PETTLEP to clinical examination performance. Also, it was delivered as an educational intervention in a real life setting - none of which had previously been attempted.

However, unexpected results were obtained from the first study. The results highlighted relatively poor examination performance, with the control group actually performing better than the experimental group. This prompted the need for further investigation, as other factors were obviously affecting students' behaviour and impacting on their exam performance. Therefore, an explicit decision was made for the research to pursue exploration of the other possible factors that may be affecting performance. This initially involved exploring students' perceptions of and preparation for the OSCEs, using a skills training questionnaire. The results suggested that issues associated the curriculum and its content were common concerns for students. Therefore, an exploration into the teaching professionals' perspective on the curriculum and its content was conducted. The purpose of this was to gain insight from the

opposing side of the teaching process, in order to assess consistencies and/or discrepancies in beliefs with the students.

The results indicated differences in the beliefs of staff and students about the nature and content of the curriculum. These differences were suggestive of further individual differences between students and how they identify with the curriculum. Therefore, the results collectively began to identify that factors in addition to motor imagery affect students' performance in examinations including individual, group and environmental variables. Consequently, the ways in which students' construe themselves and the world of nursing was postulated to have an impact on learning and performance. Such variables might be summarised as concerning identity and the representation of identity. Therefore, this was another major theme for this thesis.

The study of psychomotor skills, nurse education, and behaviour were consequently complemented by the novel initiative of exploring students' construal of the various academic and practical expectations of the curriculum. These form part of their identity as a nurse and formulate behaviours. Therefore, the investigation aimed to consider how these fit into the broader aspects of their lives.

 Accordingly, the series of studies attempted to address two novel and original areas by firstly examining the effectiveness of PETTLEP-imagery when applied to the performance of clinical nursing psychomotor skills, and secondly the exploration of identity in the context of skilled behaviour. When

the findings of the first study revealed surprise results, the research acted with this to explore avenues to identify possible factors to explain the unanticipated findings. The series of studies followed on from one another accordingly. They achieved this by investigating factors that were identified in the former and then moved these forward for further study in the latter. This was a filtered process, which led to the explicit decision to explore identity in the context of skilled behaviour and nurse education.

Therefore, the pinnacle focus of the final two out of the five investigations was to explore identity in regards to a pressing issue which had not been investigated – namely the students' construal of the complex world of nursing. All pre-registration students are presented with a compulsory curriculum, which should comprise of 50% theory – taught within the University setting, and 50% practice – in the form of a placement in the health care setting. On paper, the curriculum assumes successful integration and application of these components by students, so that they are able to back-up theoretical knowledge with practical application, and vice versa in both the academic and practical settings. However, the results of study one indicated that in reality this may not actually be as simple and attainable for a number of students.

ISA/Ipseus was therefore selected for use to explore how participants applied themselves to various aspects of nursing in the contexts of health care and broader affiliations, and how these fit into their broader sense of identity. Ipseus is an instrument to explore identity in the theoretical framework of Identity Structure Analysis (ISA). An Ipseus is built around entities - objects of

thought and feeling- and constructs - bipolar concepts that are used to think about entities. The Ipseus was presented in the form of a questionnaire using a computer software programme, where respondents applied each of the bipolar constructs to each entity. This is a new and in-depth method of analysing identity, based on a complex synthetic theoretical framework that draws on most of the major theorists in the area.

Therefore, the issue at the forefront of the ISA/Ipseus investigation was to explore students' identity in regards to the complex web of expectations, skills, and knowledge they are required to master from the regular curriculum to become competent and qualified. To conclude, the study explored whether there were various identities for student nurses in training, and whether these formed certain categories for practice learning and students' beliefs and motives behind it. A fifth and final investigation, which comprised of two individual case studies followed. The case studies involved two in-depth interviews with students used in study two. The purpose of this was to explore the meaning and reason behind individual construals of behaviour in regards to the profession of nursing. This aimed to complement the data gathered from study four and construct arguments to support the validity and reliability of the ISA framework.

INTERNAL REPRESENTATION IN NURSE EDUCATION: IMAGERY AND IDENTITY

STUDY1: THE EFFECT OF PETTLEP IMAGERY ON OSCE PERFORMANCE

- PETTLEP imagery intervention applied to an undergraduate nursing curriculum at 2 experimental sites for 12 months. 2 control sites received the regular curriculum alone
- Results revealed no significant differences – the control group actually performed better than the experimental. Observations during the intervention indicated some differences in the amount of support and training between sites during curriculum time.
- Rationale for next study: Chose to further investigate and find out more about the factors that may be affecting performance

STUDY 2: THE OSCEs AFTERMATH: INVESTIGATING STUDENTS' PREPARATION AND PERFORMANCE USING A SKILLS TRAINING QUESTIONNAIRE

- A post-OSCE Skills training questionnaire was used to investigate preparation and performance in the OSCEs
- Results revealed that students from a particular site expressed common concerns in regards to practice time, practice environment, and support/training when it came to skills practice for the OSCEs. It was commonly felt that there was too much theory and not enough practice.
- Rationale for next study: to investigate the professionals perspective on theory and practice in the nursing curriculum

STUDY 3: THE PROFESSIONALS PRESPECTIVE ON THEORY AND PRACTICE IN THE CURRICULUM

- Four nursing were interviewed in regards to the nursing curriculum – namely its content, the clarity and definitive nature of that content, and also support and training available during its delivery
- Results revealed that the professionals' felt that theory and practice were equally as important within the curriculum. The integration of theory and practice amounts to successful performance – as you can't have one without the other. However, students would not agree and may identify differently to the content that is taught
- Rationale for next study: to explore nursing identity in regards to the elements of nursing and how students cognitively construe these in their broader life

STUDY 4: IDENTITY IN NURSING DEVELOPMENT – TOWARDS A TYPOLOGY OF CONSTRUAL

- Identity Structure Analysis (ISA) used to investigate how students' construe and apply themselves to the various aspects of nursing, and how these sit in the broader affiliations of their identity
- Results revealed a varied approach to the overall construal of nursing. The approaches largely concerned being more scientific endorsed (theoretically driven), humanistic endorsed (socially & technically driven) or holistic endorsed (having an appreciation for all aspects). However, limited implications for typologies was possible due to the small sample size.
- Rationale for next study: to follow up two individual cases to further explore notions of their identity and interview them in regards to their responses to provide individual depth and meaning to the identity data

STUDY 5: IDENTITY IN NURSING DEVELOPMENT – CASE STUDY FOLLOW-UP

- Follow up interviews used to gain more depth of knowledge behind the Ipseus results, in order to establish reason behind the judgements made on the ISA.
- Results are suggestive of different cognitive styles, construals and beliefs about nursing, which are formed over time and from experiences. Such construals are believed to be associated students ability to utilise and appreciate the content of the curriculum, which can impact on their overall learning.

Figure 1: Summary of empirical work

CHAPTER 2.0 - LITERATURE REVIEW

The overall aim of this literature review is to investigate the notion of internal representation, using the application of imagery to the performance of psychomotor skills. More specifically, the review aims to investigate the effect of motor imagery on clinical nursing psychomotor skill performance. The application of motor imagery to clinical nursing skills is novel. Therefore, the review will begin by exploring the underpinning mechanisms that explain the application and use of motor imagery to improving performance of psychomotor skills. Particular attention will be paid to explaining how skills are internally represented in the brain using information processing and cognitive maps.

The review then moves on to explore the role of imagery in internal representation. Here, theories of imagery that have been previously used in psychomotor skill research will be looked at. Following this, the review will move on to predominantly focus on a more recent imagery model that was tested in this thesis, namely the PETTLEP model (Holmes & Collins, 2001). Here, the components of the model, and underpinning theory behind them, are explained. This is followed by an exploration of research that has previously used the model to enhance skilled performance. Finally, gaps that currently exist in the research literature in this area will then be discussed and recommendations for future research and applications made.

A comprehensive review of skilled performance in nursing will then follow. Here, changing conceptions of nursing will be discussed, followed by an examination of previous and existing exploratory strategies and interventions aimed at developing skilled performance in nursing. The OSCEs, which are to be used as the dependent performance measure in study one, are then discussed. The nature and purpose of the OSCEs as an assessment tool in medical education, along with their use in previous research, will then be examined. Finally, ISA/Ipseus (Weinreich & Saunderson, 2003) – the instrument used to investigate nursing identity will then be examined. Underpinning theories of identity will be explored, along with the logic behind ISA/Ipseus and the factors for constructing and developing an Ipseus tool. To conclude, the critical points to surface from the literature review, along with the research questions that the studies aimed to address, are summarised.

2.1 Psychomotor skills

Psychomotor skills are physical actions or activities that people perform involving mental and motor processes (Romizowski, 1999). Such skills can range from relatively intricate everyday tasks such as tying a shoe lace, to extremely skilled and specialist tasks such driving, piloting, dentistry, and athletic performance (Chaiken, Kyllonen & Tirre, 2000). Psychomotor primarily defines mental events that have motor consequences or vice versa. Therefore, the underlying ability to simultaneously 'think' and 'do' is a prerequisite of such behaviour. Skill on the other hand is a general capability to perform cognitive or behavioural activities through the acquisition of learning, experience and training (Schmidt & Wrisburg, 2000). Cognitive

activity represents internal mental processes such as problem solving, memory, and language. These types of processes originate within the brain and are determined by central processing. Behavioural activity refers to one's actions or reactions in relation to the environment, which can either be a conscious or unconscious process.

Motor skills are skills required for proper usage of skeletal muscles (Schmidt, 1975). Besides muscles, the ability to perform such skills also depends upon the proper functioning and co-ordination of the brain, skeleton, joints, and nervous system. Motor skills are conceptualized in one of two ways (Schmidt & Wrisberg, 2000). On the one hand, skills can be seen as tasks and thereby be classified along a number of dimensions or according to prominent characteristics. Skills can also be viewed in terms of the features that distinguish higher-skilled performers from lower-skilled performers. One classification in particular concerns the relative importance of motor and cognitive elements in the performance of skills. Therefore, in the case of motor skills the primary determinant of movement success is the quality of the movement itself, with less emphasis being given to the perceptual and decision-making aspects of the task.

Psychomotor skills on the other hand involve a significant perceptual, processing, and response load (Chaiken, Kyllonen, & Tirre, 2000). A key feature of these skills is the requirement for either complex perceptual discriminations or production of complex motoric responses. For example, the perceptual input on a psychomotor skill or task could be of a visual, auditory,

or tactile nature and the motor output could involve the manual (one or more limbs), ocular, or vocal motoric systems. Therefore, several defining features are associated with psychomotor skills (Chaiken, Kyllonen, & Tirre, 2000). Such features may include the continuity of the task (the translation of continuous perceptual display into a continuous motor response), timing (requiring the performer to time a response or estimate time accurately), and co-ordination (conducting individual aspects of the task in conjunction with others at one time). A widely accepted notion of psychomotor ability is that it is not a single general factor, but rather is made up of a set of independent sub factors (Fleishman, 1964). The work of Fleishman (1964) suggested that there may be eleven or so psychomotor factors (e.g., reaction time, multi-limb co-ordination, response orientation). Therefore, the organisation of such factors is largely rooted within perceptual and cognitive functions, which in part, determine the proficiency of psychomotor ability and skilled performance.

2.1.1 Internal Representation of Skills

During the early stages of skilled learning, performance of an unfamiliar task is usually uncoordinated and requires considerable effort in making decisions and executing movements (Willingham, 1998). It is in this early stage, during which actions may not be able to be controlled as to achieve sensory goals or improve performance that the learner attempts to discover the basic mapping rules relating motor and sensory signals before they can be implemented so as to improve performance (Sailer, Flanagan & Johansson 2005). Therefore, the art of skilled behaviour involves the ability to predict the

consequences of one's actions, and motor learning involves the acquisition of new maps relating motor commands and desirable sensory outcomes.

Early psychologists suggested that actions are driven from within and the interaction with the external world is initiated by the subject. Therefore, a relationship, which is formulated and controlled by the individual about internal representations and external experiences, is apparent. In the late 1950's cognitive psychologists proposed that living beings are not purely reactive systems: rather they exhibit spontaneous behaviour that testifies to pre-existing endogenous activity. Endogenous activity defines something that originates or is produced within the body (Stocco & Anderson, 2008). Therefore, behaviour is shaped upon previous internal experiences, which, we use to recall information when planning a response. Consequently, living beings are thought to be endowed with prior (and perhaps, in-born) knowledge about themselves and the external world, which allows rebuilding of representations of the effects of interacting with the environment (Jeannerod, 1999). These representations are then stored and, through time, real interaction with the environment is thought to internally stabilise them and allows setting their parameters for future more successful interactions. This could be seen to act as a facilitating process, by selecting those representations that best conform to the available information about the external world at that given time.

The view presented in the previous paragraph underpins the works of Neisser (1993) who presented an argument about the perceived self and ecological

and interpersonal sources of self-knowledge. Neisser (1993) proposed that the self is not a special part of a person (or of a brain); it is a whole person considered from a particular point of view. The ecological self is the individual considered as an active agent in the immediate environment. Such agents perceive themselves among other things (e.g., where they are, how they are moving, what they are doing, and what they might do), whether a given action is their own or not. The interpersonal self is the same individual considered from a different point of view: namely, as engaging in face-to-face interaction with others. These face-to-face interactions are apparent, just as positions and movements are. Therefore, we can see, hear, and feel what we are doing both ecologically and interpersonally. Neisser's claim that we 'perceive ourselves' was consistent with Gibson's (1966, 1979) theory of perception.

In this theory perception has a special status referred to as 'direct'. This means that the perceptual systems pick up information that invariantly specifies an objectively existing state of affairs. Unlike other forms of knowing, perception is not constructive or inferential. The wealth of information available through vision enables us to see the environment and our own actions as they really are. Therefore, this approach assumes that the perceptual systems evolved to take advantage of objectively existing information, with the purpose being to discover what it specifies and determine how it is picked up. As a result, real environmental interaction serves an important purpose in the building of representations of actions (Jeannerod, 1999).

Other research evidence has indicated an existence of biological and psychological initial state that owes nothing to the external environment. This supports the concept that all organisms to some degree possess innate prior knowledge about the external world (Jeannerod, 1993). Research into early human development has supported the existence of biological underpinnings prior to birth. De Vries, Visser and Prechtl (1982) made observations during fetal development in humans and mammals. They pointed out that in foetuses, the ventral aspect (responsible for object recognition, including faces) of the spinal cord matures several days in advance with respect to its dorsal aspect (responsible for spatial information for visually directed actions). However, foetuses can exhibit spontaneous movements (that closely approximate those from normal repertoire after birth) before the time dorsal roots have become functional, that is, before these movements could be influenced by any external stimulus (De Vries, Visser & Prechtl, 1982). Therefore, this behaviour is not learnt.

This is also true of cognitive functions, as research in the origins of knowledge has supported that soon after birth children show evidence of knowledge about elementary physical laws, temporal regularities and causal relationships (Spelke, Breinlinger, Macomber & Jacobson, 1992). Such evidence supports the existence of an initial state or 'internal model', whereby one would rely on pre-existing rules to build up a model of the effects of interacting with the environment.

Early work by Bartlett (1926) suggested that behaviour of this kind would be built as a combination of stored basic reactions ready for use. In the field of psychology, this concept is referred to as 'schema' in order to account for the production of behavioural responses. Bartlett (1926) regarded schemas to also consist of an arrangement of material: sensory at a low level, affective at a higher level, imaginal at a higher level yet and even ideational and conceptual. Thus, the functioning of schemas appears to be deeply rooted within internal, inherent, cognitive properties.

The term 'schema' has Greek origins that translate to the meaning of 'plan'. It takes a view that comprehension depends on integrating new knowledge with a network of prior knowledge, suggesting higher order 'planning'. This is an important pre-requisite in the learning and performance of skilled behaviour. In 1975 Schmidt adapted schema theory which was central to motor learning. This theory originated from a theory of motor control. A primary construct of this theory was the idea of the generalised motor program (GMP). Schmidt developed the generalised motor concept in response to two prevailing views. One was closed-loop control, in which movement was considered to evolve as a series of chained reactions that used proprioceptive feedback as the sensory stimulant for the generation of the next efferent signal in the movement (Adams, 1971).

The other prevailing view schema theory challenged was the concept of a motor programme. Schmidt (1975) contested that many definitions of motor programmes, most notably the versions articulated by Henry and Rogers

(1960) and Keele (1968), left little flexibility in what the motor program represented and how it unfolded in time. The primary concept of Henry and Rogers (1960) view of motor programming was specificity, in that motor learning was specific to a particular skill. Therefore, the contention was that individuals with well developed motor programs might perform that skill well but would not necessarily perform another skill well, even if it was closely related. As such, Henry and Rogers (1960) suggested that motor programs that were the underlying representations of motor skills were specific to the task that had been practised.

In the late 1960's Keele (1968) suggested a strict view of a motor programme to be one in which a motor command is executed without the influence of peripheral feedback (see appendix 1). This view was similar to that of Henry and Rogers (1960), as the motor programme would have to be specific to underlie all the conceivably different ways in which we move. In response to these claims, Schmidt argued that this notion of extreme specificity and inflexibility as an adaptable structure in the motor control process left the concept of motor programme in need of some modification (Sherwood & Lee, 2003).

Schmidt's schema theory proposed the existence of two constructs: the generalised motor program and the schema. Schmidt argued against closed loop theory (Adams, 1971) in that people do not learn specific movements. Instead, they construct generalised motor programs. This is done by exploring programming rules and learning the ways in which certain classes of

movement are related. Individuals then learn how to produce different movements within a class by varying the parameters that determine the way in which movements are constructed. An important prediction of the theory was that people will more quickly learn the relationship between manipulating parameters and achieving a desired movement outcome if they practise a task in a wide variety of situations, and experience errors in the process.

Schmidt (1975) pushed the view that actions are not stored rather we refer to abstract relationships or rules about movement. Therefore, schema theory is grounded in the concept that every time a movement is conducted four pieces of information are gathered: the initial conditions (e.g. starting point); aspects of the motor action (e.g. how fast, how high); the results of the action (e.g. success or failure); the sensory consequences of that action (e.g. how it felt). Relationships between these items of information are then used to construct a recall schema and a recognition schema. The recall schema is based on initial conditions and the results (e.g. environmental stimuli at that given time) and is used to generate a motor program to address the goal (e.g. selecting those representations that best conform to the available information about the external world at that given time).

The recognition schema is based on sensory actions (e.g. how it felt to perform) and the outcome (e.g. was it successful or unsuccessful). Ideas by Jeannerod (1994) support this process as the general concept of his work was that actions are driven by a represented goal rather than directly by the external world. Therefore, the generation of actions involves a representational step operating with fixed rules (recall schema) and relying on

identifiable building blocks (recognition schema), in order to formulate a central coding.

Some studies have investigated the idea of central coding in relation to a 'desired' position of an effector system (Abbs & Gracco, 1984; Cole & Abbs, 1987; Pelisson, 1986). Researchers have conducted experiments involving sudden perturbations (gravitational forces) occurring during execution of different movements. Conclusions have suggested that the corrections in movement trajectory and/or kinematics in response to these perturbations can be so fast (usually within less than 100ms) that they cannot be due to programming another movement based on feedback error detection. Instead, they have to rely on an open-loop adjustment of the ongoing program (Jeannerod, 1994). Therefore, this suggests that the central representation must be an active structure, in that it permanently monitors movement related signals (proprioceptive feedback) and compares them with the ongoing efferent commands (carrying of motor impulses). As a result, any deviation from this comparison would immediately trigger corrections (Jeannerod, 1990).

Another interesting area in higher level planning concerns object-orientated actions. Such actions are thought to be embedded into broader representations where longer term plans are encoded (Faillenot, Toni, Decety, Gregoire & Jeannerod, 1997). Higher level schemas control the selection, activation or the inhibition of lower level schemas. Therefore, the higher level schemas represent action plans where the serial order of the movement

needed to achieve the action is represented. Jeannerod (1994) demonstrated that when objects are goals for actions, their visual attributes are represented in a specific way, used for the selection of appropriate movements, and distinct from other possible modalities of representation used for other aspects of object-orientated behaviour. Therefore, the object processing is in continuity not of exact previous attempts, as the same object or event can be processed in different ways according to the task in which the subject is engaged. These differences usually constitute the amount of overt cognitive content involved in tasks. Consequently, distinctions between conscious/non-conscious, explicit/implicit or automatic/controlled modes of processing are apparent (Bridgeman, 1989).

It has been postulated that the internal motor representation includes much more besides spatial aspects of movements. Jeannerod (1994) proposed that during object-oriented action, objects are not only located in space and reached; they are grasped manipulated and used. As a result, it seems preferable to classify object attributes in regard to observed interactions between the subject and the objects during a given action.

Modern technology has brought with it a new repertoire of motor skills that require a relatively novel form of eye-hand coordination (e.g. piloting, engineering) (Clower & Boussaound, 2000). Many studies have investigated the learning of visually guided manual skills in many skills, such as grasping an object (Lackner & Dizio, 1994; Shadmehr & Mussa-Ivaldi, 1994; Krakauer et al., 1999, 2000; Flanagan et al., 2003). During visually guided movements,

visual information is transformed into motor commands, in order to produce a motoric response and output (Clower & Boussaoud, 2000). This transformation is known as the 'visuomotor map'. Processes whereby sensory information is used to generate motor commands are known as 'sensorimotor transformations' (Safstrom & Benoni, 2005). Typically, they can be formalised in terms of a transformation between different coordinate systems. For example, the 'visuomotor map' transforms information from visual to motor resulting in a motor output or movement coordinates (Pouget & Snyder, 2000).

As learners we therefore must practise to establish the correct relationship between visual input and motor output, in order to adapt to the new visuomotor arrangement. Once this is acquired, competent performance of the visuomotor relationship may persist for years and does not interfere with ability to learn or perform other visuomotor tasks (Ghahramani & Wolpert, 1997). These are characteristics that are typically attributed to visuomotor skill acquisition, or acquisition of a kinematic "internal model" or schema of the sort which has previously been discussed.

Previous research has examined acquisition of "internal models" in relation to visuomotor skills. Studies have demonstrated that laterally displacing prisms can produce visuomotor rearrangement that leads to adaptation during exposure. Yet, fundamental differences exist in the profile of psychophysical responses observed after prism adaptation when compared with acquisition of a novel visuomotor arrangement in a representational workspace

environment. Research has also examined states of dual adaptation to prisms, but has had difficulty demonstrating robust multi-state retention comparable to that observed with multiple "internal models" (Kurata & Hoshi, 1999; Welch, Bridgeman, Anand & Brownman, 1993). Such disparate psychophysical manifestations have led others to emphasise the distinction between visuomotor skill acquisition (e.g. task-dependent adjustment of the motor response to compensate for a manipulation of the moving environment) and perceptual recalibration (e.g. a co-ordinative remapping between different perceptual representations such as vision and proprioception) (Bedford, 1993; Lacker & Dizio, 1994; Martin, Keating, Goodkin, Bastian & Thach, 1996; Redding & Wallace, 1996).

Perceptual recalibration involves a global topological realignment, in that alterations within a trained region of space generalise to other regions (Bedford, 1993). Recalibration also shows limited inter-manual transfer and produces directional after effects that indicate a difficulty in returning to the original visuomotor mapping even with cognitive awareness of change (Bedford, 1993; Uhlarik, 1973).

Visuomotor skill acquisition is characterised by ability to establish a non-topological relationship between visual input and motor output; the capacity to maintain multiple non-competing visuomotor mappings; and substantive intermanual transfer (Cunningham & Welch, 1994; Ghahramani & Wolpert, 1997; Imamizu & shimojo, 1995). In addition, directional after-effects from exposure are rarely observed, and when noted are substantially less than

those found with adaptation prisms. For example, some studies have shown that after learning a new visuomotor mapping in which the direction of a cursor movement is rotated compared with hand movement, monkeys and humans were able to revert to normal performance on the standard mapping condition with only minimal directional after effects (Tamada, Miyauchi, Imamizu, Yoshioka & Kawato, 1999; wise, moody, Blomstrom & Mitz, 1998). Therefore, such research demonstrates the ability of long-term coding for original or 'familiar' visuomotor mapping, with little disturbance from distorted conditions.

Cognitive neuroscience research has focused due attention on the nature of the real-time processing that underlie mental functioning (Decety, 1996). The recent availability of sensitive brain-imaging techniques, coupled with experimental paradigms linked to cognitive psychology, has allowed recognition for cognition in the brain. Such techniques have enabled an enhanced understanding of how information is represented and characterised when planning and executing a motoric response.

Rizzolatti et al., (1997, 1998) discovered two fronto-parietal circuits conncecting area F4 of the brain to the ventral intraparietal (VIP) area and area F5 to the anterior intraparietal (AIP) area (see figure 1). They suggested that these circuits appeared to be endowed with the functional characteristics suitable to guide arm reaching and hand grasping movements. Both areas VIP and F5 contain bimodal neurons that respond to tactile stimuli applied to specific curtaneous (Pertaining to or affecting the skin) sectors (tactile

receptive fields, RFs) and to 3D visual stimuli presented in specific space sectors (visual RFs). The visual RFs of these neurons are anchored to tactile ones regardless of eye position. Therefore, these neurons play a crucial role in the process of visuomotor transformation necessary to guide arm of head movements toward or away from visual stimuli. Similarly, in area AIP and F5 there are neurons that respond both to the visual presentation of 3D objects of different size and shape and to the grasping movements aimed at those objects (Rizzolatti et al., 1997, 1998).

Research by Milner and Goodale (1995) found that within the dorsal stream of primates, there are parallel cortico-cortical circuits, each of which elaborates a specific type of visual information in order to guide different types of action. They suggested that the peculiarity of these circuits resides in the fact that different effectors are provided with the most suitable type of visual information required by their motor repertoire. Therefore, this firm connection between vision and action seems to be the organising principle within the circuitry connecting the parietal with the agranular frontal cortex.

The past decade or so has seen a burgeoning of interest in the neural basis of mental imagery, and much of this new research activity has been directed towards understanding mental image generation. From the previous literature it has become evident that the integration of new knowledge with a network of prior knowledge results in higher order planning – namely a schema. In the case of skilled performance, one can learn quicker when a schema is practised in a wide variety of situations, where errors can be experienced in

the process. Therefore, higher level schemas represent action plans where serial order of movement is needed in order to achieve representation of the action. This process involves an internal motor representation, which includes much more besides the spatial aspects of a movement. Therefore, visuomotor maps are constructed, which transform visual input into motor commands, then a motor response. Then once this relationship is acquired and practised, the acquisition of an internal model is apparent. It is therefore evident that the visual and motor systems work hand in hand in the production of skilled performance. Mental image generation plays a central role in this process, in order to recall, recognise, and generate specific programs for the execution of skills. The following section will explore and discuss the relationship and role of imagery in internal representation. This will be largely underpinned by what has been previously discussed in the above section.

2.1.2 *Imagery and Internal Representation*

As previously discussed, motor acts are centrally represented and like other representations, are stored, modified, and may be retrieved from specific cognitive processing (Stelmach & Hughes, 1984). Action planning and motor preparation can be studied using motor imagery. A close functional relationship between motor imagery and motor preparation has been suggested by: the positive effects of imaging movements on motor learning; the similarity between the structure involved; and the similar physiological correlates observed in both imaging and preparing (Jeannerod, 1994).

Visual mental imagery has been a subject of considerable controversy in cognitive neuroscience for many years (Farah, 1989). The issues of discussion have concerned whether images are fundamentally different from verbal thoughts, whether they share underlying mechanisms with visual perception, and whether information in images is represented in a spatial (map-like) format. Farah (1989) presented the view that mental imagery involves the efferent activation of visual areas in the prestriate occipital cortex and the parietal and temporal cortex, and that these areas represent the same kinds of specialised visual information in imagery as they do in perception. In addition, different components of imagery processing appear to be differentially lateralised, with generation of mental images from memory depending primarily upon structures in the posterior left hemisphere, and the rotation of mental images depending primarily upon structure in the posterior right hemisphere. Therefore, research on the neural systems underlying imagery brings a new source of evidence to bear on the cognitive science controversies, as well as on the cerebral localisation of imagery processes.

Research in neuroscience has stipulated that the organisation of motor activity is based upon the utilisation by the motor system of information stored in memory in the form of multiple hierarchically organised representations of action (Decety, 1996). Therefore, cognitive processes and overt behaviour appear to be intimately related. Decety (1995, p. 87) defines motor imagery as, *"a dynamic state during which a subject mentally simulates a given action".* Therefore, this suggests that motor imagery is a conscious and deliberate act. In order to access this type of information from the working

memory, the capacity to deliberately control attention is critical to its higher cognitive functions. Working memory is the limited capacity to hold and manipulate information in the mind for several seconds in the context of cognitive activity (Gevins & Smith, 2000). It is also an outcome of the ability to control attention and sustain focus on a particular active mental representation (or set of representations) in the face of distracting influences (Engle, Tuholski & Kane, 1999). This is a common and enduring feature in the learning, acquisition and performance of psychomotor skills and visuomotor performance.

One of the first reported involvements of motor processes in the field of imagery was identified back in the nineteenth century. James (1892) reported the case of Professor Stricker of Vienna, a self-described 'motile' whose recollection of both his own actions and those of others were invariably accompanied by distinct muscular feelings in those parts of the body which would normally be used in carrying out the action (Annett, 1995). In thinking of a soldier marching, James (1892) reported that it was as if he were helping the image to march by marching himself. If he suppressed this sympathetic feeling and concentrated attention on the imaged soldier, the latter became, as it were, paralysed.

Holmes and Collins (2001) have suggested that the primary representational sense of motor imagery is kinesthesis. Kinesthesis can be described as sensory information that comes from the motor system which signals muscular contraction and limb movements (Schmidt & Wrisberg, 2000).

Human motor skills depend crucially on visual and proprioceptive feedback (Bock, Pipereit & Mierau, 2007). Feedback from the two sources forms the basis of skilled behaviour as it provides valuable information to the performer about their execution of a skill, which is recalled in future performance attempts.

Over the past few decades cognitive neuroscience research has led us to the knowledge that, when motor preparation in the pre-execution stage becomes a conscious process it automatically becomes a motor image of the same action, but is still part of the same motor representation (Jeannerod, 1999). Therefore, as a skill becomes autonomous in the working memory, the 'mapping' or 'internal model' that underpins that action becomes more automatic and ones ability to control attention and sustain focus during active processing improves.

Motor imagery has been suggested as pertaining to the same category of processes as those which are involved in programming and preparing actions, with the difference that in the latter case execution would be blocked at some level of cortico-spinal flow (Decety & Ingvar, 1990). Therefore, this means that during imagery of a task the same internal processes would occur as in the pre-execution stages for that task. However, the neural activity and transition linked to actual execution would be halted, as the performer would not be intending to produce a direct motor output of that task.

Work by Jeannerod (1995) investigated the concept of mental imagery in the context of internal mapping of motor actions. The general proposition behind his work is that motor imagery is part of a broader phenomenon (the motor representation) related to intending and preparing movements. Jeannerod (1995) proposed that the process of motor representation, a normally non-conscious process, can be accessed consciously under certain conditions, as a motor image is a conscious motor representation. Therefore, motor images are endowed with the same properties as those of the (corresponding) motor representation, that is, they have the same functional relationship to the imaged or represented movement and the same causal role in the generation of that movement.

Early visual imagery research (Finke, 1980; Kosslyn, 1987) studied the role and equivalence of internal mechanisms during the imagery process. Such research was later extended to motor imagery, by assuming that motor images share the same neural mechanisms as those that are also responsible for preparation and programming of actual movements (Decety & Ingvar, 1990). Decety (1996) further explored this concept by addressing the question: do motor images share the same neural mechanisms as those that are also responsible for preparation and programming of actual movements? Decety investigated this matter in normal subjects during motor imagery tasks using three different methods: mental chronometry; monitoring autonomic responses; and measuring cerebral blood flow.

Decety (1996) proposed that mental activities are represented by neural activities, although the presence of the former must be inferred from observational behaviour. The concepts used in motor imagery stem from the early methods of Donders (1969), which were centred upon the measurement of response-time to sensory stimuli. Donders found that when a task required a stimulus discrimination of a reaction choice, the reaction time was longer than when only one stimulus was presented and a predetermined response was required. In light of this, mental chronometry measures have since been taken to reflect the level of efficiency of neural and cognitive mechanisms. Therefore, this acts as a way of accessing the content of motor images.

Research by Parsons (1994) tested the comparison between actual and mental movement time. Here, subjects were instructed to move one of their hands into the orientation of a stimulus (a hand) or mentally simulate that action. Results revealed that mental simulation time mimicked movement time for natural efficient movement. This, therefore, lent support for temporal and mental processing matches. Earlier work by Decety and Michel (1989) also investigated comparisons between the temporal organisation of graphic movements executed either actually or mentally in normal subjects. Here, subjects performed two graphic tasks, drawing a cube or writing a sentence, with either the right (dominant) or the left hand. These tasks were selected as they allowed for a comparison between right and left hemisphere cognitive processing since handwriting involves left hemisphere resources and drawing is supposed to require more the participation of the right hemisphere's visuo-spatial ability (see figure 1). Results from the study indicated that movement

times were very stable from trial to trial in the same subject for both conditions (active and mental). Also, the time required to execute actual graphic gesture and the time to execute the same gesture mentally were similar (mental left hand slower than mental right hand in the same proportion to actual left and actual right hand).
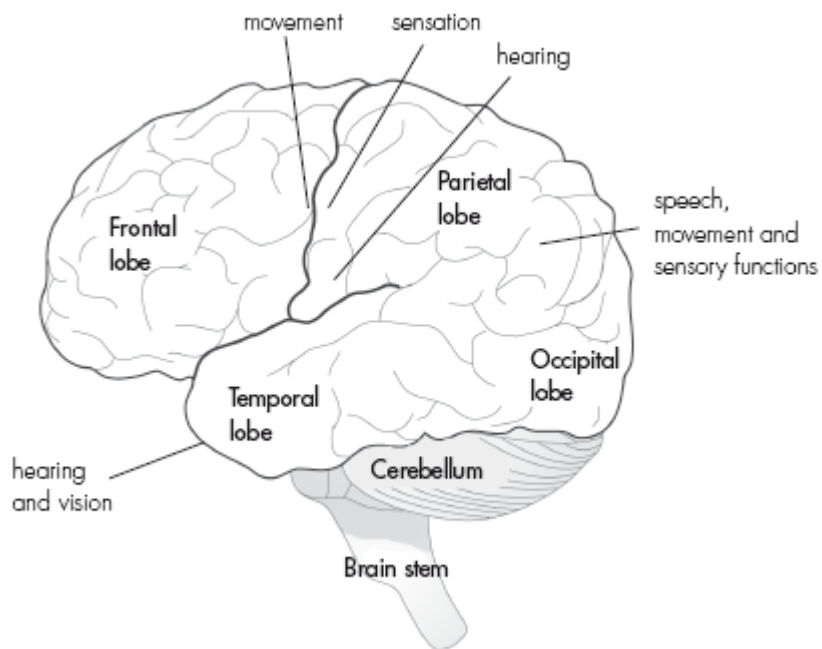
Figure 2: The lobes and functions of the brain

Previous cognitive neuroscience research (Fadiga, Fogassi, Pavesi & Rizzolatti, 1995; Iacoboni, Woods & Mazziotta, 1999) has lent support to the work of Jeannerod by evidencing an equivalence of internal operations between imagination of action and action execution at a structural neuronal level. Fadiga et al., (1995) used a method called transcranial magnetic stimulation (TMS) to stimulate the motor cortex of normal subjects. TMS is a noninvasive method used to excite neurons in the brain, where weak electric currents are induced in the tissue by rapidly changing magnetic fields (electromagnetic induction). This way, brain activity can be triggered with minimal discomfort, and the functionality of the circuitry and connectivity of the brain can be studied. In this particular study TMS was used under four experimental conditions: 1) observing an experimenter grasping 3D-objects; 2) looking at the same 3D-objects; 3) observing an experimenter tracing geometrical figures in the air with his arm; 4) detecting the dimming of a light. Motor Evoked Potentials (MEPs) were recorded from the hand muscles as an outcome measure of each experimental condition. Motor evoked responses' are electromyographic waveforms recorded after stimulation of the motor (or movement) pathways of the central nervous system.

There are several types of MEPs depending upon where the stimulation occurs and from where the response is recorded. Transcranial MEPs involve stimulation of the brain through the skull, with recording either from the nerves or muscles of the arms and legs. The results of Fadiga et al., demonstrated a significant increase in MEPs during the conditions in which subjects observed

movements, as the pattern reflected the pattern of muscle activity recorded when the subjects executed the observed actions.

Other MEP research has found evidence of the facilitation of MEPs through motor imagery (Kasai, Kawai, Kawanishi & Yahagi, 1997). This particular study examined the extent to which motor imagery can facilitate specific pools of motor neurons. A wrist flexion exercise was selected where subjects were required to image themselves performing that task. To estimate the excitability changes of the relevant pools of spinal motoneurons, H-reflex methods were used to induce electrical stimuli and detect changes in the spinal cortical level. TMS was also used to record motor evoked potentials and test the excitability of the motor cortex during motor imagery.

Results revealed that during motor imagery of wrist flexion remarkable increases in the amplitude of the MEP of the flexor carpi radialis muscle (flexor muscle of wrist) were observed with no change in H-reflex. Furthermore, facilitation of antagonist (extensor carpi radialis: extensor muscle of wrist) was also observed. Kasai et al., (1997) concluded that internal motor command can precisely activate cortical excitability with no change in spinal level without recourse to afferent feedback.

A central tenet in cognitive neuroscience is that the neural counterparts of complex human behaviour are composed of large-scale cortical networks that integrate separate local neural assemblies that sub-serve specific cognitive processes (Mesulam, 1990). Lacoboni et al., (1996) studied brain-behaviour

relationships by looking at practice effects in spatial stimulus-response compatibility. They looked at the behavioural profiles and the underlying cerebral activity of two aspects of human performance in sensorimotor integration tasks: 1) spatial stimulus response compatibility and 2) the procedural learning acquired with practice. Sensorimotor integration and procedural learning are two basic aspects of human behaviour. Sensorimotor integration is essential for the ability to attend to the outside world, to move the body accurately in space, and to interact with objects that are around us. Procedural learning is acquired with practice and is essential to become faster and more accurate in sensorimotor skills (Lacoboni et al., 1996).

In this study relative cerebral blood flow (rCBF) changes were measured using positron emission tomography (PET) in six normal subjects repeatedly performing a spatial stimulus-response compatibility task. PET is a nuclear medicine imaging technique that produces a three-dimensional image or map of functional processes in the body. Subjects had two motor response conditions. They were instructed to respond with the left hand to a left visual field light stimulus and with the right hand to a right visual field light stimulus (compatible), and with the right hand to a left visual field light stimulus and with the left hand to a right visual field light stimulus (incompatible condition).Six cerebral blood flow measurements were taken per condition to identify the regional blood supply in the brain at that given time. Results indicated that reaction times were faster in the compatible (287 ms) than the incompatible (339 ms) condition (spatial stimulus-response compatibility effect). Therefore, a bilateral increase in rCBF in the superior

parietal lobule of the two hemispheres was observed during the incompatible condition when compared to the compatible one.

More recently, Ganis, Thompson and Kosslyn (2004) investigated brain areas underlying visual mental imagery and visual perception in a functional magnetic resonance imaging (fMRI) study. They used fMRI to assess the maximal degree of shared neural processing in visual mental imagery and visual perception. FMRI is one of the most recently developed forms of neuroimaging to monitor brain activity by measuring changes in blood flow. Oxygen is delivered to neurons by haemoglobin in red blood cells. Therefore, when neuronal activity increases there is an increased demand for oxygen and the local response is an increase in blood flow to regions of increased neural activity. In this study, participants either visualised or saw faint drawings of simple objects, and then judged specific aspects of the drawings (which could only be evaluated properly if they used the correct stimulus). Each MRI session consisted of six functional scans, which alternated imagery and perception conditions.

The imagery and perception conditions were administered in separate scans to avoid potential artefacts due to cognitive demands associated with task switching (Konishi, Kawazu, Uchida, Kameyama & Miyashita, 1999). The results revealed that visual imagery and visual perception draw on most of the same neural networks. However, although the vast majority of activated voxels (units of volume that are the equivalent elements to pixels with a depth component, which is related to slice thickness) were activated during both

conditions, the spatial overlap was neither complex or uniform; the overlap was much more pronounced in frontal and parietal regions than in temporal and occipital regions. Therefore, this finding suggests that cognitive control processes function comparably in both imagery and perception, whereas at least some sensory processes may be engaged differently by visual imagery and perception.

Other research has also demonstrated evident increases in cerebral blood flow in the pre-motor cortex, middle temporal gyrus, inferior and middle frontal gyri and parietal cortex during observation of goal-directed hand movements (Grezes & Decety, 2001). As a result, growing evidence (Calmels *et al.,* 2005; Gallese *et al.,* 1996; Grezes & Decety, 2001) has suggested that both imagery and observation of motor movements consist of similar neural processes as that experienced during preparation and actual motor execution, as each operation are proposed to be assigned to the same internal representation. Therefore, a strong link between imaged action, motor preparation and motor execution has evolved suggesting that motor imagery, if used appropriately, can enhance the activation of internal processes linked to psychomotor skill performance.

Jeannerod's (1994) suggestion that motor imagery and motor preparation are both assigned to the same motor representation vehicle has a strong logical sequence, namely motor images cannot be considered as an epiphenomenon (a useless accompaniment) of the process of motor generation. Instead, motor representation has a causal role in the generation of movements. Therefore,

motor images are also considered as functionally related to the imaged movement. Jeannerod developed this idea by claiming that motor images and motor preparation processes have different subjective components. Motor preparation is an entirely non-conscious process, which escapes the subject's awareness. As a result, only the final result is under the subject's judgement, so that the action, once executed, can be recognised by them to correspond (or not) to their intent. By contrast, the imaginer can access the content of motor images consciously.

It has become evident that image generation plays a central part in internal representation and the production of motor images. We know that imagery can closely approximate the neural basis of motor representation, due to an overlapping of the systems used. Therefore, imagery can be seen as a powerful tool for enhancing motor performance by reinforcing the neural pathways used for producing behavioural outputs. The following section will discuss this in depth and explore the performance-enhancing effects of imagery in relation to skilled performance.

2.1.3 Imagery and performance

Imagery training has received much attention for its role in athletic performance and is often given to athletes as a tool to complement their regular training regimes (Beauchamp et al. 1996). Imagery, as a performance tool, has been shown to serve a number of marked advantages. Such advantages include enhancing self-confidence and awareness; enhancing preparation strategies; facilitating skill acquisition, learning and understanding;

and regulating arousal and controlling emotions (Murphy & Jowdy, 1992). For this reason, the literature on imagery and mental practice is extensive (see reviews by Feltz & Landers, 1983; Murphy, 1990; Paivio, 1985) and generally leads to the conclusion that various forms of imagery practice can have measurable effects on learning and performance. However, these effects are usually less powerful than those achieved by overt physical practice.

Typically, previous studies investigating imagery and mental practice have included an imagery group who would mentally practice a skill, a physical practice group who would conduct normal practice, a combination group of both physical and mental practice, and a control group. Such designs usually consist of a pre-test in a specific motor skill, followed by an intervention period and a post-test in the same skill. This then allows for any between and within group differences to be identified, in order to measure the effectiveness of each intervention type.

There has been much discussion in the research literature as to which types of tasks benefit most from motor imagery interventions. Some studies have shown that imagery is more effective for motor tasks, where large muscle groups are involved for completing the movement (Ryans & Simons, 1981). Other research, however, has shown that imagery is more effective with tasks that are predominantly cognitive in nature and which require a high level of decision making (Wrisberg & Ragsdale, 1979). In a review by Feltz and Landers (1983), tasks were classified as either motor, cognitive or strength, and the mean effect sizes for each type of task were compared. They found

that the effects of imagery on cognitive tasks (1.44) were clearly greater than the effect on motor (0.43) or strength (0.20) tasks. This suggested that imagery may be more effective in enhancing performance in cognitive tasks than in motor or strength tasks. Many of the findings of the Feltz and Landers (1983) review were confirmed by Driskell *et al.* (1994), who, using more stringent selection criteria, performed a meta-analysis of 62 studies. Here they found imagery to have a significant performance-enhancing effect across a large number of studies. Also, as did Feltz and Landers (1983), they found that type of task was a significant predictor of the extent to which imagery improved performance. Here, they found imagery to enhance the performance of cognitive tasks (0.69) more than that of motor tasks (0.34).

Research has also suggested that imagery is more effective during the early stages of learning (Wrisberg & Ragsdale, 1979). The early stages of learning are more cognitive, as the performer is still not performing automatically. Therefore, it is believed that because imagery is more effective in the early cognitive stages of learning, this then supports the cognitive component of the task (Decety & Ingvar, 1990; Schmidt, 1975).

A number of early theories of imagery were developed in order to explain the mechanisms underpinning the involvement of motor processes in imagery. The first of these was Psychoneuromuscular Theory (Richardson, 1967). The origins of this theory lie in Carpenter's (1894) "ideo-motor principle", which states that any idea dominating the mind will find its expression in the muscles. Therefore, the idea was centred on the proposition that when an

idea reaches a certain level of intensity, the content of that idea will be expressed through muscle activity. As a result, psychoneuromuscular theory is based on this notion. During physical activities the central nervous system (CNS) constantly transmits nervous impulses to the skeletal muscles in order to generate movement.

The psychoneuromuscular theory postulates that similar nervous impulses are also transmitted to the muscles during imagery processes. The nervous impulses are similar (same firing pattern) as in actual execution of movements, although the intensity and frequency of those impulses are reportedly lower. As a result, no actual movement will occur, although kinesthesis in the limbs used in actual movement will occur. This activity provides kinesthetic feedback that is relayed to the brain, which is then used to recall in future trials in order to adjust performance. Therefore, practising imagery will strengthen the muscle-firing pattern in the absence of overt activity, thus improving performance (Richardson, 1967).

Many studies using electromyography (EMG) have shown the imagery of motor skills to be associated with muscle activity, as predicted by psychoneuromuscular theory. EMG refers to the study of muscle function through the electrical activity occurring in the muscle (Basmajian and De Luca, 1985). EMG signals are manifestations of action potentials caused by activation of underlying muscle fibres (Clarys & Cabri, 1993).
This phenomenon was first shown by Jacobson (1931), who inserted needle electrodes into the biceps brachii muscle, and the recti muscles of the

isolateral eye. Electrical activity was measured using a string galvanometer (a device for measuring electrical currents). When subjects were requested to "visualise bending the right arm", increased action potentials occurred in the ocular muscles but not in the biceps. However, when subjects were asked to "image bending the right arm", muscle activity almost always appeared in the biceps. Therefore, external (third person) imagery produced only ocular responses, however; internal (first person) imagery produced biceps activity. Hale (1982) replicated Jacobson's finding using modern EMG analysis and statistical techniques. Using a within-subject design, he found that internal imagery of a dumbbell curl produced biceps activity, whereas external imagery did not, thus supporting Jacobson's findings.

Another theory that was later developed was Bio-informational Theory (Lang, 1979, 1985). Lang's theory was based on a cognitive, representational model of imagery. The assumption that underlies this theory is that a mental image is an organised group of units of the task to be performed. According to this model, although images are often reported as graphic mental displays, they are not stored in the brain in analogue form. Instead, all knowledge is represented in the memory as processed, abstract units of information regarding objects, relationships and events (Lang, 1979). These units (propositions) can be separated into three fundamental categories in the memory; stimulus, response and meaning propositions. The stimulus propositions are a combination of information regarding the external and internal environment that relates to the imaged scenario of the task (e.g., sights, sounds etc). The response propositions describe the specific

responses of the individual to stimuli in the imaged scenario (the successful execution of the task). These responses may include motor activity (e.g., limb and eye movements) and automatic changes (e.g., sweating, alterations in heart rate, breathing patterns etc). The meaning propositions are analytical and interpretive and add components of information that are not readily available from the stimuli in the situation. As a result, they define significance of events and the consequences of action for an individual, which personalises relevance for given aspects of the task.

An effective imagery programme must include both sets of propositions in order to be meaningful and effective for an individual. Lang's theory proposes that by frequently accessing the response propositions for a particular scenario and modifying them in order to fit the best response possible, the actual performance will be enhanced. Based on previous models of information processing, this sequence of events is accurate, therefore lending support to Lang's theory.

Early research (Birbaumer, Lang, Cook, Elbert, Lutzenberger & Rockstroh, 1988) used Lang's theory of emotional imagery to investigate the relationship between slow brain potentials (SP) and emotional imagery, using three experiments. According to the assumptions of Lang's theory and the model of SP-function (see Rockstoh et. 1982) imagery ability was hypothesised to be related to one's capacity to generate and suppress preparatory activity in cortical networks 'on demand'. Subjects in a first experiment were trained to regulate right- versus left-hemispheric SP-differentiation within an

instrumental learning paradigm. Thirty-four subjects were reinforced for achieving maximal SP-differences between electrode locations over C3-C4 over a 6 second interval across 120 trials. Success in the SP-regulation task correlated significantly with the capacity for vivid imagery as measured with the Questionnaire for Mental Imagery (QMI: Sheehan, 1967). In a second experiment instructions to imagine right- versus left-hand movements were introduced successively over five sessions of SP-self-regulation.

Results showed that imagery clearly modified right- verses left-hand EMG-differentiation but had no influence on cortical SP-differentiation. A third experiment tested the influence of already achieved SP-regulation at the vertex on the perceived vividness of emotional images introduced after the SP-biofeedback training. Again, results revealed clear effects of imagery content on autonomic variables (heart rate and skin conductance response). However, SP-amplitude and SP-polarity had no effect on perceived vividness, arousal or emotional content. From the results of the first and second experiments the authors concluded that SPs either are not the crucial parameter to represent the cortical efferent outflow component of imagery, or that the dual task of SP-self-regulation and imagery prevented co-variations showing up. The first experiment on the other hand, suggested a positive regulation of imagery-ability as a trait variable and brain-self-regulation.

Smith, Holmes, Whitmore, Collins and Davenport (2001) conducted a study that examined the application of a Langian imagery perspective. Here they applied the theory to a real-life sporting task, namely field hockey penalty flick

performance. Twenty-seven novice hockey players were randomly assigned to either one of two imagery groups, or a control group. Participants in one of the imagery groups received stimulus and response proposition-laden imagery scripts, while the other received stimulus proposition-only scripts. All imagery participants imaged performing twenty penalty flicks three times per week for seven weeks, and control participants performed no imagery or physical practice during this period. Pre- and post-tests consisted of ten penalty flicks, with performance recorded for all groups. The response proposition group improved to a significantly greater degree than the stimulus proposition-only group, which in turn showed greater improvement than the controls. Therefore, the results supported the application of bio-informational theory to sport and indicate that imagery scripts should be laden with response propositions to maximise their effectiveness.

More recently, Smith and Collins (2004) examined the application of Lang's (1979, 1985) bioinformational theory to mental practice in two separate studies. Study one applied Lang's theory to the mental practice of a strength task: the maximal voluntary contraction of the abductor digiti minimi (muscle that abducts the little finger). Here, 18 males were divided into three groups: physical practice (PP) group; a stimulus and response proposition mental practice (SRP) group; and a stimulus proposition mental practice (SP) group. Each participant either physically or mentally practised 40 contractions twice a week for 3-weeks, and EEGs were recorded during testing sessions. All three groups significantly increased abduction strength, but there were no significant between-group differences in the magnitude of improvements. In

addition, late contingent negative variation (CNV: An electrical sign of sensorimotor association and expectancy in the brain) waves were apparent prior to both real and imagined movements in all conditions. Study two allocated 24 participants to PP, SRP, SP, and control groups. Participants each performed 120 imaginary or actual computerised barrier knockdown trials; with EEG recorded as in study one. The results revealed that the PP and SRP groups both improved to a significantly greater degree than the SP and control groups. Also, the late CNV was observed prior to real and imaged movement in the SRP group, but not prior to imagined movement in the SP group. Therefore, the authors concluded that the results supported bioinformational theory with respect to cognitively orientated motor tasks, but not strength tasks.

In summary, research has shown that imagery can significantly enhance performance of motor skills using a Langian approach to interventions. However, precisely how imagery should be performed to ensure optimal improvements in performance has been questioned (Holmes & Collins, 2001). Various methods of delivering imagery interventions have been advocated, including the use of written scripts, video and audiotape. However, minimal research has compared these methods systematically.

Smith and Holmes (2004) addressed this area by investigating the effects of various imagery modalities on golf putting performance. Forty experienced male golfers were randomly assigned to one of four groups: written script group; audio group; video group; and control group. The written script group

received a personalised, response proposition-laden script. Participants in the audio and video groups either listened to an audiotape or watched an internal-perspective videotape of them putting. Control participants spent and equivalent amount of time reading golf literature. Each participant completed a 15-ball putting task twice a week for 6-weeks and also performed their imagery or reading daily during this period. Pre-tests of performance revealed no significant differences in performance. Post-tests, however, showed that the video and audio groups performed significantly better than the written script and control groups. In conclusion the results suggested that the form in which an imagery intervention is delivered can have a significant impact on its performance effectiveness. Therefore, careful consideration of the task and appropriate modalities must be taken when tailoring and delivering imagery interventions.

The research that has been discussed in the previous paragraphs presents a strong case for the wide use and performance enhancing effects of imagery. However, despite the common use of imagery in sport and other fields (Fleet, Goodchild & Zajchowsky, 1999; Sisterhen, 2004), there is concern that imagery interventions that are typically used are often provided with little theoretical justification or empirical support (Holmes & Collins, 2001).

Therefore, imagery usage can appear to be inconsistent and slipshod. Traditionally in sport, imagery interventions have been heavily centred upon the use of relaxation techniques. This has been common practice amongst many sports psychologists as they advocate the belief that imagery, when

combined with relaxation, is more effective than imagery alone. This style of practice often consists of instructing an athlete to adopt a comfortable position, whilst being contained in a quiet room to minimise distractions, and then 'visualise' with their eyes closed (Cabral & Crisfield, 1996; Miller, 1991; Harris & Williams, 2001). Harris and Williams (2001) believe that it is necessary to complete relaxation prior to imagery because it minimises distractions that may interfere with the imagery process. Other researchers support this notion and have suggested techniques such as deep progressive breathing as a means of inducing a relaxed state (Weinberg & Gould, 1999).

Research evidence has directed attention to the significant role of motor and autonomic processes underpinning imagery. Also, the importance of the emotional component in imagery interventions has been identified, in order to optimise functional equivalence and elicit arousal states that closely approximate performance. Therefore, this challenges the common practice of preceding imagery with a relaxation session (e.g., Miller, 1991; Weinberg & gold, 1999). Emotion has been referred to as the "missing link" in sports performance (Botterill, 1997), while others have observed, "the central core of mental training is emotional" (Loehr, 1997, p. 87). Decety (1996) suggested that the affective response to a motor image is best shown through the autonomic system. Therefore, the heart rate and respiration changes that accompany motor preparation and execution reflect alterations in the energetic state of the performer when faced with psychological challenge (Smith & Collins, 2004) as well as metabolic requirements. Holmes and Collins (2001) proposed that such changes should certainly be considered

and reflected in the imagery content used to address functional equivalence issues.

The following section will discuss how motor and autonomic processes play a significant role in the performance enhancing effects of imagery. This phenomenon known as 'functional equivalence' was discovered in the fields of neuroscience and psychophysiology and has provided strong evidence for a 'matching system' in the brain and peripheral functions. Therefore, during motor imagery, similar effects have found to be elicited to that during actual execution.

2.1.4 Functional Equivalence

Preparation for action involves several different types of phenomena (Jeannerod, 1994). Some of these functions can be deliberately inhibited (albeit incompletely) by the subject: the production of the prepared or intended movement can be blocked (e.g. in the motor imagery situation). In other words, while the same neural firing pattern in the brain may be activated in the preparatory stages of movement during imagery, the executed response (e.g. muscular contraction/motor movement) may not take place. Other functions, however, escape voluntary control. This is the case for vegetative functions normally associated with muscular activity, such as adaptation of heart and ventilatory rates to effort. Therefore, monitoring these functions during motor preparation and imagery is an interesting way for comparing the two situations.

Previous psychophysiological investigations have reported that peripheral indices such as heart rate and respiration can be influenced during motor imagery and observation. Therefore, the act of motor imagery and observation has the ability for involuntary activation of these systems.

Research by Wuyam *et al.* (1995) suggested that mental imagery of exercise 'at rest' produced increases in heart rate and ventilation. They found that imagination of treadmill exercise in a sample of competitive sportsmen produced a treadmill speed-related increase in ventilation, amounting to one fifth of that observed during actual execution of the same exercise.

Other research investigating the effects of observed and imaged exercise (Calabrese *et al.,* 2004; Decety *et al.,* 1991; Wang & Morgan, 1992) has also reported increases in ventilation, oxygen consumption and/or heart rate. An explanation for such changes concerns autonomic functions normally associated with muscular activity (e.g., increases in heart rate and blood pressure to exerted effort) being activated independently from the increases in metabolic demands. Therefore, commands issued by the central nervous system during motor preparation are not targeted to the limb muscles alone and also involve an autonomic component. This then permits an anticipation of the metabolic adaptations produced by the brain (Decety *et al.,* 1993).

Cortical influences are believed to be powerful in regulating cardiac activity. Previous physiological investigations (Kerman *et al.,* 2003; Rowell, 1993; Waldrop *et al.,* 1996) have suggested the existence of a neural circuit that

coordinates activation of motor and autonomic structures before the onset of exercise and skilled performance. This response is attributed to impulses that originate in the brain's higher somatomotor central command system. These pass via small efferent nerves to directly modulate the activity of the cardiovascular centre in the ventrolateral medulla (Williamson *et al.,* 1995).

Research by Jansen *et al.,* (1995) specifically identified a set of central autonomic neurons, located in the hypothalamus and brainstem, which were shown to innervate sympathetic outflow. Therefore, this group of neurons is assumed to provide the co-ordinated and rapid response of the heart and blood vessels that optimises tissue perfusion and maintains central blood pressure in relation to motor cortex involvement. This type of neural control operates during exercise as well as in the pre-exercise anticipatory period and accounts for primary peripheral indices found in previous research such as imaged or observed exercise, at rest (Jansen et al, 1995). Such autonomic responses in situations where no muscular work is produced are attributed to a central influence similar to that observed during motor preparation. Therefore, as the autonomic system by definition escapes voluntary control and cannot be held under inhibition, the central influences on this system become recordable at the periphery (Jeannerod, 1994).

Studies of emotion have also provided support for physiological differentiation of affective states, although evidence has been inconsistent. Prkachin, Williams, Zwaal and Mills (1999) investigated cardiovascular changes associated with relived experiences of happiness, sadness, anger, fear, and

disgust. Thirty-four undergraduates who scored 0.5 SD above the mean on Larsen and Diender's affect intensity measure described their most intense experiences of five emotions. These descriptions were then used to induce those emotions while blood pressure and hemodynamic measures were monitored. Results revealed that systolic blood pressure, diastolic blood pressure, and stroke volume differentiated among emotions. Therefore, the results support the suggestion that cardiovascular activity differentiates emotional states and provides some insight into the physiological adjustments sub-serving such effects. With this in mind, it could be suggested that such occurrences are also true for the performance of tasks in high-pressure situations, for example sport or examinations.

Recent neuro-imaging studies have identified a network of brain regions associated with regulating emotional responses, including the medial prefrontal cortex (MPFC), the superior temporal sulcus (STS) and less consistently, the posterior cingulate (Moll et al., 2002; Greene et al., 2004; Heekeren et al., 2005). Different kinds of emotional stimuli, however, may recruit different regulatory processes and, in turn, recruit different regions.

A recent study by Harenski and Hamann (2006) compared emotion regulation for two types of negative emotional stimuli: those involving moral violations (moral stimuli), and those not involving moral violations (non-moral stimuli). In addition, they also investigated whether activation in the medial prefrontal cortex (MPFC), a region implicated previously in specifically moral processing, may instead reflect greater social and emotional content. Ten female subjects

were scanned using fMRI while they passively viewed or were instructed to decrease emotional reactions to moral and non-moral pictures closely matched on social and emotional content. Passive viewing of both picture types elicited similar activations in areas related to the processing of social and emotional content, including the MPFC and amygdale. During regulation, different patterns of activation in these regions were observed for moral vs. non-moral pictures. These results suggest that the neural correlates of regulating emotional reactions are modulated by the emotional content of stimuli, such as moral violations. In addition, the results suggest that some brain regions previously implicated in moral processing reflect the processing of greater social and emotional content in moral stimuli.

Strong evidence in the fields of neuroscience and psychophysiology (Decety & Jeannerod, 1996; Grezes & Decety, 2001; Jeannerod, 1994) has provided support for a functional equivalence between action execution and motor imagery. Therefore, an element of 'sharedness' between the two processes is assumed, which reinforces the use of common neural pathways associated with the underlying mechanisms responsible for motor preparation and execution. Psychophysiological research has lent further support to a functional equivalence between action execution and motor imagery through the use of direct physiological measures in experimental paradigms. Previously, imagery has been assumed to be a primarily visual experience. However, cognitive neuroscience has suggested otherwise, describing the act of imagery as a subject 'feeling' them self whilst executing a given action (Jeannerod, 1994). From what has already been discussed, it is evident that

motor and autonomic processes play a significant role in imagery, eliminating the proposition that the experience is solely a visual process. Also, the inclusion of emotion as a motor imagery variable plays a significant role in confirming its functional equivalence. It is important to note however, that the notion of functional equivalence is not suggesting that the neural processes during motor imagery and motor preparation/performance are exactly the same, but they do share common pathways. Therefore, consideration of the two processes and the extent to which they covary is indeed vital if motor imagery is to be optimally used as a successful performance-enhancing tool.

The development of the PETTLEP model (Holmes & Collins, 2001) aimed to address the concerns and conflict surrounding traditional imagery methods and presented an empirical approach based on cognitive neuropsychology and functional equivalence. The model provides an enhanced understanding of the neurophysiological mechanisms underlying motor imagery and motor execution, which have been previously discussed. Therefore, PETTLEP aims to guide imagery interventions to promote and optimise functional equivalence between imagery and actual performance of tasks. One should be aware that functional equivalence can be both neural (the internal representations of action preparation via motor programs/maps) and behavioural (motor output, use of internal and external stimulus propositions that usually occur in performance). This should be kept in mind when designing and implementing appropriate imagery interventions.

2.1.5 PETTLEP

PETTLEP is an acronym, with each letter standing for a practical issue to be considered when devising an imagery intervention. These are Physical, Environmental, Task, Timing, Learning, Emotional, and Perspective. These are important practical components to consider when implementing meaningful and realistic motor-based imagery modalities. The inclusion of elements of the physical task, in an internally driven access procedure, is assumed to subsequently access greater proportions of motor representation (Holmes & Collins, 2001). All components of the PETTLEP model are subsumed by Langian theory (Holmes & Collins, 2001) as "it is the interaction between training mode and the propositional structure of the imagery presentation that is crucial" (Carroll, Marzillier, & Merian, 1982, p.76).

Therefore, when using this approach it is vital that consideration of the two processes and the extent to which they co-vary (their functional equivalence) is accounted for, if motor imagery is to be optimally used as a successful tool (Holmes & Collins, 2001). Therefore, careful consideration of the meaningful aspects of the task is essential when applying and integrating the seven components into motor imagery. The purpose of this is to best facilitate the probability of accessing more shared brain regions to strengthen the cortical pathways used during action (Beisteiner *et al.,* 1995).

The Physical component refers to an individual's physical responses in the performance situation. Some authors (Miller, 1991; Weinburg, Seabourne, & Jackson, 1981) have advocated that relaxation strategies prior to imagery are

most appropriate in order to free the mind of distractions, in the pursuit of optimised performance. However, if functional equivalence is driving imagery behaviour, then manipulating the physical nature of the imagery to most closely approximate to motor preparation and execution would seem more appropriate. This could include standing in the correct stance, wearing the correct clothing and holding any implements that may be used during performance. It is important to note that the individual should imagine performing the relevant skill correctly, and, if they are unsure of the correct technique, coaching advice should be sought prior to incorporating imagery so as to avoid the possibility of 'ingraining' poor technique (Smith, Wright, Allsopp, & Westhead, 2007).

The Environmental component of the model refers to the physical environment in which imagery is performed. Lang (1979, 1985) has emphasised that the response and meaning propositions must be relevant to the individual. Therefore, in order to access the same motor representation, the environment when imaging the performance should be as similar as possible to the actual performing environment for the individual. For example, a football goal-keeper may perform his or her imagery out on the pitch stood in between the goal posts, as he or she would in a real game. In cases in which performance is to take place at a new venue, every attempt should be made to provide the performer with multi-sensory environmental cues to increase the validity of the stimulus propositions in the imagery process (Holmes & Collins, 2001). Therefore, the use of video footage, photographs, or discussion with previous venue performers could be used as a valid

substitute. This could also be the case for instances where an individual is unable to access the appropriate environment regularly for their imagery.

The Task component is an important factor, as the imaged task needs to be closely matched to the actual task (Smith et al., 2007). Therefore, the task specific content of the imagery should be personalised for the performer, with him or her focusing on the same thoughts, feelings and actions as during real performance of that task. Research evidence from Decety et al. (1994) has demonstrated that different portions of the supplementary motor area (SMA) are activated depending on the nature of the task. For example, when the motor imagery requires visually guided movements in the presence of a visual object (an externally driven task), the pre-motor neurons are more active. With internally driven tasks the ventral and mesial portions of the SMA exhibit preferential activity. With this in mind, there is strong evidence that imagery techniques should be different for elite compared with pre-elite performers (Konttinen, Lyytinen, & Konttinen, 1995).

Konttinen, Lyytinen, and Konttinen (1995) conducted research with rifle shooters and found that during good performance, elite rifle shooters focused primarily on motor control prior to triggering (internally driven) whereas pre-elite shooters were more concerned with visuo-spatial processing (externally driven). Therefore, if functional equivalence is to be met, the content and possibly the imagery modality for elite versus pre-elite should be different until the pre-elite begin to exhibit characteristics of the elite group (Holmes & Collins, 2001). This fact stresses the importance of tailoring and implementing

personalised imagery interventions that meet individual's current level of ability of the task in question. To enable functional equivalence in imagery interventions, response training (Lang, Kozak, Miller, Levin & McLean, 1980) should be adopted, which is focused on individual participant responses. Response training involves the participant focusing on actual responses, by eliciting and reinforcing verbal reports of physiological and behavioural involvement in the scene. This emphasises a kinaesthetic orientation toward the imagery. Therefore, individual responses can be gained from participants so that interventions can be fully personalised.

From the literature covered, it has become apparent that motor preparation and execution and motor imagery access the same motor representation. Therefore, it is reasonable to assume that the temporal characteristics of these processes are also the same. Holmes and Collins (2001) supported this claim from a functional equivalence perspective, as both types of activity are characterised by a requirement to "reconstruct or generate a temporally extended event on the basis of some form of memory" (Vogt, 1995. p. 193). In the field of sports psychology, Holmes and Collins (2001) suggested that the use of sport-specific implements during imagery may aid the timing component in imagery interventions. Adopting such a strategy would also comply with the physical component. Therefore, functional equivalence could be satisfied on two levels. Previous research has found that duration of imagery tends to be greater than that of actual movement when the perceived difficulty of the skill is high (Calmels & Fournier, 2001). Results from this study found that gymnasts tended to slow down the sections of their routine that

they found most difficult. Therefore, functional equivalence regarding imagery timing may be only appropriate when the performer has mastered the skill they are imaging. However, more research is needed in order to clarify such a suggestion (Smith et al. 2007).

It is logical to assume that motor representation and associated responses will change over time as learning of a skill takes place. Therefore, the content of the motor image must change too, in order to accommodate to such learning and maintain functional equivalence. The Learning component of the model supports this by prompting adaptation of imagery content in relation to the stage of the learning. As the skill level of the performer moves from being cognitive to autonomous, the motor representation and associated responses will change. Therefore, the imagery content must be altered accordingly in order to reflect this. For example, a novice gymnast would have to think about a new movement a great deal before and during its execution. Therefore, their imagery of that skill may focus heavily upon correct technique of the skill, with elements such as the primary limb positioning being central. As the skill becomes more automatic however, the performer would not have to think so much about the correct technique, and imagery may be focused more on the 'feel' of the movement as opposed to the specific technique.

As previously discussed, emotion plays a key role in functional equivalence and arousal states linked to performance can activate peripheral indices, independent of actual execution. To achieve optimal functional equivalence in imagery interventions, the athlete should therefore try to experience all of the

emotions and arousal associated with performance (Smith et al. 2007). For example, the possible excitement the performer feels during performance should be an important part of the imagery experience. The Emotion component aims to address this concept and focus the performer on the real and appropriate emotions experienced during performance. As previously discussed, some traditional imagery interventions have advocated the use of relaxation prior to imagery. However, the research underpinning functional equivalence has suggested otherwise and has offered strong support for underlying processes highlighting the significance of emotion in functional equivalence. Therefore, focusing a performer on the positive and relevant emotions associated with performance will arguably facilitate functional equivalence of arousal states that closely approximate actual performance.

Finally, the perspective component refers to the way in which imagery is viewed. Evidence from cognitive neuroscience has suggested that humans have the ability to use both internal and external visual perspectives. However, when using different perspectives it has been found that different regions of the brain are recruited depending on the strategy used (Kosslyn *et al.,* 2001). Recent research comparing internal and external visual perspectives has shown more activity in the left sensory-motor cortex for an internal perspective, even during observation alone. However, more activity in the lingual gyrus was observed for an external perspective (Jackson *et al.,* 2006). Therefore, these findings are suggestive that an internal (first person) visual perspective is more tightly coupled to the sensory-motor system than

an external (third person) visual perspective, which requires additional visuo spatial transformation.

Previous research (Doody *et al.,* 1985; Magill, 1993; Whiting & Den Brinker, 1981) has suggested that learning will occur if key information about the motor skill (e.g. precise timing or co-ordination) is accessible from the model, and therefore may benefit best from either an auditory or visual model. As a result, visual models could be considered as external visual images of a particular skill, as they are viewed from a third person perspective (White & Hardy, 1995). Suggestions have also been made that an external visual perspective may assist learners to extract higher order aspects of a skill, such as form (Whiting & Den Brinker, 1981). Therefore, in the case of form dependent skills, an external visual model or image would be a more efficient visual perspective for learning and retention of specific task components (White & Hardy, 1995).

Other research, however, has demonstrated that cardio-respiratory responses to motor imagery and observation modalities were significantly associated with an internal visual perspective but not an external visual perspective (Wang & Morgan, 1992). Furthermore, the findings of Hale (1982) and Harris and Robinson (1986) support this notion, reporting electromyography responses to be significantly greater during the use of an internal visual perspective of an elbow flexion than that of external visual perspective. White and Hardy (1995) proposed that an internal visual imagery perspective presents a more accurate rehearsal of the task. Therefore, the ability to

observe changes in the visual field from a first person perspective may prove helpful in planning when to respond to the field and subsequently improve readiness of the system. In conclusion, it may be most beneficial for performers to use a combination of perspectives depending on their skill level at a given time. This would allow them to therefore best facilitate their imagery to their current level of learning.

Some components of the model have been supported by recent research. For example, Smith and Collins (2004) supported the importance of imaging the kinaesthetic sensations experienced whilst performing the task (*P*hysical and *T*ask components). Also, the usefulness of video and audiotape in enhancing the effectiveness of imagery has been shown by Smith and Holmes (2004; *E*nvironment component). The model was also systematically tested by Smith, Wright, Allsopp and Westhead (2007) using two different sports skills, the hockey penalty flick and the gymnastics full turning jump, with results strongly supportive of PETTLEP.

In study one, forty-eight varsity hockey players were randomly assigned to one of four groups: sports-specific imagery, clothing imagery, traditional imagery and control. Post-test results revealed that the sport-specific imagery group scored significantly higher than the clothing imagery group, who scored significantly higher than the traditional imagery group. In study two, forty female gymnasts were randomly assigned to one of four groups: PETTLEP, physical practice, stimulus and control. The PETTLEP group received response training based upon the seven components of the model. However,

the stimulus group received response training that incorporated only some components of the PETTLEP model (*T*iming and *P*erspective components). Results revealed that performance of both the physical practice and PETTLEP groups improved significantly from pre-test to post-test, with no significant difference between them. However, the stimulus and control groups did not improve significantly. Therefore, taken together, the results from this study provide support for the efficacy of PETTLEP-based imagery over more traditional imagery interventions.

Wright and Smith (2007) also lent further support to the performance enhancing effects of imagery on cognitive tasks. They explored the effect of a short-term PETTLEP-imagery intervention compared to 'traditional' imagery on a computer game. Eighty participants were randomly assigned to one of four groups: PETTLEP-imagery group, 'traditional' imagery group, physical practice group, and control group. After three practice attempts, pre-tests consisted of five attempts at the computer game. The game involved completing timed laps by manoeuvring a vehicle around a track using the computers arrow keys. The PETTLEP group completed individualised response training, and then performed imagery sitting in front of the computer screen and repeatedly imaged themselves performing the task. The 'traditional' imagery group was sat in a separate room and given individualised stimulus training, whilst being instructed to relax and close their eyes during imagery. The physical practice group performed the actual task. Each intervention lasted forty-five minutes and was immediately followed by a post-test, which consisted of five attempts at the game. Results showed that

the PETTLEP-imagery and physical practice groups improved significantly from pre- to post-test. The traditional imagery and control groups showed no increase in performance from pre-test to post-test. In conclusion, the results strongly supported the use of PETTLEP-imagery in enhancing performance on a cognitive task. Also, contrary to previous studies, PETTLEP was as effective as physical practice.

More recently, Smith, Wright and Cantwell (2008) compared the effects of physical practice with PETTLEP-based imagery and PETTLEP and physical practice interventions on golf bunker shot performance. In this study thirty-two male county or international level golfers were assigned to one of four groups; PETTLEP imagery, physical practice, PETTLEP and physical practice, or control. The PETTLEP imagery group imaged performing 15 bunker shots twice a week, with their intervention incorporating PETTLEP components such as physical, environmental, and emotional. The physical practice group physically performed 15 bunker shots twice a week; and the PETTLEP and physical practice group performed imagery once per week and physical practice once per week. Each group performed their respective practice for 6-weeks.

Pre- and post-tests of performance consisted of 15 bunker shots, with points awarded according to the ball proximity to the pin. Results revealed that all groups improved significantly from pre- to post test, and the PETTEP and physical practice group improved more than the PETTLEP and physical practice groups alone. In conclusion, the results are supportive of the effects

of PETTLEP in enhancing golf performance, when combined with physical practice.

Another more recent study by Wright and Smith (2009) investigated the effects of PETTLEP imagery on strength performance. In this study 50 untrained University students were randomly assigned to one of five groups: a PETTLEP imagery group, a 'traditional' imagery group, a physical practice group, a PETTLEP imagery/physical practice (combination group), and a control group. A bicep curl machine was used to assess strength performance, with the criterion task being a one repetition maximum (1 R.M.). The PETTLEP imagery and combination groups were given response training. This involved focusing the participants upon their physiological and behavioural responses to the scenario to be imaged. These responses were recorded, and participants referred to them at the start of each imagery session and were encouraged to incorporate these responses in their imagery as fully as possible.

The traditional imagery group was given stimulus training, which involved focusing on the surroundings and actions rather than the feelings associated with the actions. These included aspects such as the bright lights and music in the gym. During the six-week intervention period, the PETTLEP imagery group performed their imagery while sitting at the bicep curl machine, in the gym where the pre-test took place. This ensured that the environment factor of the PETTLEP model was accounted for, as the sounds, visual stimuli, and smell of the gym during the interventions were identical to those that the

participants experienced during the pre-test. The participants were also encouraged to hold the handles on the machine to ensure functional equivalence of haptic sensations. During the set of curls completed following the pre-test 1 R.M., an individual video recording was made of each participant from an internal perspective (i.e., with the camera situated over the shoulder of the participant). This video was shown on a television screen in front of the bicep curl machine and was watched by the participants while they completed their imagery. It consisted of 6-10 repetitions of the task. They were encouraged to use the video as an aid for their imagery intervention. Factors such as perspective (seeing their own arms moving) and timing (video in "real time") were considered, as the individual video showed the participants moving exactly as they would have during the set. The participants were also encouraged to include any emotions that they experienced during the actual performance, aided by the response training. They then imaged themselves performing two sets of 6-10 repetitions to failure, while watching the video, and with a short rest in between each set.

The "traditional" imagery group was provided with a short relaxation procedure prior to their imagery. They performed the imagery while sitting in a comfortable chair with their eyes closed. Although their imagery incorporated some aspects of the PETTLEP model (e.g., recreating emotions associated with performance), this was less-strongly based on PETTLEP than the specific PETTLEP group, as factors such as the physical sensations and the environment were not accounted for. This group also imagined performing two sets of the bicep curls, twice per week for six weeks. The participants in the

imagery groups were given a definition of imagery and told that its effect on performance was being assessed.

The physical practice group attended the gym and completed two sets of the bicep curls twice per week for six weeks, with a short rest in between each set. The weight used for the set was 80% of the 1 R.M. that was calculated in the pre-test, with each set performed to failure. Participants were encouraged to increase their repetitions in every session. The combination groups physically performed one set per session and used the PETTLEP imagery technique described above to imagine a second set. Again, both the physical practice and imagery were performed to failure and were performed twice per week for six weeks. The physical practice group was told that the study was focusing on the impact of a strength training program.

The control group completed a placebo task. This was reading some literature related to bodybuilding, which took approximately the same amount of time to perform as the two sets completed by the other groups. Participants were instructed to do their reading twice per week for six weeks. However, the text did not contain any technical information that could have aided with the completion of the post-test 1 R.M. Participants were issued an imagery diary that they were instructed to record in when they had completed each imagery session and to note down any difficulties they experienced while performing their imagery.

Results indicated that the mean weight lifted for all five groups was greater in the post-test than in the pre-test. The percentage increase in weight lifted was 23.29% in the PETTLEP imagery group, 28.03% in the combination group, and 26.56% in the physical practice group. The traditional imagery group and control group increased by 13.75% and 5.12%, respectively. Most participants in the PETTLEP imagery, combination, and physical practice groups made reference to the beneficial effect that they believed the interventions had on their performance. One participant in the PETTLEP imagery group encountered an increase in confidence due to the video and a subsequent increase in strength. However, the traditional imagery group often reported struggling to remember vividly how the action felt over the six-week period. One participant in this group stated during the post-test interview that "it was harder to imagine further into the study and it was hard to be exact in the imagery as there was no bed to rest my elbows on." Kinaesthetic sensations such as this were accounted for in the PETTLEP and combination groups, which aided in producing functionally equivalent imagery. This was aided, in part, by the timing element which was controlled in the PETTLEP imagery videos.

One of the PETTLEP participants explained during the post-test interview that "I wanted to do the action more quickly during the imagery than I did when completing the pre-test as I remembered how my muscles hurt, but the video stopped me from doing this and made sure I did it at the right pace." It was concluded that the results of the study have important implications for the fields of sport psychology and strength training. When completing imagery

interventions, strength coaches and athletes need to use functionally equivalent imagery to have the greatest positive effect on performance. As combining PETTLEP imagery with physical practice was the most effective intervention, athletes may adapt their training to incorporate a PETTLEP imagery component, possibly even replacing some actual strength training with imagery. This may reduce the likelihood of overuse injuries and overtraining, while still proving sufficient to stimulate strength increases. Additionally, to begin with, training programs could be altered to include PETTLEP imagery in addition to physical practice.

To summarise, from the research covered it has become evident that the PETTLEP model has begun to undergo testing within the field of sport psychology, with very positive results. However, Holmes and Collins (2001) explain that the model would benefit from comprehensive testing in a variety of settings. Imagery has been advocated, for example, as an aid to examination performance (Fleet, Goodchild & Zajchowsky, 1999). PETTLEP, aimed as it is at the imagery of motor tasks, therefore may be particularly helpful when the examination in question is one that involves psychomotor skills. As mentioned earlier, one such examination that is taken by many thousands of UK health students every year is the Objective Structured Clinical Examination (OSCE). OSCEs are well-established assessment methods in medical education and training, nursing and the professions allied to medicine (Prakash, 1999; Van der Vleuten, 2000). The completion of OSCEs during pre registration nursing training involves the completion of several skilled procedures.

Wright, Hogard, Ellis, Smith and Kelly (2008) recently developed the novel

initiative of applying PETTLEP-imagery to the clinical field for the performance

of OSCEs. Here they conducted a small pilot study aimed to test the effects of

PETTLEP-imagery on two nursing skills, namely blood pressure

measurement and aseptic technique. Forty pre-registration nursing students

were recruited voluntarily from the University of Chester. All data for the study

was collected in 2005. Prior to the study, all participants completed the

Movement Imagery Questionnaire – Revised (MIQ-R; Hall & Martin, 1997).

The MIQ-R is an eight-item inventory that assesses an individual's ability to

perform visual and kinaesthetic imagery. Participants were excluded from the

study if the attained a score below 16 on either sub-scale, due to an apparent

lack of ability to image. Participants were then randomly assigned to one of

two groups: a PETTLEP imagery group and a control group.

The blood pressure measurement task used in the study involved following a

set of procedural guidelines in order to calculate a patient's blood pressure

measurement in the appropriate manner. The aseptic technique task involved

the preparing and administering of a dressing without causing contamination.

An external examiner assessed both of these tasks and the nurses were

awarded points for the correct completion of each of the elements of the skill.

The PETTLEP-imagery group were interviewed after a practice session of the

OSCEs. This was to gain information about their individual experience of the

skill. This information was then used to produce individualised imagery scripts

for the PETTLEP group. These were used as a source of response training (Lang, Kozak, Miller, Levin & McLean, 1980), as advocated by the PETTLEP model. This involved focusing the participant on their own responses by reinforcing verbal reports of physiological and behavioural involvement in the scene, for example, hearing the systolic and diastolic changes. The intervention for this group was based upon the seven components of the PETTLEP model. Participants were instructed, wherever possible, to perform their imagery dressed in their uniform and holding the pump (for blood pressure measurement). This made the environment as realistic as possible, as the feel of the pump, and the stance required performing the task were included in the imagery. The nurses imaged completing the task three times per week for four weeks prior to the OSCE examinations.

The control group continued with their preparation in the usual manner, but none of them recorded the use of conscious or intentional imagery. Diaries were also given to participants to record the number of interventions they completed. The OSCE scores were taken as a measure of effectiveness.

Results revealed that the PETTLEP-imagery group scored significantly higher on the blood pressure measurement OSCE than the control group. However, the PETTLEP-imagery group did not score significantly higher on the aseptic technique OSCE than the control group. This was true of both sections of the technique taken in isolation, and a calculated average of the two scores. Results of the blood pressure intervention strongly support the use of the PETTLEP model when preparing for this skill-based examination. This may have been due to the high number of PETTLEP-imagery components

employed during the imagery of that task, which may have produced a higher level of functional equivalence. However, the PETTLEP-imagery interventions were not significantly beneficial in the aseptic technique OSCEs. This may have been because blood pressure measurement is a highly skilled task, whereas aseptic technique relies more heavily on the recollection of procedure, and therefore did not follow the same neural firing pattern each time it was completed. It was concluded that further research is needed to examine the effect of PETTLEP-imagery on skill-based tasks within the nursing and medical arena.

Therefore, one of the prime aims of this thesis is to further test PETTLEP in the arena of clinical nursing skills and extend its use to all five OSCE assessed skills (Clinical hand washing; blood pressure measurement; temperature, pulse and respiration: TPR; analysis of urine; oral medication administration). This will be done by applying PETTLEP in a more ecological environment – namely part of an undergraduate nursing curriculum. This will partly aim to assess how accessible PETTLEP is as a learning tool for real and everyday tasks and situations. The following section will explore psychomotor skills in nursing and will investigate previous methods used by research regarding the acquisition, training and assessment of these skills.

2.2 Psychomotor skills in nursing

Practical, clinical skills lie at the heart of nurses' professional practice (Nicol & Freeth, 1998). Therefore, the mastery of fundamental clinical skills is an important component in academic programs leading to registration. In the clinical field 'doing' is important (Major, 2005). Patients expect to be treated with mastery and efficiency when they are in need of practical nursing care. Therefore, competent teaching methods to facilitate the acquisition of skills are a necessity in nursing education.

Beliefs about skill acquisition in nursing have changed over time. Some beliefs date back to the early decades of the 1900's, reflecting the early origins of professional nursing practice. Bjork (1997) presented a comprehensive review of the changing conceptions of practical skill and skill acquisition in nursing education. In this review practical nursing skill was essentially understood in two distinct ways: as 'art' or as 'psychomotor skill'. Being proficient in the performance of practical nursing skills was believed to be the essence of nursing, one which was taken for granted and not questioned. However, since the time of Florence Nightingale, knowledge was deemed highly necessary for a nurse and learning to nurse was primarily presented as the refinement of practical skill towards the 'art' of taking care of the patient. According to Nightingale the art of nursing was the totality of 'how' you did your nursing. The 'how' was not primarily the aesthetics of performance, but the more pragmatic demonstration of a broad behavioural ability. Such behavioural activity concerned efficiency, good routine, accuracy

and endurance, in addition to undivided attention, observational skill and the attitude of tenderness (Nightingale, 1992; Johnson, 1994; Naden, 1990).

The concept of nursing as an 'art' was later transformed into an understanding of specific motor skills in the psychomotor domain of learning outcomes. Heidgerken (1946) distinguished between sensorimotor and perceptual-motor skills, emphasising the latter as typical nursing practice, since it was the mental process of interpreting sensory information that turned an action into a skill and not merely a habit.

In the early 1970's two clearly divergent views regarding practical skills in nursing evolved. These were related more to a difference of opinion regarding the relative significance of practical skill than different ideas about the constitution of practical skill. Bevis (1972) claimed that these divergent views were only implicitly evident since nearly all nursing schools definitively stated in their academic written programme that direct patient care was one of their primary commitments. Although in reality, skills necessary for such practice were often only perceived as motor or manual skills or as a backdrop or adjunct to more important skills, such as communication, leadership and decision making. De Tornyay (1971) represented a different view, in that she argued that manual skills were not very central to nursing. In her works 'strategies for teaching nursing', the educational scene in nursing was described in the following manner:

"From the old apprenticeship type of preparation, which is familiar to many, there has been a concerted effort to move towards inquiry methods of learning" (p.9).

Therefore, this resulted in a near exclusion of the subject of practical skill. However, De Tornyay and Thompson (1982) later admitted that improving the performance of psychomotor skills was one of the solutions for returning to the art of nursing. This implied that something was missing in the new type of preparation nursing. Quinn (1988) presented the view that practical skill was a very central element of nursing and asserted nursing to be above all a practical art, involving the performance of motor skills to a great extent.

In (1989) Bevis and Watson introduced an educative-caring paradigm for curriculum development in nursing, which discarded a long-standing behavioural-technical paradigm. Bevis and Watson (1989) presented a typology of learning where six types of learning were categorised into 'training' and 'education'. A key proposition of their work was that the more weight that was given to the educative types of learning in the curriculum, the more professional was that curriculum. In the case of clinical skills, they defined the learning of procedures and tasks as training rather than education.

In the late 80's to early 90's, there was a growing educational interest in the teaching, learning and evaluation of practical nursing skill, which was largely evidenced by the increasing number of research studies reported in nursing journals. Clinical skills began to be characterised in 3-major areas based upon

the criterion-referenced definitions devised by Bondy (1983). Bondy's Criteria represented three categories with five different levels of achievement. The categories concern: standard procedure, quality of performance, and cues. The levels of achievement concern: 1) need of constant supervision during care delivery; 2) practice with developing competence but with assistance during care delivery; 3) practice with decreasing supervision in developing competence of delivering care; 4) independent care, seeking appropriate advice and support as appropriate in meeting competence for delivering care; 5) proficient, independent and competent at delivering care.

The first category concerned professional standards. This included safety for all involved in the skill performed; accuracy; and effect in relation to intended purpose and affect as the manner in which the action is performed. The second targeted quality was more specifically of performance. This referred to the use of time, space and equipment and expenditure of energy to perform an action. Finally, the third concerned the amount of assistance or cues needed to demonstrate the action. Bondy's criterion-referenced definitions are widely used and represent the most inclusive view, in many decades, of what it means to be skilled (Bjork, 1997).

When practical nursing was conceived as an art, learning was mostly ensured by a long and varied apprenticeship in the clinical setting. Students were taught at the bedside, which was often preceded by an introductory lecture in a school. As theories of educational psychology moved into nursing education, the 'bed side' scenario of learning changed (Bjork, 1997). The

predominant ideas of learning theory presupposed more structured control over students' process of learning. Therefore, the teaching of skills was moved into the school/academic setting. This meant a reduction in the amount of clinical time. The idea was that students should experience the clinical setting in more focussed and controlled sessions, which fitted more readily into the college and university curriculum.

The original technical and practical approach to nursing education has been changed to one more theoretical and professional (Bjork, 1999). This has resulted in vague and unclear definitions of nursing competency and has reduced emphasis on teaching and learning of practical skills (Bradshaw, 1998). Actual practice and clinical learning of new nurses had previously received little attention in nursing research, which may build on the assumption that practical skill naturally improves as a result of working in the clinical setting.

In response to this assumption Bjork (1999) presented a study based on practical skill development in new nurses. In this study nurses were videotaped several times as they performed in the clinical setting, and interviewed after each filming. Analysis of skill development was monitored by comparing characteristics of performance over time. A model of practical skilled performance was developed during the analysis (see figure 3). The model advanced a broader understanding of practical skill by incorporating the following constructs: substance and sequence, accuracy, fluency, integration and caring comportment.
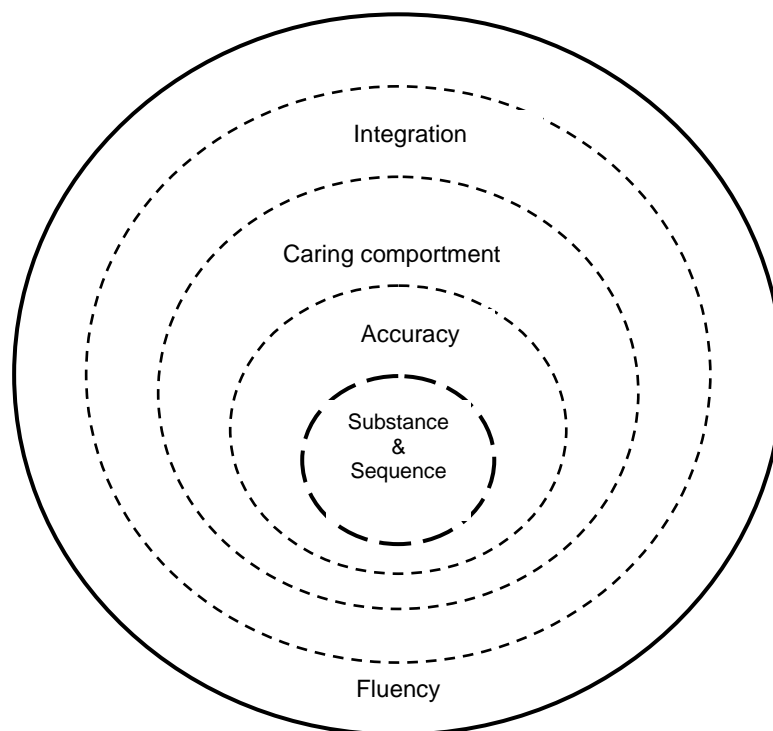
Figure 3: A model of practical skill performance

Substance refers to the inclusion of relevant content in the form of movement steps, instruction and information (e.g., raising the bed to working height and turning the patient over on the side). Instruction is the direct guidance on how to act in specific ways (e.g., telling the patient how to move or breathe whilst getting out of bed).

Information refers to proffering any material that might further understanding or knowledge (e.g., about the purpose of ambulation or what steps are involved in the action). Sequence refers to the extent to which movements,

instruction and information come in a logical order (e.g., is the bed raised and lowered adequately in regard to patient safety and nurse body-mechanics).

Accuracy refers to the precision of each movement step and the correctness of instruction and information included (e.g., is support given in the right mode and place, is information about the purpose of ambulation correct or is instruction to get out of bed precise).

Fluency refers to the way in which each element of performance gives an impression of ease and smoothness, that is when they seem 'finished' and without hesitation. Good organisation of equipment and environment promotes fluency of movement steps, and knowledge promotes fluency of instruction and information.

Integration reflects the nurse's ability to harmonise and time the parallel aspects of an action such as movement steps, physical support and verbal interaction (e.g., does the nurse give an instruction so the patient has time to comprehend it before they start the corresponding movement, or is support given in time to hinder strain on wound and muscles). Integration also includes being attentive to what the patient needs generally, whilst taking care of the specifics of the ongoing action.

Finally, the caring component relates to how the nurse creates an atmosphere that is respectful, accepting and encouraging. It includes concern with the

whole person by relating to the patient's feelings and reactions to the instrumental steps of action, and to the total experience of being a patient.

Bjork (1999) claimed that the elements of the model are not seen as levels of a hierarchy. Rather they are depicted as layers in a circle which represents a symbol of wholeness and integration. The core construct is substance and sequence. The enclosing construct is the caring component. The in-between layers depict accuracy, fluency and integration. As nursing actions are purposeful actions, the inclusion of substance and sequence that attain that purpose can be understood as a basic and necessary element and therefore the core of the model.

The results of Bjork's study indicated some very important concerns for nursing practice. The first of these was that it is important not to underestimate the complexity of 'simple' practical nursing actions. The model presented in the study incorporated 'behaviours' traditionally defined in separate domains of action, in the cognitive, affective and psychomotor domain. Therefore, learning to perform such integrated actions implies more complex underlying processes. Also, styles of performance may be firmly established when graduate nurses enter practice, and should be of greater concern to nursing educators. Thus, passing of time and multiple performances by themselves do not necessarily result in natural development from beginner to a more competent nurse.

The second concern highlighted that in practice, it is important to consider new nurses' practical skill when they start. It is not possible to utilise knowledge one does not possess. At the same time possession of knowledge does not guarantee its use. Therefore, the findings suggested that by examining a unit's 'culture', one can reveal codes of practice that influence performance and learning of practical skill. Examples are codes for collegial support and collaboration, or what aspects of care can be sacrificed for the sake of efficiency. Therefore, introductory programmes need to do more than orientate nurses to unit routines and paper work. More attention should be paid to feedback on errors, observation of good practice and encouraging reflection on one's own practice, as these are still conditions for learning. However, that would necessitate working together with a more knowledgeable nurse in actual hands-on practice. To conclude, results of the study highlighted the importance of looking closely at conditions for practical skill learning and development in clinical settings, as well as in the education of nursing students.

A year after the model's development, Bjork and Kirkevold (2000) presented a more in-depth, follow-up paper: 'from simplicity to complexity: developing a model of practical skill performance in nursing'. This paper presented the model and characterised its complexity on many levels, in attempt to broaden the traditional conceptualisations of practical skill performance in nursing. Bjork (1999) suggested in the earlier paper that research addressing nurses' practical skill performance had limited its focus to the motor aspects of performance, or to a global approach that prevented a focus on the details of

actual doing nursing. Therefore, Bjork and Kirkevold proposed that their practical skill performance model might contribute to filling out the picture of what it implies to perform well in actual nursing practice.

They went on to claim that the model attempts to capture nurses' practical actions as they occur in real work with patients. Therefore, the model assumes that muscular activity, a specific knowledge repertoire, reflection, decision and thoughtful consideration combine to create a well-performed practical nursing action. As a result, domains of behaviour that were formerly addressed separately are thereby integrated, meaning that simple skills are not simple when they are viewed from that comprehensive perspective. Bjork and Kirkevold claimed that a major problem in contemporary nursing practice is an under-evaluation of practical nursing skill, as well as a general underrating of the complexity of such skill.

 Defloor, Hecke, Verhaeghe, gobert, Darras, and Grypdonck (2006) conducted a recent study which investigated the clinical nursing competences and their complexity in Belgian general hospitals. Competence is an essential factor for assuring quality, safety and cost-effective healthcare (Defloor et al. 2006). Clinical competence, they claim, cannot be evaluated separately from the clinical context in which decisions are made. Therefore, for this study competence was defined as functional adequacy and the capacity to integrate knowledge and skills with attitudes and values into specific contexts of practice. The study took place in 2003 and focused on basic care, specialised care and elder care. Head nurses of 176 departments processed 521 patient

situations. Experts then selected 50 situations per area. In a Delphi procedure 100 experts then described the nursing competences required in each situation necessary to provide good quality, acceptable care. The experts then determined the all round complexity of each competence, as well as the complexity of the cognitive, psychomotor and affective aspects.

Results revealed that the all round complexity of the various care areas were similar. However, cognitive and affective aspects of competences scored higher than psychomotor aspects. Simple and average situations did not show any significant difference with regard to complexity and were less complex than difficult situations, which obtained the highest complexity score. The complexities of emergency situations not differ from that of difficult situations. The authors concluded that emergency and difficult situations in nursing require more competences than offered by basic nursing education. For the particular setting used in this study, it was believed that the continuous presence of care providers with additional education was necessary for each care area to respond adequately to emergency and difficult situations. Finally, it was concluded that both cognitive and affective aspects of nursing competences required particular attention during nursing education programmes.

It is evident that beliefs about skill acquisition in nursing have changed over time and approaches have moved from being explicitly technical and practical to more theoretical and broadly professional. The setting for clinical skills practice has undergone huge change, which has seen Nurse Education and

the teaching of skills move into colleges and universities where the pressures

of a more academic curriculum might reduce the attention paid to technical

skills. A further issue has been the integration of college work with work in

clinical settings. As a result, there is concern over the amount of 'hands on'

exposure for students to practice clinical nursing skills in the clinical

environment. Also, the complexity of nursing skills appears to have been

underestimated. This has resulted in development of theoretical frameworks,

which aim to guide and improve practical skill performance in nursing. The

following section will further discuss these issues in relation to training for

clinical nursing skills in the academic setting.

2.2.1 Training for Psychomotor skills in Nursing

In basic practical nursing actions, skill is often considered as a form of

uncomplicated manual/technical movement that is learned relatively easily in

academic institutions and then transferred into adequate performance in the

clinical setting (Bjork & Kirkevold, 2000). However, the fallibility of this

simplistic view is revealed by new graduates' deficiencies in performing

practical nursing skills (Bradshaw, 1998; Myrick, 1988; Scheetz, 1989;

Wilkinson, 1996).

A body of research has reported that there is growing concern about newly-

graduated nurses' skill acquisition and their ability to transfer skills into the

workplace (Gerrish, 2000; Heslop, McIntyre, & Ives, 2001; Neary, 1997;

Packer, 1994; Stevenson, 1996). Also, both students and educators have

expressed concern about the inadequacy of skill development in nursing programs (Heslop et al., 2001; Holloway, 1999; Spitzer & Perrenoud, 2006). To add to this problem it has been suggested that few recent studies have been conducted to identify essential skills for new graduate nurses that could ensure adequate preparation for the first year of clinical practice (Boxer & Kluge, 2000)

Reasons behind such concerns, in part, are attributed to inconsistent methods for teaching psychomotor skills, and to what extent is the term 'psychomotor' used in the nursing literature. In nursing programmes there are inconsistent expectations by students, faculty, and nursing staff regarding which skills are essential for practice and how to best develop these skills (Salyers, 2007). Therefore, new graduates entering the workplace may be unable to perform proficiently many essential nursing skills (Lofmark, Smide, & Wikblad, 2006; Myrick, 1991; Santucci, 2004). As cognitive and kinaesthetic demands on nursing student's increases, so does the need for optimal learning environments (Noble, Miller, & Heckman, 2008).

The preparation of nursing students for health care in the 21st century requires that programs deliver instruction in the most effective and efficient manner possible. However, in contrast, the traditional instructional lecture usually has little interaction occurring, and all students get the same material at the same time. Therefore, the lecture is not individualised and can sometimes provide little time for the student to ask questions (Rouse, 2007). Despite this, lecture has been the accepted method for teaching for decades in higher education.

However, with the change in teaching methods from being teacher centred to becoming student centred, it is believed that educators must look to alternative methods of instruction that are student centred (Jeffries, 2001).

Research in nurse education has studied several additional teaching and learning methods which aim to complement traditional instructional styles of learning. Previous research has investigated student nurses' knowledge in relation to blood pressure measurement by sphygmomanometry and auscultation (Torrance & Serginson, 1996). In this particular study, students were questioned about factors that might influence blood pressure; on resting the patient before blood pressure measurement; on which arm should be used; on the interval between repeat readings; on the marking of the mercury column; and on the details of sphygmomanometry technique and recording of the result. A 20-item questionnaire was administered to a group of 78 project 2000 students nearing the end of their common foundation programme. Project 2000 was a nurse initiative introduced in the early 1990's. Prior to Project 2000, nursing and midwifery training was carried out within schools of nursing, which were hospital based where the nurses carried out their studies and practical ward work. However, a push towards establishing nursing in a more professional light meant that a more academic approach to its training was needed. This led to a move into higher education with nurses studying to diploma and degree level within the University setting. Results revealed evident deficits in students' background knowledge. Major deficits were also evident in the students' knowledge of correct measurement techniques.

More recent research has also identified that errors in measuring blood pressure can have a significant impact on the investigation and treatment of patients, and errors can arise from faults in the measurement technique or the equipment used (Armstrong, 2002). In this study 78 clinical nurses from a metropolitan teaching hospital answered a questionnaire to determine the need and focus for updating blood pressure measurement technique. Results revealed that 61% of participants conformed to currently accepted practice in identifying systolic blood pressure, and 71% diastolic blood pressure. Also, 54% correctly interpreted a description of blood pressure sounds containing an auscultatory gap. Correct answers for assessment of faulty equipment were given by 58% of participants; assessing cuff size by 57%; arm position for seated measurement by 14%; determination of inflation pressure by 29% and deflation rate 62%. In conclusion, the findings indicated that knowledge of participants was inadequate to perform blood pressure measurement in a standardised manner, and prevent introduced error. Therefore, errors in measurement may have a significant impact on the investigation and treatment of patients (Armstrong, 2002).

Given these deficits in knowledge and skills, it may be thought that additional teaching and learning methods could be of considerable benefit to trainers and the student nurses themselves to optimise the quality of the teaching and learning experience provided in the curriculum. Increasing use of technology in health care and higher expectations on the part of patients has encouraged the development and use of new training tools in health care education (Alinier, 2005). However, students' experience gained by practice has been

diminished for patient safety and ethical reasons (Ziv, Small, & Wolpe, 2000).

This is largely due to the increased demand for clinical placements and limited

availability of practice supervisors (Aliner, 2005). As a result, individual

students' involvement with patient care and opportunities to deal with patient

situations has also reduced. Therefore, there is a need to reproduce that

experience by some other means which are feasible in the university setting.

Research has demonstrated a significant improvement in undergraduate

nurses' performance and knowledge of OSCEs clinical skills through the use

of patient simulated technology (Alinier, Hunt, Gordon & Harwood, 2005).

Simulation is the reproduction of the essential features of a real life situation

(Medley & Horne, 2005). Therefore, it enables experiential learning in a safe

environment (Cioffi, 2001). It also gives students the opportunity to be

involved in approximations of real-world settings, whilst being confronted with

the challenging task of establishing a relationship whilst eliciting clinical

information (Wallace, Rao, & Haslam, 2002). Although nurse educators strive

to mimic reality in their practice laboratories, they find that nursing students

often do not make the imaginative leap required to visualise a dummy model

as a real patient (Alinier et al. 2005). Consequently, students often experience

difficulty making the transition from learning laboratory to the real patient

setting. To better facilitate this transition, nursing institutions have begun

moving from static, plastic models to costly, interactive computerised models.

Such training has been encouraged in the institute of Medicine's 1999 report

'To Err is Human: Building a Safer Health System' (Kohn et al. 1999, p.179) to

train novice as well as experienced practitioners in different disciplines (Issenberg et al. 1999).

Research by Aliner et al (2005) investigated the effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education. This was done using a computerised simulated dummy. The study aimed to determine the effect of scenario-based simulation training on nursing students' clinical skills and competence. A pre-test/post-test design was used with 99-undergraduate nursing students using a 15-station OSCE. Students were randomly allocated to either a control or an experimental group. The control group followed their normal curriculum. The experimental group, as well as following their normal curriculum, were exposed to simulation training. All students were re-tested and completed a questionnaire and the data were collected between 2001 and 2003.

Results revealed that the control and experimental groups significantly improved their performance on the second OSCE, with mean test scores increasing by 7.18 and 14.18 percentage points. Students' perceptions of stress and confidence, which was measured on a 5-point likert scale, were similar between both groups at 2.9 (1, not stressful; 5, very stressful) and 3.5 (1, very confident; 5 not confident) for the control group, and 3.0 and 3.5 for the experimental group. The authors concluded intermediate-fidelity simulation to be a useful training technique, as it enabled small groups of students to practice in a safe and controlled environment and facilitated how to react adequately in a critical patient care situation.

Also, it helped them to understand and apply cognitive and psychomotor skills as they would do in their future professional function. Therefore, this type of training is valuable for equipping students with a minimum of technical and non-technical skills before they use them in practice settings. However, it should be noted that as good as the simulation experience may be, it cannot entirely replace some of the traditional learning methods, as students still need to learn at the bedside with real patients too (Hagarty & Bloch, 2002; Lane, Slavin & Ziv, 2001)

Other previous research (Bauer & Huynh, 1998) has also investigated nurses' performance in blood pressure measurement following different teaching and learning interventions. Here, first year nursing students' adherence to the recommended auscultatory blood pressure measurement procedure following three different forms of instruction (conventional classroom demonstration of the technique, a self instructional CD-ROM tutorial program, and a combination of both methods) were investigated. Results suggested that the CD-ROM was no substitute for real life, hands-on experience, although when used as an adjunct to traditional teaching methods, it could enhance learning.

Pfeil (2001) investigated the concept of re-introducing skills teaching to nurse education in the shape of an action research project. In this study a skills teaching programme for first year nursing students was developed as an action research project with the participation of lecturers, practitioners of three NHS trusts and first year students. All branches of nursing were equally represented in the project. In the first part of the action research cycle the skills that were to be taught were decided upon using anonymous

questionnaires and branch-specific group interviews. The selected skills related to aspects of communication, observation, care planning and nursing activities as well as health care and information technology. The professional and personal developments of students were also considered. All branches were able to agree on a common skills teaching programme.

During the first part of the action research cycle concerns about the organisational possibility of teaching skills to an ever-increasing number of nursing students and with the necessary participation of many lecturers were raised. Nevertheless, all participants emphasised the need to continue the project, requesting the development, implementation and evaluation of a new curriculum based on this research as soon as possible. This research demonstrated how small schools of nursing without the resources of large metropolitan-based medical schools and teaching hospitals, can nevertheless improve or design and implement skills teaching programmes for their students in a logical and research based fashion.

It has become apparent from the research that there are deficiencies in newly graduated nurses' performance of clinical skills. This may be due largely to the shift of training from the clinical setting into the academic setting, which has resulted in a reduced emphasis on teaching and learning of practical skills. The research has indicated that training for clinical skills needs to be hands on, realistic and student centred. The purpose of this is to develop skills in a relatively controlled environment and to facilitate the transfer of the skills into the clinical setting, allowing professional and competent performance. Simulation appears to be an increasingly popular means for

enhancing skills training in both medical and nursing settings. However, such technology can be expensive, which may act as a barrier for some training institutions. Real life, hands on experience, is still thought to be the most effective means for clinical skills training. However, knowledge of performance plays a key function.

The following section will explore and discuss the assessment of psychomotor skills in nursing and look specifically at the Objective Structured Clinical Examinations (OSCEs) that have been developed. Such OSCEs will be used as the dependent performance measure in study one of this thesis

2.2.2 OSCEs for the assessment of Psychomotor Skills in Nursing

The assessment of clinical performance has been recognised as a complex process and it has taxed nurse educators for many years (Nicol & Freeth, 1998). The need to accurately assess a student's clinical abilities is of great importance if teaching staff are to be certain that the curriculum is meeting its objectives (Martin, Stark, & Jolly, 2000). Until the early 1970's, the assessment of practical skills largely took place in practical rooms within schools of nursing. Here, students were tested on their ability to perform a range of standard procedures in front of examiners appointed by the General Nursing Council. Concern was expressed about the artificiality of this system, which resulted in the 'four-part ward-based' assessment being introduced (Aggleton et al. 1987). By the 1980's this method too underwent criticism because, although it took place in real clinical practice, the assessment

98

process created an artificial situation, leading to dissatisfaction for both students and assessors (Clifford, 1994).

In 1979 Harden and Gleeson had the idea of creating a test to assess clinical competences of trainee doctors by making them individually rotate through a number of 'stations' where they were assessed individually using precise sets of criteria in the form of a checklist. This test was known as an OSCE and was first developed more than 20 years ago in Scotland, as an effort to make exams in medical training more valid, reliable, and practical (Harden & Gleeson, 1979). OSCEs aim to be Objective in nature, Structured and replicable and clinically relevant Examinations, hence the acronym. Thus OSCEs are an approach to the assessment of clinical competence in which the components of competence are assessed in a well planned or structured way with attention being paid to productivity (Harden, 1988).

OSCEs are clinical in the sense that they focus on component psychomotor and communication skills used in the clinical situation. They are structured in the sense that each examination focuses upon a particular skill, for example, blood pressure measurement; temperature, pulse and respiration measurement; aseptic technique (preparation and procedure); oral medication; urinalysis or hand washing, which the student is required to demonstrate on a simulated patient in a controlled physical and temporal framework. The examination is objective in that trained examiners assess the student's performance using a structured assessment schedule that breaks the skill down into its component parts with marks allocated to these.

The original purpose of the OSCEs provided a means of examining the skill acquisition of medical students, which led some years later to the development of OSCEs into pre-registration nursing curricula (Major, 2005). OSCEs were first described by Harden and Gleeson as, 'a timed examination in which medical students interact with a series of simulated patients in stations that may involve history taking, physical examination, counselling or patient management' (Harden & Gleeson, 1979). Their use has become widespread as the standard for performance based assessment, particularly in undergraduate examinations. This is largely due to the fact that they have been shown to be feasible and have good validity and reliability (Hodges et al. 1998). Since then, their use has been welcomed as a means of objectively assessing students' skills across healthcare disciplines such as physiotherapy, radiography and dentistry (Marshall & Harris, 200; Mossey et al. 2001). However, they were less often used in nurse assessment in the early 90's (Hamadeh et al. 1993). However during the past decade, increasingly, nurse practitioner programs have incorporated OSCEs into nursing education for measuring clinical competence in nursing practice (Khattab & Rawlings, 2001).

A review from Miller (1990) on the assessment of clinical skills, competence and performance, raised an interesting point concerning the performance and action components of future graduates. Miller argued that examinations should be designed so as to test students in conditions closely related to their future professional function. Miller used a pyramid (figure 3) for illustrative

purposes to show the different skills levels of knowledge and performance

that trainees should be able to demonstrate.
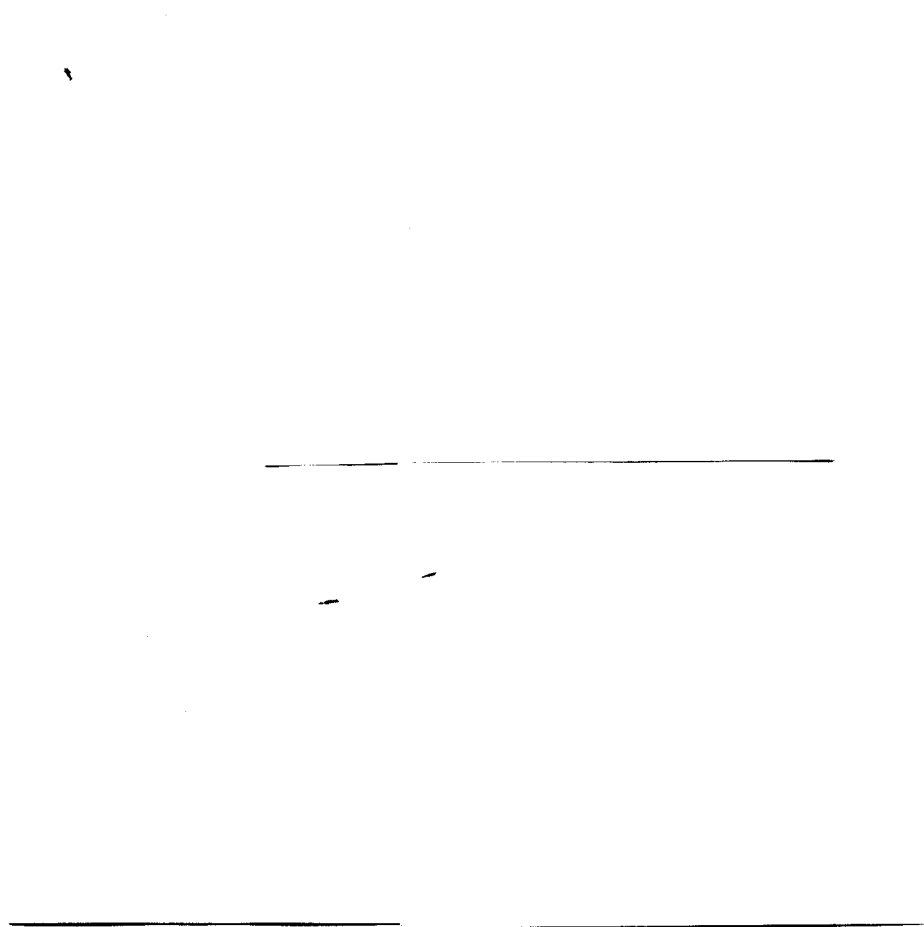
Figure 4: Framework for assessment (Miller, 1990)

Miller proposed that teaching faculties should seek both instructional methods and evaluation procedures that fall into the upper reaches of the triangle. This would allow for the outcome that students are better prepared for their future role. Bradley and Humphris (1999) supported the idea that OSCEs evidence the ability of students to put evidence-based medicine, which combines knowledge and communication skills, into practice. As a result, the OSCEs serve a very useful purpose that enables educators to test trainees in the upper reaches of Miller's pyramid, as it places them in a situation that they might encounter in their future clinical practice. In addition, the use of simulation in this context also enables the examiner to identify students' learning and skills deficiencies (Kowlowitz et al. 1991), as well as helping students to identify and consider their own learning needs (Townsend et al. 2001).

Macleod Clark (1996) reported that a lack of clinical skills competence in newly qualified project 2000 nurses in the United Kingdom was due to the low profile of skills teaching within nursing curricula at that time. Research by Gomez and Gomez (1987) endorsed the value of student nurses learning through methods such as observation of good role models and performance of practical nursing skills in the real situation. In the mid 1990's students had fewer opportunities to gain the essential fundamental skills to enable them to progress to being independent competent practitioners (Studdy et al. 1994). As a result, the strengthening of the theory-practice link through the re-establishment of clinical skills centres in which to learn, and emergence of the

OSCE framework to examine the skills, were seen as new steps towards achieving this competence (Studdy et al. 1994; O'Neill & McCall, 1996).

Martin, Stark, and Jolly (2000) conducted a study that assessed the relationship between clinical experience, learning style and performance in an OSCE in medical students at the end of their first clinical year. This was a prospective study of undergraduate students who were undertaking their OSCE at the end of their first clinical year. One hundred and ninety four medical students participated in the study. All participants undertook a 24-station OSCE, which was the main outcome measure of performance. To assess student's learning style, student's completed the learning style inventory (Entwhistle, 1981) within one week of the examination. This was a 30 question inventory that has three principal and four supplementary components: an achieving scale, a reproducing scale (surface learning) and a meaning scale (deep learning) being the first three, and comprehension learning, operation learning, versatile approach and learning pathologies the subsequent four components.

To assess clinical experience, students were asked to report in a questionnaire three important aspects of their clinical experience during the year. The first of these was the total number of patients seen to. The second was the number of outpatient clinics attended. Finally, the third was the number of emergency 'takes' the student attended. For each of the parameters, students were given options of various levels of activity. For the number of patients clerked this varied from 5 or less through to more than 40.

For outpatients attended this varied from less than 5 to more than 20. Finally, for number of emergency takes this varied from none to more than 10. The answers were then grouped to give a numerical score and the total amount of clinical experience was taken as a combined score for the three areas of clinical activity.

Results revealed that performance in the OSCE was related to well organised study methods but not to clinical experience. A significant relationship between clinical experience and organised deep-learning styles suggested that knowledge gained from clinical experience was related to learning style. Therefore, Martin, Stark and Jolly concluded that the relationship between clinical experience and student performance is complex. Well-organised and strategic learning styles appear to influence the benefits of increased clinical exposure. However, further work is required to elucidate the most beneficial aspects of clinical teaching.

Limited literature exists that is pertinent to the use of OSCEs in evaluating nurse practitioner performance (Khattab & Rawling, 2001). However, interest is increasing in using OSCEs as a measurement of clinical competence in nursing practice. The University of Salford began the preparation of an OSCE programme within their pre-registration nursing curriculum (Major, 1998). It was the delivery and assessment of comprehensive nursing care which was of importance to the Salford clinical skills teaching team when beginning to develop their OSCE programme. This reflected the philosophy of holistic patient care which the curriculum delivered through its clinical teaching

sessions and led to the development of a holistic patient-centred OSCE rather than adopting the workstation approaches, as mentioned in previous OSCE literature.

The Salford OSCE centred around one model patient, which provided an opportunity for students to demonstrate the role responsibility, interpersonal, clinical and caring skills as directed from the four domains of pre-registration nursing curriculum at that time. The nursing OSCE was designed to be a formative element of examination at the end of semester four, being nineteen months into the programme, in preparation for the first summative assessment in practice. For this reason it was entitled Objective Structured Clinical Evaluation, with an emphasis on constructive advice and feedback to the student rather than on a point's score or grading system seen in summative OSCEs. The formative nature of the Salford OSCE was supported in Andrusyszyn's (1989) work, which distinguished between evaluations and grading. Harris & Miller (1990) have endorsed the students' view that there is a need for adequate verbal feedback, rather than a score, as they see this to be important for boosting confidence, identifying weaknesses and providing positive reinforcement for enhancement of skill development.

Results revealed that student perspectives in favour of the OSCE were positive and mirrored the published literature, in that many identified with the apparent realism of the situation and saw the experience as a chance to self-evaluate. Immediate feedback was a highly valued feature of student evaluations, with the verbal discussion creating motivation to further practise

their skills. Some students criticised the unrealistic nature of the OSCE. However, as Buckingham (2000) and Macleod Clark (1996) pointed out, the rehearsal of skills in the laboratory removes the uniqueness of the complexity and constraints of the clinical setting. Therefore, this leaves greater objectivity for assessment, particularly for junior students as they are limited in the experience of 'getting to grips with the job on the ground'.

Fletcher (1994) distinguished between training and education by using Clarke's (1992) work to compare the technician model of skills acquisition verses the professional model, with its intellectual component using clinical judgement based on knowledge. Nichol et al. (1996) stated that an integrated approach would discourage the focus on product but realised that to make learning manageable, it must be broken down into small pieces. Therefore in conclusion, the Salford nursing OSCEs appeared to address both sides of the contemporary discussion by encouraging holism through building on those small manageable pieces. It would seem then, that rather than jumping from the newer OSCE methods and reverting to the 'old relics' (Major, 1998) of workstation OSCEs, the Salford nursing OSCE programme evolved in line with its own curricular and learning resource developments.

Other pioneering work of the Royal College of Nursing (RCN) has also borne witness to the interest of the use of OSCEs in assessing nursing practice. A study by Khattab and Rawling (2001) looked at assessing nurse practitioner students using a modified OSCE. This was an exploratory study which was initially based on an in-depth literature search and analysis. Conclusions of

the literature search indicated that it was clear that the OSCEs are well-established in medical education, but not so in nurse education. Also, much of the postgraduate use of the OSCE in medicine tended to focus on summative assessment. The authors then conducted a second literature search exploring a wide range of past exam papers of the Royal College of Nursing (RCN) and final year undergraduate medical exams. The purpose of this was to establish the appropriate level and the format for the assessment procedures to be developed and used in the study. The assessment criteria were summarised into guidelines, and from this a supporting document was produced containing the tables and appendices relevant to the exam. The modified OSCE was structured so as to serve as an examination as well as a means of self-assessment and learning. The final format of both parts of the criteria was then decided after consultation with a practice team, which comprised of nurse practitioners and university nursing and medical lecturers. The purpose of this was to seek their opinions, answer any queries, and enhance a feeling of ownership.

Stations for the OSCE were classified into two types as suggested by Harden and Gleeson (1979). These comprised of a procedure station (station 1) and a question station (station 2: student to answer questions on the basis of information obtained during the course). During the OSCE, students started with station 1 and then proceeded onto station 2. The emphasis for station 1 was on techniques, communication skills, and approach to the physical examination. Students were allowed 70-minutes for this station and the

107

examiner used a checklist to record the performance of the students as they proceeded through the examination of each body system.

A pass mark of 40% was used in accordance with the University examination regulations and the RCN marking scheme. Station 2 comprised of two forms of a viva voce. In the first viva, 20-minutes were allowed for questions based on one of the body systems or regions examined by the students in station. Four envelopes, each containing a card naming two systems/regions, were offered to each student. Students then were asked to select an envelope, and then upon reading the card, they selected one of the systems/regions written on it. Questions were graded into three levels of cognitive activity. The first level considered the reasons for, and methods of, examining the system or region. The second level addressed relevant anatomy and physiology. Finally, the third level required students to relate their physical examination to its clinical significance, although not in terms of suggesting a diagnosis.

The second viva was also 20-minutes, in which the questions were based on photographic and audiotape material that demonstrated common signs and sounds found in clinical practice. Here, observational and descriptive powers, based on an understanding of normality versus abnormality, were being tested. Again, students were offered a choice of envelopes, each one containing a different series of photographs. Questions, again, were graded into three levels of cognitive activity, as in the first viva voce. Descriptions of the sites and appearances of lesions and signs (e.g. a skin rash, uneven pupils, a swelling) or the nature of a taped heart or breath sound were required from the student. Interpreting the sign or sound in terms of altered

physiology, rather than diagnostically, constituted the third level of cognitive activity.

The conclusions of the study suggested that the modified OSCE enabled the University to state that students who achieved a 'pass' in the assessment could: conduct a full physical examination safely and with patient comfort in mind (station 1); reason their actions and findings arising from the physical examination (station 2: viva voce 1); and extend their reasoning and observational skills to clinical material provided in audiovisual form (station 2: viva voce 2). Some issues centred on reliability, feasibility and the costs of delivering such types of assessment. However, feedback from the students, nurse practitioners and external examiners used, was extremely positive and appeared to demonstrate the educational benefits of the modified OSCE as a formative and summative assessment of physical examination skills.

More recently, Alinier (2003) conducted a study which investigated students' and lecturers' perspectives of objective structured clinical examination incorporating simulation. The Hertfordshire Intensive Care and Emergency simulation session (HICESC), a specialised teaching laboratory at the University of Hertfordshire, used a 15-station OSCE in the context of a research project founded by the British Heart Foundation, to determine the usefulness of immediate-fidelity simulation in undergraduate nursing education. The assessment was used to test nursing students' skills at two different stages in their course curriculum. They were initially tested towards the middle of their second year, then at the start of their third year of their

diploma course. The session relied on the voluntary participation of the students and operated in a formative way under examination conditions. Students were encouraged to go to the sessions for the educational experience and were also awarded with a certificate of attendance to enhance their professional development portfolio. To gather more information about how people viewed the sessions, two questionnaires were designed and administered to both the staff involved and the students. The first questionnaire collected information from the students (n= 86) from the two nursing cohorts who took part in the sessions. The second questionnaire was distributed to the lecturers (n=39) who assessed students skills during OSCE sessions.

Results revealed that the 'mixed mode' OSCE sessions were generally appreciated by students and examiners, who rated them respectively, with means of 1.58 and 1.82 on a five point Likert scale (1, very useful; 5 not useful at all). A similar positive feedback was reported by Khattab and Rawlings (2001) concerning the perception of students and examiners of the educational benefits of OSCE as a formative and summative assessment. In agreement with a study by Hill et al. (1994) showing that formative assessment should be incorporated into the teaching process, Alinier (2003) showed that 96.5% of the students and 94.9% of the examiners also thought that the sessions should be incorporated into the nursing curriculum.

Finally, results revealed that students thought that OSCEs should take place 3-4 times per year (mean = 3.39), which is slightly more regularly than staff

would be willing to support (mean = 3.03). The difference was due to the time constraints exerted on the assessors and low student to staff ratio (less than 1.5-1) required during the OSCE. It was reported that the usefulness in repeating the same OSCE lies in the fact that it familiarises students with the process and enables them to have time to reflect on their performance and solve any problems they might have with some of the stations. Boud et al. (1985) pointed out that some benefits of the reflection process could be lost if they were not linked to action. Therefore, reflection upon experience of the OSCE process and the students own ability to perform would encourage students to think about their performance and help them in the future occurrence of a similar experience. Alinier (2003) supported this by noting that when students do an OSCE for the second time they usually perform to a higher standard.

Overall, from the literature it has become evident that the OSCEs are an established and valued tool for the assessing the performance of clinical skills. Research into nursing OSCEs is still relatively sparse. However, from the published studies that do exist, positive findings relating to student and staff perceptions of the OSCEs are apparent. Factors such as reflection, self-evaluation and educational benefits have emerged to be highly useful skill outcomes from the OSCE process. Therefore, students feel facilitated by the OSCE process, especially as it becomes more familiar to them. Miller's pyramid appears to be a useful framework for achieving high standards and evidence-based practice in the OSCEs. As a result, the OSCEs serve a very

useful function that helps to enable educators to test trainees in the upper reaches of Miller's pyramid, in pursuit of competent performance.

With this in mind, PETTLEP imagery could well act as an effective adjunct for facilitating student nurses' performance in clinical motor skills in OSCEs, when coupled with physical practice. This would be due to the multi-sensory involvement that aims to mimic the physical task and optimise functional equivalence. It would also provide an invaluable reflection process from which nurses could gain extensive knowledge of, and familiarity with, competent performance of skills. Finally, it would also involve limited financial constraints to provide and use the training at institutions, and provide nurses with skills for life that they could further use and apply in their professional careers.

To recap, this program of research is concerned with internal representation and the extent to which these representations are amenable to conscious reflection and can be measured through behavioural outputs. Therefore, the empirical work in this thesis aimed to investigate the notion of internal representations, whether of psychomotor actions or of identity formulations, and how they manifest themselves in behaviour.

The OSCEs acted as one major behavioural measure, and were used in study 1 of the empirical work. Behaviour was reflected and measured by student's clinical psychomotor skill performance in the OSCEs following a program of PETTLEP training. As previously discussed, behaviour can be exhibited both internally and externally. Internal representation of the psychomotor skill

performance was manifested in student's ability to apply internal knowledge and its demands, into their motor counterparts for the performance of clinical skills. In the case of the OSCEs, behaviour was exhibited externally by using student's performance on the taught clinical skills as an indicator of success.

The second behavioural measure used in this thesis concerns internal behaviour, which is mostly manifested in student's conscious reflections and cognitions. This was exhibited using a psychometric measure of identity, as a behavioural output. The link between psychomotor skill ability and identity formulations is very apparent, given the primary underlying internal underpinnings responsible for behaviour outputs. Studies four and five aimed to investigate the cognitive construals of thought and feeling behind the concepts concerned with nurse education and training. So, how students initially think, feel, and ultimately identify (at an internal processing level) with nurse education and its counterparts, was explored.

In respect of this, the following section will explore theoretical approaches to identity and their relation to a particular theoretical formulation- ISA/Ipseus (Weinreich & Saunderson, 2003). This section of the literature review will thus be specific and relevant to ISA and Ipseus. Ipseus is the instrument derived from ISA and was used in study four as a cognitive measure of identity structure and change in relation to the worlds of nursing and nurse education. Thus key theoretical formulations of identity will be explored and discussed as a prelude to an exposition of ISA/Ipseus that was developed and used in the study three.

2.3 Identity

In philosophy, identity is whatever makes an entity definable and recognisable, in terms of possessing a set of qualities or characteristics that distinguish it from entities of a different type. An entity can be described as a state of having existence. Therefore, this could be a past, present or even future state.

In layman's terms, identity is whatever makes something the same or different. This includes operational definition that either yields a yes or no value for whether a thing is present in a field of observation, or that distinguishes the thing from its background, allowing one to determine what is and what is not included in it. Taking this into account, it is assumed that this process is centred on a time element, as in order to determine what is included or not, one would need to have acquired previous experiences, of which to reflect upon in order to base observations. For example, as a postgraduate reflecting back onto being an undergraduate, they may question several factors about themselves in order to establish whether they are subsumed in the same identity state.

Anando Osel wrote a poem titled 'Laymen of history', which was featured in an identity theory series (www.identitytheory.com/verse/spring2007/osel.php). This poem captures the complex essence of entities, as it is suggestive that some may believe to exist in a continuous entity or state:

Once a man of suchness

made the choice

that nothing was current, and

he would never turn towards the future

eyes directed only at the past

at the history of man

the history of it all

and what we have seen as

one event after another

the man of suchness has seen

as one continual event

an unbroken cycle of human psychosis

and as we turned outward

the man of suchness never turned

his back still to us

facing history

and at his feet piled human defilement

and as ruin blocked out the sun

the man of suchness breathed out

and then in

never knowing of history

The occurrence or anticipation of an existence is certainly inclusive of a time element (past, current, future). So, the existence of a continual state could be seen as controversial. Therefore, in the broad investigation of identity, entities serve as important reflective processes for individuals to interpret past, future and current selves, as well as significant others. This notion is expressed explicitly in the poem.

In its broadest sense, identity can be defines as,

"The totality of one's self-construal, in which how one construes oneself in the present expresses the continuity between how on construes oneself as one was in the past and how one construes oneself as one aspires to be in the future" (Weinreich, 2003, p. 26).

This definition is an inclusive one and directs attention to the totality of one's identity at a given phase in time. It is also applicable to the young child, the adolescent, the young adult, and the older adult in various phases of the life cycle (Weinreich, 2003). Exploring identity therefore allows investigation into people's sense of identity, namely: who they are, and how they relate to others in contemporary times.

With this in mind, the purpose of identity exploration in this thesis was to investigate how pre-registration nursing students construe their world of nursing, This was done by exploring how student nurses associated with and applied themselves to various aspects of nursing in the contexts of health care and broader affiliations, and how these associations fitted into their broader sense of identity. As found in study three, the essence of nurse training is typically centred on theoretical knowledge – delivered in the academic setting, and practice – carried out in the health care setting, as a placement. The successful integration of these two components reflects a complex web of construals, including constructions of nursing theory and practice, health care, knowledge and human relations. Therefore, the investigation of identity acted as an interesting follow on from the procedding

studies, as allowed an in depth investigation into the construal of internal behaviours and nurse identities, which formed links to individual views about the acquisition of nursing skills, and where and how nursing sits in students' identity on the whole.

This created a new exciting line of investigation to explicating students' behaviour by exploring construals of students' various identities through the process of conscious reflection. Study one looked at the feasibility of using structured imagery training as part of a structured curriculum, which used performance as an outcome. However, the results identified that performance was not enough to base the success of the intervention on, as a lot more unexpected variables were identified as influencers on performance. Study two then further investigated such factors using a skills training questionnaire to explore students' preparation for the OSCE process, which highlighted some common concerns in regards to the curriculum and its content. Study three then followed up these concerns by interviewing the professionals' responsible for teaching and delivering the curriculum. The results revealed a coherent view that theory and practice were equally as important for nurse education and that curriculum provided an equal proportion of both for training students'. However, it was felt that students' often dismiss the importance of the theoretical side and always favours the practical aspect as being the most important factor for learning. It was also felt that students' often identify with the content differently and some often struggle to bridge the theoretical knowledge to the practical side and vice versa. Therefore, in light of this, it seemed logical for study four to focus on conscious reflection of identities in

relation to nursing and broader aspects of students lives, in order to attempt to identify further underlying variables associated with the results of study one and the proceeding studies.

2.3.1 Theories of identity

The literature on identity presents many theories which are subsumed by the term 'identity', emphasising differing identity approaches (Weinreich, 2003). Those presented here reflect a wide range, which all contribute to the underpinnings or informing of identity structure analysis (ISA) conceptualisation. These stem from a range of disciplines, which include psychology, social psychology and sociology.

2.3.1.1 Psychodynamic approaches

Psychodynamic approaches stem from the discipline of psychology. These approaches strongly emphasise developmental issues in the formation of identity in which a person's identity is grounded in childhood and subsequent experiences. They also emphasise the 'incorporation' of experiences of the other into one's identity, the other being in various guises – parent, peer, admired or despised person, amongst many others. Therefore, a person's identity is to a significant extent grounded in identifications and transaction with others.

One of the main theorists of the psychodynamic approach is Erikson (1950, 1959a, b, 1968). This theory describes the impact of social experience across the whole life span. Erikson's definition of identity spans one's past sense of

self, what one is currently in the eyes of oneself and for others, and one's expectations of the future.

One of the main elements of Erikson's theory is the development of ego identity. Ego identity is the conscious sense of self that is developed through social interaction. According to Erikson, our ego identity is constantly changing due to new experience and information we acquire in our daily interactions with others. In addition to ego identity, Erikson also believed that a sense of competence also motivates behaviours and actions. Each stage of the theory is concerned with becoming competent in an area of life. If the stage is handled well, the person will feel a sense of mastery, which Erikson sometimes refers to as ego strength or ego quality. If the stage is managed poorly, the person will emerge with a sense of inadequacy.

In each stage, Erikson proposed that people experience a conflict that serves as a turning point in development. In Erikson's view, these conflicts are centred on either developing a psychological quality or failing to develop that quality. During these times, the potential for personal growth is high, but so is the potential for failure.

Stage one of the psychosocial theory deals with trust vs. mistrust. This stage occurs between birth and one year of age and is the most fundamental stage in life (Erikson, 1950). As an infant is utterly dependent, the development of trust is based upon the dependability and quality of the child's care givers. Therefore, if a child successfully develops trust, he or she will feel safe and

secure in the world. However, caregivers who are inconsistent, emotionally unavailable, or rejecting, contribute to feelings of mistrust in the children they care for. As a result, failure to develop trust will result in fear and a belief that the world is inconsistent and unpredictable.

The second stage of Erikson's theory refers to autonomy vs. shame and doubt. This stage takes place during early childhood and is focused on children developing a greater sense of personal control (Erikson, 1950). Like Freud, Erikson believed that toilet training was a vital part of this process. However, Erikson's reasoning was quite different than that of Freud's. Erikson believed that learning to control one's body functions leads to a feeling of control and a sense of independence. Other important events may include gaining more control over food choices, toy preferences, and clothing selection. Erikson (1950) found that children who successfully complete this stage feel secure and confident, while those that don't are left with a sense of inadequacy and self-doubt.

Stage three concerns initiative vs. guilt. During the preschool years, children begin to assert their power and control over the world through directing play and other social interaction. Therefore, children who are successful at this stage feel capable and able to lead others. However, those who fail to acquire these skills are left with a sense of guilt, self-doubt and lack of initiative (Erikson, 1963).

Stage four refers to industry vs. inferiority. This stage covers the early school years from approximately age 5 to 11. Through social interactions, children begin to develop a sense of pride in their accomplishments and abilities. Children who are encouraged and commended by parents and teachers develop a feeling of competence and belief in their skills. Those who receive little or no encouragement from parents, teachers, or peers will doubt their ability to be successful.

Stage five concerns identity vs. confusion. During adolescence, children are exploring their independence and developing a small sense of self. Those that receive proper encouragement and reinforcement through personal exploration will emerge from this stage with a strong sense of self and a feeling of independence and control. Those who remain unsure of their beliefs and desires will be insecure and confused about themselves and the future.

Stage six refers to intimacy vs. isolation. This stage covers the period of early adulthood when people are exploring personal relationships. Erikson believed it was vital that people develop close, committed relationships with other people. Those who are successful at this step will develop relationships that are committed and secure. Erikson emphasised that it is important to remember that each step builds on skills learned in previous steps. Therefore, a strong sense of personal identity is important to developing intimate relationships. Research has demonstrated that those with a poor sense of self tend to have less committed relationships and are more likely to suffer emotional isolation, loneliness, and depression.

Stage seven concerns generativity vs. stagnation. Generativity regards concern for people besides self and family that usually develops during middle age; especially a need to nurture and guide younger people and contribute to the next generation (Erikson, 1968). Erikson proposed that during adulthood we continue to build our lives, focusing on our career and family. Those who are successful during this phase will feel they are contributing to the world by being active in their homes and community. Those who fail to attain this skill will feel unproductive and uninvolved in the world.

Finally, stage eight concerns integrity vs. despair. This phase occurs during old age and is focused on reflecting back on life. Those who are unsuccessful during this phase will feel that their life has been wasted and will experience many regrets and be left with feelings of bitterness and despair. Those who feel proud of their accomplishments will feel a sense of integrity. Successful completion of this phase means looking back with few regrets and a general feeling of satisfaction. Those individuals will therefore attain wisdom, even when confronting death.

In summary, Erikson's theory is centrally concerned with human development and involves one reflecting upon the various stages and experiences of development. This may be a conscious process at the time of experience or occur thereafter via reflection of self. Therefore, entities serve as key features in this theory during the stages of development. Each stage of development may experience a conflict as the constructs in each stage represent bipolar

experiences (one extreme or the other: e.g., intimacy vs. isolation), and the outcome has an immediate effect on stages of self development.

This is an important process in the investigation of identity. Therefore, Erikson's theory contributes to the understanding and underpinnings of ISA.

Some early research using Erikson's theory investigated human development as it applies to age, in regard to wisdom as contradictive cognition. Clayton (1975) investigated the theory's emphasis on the feasibility of attaining the 8th stage - wisdom. Clayton raised the question as to whether the most elderly individuals resolve the last major crisis involving integrity and despair, and emerge with the concomitant virtue of Wisdom. This was conducted by examining the basic tenets and stages of Erikson's model and relating it to other organismic theories of development. Results of the study indicated that most individuals either seek foreclosure or enter prolonged moratoriums after adolescence, never actually reaching the last stage of the cycle. However, affective and reflective dimensions of wisdom may be apparent. Therefore, it was concluded that compromise rather than complete resolution between conflicting forces at each major life crisis seems the most common and realistic, though insufficient, approach for attainment of the last stage of development.

Other early research investigated the cross-cultural validity of Erikson's theory. Ochese and Plug (1986) designed a self-report questionnaire for measuring the personality components that, according to Erikson, are formed before the onset of old age (see study for detail of personality components).

This was distributed to a sample of 1,859 South African white and black men and women for completion. The results indicated that the reliability of the total scale was high for white and black subjects and the reliability for the subscales were adequate. Evidence of the validity of the scale indicated that the components of personality that theoretically develop in childhood seemed strongly interrelated in adolescent and adult whites. White women appeared to solve the identity crisis earlier, and they experienced a higher degree of intimacy than white men, although the difference narrowed with age. In both sexes, psychosocial development was related to well-being. Black men seemed to resolve the identity crisis only after age 40, and there were indications that the psychosocial development of black adult women was frustrated. Therefore, this suggests that genetic and/or cultural differences can influence some aspects of development and its stages.

More recently, Bosma and Kunnen (2002) conducted a review on the determinants and mechanisms in ego identity development. They initially started with a review of literature from different fields in the social sciences, in an attempt to integrate the ideas offered in the literature into a model of the process of identity development. The model described identity development as an iterative process of person-context transactions. Therefore, development is centred on repetitive experiences involving others. Conflicts arising in the course of the transactions are considered to trigger off development, and the developmental trajectory is determined by the way in which the conflicts are solved. As a result, it is proposed that optimal development requires a good balance between assimilation and

accommodation of a person's commitments. Important determinants in this process are factors that enhance openness to change, environmental support, and the developmental history in order to shape identity formulation.

Another theory that adopts ideas from the work of Erikson is the Identity Status (IS) approach (Marcia, 1980, 1987). This is an interpretation of Erikson's work on identity, in which the person is classified into 'identity statuses'. Marcia came up with four statuses' of psychological identity development. The main idea is that one's sense of identity is determined largely by the choices and commitments made regarding certain personal and social traits.

Based on Erikson's groundbreaking work on identity and psychosocial development in the 1960s, Canadian developmental psychologist Marcia refined and extended Erikson's model, primarily focusing on adolescent development. Addressing Erikson's notion of identity crisis, Marcia posited that the adolescent stage consists neither of identity resolution nor identity confusion, but rather the degree to which one has explored and committed to an identity in a variety of life domains from vocation, religion, relational choices, gender roles, and so on. Marcia's theory of identity achievement argues that two distinct parts form an adolescent's identity: crisis (e.g., a time when one's values and choices are being re-evaluated) and commitment. Marcia defined a crisis as a time of upheaval where old values or choices are being re-examined. The end outcome of a crisis leads to a commitment made to a certain role or value.

Upon developing a semi-structured interview for identity research, Marcia proposed Identity Status of psychological identity development: *Identity Diffusion* - the status in which the adolescent does not have a sense of having choices; he or she has not yet made (nor is attempting/willing to make) a commitment; *Identity Foreclosure* - the status in which the adolescent seems willing to commit to some relevant roles, values, or goals for the future. Adolescents in this stage have not experienced an identity crisis. Therefore, they tend to conform to the expectations of others regarding their future (e. g. allowing a parent to determine a career direction). As such, these individuals have not explored a range of options; *Identity Moratorium* - the status in which the adolescent is currently in a crisis, exploring various commitments and is ready to make choices, but has not made a commitment to these choices yet; *Identity Achievement* - the status in which adolescent has gone through a identity crisis and has made a commitment to a sense of identity (e.g. certain role or value) that he or she has chosen.

The core idea is that one's sense of identity is determined largely by the choices and commitments made regarding certain personal and social traits. The work done in this paradigm considers how much one has made certain choices, and how much he or she displays a commitment to those choices. Identity involves the adoption of 1) a sexual orientation, 2) a set of values and ideals and 3) a vocational direction. A well-developed identity gives one a sense of one's strengths, weaknesses, and individual uniqueness. A person with a less well-developed identity is not able to define his or her personal strengths and weaknesses, and does not have a well articulated sense of self.

Laing (1960, 1961) also offered an approach which stemmed from social psychiatry. This approach involved a definition of identity that closely follows Erikson's in emphasising past, current and future components of the experienced self. Laing proposed that various processes of social interaction and family dynamics can result in 'psychiatric disorders'. The reason for this is because when people make demands on each other that can be psychologically destructive in coercing a person to be other than what they are. Such experiences of self are located primarily within a context of collaborative processes within dysfunctional families that convey demeaning and contradictory messages to the 'victim' of family 'alliances'. Therefore, this may result in a crisis of identity, as featured in the identity status conflicts.

In his book 'Interpersonal perception' (1966), Laing's opening sentence proposed that,

"The human race is a myriad of refractive surfaces staining the white radiance of eternity. Each surface refracts the refractions of refractions of refractions. Each self refracts the refractions of others' refractions of self's refractions of others' refractions" (Laing, Phillips & Lee, 1966, p.3).

This reflects Laing's thought and method of studying perspectives and metaperspectives to make sense of behaviour and personal relationships. By doing this, one is able to anchor the various psychological processes and dynamics of their identity in regards to: themselves; others; and themselves as perceived to be evaluated by others; at various points in time and stages of development.

Bru, Merberg and Stephens (2001) conducted some interesting research regarding social support, negative life events and pupil misbehaviour among young Norwegian adolescents. This aimed to take into account Laing's idea of past, current and future components of the experienced self, and investigate how the various processes of social interaction and family dynamics can result in altered behaviours. In the study, relationships between negative life events, perceived social support and pupil misbehaviour were assessed in a national representative sample of 1057 Norwegian young adolescents aged 14 and 15.

Results indicated that negative life events were significantly associated with pupil misbehaviour among both male and female adolescents. Support from parents, friends and teachers was negatively associated with pupil misbehaviour. Therefore, this suggests that events and experiences are significant factors in shaping cognitions, and producing psychologically destructive behaviours that are away from the norm. As a result, this would undoubtedly have major effects on one's identity, potentially resulting in a crisis.

2.3.1.2 Symbolic interactionist approaches

Symbolic interactionism stems from the field of sociology and emphasises human skill in the use of language and symbols in communication with others. It seeks to unify intelligent thought and logical method with practical actions and appeals to experience (Plummer, 2000). The sociological theorists who developed and have continued this perspective include Blumer, Becker,

Goffman, Denzin, and Hochild. Some of the characteristics of the symbolic interaction perspective are an emphasis on interactions among people, use of symbols in communication and interaction, interpretation as part of action, self as constructed by others through communication and interaction, and flexible, adjustable social processes. Its emphasis tends to be the interaction order of daily life and experiences, rather than the structures associated with large scale and relatively fixed social forces and laws.

Blumer (1937) claimed the term symbolic interactionism to refer to the peculiar and distinctive character of interaction as it takes place between human beings. The peculiarity consists in the fact that human beings interpret or 'define' each other's actions. Their 'response' is not made directly to the actions of one other but instead is based on the meaning which they attach to such actions. Therefore, human interaction is mediated by the use of symbols, by interpretation, or by ascertaining the meaning of one another's actions. This mediation is equivalent to inserting a process of interpretation between stimulus and response in the case of human behaviour (Blumer, 1937, p. 180).

Therefore, an overlap is identifiable between the psychodynamic view that identity is grounded in identifications with others and the symbolic interactionist perspective of the adoption and expression of self in terms of behaviours and role identities.

2.3.1.3 Self-concept, social identity and self-esteem approaches

These approaches concern investigations of the central core of identity, namely the self, and emphasise the significance of self-esteem both in self and one's group. Self may be considered in personal terms – *personal identity* – and one's group membership in broader terms - *social identity* (Weinreich, 2003).

Self-esteem refers to an individual's self of his or her value or worth, or the extent to which a person values, approves of, appreciates, or likes him or herself (Blascovich & Tomaka, 1991). The most broad and frequently cited definition of self-esteem within psychology is Rosenberg's (1965), who described it as a favourable or unfavourable attitude towards the self (p.15). Self-esteem is generally considered that evaluative component of self concept, a broader representation of the self that includes cognitive and behavioural aspects as well as evaluative or affective ones (Blascovich & Tomaka, 1991). While the construct is most often used to refer to a global sense of self-worth, narrower concepts such as self-confidence or body confidence are used to imply a sense of self-esteem in more specific domains. It is also widely assumed that self-esteem functions as a trait, that is, it is stable across time within individuals. This is important to the study of identity. This is due to the process of self-appraisal in relation to identity aspirations, when situated in particular social contexts.

Social identity can be described as the cognitive and motivational basis of inter-group differentiation, and the Social Identity theory was developed by

Tajfel and Turner (1979). The theory was originally developed to understand the psychological basis of inter-group discrimination. Tajfel et al (1971) attempted to identify the minimal conditions that would lead members of one group to discriminate in favour of the in-group to which they belonged and against another out-group.

In social identity theory, a person has not one, 'personal self', but several selves that correspond to widening circles of group members. Different social contexts may trigger an individual to think, feel, and act on the basis of their personal, family or national 'level of self' (Turner et al., 1987). Apart from the 'level of self', an individual has multiple 'social identities'. Social identity is the individual's self-concept derived from perceived membership of social groups (Hogg & Vaughan, 2002). Therefore, it is an individually-based perception of what defines the 'us' associated with any internalised group membership. This can be distinguished from the notion of personal identity which refers to self-knowledge that derives from the individual's unique attributes.

Social Identity Theory asserts that group membership creates in-group/ self-categorisation and enhancement in ways that favour the in-group at the expense of the out-group. The examples (minimal group studies) of Turner and Tajfel (1986) showed that the mere act of individuals categorising themselves as group members was sufficient to lead them to display in-group favouritism. After being categorised by a group membership, individuals seek to achieve positive self-esteem by positively differentiating their in-group from a comparison out-group on some valued dimension. This quest for positive

distinctiveness means that people's sense of who they are is defined in terms of 'we' rather than 'I' (Turner & Tajfel, 1986).

Tajfel and Turner (1979) identified three variables that contribute to the emergence of in-group favouritism: A) the extent to which individuals identify with an in-group to internalise that group membership as an aspect of their self-concept; B) the extent to which the prevailing context provides ground for comparison between groups; C) the perceived relevance of the comparison group, which itself will be shaped by the relative and absolute status of the in-group. For example, during academic contact, those student nurses who are highly studious and driven in regard to the theoretical side of their course are highly likely to stick together and form an 'in group', in comparison to those that feel the theory is a waste of time and appear disinterested.

Consequently, individuals are likely to display favouritism when an in-group is central to their self-definition and a given comparison is meaningful or the outcome is contestable. This is important to the study of identity as the manifestations of the many kinds of in-group/out-group identification processes can attempt to be understood with clarity.

2.3.1.4 Personal Construct Theory (PCT)

Personal Construct Theory (PCT) is a theory developed by Kelly (1955). It represents a coherent, comprehensive psychology of personality that has special relevance for psychotherapy. The key message of PCT is that the world is 'perceived' by a person in terms of whatever 'meaning' that person

applies to it and the person has the freedom to choose a different 'meaning' of whatever he or she wants. In other words, as suggested by Kelly (1955), the person has the 'freedom to choose' the meaning that one prefers or likes. Kelly referred to this as alternative constructivism, as the person is capable of applying alternative constructions (meanings) to any events in the past, present or future. Therefore, the person is not a prisoner of one's 'biography or past' and could liberate oneself from the 'misery' of miserable events if one desired by reconstruing (reinterpreting and redefining) them. The theory rejected the existing divide between affect, cognition, and action and recommended that they be construed together for developing a fuller understanding of human behaviour.

An essence of PCT is that the person's processes are psychologically channelled by the ways in which he or she anticipates events. Therefore, the subject is the process, the individual is essentially a behaving organism and therefore does not need an external 'push' or 'pull' to get into motion. The processes include those of our self-definition and our relationships with others, as well as the tasks at hand (Kelly 1955).

Kelly (1955) Suggested that PCT is based on the model of man-the-scientist. Within this model the individual creates his or her own ways of seeing the world in which he/she lives; the world does not create them for him/her. Also the individual builds constructs and tries them on for size. The constructs are sometimes organised into systems. These are groups of constructs which embody subordinate and superordinate relationships. It also stipulated that

the same events can often be viewed in the light of two or more systems, yet the events do not belong to any system. Finally, the individual's practical systems have particular foci and limited range of convenience.

Constructs are described as transparent patterns which an individual creates and then attempts to fit over the realities of which the world is composed – patterns that are tentatively tried for size – ways of viewing the world (Kelly, 1955). Constructs are therefore used for the predictions of things to come and the world keeps going and revealing these predictions to be either correct or misleading. This fact then provides the basis for revision of constructs, and eventually, of whole construction systems.

Kelly suggested that PCT was based on the philosophy of 'constructive alternativism'. Constructive alternativism assumes that all of our present interpretations of the universe are subject to revision or replacement, as there are always some alternative constructions available to choose among in dealing with the world. Later research by Bannister (1981) noted that constructive alternativism argues for an open society in which the pursuit of alternatives is central to the way in which we live. Therefore, political doctrines favouring authoritarian forms of social structure require the acceptance of indisputable truths, indisputable realities.

Kelly's observations about determinism and man's free will were summed up in the following words:

"He is not the victim of the pie, but of his notions of etiquette under which the pie cutting has been subsumed… Man to the extent that he is able to construe his circumstances, can find him self freedom from their domination… Man can also enslave himself with his own ideas and then win his freedom by reconstruing his life. Ultimately a man sets the measure of his own freedom and his own bondage by the level at which he chooses to establish convictions"

Therefore, PCT promotes the fact that individuals are in control of their own destiny.

PCT also does not ignore the relevance of the social context and the constraints imposed by it on personal construction. Kelly explained:

"But to believe that man is the author of his destiny is not to dent that he may be tragically limited by circumstances. I saw too many unfortunate youngsters, some of them literally starving in that depression-ridden dust bowl, for me not to be aware of their tragic limitations. Clearly there are many things they might have liked to do that circumstances would not permit. But, nevertheless, this is not to say that they were victims of circumstances. However, much there was denied them there was still infinity of possibilities open to them. The task was to generate the imagination needed to envision those possibilities" (cited in Fransella, 1995).

Therefore, social context can have an impact on personal construction. However, this can still be re-construed to some extent through the process of alternative constructivism by the individual.

Kelly noted the contrast between the individual reality, social reality and shared reality in PCT. Kelly used three key distinctions: Individuality, communality, and sociality. Individuality was seen in terms of the fact that people differ from each other in their construction of events. Communality was the extent to which one person employs a construction of experience which is similar to that employed by another. Therefore, one's psychological processes are similar to those of that other person. Finally, sociality was seen as the extent that one person construes the construction processes of another. Therefore, one may play a role in a social process involving the other person.

Overall the theory has fitted into many areas such as education, human computer interaction, and human learning, as is gaining ground in sociological disciplines such as the study of identity. Of particular interest is the emphasis of the theory that communality (the social reality) and individuality (the personal reality) must be considered together for developing an understanding of the psychological processes. This is extremely applicable and apparent for the study of identity using ISA/Ipseus due to the complex psychological parameters it works within. The following section will explore this in depth.

The theories that have just been discussed all significantly contribute to the underpinnings and workings of ISA/Ipseus. The theories bring together ideas and concepts from individual disciplines to holistically inform the rationale and workings of ISA/Ipseus. The following section will describe ISA/Ipseus and its

approach to investigating identity and underpin how the theories inform its workings.

2.3.2 What ISA/Ipseus says about identity?

ISA/Ipseus is a theory of identity developed by Peter Weinreich and his colleagues drawing on the work of a number of theorists in psychology, social psychology, and sociology. Observations common to such disciplines existence highlight that individuals appraise and interpret the events in which they participate, and therefore identify with other people and social institutions (Weinreich & Saunderson, 2003). Therefore, they experience others within a framework of institutions that are filled with a sense of relative permanence through social representations (Moscovici & Paicheler, 1978). While social representations are not entirely unchanging, they are nevertheless maintained within societal structures that have symbolic meaning interpreted according to shared norms.

ISA/Ispeus represents the theory and practice of an open-ended framework of theoretical concepts and process postulates about processes of identity development and redefinition (Weinreich & Sauderson, 2003). The mission of identity exploration (IDEX) is to promote investigations into individual and societal issues, in which people's identity processes are of central concern. ISA/Ipseus represents a conceptual framework of well-defined psychological concepts and explicit postulates about psychological processes that have a fundamental significance for the person's processing of day-to-day

experiences that vary according to the context in which one is engaged. These processes have to do with the person's sense of identity.

IDEX focuses on arguably the most pressing of universal human concerns, namely people's sense of identity: who they are, and how they relate to others in contemporary times. Identity exploration is concerned with making available analytic and methodological tools grounded in the innovative ISA/Ipseus conceptual framework of psychological concepts and process postulates pertaining to identity in their numerous manifestations.

ISA/Ipseus assesses features of identity that are not readily accessible by traditional methods in an integrated assessment. These include: -
Appraisal of the social world: - the person's extent of identification with other people, agents, institutions, icons etc. This involves appraisal of the significance of others to the individual and their attributes, whether facilitative or detrimental, for example determination of role ambivalence;
Conflicted identifications: - problematic identification with such others. This involves problematic issues of the person's identity – being like the other, while wanting to dissociate from some features of the other – such as in role conflict; *Symbolic representations of significant matters*:-
The symbolic function that some other person, icon, or emblem might represent within the individual's identity structure. This involves discovering whether some other agent functions for the individual as 'standing in' symbolically for another who had a formidable influence on the individual's biography; *Personalised stress*: - aspects of stress that are due to the

person's manner of appraising circumstances in a personal way. This involves discovering the issues over which the person is particularly liable to experience stress and uncertainty, and ambivalence detection of vulnerability to mood states that are detrimental to achieving progressive aspirations; *Defensive or over-responsive orientations*: - Defensiveness or openness towards others. This involves determining the balance between ignoring the experience, skills, knowledge of others, and being gullible and over-responsive towards suggestions by others.

The ISA/Ipseus variables include such dimensions as ego involvement (one's overall responsiveness in terms of the extensiveness both in quantity and strength of the attributes one construes the other as possessing), evaluation, identification, contra identification (similarity between the qualities one attributes to another and those from which one would wish to dissociate) and dissonance (a state of tension) with regards to entities including particularly entities which represent aspects of identity. They also give information on the significance and use of constructs. Those ISA/Ipseus variables will provide information about respondents, which should relate to the theories and ideas that one hypothesises about identity as they figure in the given topic. The preliminary ideas will then inform the entities and constructs to be included and will be tested out through the ISA/Ipseus variables that emerge from the completed questionnaires.

The ISA/Ipseus framework has wide-ranging research applications. Such applications range from societal issue such as ethnic, national and linguistic

identity to clinical issues such as occupational stress, co-morbid anxiety and depression, personality disorder and schizophrenia. However, no ISA/Ipseus studies to date have investigated identity in regards to educational development in nursing.

2.3.3 How does ISA/Ipseus work?

Ipseus (previously IDEX) is the tool which enables identity to be explored in the framework provided by ISA. An Ipseus is built around entities - objects of thought and feeling, and constructs - bipolar concepts that are used about entities. In devising an Ipseus, entities and constructs are chosen partly to reflect a particular area of interest and theories about what is important and partly reflect more general aspects of identity and its context.

An Ipseus instrument is in the form of a questionnaire where respondents are invited to apply each of the bi-polar constructs to each of the entities. The construct is applied by requiring a judgement to be made regarding the entity on a nine-point scale from one pole of the construct to the other. For example, in the case of a student on a nursing placement: -

Me, as a student nurse on placement…

thinks theoretical knowledge is most important for good patient care

thinks the ability to build relationships is the essence of good patient care
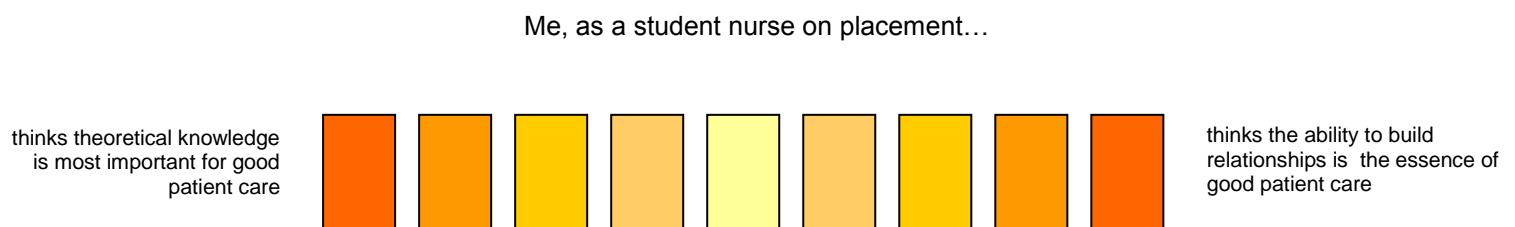
On the basis of these judgements and using algorithms and formulae contained within the software there is an output in terms of identity variables contained in ISA/Ipseus. The variables give information mainly on the respondent's position regarding the entities but also regarding the way in which they use the constructs. It is the variables that then describe the individuals position regarding their own and related identities.

In order for the tool to work properly, there are certain criteria the researcher must follow when constructing your instrument. It is important to initially state the interests of the investigation that you wish to conduct. A researcher often has a notion of what requires investigating, but without necessarily being able to articulate about what this might refer to in detail. Therefore, initial predictions are a valuable starting point for developing the aims and objectives for an ISA/Ipseus investigation. Once initial aims and objectives have been established, it is then essential for ethnographic work to be carried out. Ethnographic work may consist of using focus groups, observing formal and informal discussions, and non-verbal types of interaction, such as gestures, with the target population or sub-cultures within the population. Carrying out such work can then help to better clarify the aims and objectives for the investigation with your target audience, and also develop the vernacular to be used in the tool. This ensures that the dialect is relevant and accessible to your target population and can help engage them more in the meaning of the judgements they make.

The results of the ethnographic work can then be used to help develop prominent themes of concern to participants in the investigation. The themes will be central to the topic of investigation and also the aims and objectives for the work. These are usually expressed in words or discourses, and are represented by bipolar constructs derived in part from the ethnographic work. Some of these may also be generated by theoretical considerations present in the literature of your area investigation.

While themes that are fundamental to the aims and objectives will necessarily dominate the tool, it is also essential for such themes to be placed into a wider context and arena of a person's identity in general. Therefore, additional themes representing broader aspects of the person's identity, such as family, leisure, cultural concerns etc, must be included so that the substantive themes for investigation can be placed in perspective with regard to the person's overall identity.

2.3.4 How will I use ISA/Ipseus in this thesis?

Specific to this thesis, the principal aim of using ISA/Ipseus was to investigate how participants construe their world of nursing and how nursing fits into their identity. This was done by exploring how student nurses' associated with and applied themselves to various aspects of nursing in the contexts of health care and broader affiliations, and how these associations fit into their broader sense of identity. The essence of nurse training is typically centred on theoretical knowledge – delivered in the academic setting, and practice – carried out in the health care setting, as a placement. The successful

integration of these two components reflects a complex web of construals, including constructions of nursing, theory and practice, health care, knowledge, and human relations.

An ISA/Ispeus explored this notion using practical, theoretical, scientific and humanistic based domains of nursing, and their connotations through various agents and contexts, which featured as part of participants' broader context and biography. From this, the construal of alternative orientations to nursing was also explored to gain insight into the identity processes students' were experiencing in their role as a 'nurse' and also the broader world around them. These orientations featured as a key theme for investigation, specifically exploring if participants orientated more towards a scientific (theoretically driven), humanistic (practical & socially driven), or holistic identity (theoretically, practically & socially driven) approach to the profession of nursing.

There have been many theoretical and empirical applications of ISA/Ipseus to a variety of research arenas concerning cross-cultural issues, societal issues, and clinical issues. A study by Irvine (in Weinreich & Saunderson, 2003), investigated gender and identity processes in relation to adults returning to education. The incorporation of ISA/Ipseus allowed for individuality by anchoring each respondent's identifications in their own value and belief systems, while the nomothetic analysis identified commonality in adult development experience. The postulates of the investigation concerned: - 1) Social identity – improving one's position and power within the social structure

was commonly cited as a reason for returning to education. Therefore, the concern with social status and desire for upwards mobility was presumed to be reflected in the value systems of adult returners and their patterns of high and low status social groups; 2) academic identity – adults who have positive attitudes towards education and positively identify with academics are inclined to return to education; 3) Self evaluation and psychological adjustment in relation to: (a) self-evaluation – returners concerned with self-improvement when formal education is a challenge which demands new skills, will exhibit low self-evaluation; (b) identity state – adults returning to education are dissatisfied with their status and position in society will exhibit extensive identification conflicts with various social groups and individuals, coupled with low self-evaluation. Therefore, many of them will be in a vulnerable identity state; (4) Feminist orientation and women's participation – the women's movement has influenced society's expectations and norms with regard to women's social and occupational roles. Therefore, women returners who are concerned with fulfilling their potential will have adopted a feminist orientation, which will be reflected in their value systems and patterns of identification.

Taking the above postulates into account, the aim of the study was to design an identity instrument that would give insights into issues and concerns that mature students are unaware of, or are either unwilling or unable to articulate. The entities and constructs that were selected for this study and its social context resulted from reference to the previous findings from Irvine's 1991 study, coupled with analysis of constructs and entities included in previous

ISA/Ipseus studies involving adults; and consideration of the salient questions arising from theoretical and empirical research concerning adult education. A total of 109 adults participated in the research project. The main study group comprised of 72 mature students on University Access courses (52 female, 20 male). The ratio of females to males was in line with statistics that indicate that women generally out number men two to one on academic courses for adults. A control group of 37 adults was also included in the study. The purpose of this was to control for the effects of societal and political influences on adult self-concept and identity over the time period of the study. To control for participation in college activities, adults enrolled on non-vocational (leisure) courses were asked to participate in the study. All adults in the comparison group were required to be 23 years or over (minimum age for entry to an access course) and not have had third-level education.

Results of the study indicated that for both men and women, internal factors – more specifically, psychological transitions – are related to their return to education. However, the nature of these differences was somewhat different for men and women. Women returners were concerned about their occupational and social identity. They aspire to social position and power and being successful in public as well as their private life. Men on the other hand, appeared to be less concerned with social identity and social mobility. Rather, educational achievement was seen by them as a means of achieving self-respect, and recognition and respect from others.

In conclusion, analysis of adult returners' identity structure and information about their stated aims at the time of enrolment provided evidence that gender-specific internal transitions are important motivational forces proceeding and providing impetus in the return to education.

Other research in the clinical field has used ISA/Ipseus to explore predisposing, precipitating and perpetuating factors associated with anorexia nervosa. Saunderson and O'Kane (*in Weinreich & Saunderson, 2002*). It is believed that the core of anorexia nervosa is commonly associated with the struggle for control and a sense of identity, and reflects the displacement onto the body of young women's struggle for autonomy and self-hood. This study used ISA/Ipseus in an individual case study design and presented a diagnostic study procedure for: a) elucidating the particularities of the cases identity processes rooted in self's biographical experiences of untoward and personally threatening happenings; b) understanding ongoing identity processes that sustain anorexic identity that are peculiar to the case; c) strategies that will facilitate self's agentic reappraisal of biographical experiences, so as to be able to countenance alternative identity processes that diminish anorexic ones.

ISA/Ipseus' facility for the mapping and plotting of identification patterns with self and others in several situated identities was used to explore the case's construal of self and significant others in two situated past selves and four situated current contexts of identity. The two explored past contexts were: the 'childhood self' (me, as a child); ad the past 'traumatised self' (me, when I

experienced a devastating set back to my person). The four situated current

contexts of identity were: the 'in-situ self' ('me, as I am now'. i.e. self 1, not

situated in any particular context); 'depressed self' (me, when I am

depressed); 'out of control self' ('me, when I am out of control' [nominate

context]), and lastly, 'controlled self' (me, when I am in control of myself

[nominate context]).

Results from the Idiographic ISA/Ipseus analysis indicated that the cases'

predisposition to anorexia appeared to lie in a very poor childhood self-

concept, with particular focus on childhood sexual abuse, and more than a

partial focus on her mother-daughter relationship, suggesting an unhappy and

probably insecure childhood. The findings suggested implications for

therapeutic interventions as in this case for the following purposes:

(i) to explore and discuss dynamics of past events to explore any conflicted

identifications and how these feature in the different facets of ones past,

current, and aspirational selves; (ii) to probe one's concept, experience and

handling of 'conflicted situations' and offer appropriate counselling towards a

reformulation of the identifications with past or conflicted experiences; (iii) to

focus on fundamental 'duality' in ones identity structure: the nature of core

evaluative dimensions of ones identity (and their impermeability to change or

revision), and the conflicted evaluative dimensions of identity, and explore

how this may have effects on one's overall identity and other relationships; (iv)

to moderate extremes of self-evaluation by addressing 'splitting' between the

experiences of entities. It was concluded that using ISA/Ipseus in such

therapeutic cases could help provide a wealth of rich, detailed and valuable

information about self and identity towards a better understanding about such sensitive issues and cases, and help build a more three-dimensional picture of certain conditions and the individual within them.

Other research using ISA/Ipseus has looked at intercultural relationships (Weinreich, 2009). Due to the vital requirement of idiographic work prior for an investigation using ISA/Ipseus, this study began with a critique of Berry's model of 'acculturation strategies', which considered the relationship between heritage culture and ethnic identity. Analysis of processes of development revealed that maintenance and redefinition of identity in contexts of alternative cultural norms contended with the assumption of conscious choice or strategy towards mainstream and heritage cultures. From the perspective of identity issues, enculturation of cultural elements rather than acculturation were often the more significant process. Going beyond the critique to consider issues of the persistence of ethnic identity and processes of cultural reformulation, attention was also brought to the origins of primordialist *(devotion to the conditions which existed at the beginning of creation)* sentiment within ethnic identity and the possibility for generating situationalist perspectives. By referring to empirical investigations which had previously used ISA in similar contexts, evidence was provided for different identity processes and structures according to socio-historical context and the greater malleability of situationalists, compared with primordialists in their empathetic identifications with alternative cultural groups.

From the studies detailed it is apparent that ISA/Ipseus exhibits both theoretical and empirical applications for a variety of research arenas. Such contributions illustrate how the interdisciplinary theoretical conceptualisation and readily operationalised methodological tools of ISA/Ipseus can clarify such fundamental issues concerning the expression of personal and social identity. This form of investigation was ideal for the rationale of study four in order to explore internal behaviour and personal, social and professional identities of nurses' in training. This allowed exploration into their connotations of their world and how nursing fits into that, and how behaviour may be influenced and shaped according to that.

From the previous studies explored, it has become evident that past experiences and events can have an influential effect on one's various identities. The sophisticated methods of ISA/Ipseus allow access to explore such variables, and identify any deeper and underlying factors associated with motivations for achievement. As a result, these could reflect onto one's academic and nursing performance (as seen in the results of study one).

2.4 Summary and conclusions

A number of internal processes underpin the planning, performance and execution of psychomotor skills. Specific strategies aimed to improve the performance of psychomotor skills have been researched. Imagery is one, and is commonly used to enhance psychomotor skill performance. However, advice on how to use motor imagery is often provided with little theoretical justification or empirical support. Therefore, imagery usage can appear to be

inconsistent and slipshod (Holmes & Collins, 2001). A recent theoretical approach, namely the PETTLEP model, was proposed in an attempt to provide a better understanding of the mechanisms involved in motor imagery. The PETTLEP model provides a structured framework for guiding imagery interventions in sport, and research to date has strongly supported the tenets of the model. However, despite strong findings, the application of PETTLEP remains untested in diverse fields away from sport. Extending the use of PETTLEP as an aid to practical examination performance for student nurses undertaking OSCEs is fruitful, as a previous pilot has shown significant results for its use with the skill of blood pressure measurement, and research (Wright et al., 2008) has indicated that a significant amount of errors are made during the acquisition of nursing skills.

As well as examining the effect of PETTLEP on clinical examination performance using a behavioural outcome measure (OSCEs), there was also a need to investigate internal behavioural processes in regards to students' representations whether of psychomotor actions or of identity formulations, and how they manifested themselves and in their overall behaviour. The purpose of this was to explore both behaviour as an external output in terms of examination performance, and internally in regards to the processes students' experience in construing their thoughts and actions in regard to nursing. No research to date has done this at length. Therefore, a mixed investigation that incorporates both quantitative and qualitative data regarding internal representation of behaviour in nursing is novel and innovative.

This review has covered three key areas of the literature which underpin the five studies of the thesis. These three areas are: 1) psychomotor skills and imagery as a method of improving psychomotor skills; 2) Psychomotor skills in nursing and the assessment of psychomotor skills in nursing; and 3) Identity, theories of identity, and ISA/Ipseus for measurement of identity for explicating behaviour. The three areas blend together as they interchangeably exchange knowledge as they are all manifested in behaviours, whether of an external or internal nature. Application of these three areas within a programme of empirical work is novel and innovative as no research to-date has ever incorporated such measures or ideas to explore the acquisition of nursing skills in nurse education. Also, the unanticipated findings of study one has led to the investigation of internal factors - namely students' identity, to explain and underpin academic achievement and performance in nursing. This is an area that has never been investigated in the context of nurse education and presents many interesting implications for future research. Therefore, the five studies in this programme of empirical work combine three very complex and topical areas using novel and innovative approaches. In brief the research aimed to do the following:

1. To contribute towards greater understanding of how PETTLEP could be used to enhance psychomotor skilled performance in fields other than sport. This was done by exploring how internal representations of skills can manifest themselves in their motor counterparts as a behavioural output by using PETTLEP with normal practice. PETTLEP was applied as a facilitative intervention to help enhance understanding

and performance of clinical psychomotor skills that were examined as part of a nursing curriculum. PETTLEP was delivered as an educational tool on an undergraduate pre-registration nursing curriculum to assist learning and performance

2. Explicate the unexpected results obtained from study one in order to identify other unknown factors that may be affecting behaviour and performance. Post-intervention explorations using both qualitative and quantitative means were conducted in order to gain more in- depth information on preparation for the OSCEs and the use of PETTLEP. Results from the follow-up then led to further a qualitative exploration to investigate the content and nature of the curriculum. This was conducted with professionals responsible for the delivery and implementation of the curriculum. This aimed to gain insight from the staff perspective on the nursing curriculum and how well it was perceived to facilitate learning. The interviews were based on common concerns expressed by students in the previous investigations.

3. Based on the findings of the previous investigations, to examine how student nurses identify and construe the world of nursing and its various aspects that are featured within the curriculum. In light of the unexpected results of study one and its proceeding investigations, the issue at the forefront of study four was to explore identity in regards to the complex web of expectations, skills, and knowledge student nurses' are required to master from the regular curriculum to be a competent

professional. ISA/Ipseus was used to explore further the underlying issues that may have been related to poor examination performance from study one and its follow-up investigations. This was done by exploring internal behaviour, in the shape of nurses' construals and orientations to nursing and the broader aspects of their lives. The results then looked at whether there were various identities for student nurses' in training. This looked specifically at whether there were certain typologies within nurse identity which shaped individual behaviour, learning, beliefs, and motives behind the profession.

Holistically, the five studies are coherently connected based on the findings from each former investigation. Therefore, they add knowledge to each other in order to explicate the factors underpinning the results obtained from the first investigation. The initial starting point examined the extent to which intervening with an undergraduate nursing curriculum to enhance imagery can influence behaviour. Due to unexpected results which saw the control group actually performing better than the experimental group, the explicit decision was made to pursue investigation into other underlying factors that may have been influencing and affecting behaviour. Study two highlighted a number of factors and concerns associated with the curriculum and its content that students had identified. To substantiate these findings study three then investigated these concerns from the professionals' perspective in order to identify any coherency or conflict in beliefs. Results of study three then led to the investigation of identity and how imaging ones self

as an identity can influence behaviour and performance in nursing. Studies four and five investigated this notion and looked specifically at typologies of identity within nursing. These were manifested by the content of the curriculum and also individual experiences.

Collectively, this programme of work aimed to explore two lines of behaviours, in regard to conscious reflection and cognitions (internal) and performance (external). The unanticipated OSCE results therefore set up a new line of enquiry using conscious reflection of ones-self and identity, in order to identify internal construals and motives of behaviour. This aimed to provide explanation for key happenings of behaviour that may influence and direct performance and development - see figure 5 below.

Observable External Behaviour
E.g. behaviour that is measured and seen such as OSCEs

Internal Behaviour

E.g. Happenings in the nervous system, psychology such as ISA/Ipseus

Hypothetical Constructs

Explanation of behaviours
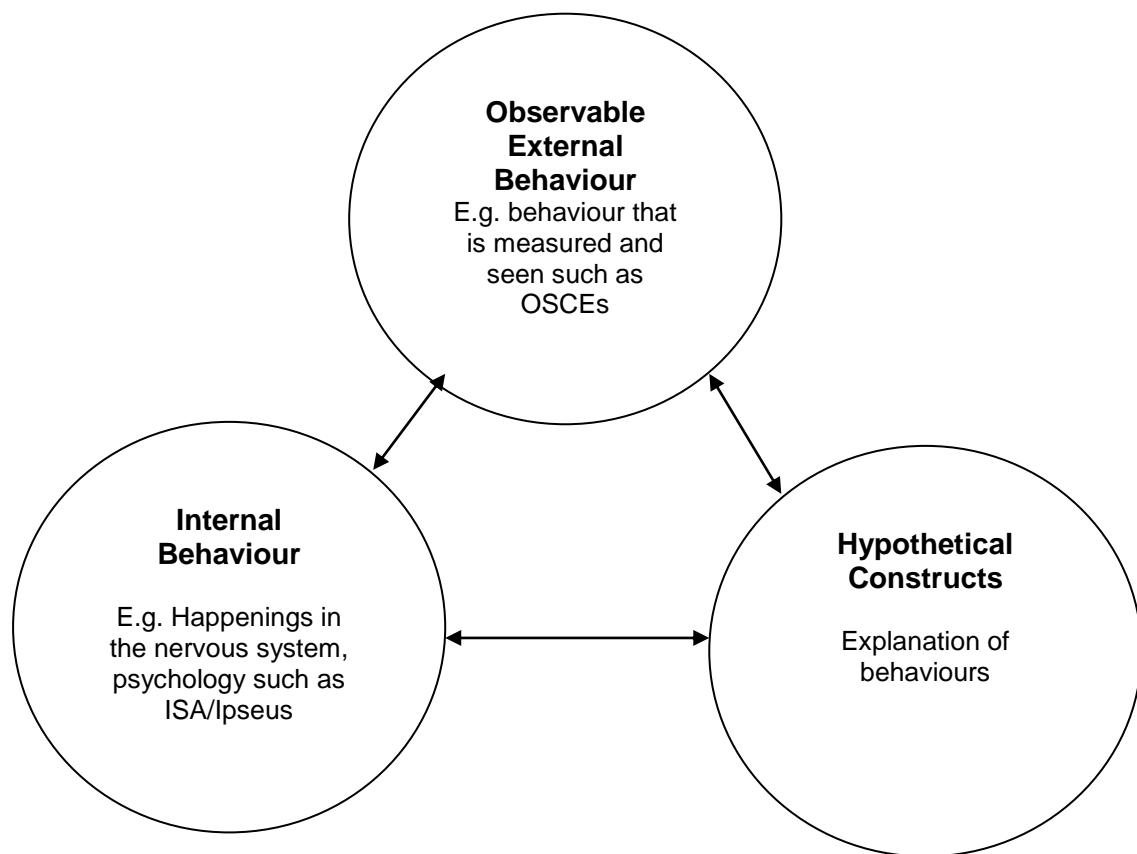
Figure 5 – The integral nature of the programme of work

CHAPTER 3.0 - STUDY 1: The effect of PETTLEP-imagery on OSCE performance in Nursing

3.1 Introduction

A fundamental problem for this study was its location in a real life setting, rather than in a laboratory. Therefore, the advantages of high ecological validity are undermined by the difficulties of maintaining strict control over the study.

The study used an experimental design – namely a programme of imagery training, in a real-life setting – as part of a pre-registration nursing curriculum. This study however, adopted a different research design to that of Wright et al. (2008), although PETTLEP was still the same tool under scrutiny. The rationale for this programme of research was grounded in the positive initial results of the Wright et al. (2008) pilot study. These results indicated that PETTLEP had the potential to enhance clinical nursing skill performance – namely on a blood pressure measurement task. The change in research design in the present study was due to the structure of the nursing curriculum being changed following the Wright et al. study.

Specifically, the fundamental and key caring skills module, where the OSCE skills were taught and assessed, was taught over a 12-month period as opposed to the old schedule of three months. Wright et al. used a pre- and post measure design, which used the mock and real OSCEs as dependent measures. However, this was not possible in the present study, as the skills

were taught over a longer period rather than an intense shorter period as in previous cohorts. Therefore, the skills were taught progressively across the year. Within this time students also spent time away on placement. However, in the old structure the time was dedicated to academic contact alone, and students undertook one other module along side the fundamental and key caring skills module.

With the new structure, the acquisition of the skills was a gradual and progressive process, with the mock-OSCE being 1-week before the real examination. Therefore, it was not possible to gain a baseline measure of performance prior to introducing PETTLEP. There were a number of reasons for this: 1) it would be hard to identify a point across the year when all students were able to perform competently all of the skills to mock-OSCE standard; 2) If this were achievable, there would have then been the barrier of trying to get students and clinical facilitators to give up a whole day of their time for voluntary research. This coupled with having to pre-book rooms and facilities months in advance to ensure it coincided with academic contact time would have been unrealistic.

As a result, it was decided that no baseline measure would be taken across both conditions, and the final OSCEs scores would act as the dependent measure of the study. The intervention was therefore an experimental educational initiative, as it was featured along side a regular teaching curriculum. As result, its ecological validity was high, although, control of some variables proved more difficult compared to laboratory research

157

designs. This was so as the intervention had to adapt to the curriculum. However, this was a risk taken with the research design.

3.2 Design and Methods

3.2.1 Participants

Forty three pre-registration nursing students were used in an experimental group and fifty eight in a control group. All subjects were from the University of Chester nursing sites, who undertook a Fundamental and Key Caring skills module on their programme of study. All subjects provided informed consent for their OSCE results to be used for the final data collection. All imagery training sessions were provided as part of the regular curriculum, in curriculum time, for the Fundamental and Key Caring Skills module. None of the subjects had previously undertaken a programme of structured imagery training.

3.2.2 The Pre-registration Nursing curriculum

The programme of study was designed to ensure that completing students were fit for practice, fit for award and professional standing, and fit for purpose, according to statutory rules by the Nursing and Midwifery Council (2000). The programme embraced a broad view of health, which reflected local, national, international and global health initiatives. To facilitate this, it drew upon a range of disciplines to enable students' to recognise factors, which contribute to, and adversely affect physical, mental, and social well-being. It also recognised the essential need for preparation for work in a range

of health care settings. Therefore, a balance and integration of theoretical knowledge and skills for practice was clearly evident in its structure.

The programme comprised of foundation studies, leading to specialist branch studies. The key focus of the programme was to 'nurture' an autonomous nurse practitioner who could adapt to the dynamic nature of nursing. A cornerstone of the programme was personal development. Therefore, learning was to be student centred and reflective, building on prior learning to enable the student to take responsibility for his/her continuing professional development. Overall, the programme aimed to produce flexible, analytical, responsive practitioners with the necessary skills, knowledge, and attributes required for modern health care at that time and in the future.

The specific aims of the programme were to: 1) offer a dynamic and quality educational experience for all students; 2) develop and promote the skills of critical, analytical, and reflective thinking in students; 3) promote the ethos of life long learning and advance students' sense of personal responsibility and commitment to their ongoing education and development; 4) prepare students to be competent professional practitioners who were fit for practice through promotion of practice centred learning and the integration of evidence based theory and practice; 5) develop students to be fit for purpose through reflection of all aspects of the constantly changing service delivery needs of modern health care within a holistic health care model; 6) facilitate students to achieve fitness for award through flexibility in entry criteria, advanced standing recognition, and clear competency outcomes for all levels of study; 7) prepare

students' to be fit for professional standing through the promotion of responsibilities regarding professional conduct, accountability, ethical and legal obligations and respect for others (Diploma in Higher Education Nursing Pre-registration Programme Handbook, Sept. 2006).

3.2.3 Variables

The investigation had many variables to consider. Steps were taken to best control each variable in the investigation. The first of these concerned the group conditions, which had two levels – experimental and control. Each group was made up from two of the four sites. The four sites all provided nominally the same nursing programme and were part of the same qualifying institution, but were located across the Wirral and Cheshire. The group conditions were either a programme of structured PETTLEP-imagery training (experimental group condition) or continuation with the regular curriculum (control group condition). The experimental condition was featured as an addition to the regular schedule of teaching that they received as part of the Key and Fundamental Caring Skills module. The control condition was the regular scheduled curriculum that participants would have received anyway. The sites were randomly selected for the group conditions.

The teaching site also acted as another variable in the investigation, as not all students were taught together, but received exactly the same curriculum programme. Therefore, consideration needed to be given to this. Age was another key variable. Due to the programme's nature and level, it appeals to a diverse age range. This was apparent across the intake of all sites, and

normally is the case in nursing education enrolment. As a result, it was anticipated that there may be varying levels of academic and practical experience between students. Therefore, this could have an effect on performance.

OSCE performance was the dependent variable of investigation. This was used to identify between group differences based on the group conditions. In addition to this, imagery ability represented another variable, which could have had an effect on the group condition. This was measured prior to the intervention (see instrumentation section). Attendance, compliance, and understanding were also independent variables that could have impacted on the effectiveness of the experimental design. Attendance was controlled for by using a register to monitor attendance for all experimental group sessions. Attendance could impact on understanding if sessions were missed. Therefore, anyone who missed a session was brought up-to-date in the next session. This was done by a one-to-one or small group seminar depending on the number of students.

To control for overall understanding, students were always given the chance to ask questions throughout the session and also provide feedback at the end of each session. Towards the latter stages of the intervention in the run-up to the OSCEs, students were then broken into small groups each session to re-cap on the important information and also check compliance to understanding. The method employed to do this was subjective and was heavily dependent on participant honesty. However, as there was no objective

means to assessing understanding this was deemed the best possible method.

Compliance was controlled for by using an imagery diary and also activities to complete within the PETTLEP-Imagery handbook (see instrumentation). These were checked in sessions. It was not feasible to control for compliance individually, as participants could not be monitored outside of academic contact time. Therefore, this was the most realistic method of controlling this variable, which was coherent with previous imagery research (Wright et al. 2008). However, the diary and handbook activities were self-reports and thus subjective methods of assessment. Therefore, they greatly depended on participant honesty.

3.2.4 Instrumentation

3.2.4.1Fundamental and Key Caring Skills module

The module was part of the Foundation Studies Branch of the curriculum. The aim of the module was to introduce the students to Fundamental and Key Caring Skills and Care Management within a statutory, evidence-based, and inter-professional framework. The teaching and application of key skills corresponded to the requirements stipulated by the Qualification, Curriculum and Assessment Authority (QCA). The module aimed to introduce students to the theory and practice of a range of evidence-based key and fundamental caring skills, and to facilitate the acquisition of these skills in simulated and practice settings. Also, it aimed to encourage an appreciation of the relevance

of key and fundamental caring skills in client care across the age and ability continuum.

The learning outcomes clearly identified that by the end of the module students would be able to: 1) describe, discuss, and demonstrate principles and methods of effective communication and interpersonal relationships whilst demonstrating sensitivity when interacting with patients and clients; 2) demonstrate understanding of contemporaneous philosophies of nursing care and management within the framework of statutory and regulatory requirements, inter-professional teamwork and evidence based practice; 3) contribute to and participate in, the development, implementation and documentation of nursing assessments informed by contemporaneous evidence underpinning safe and effective nursing practice; 4) demonstrate the application of theoretical principles to a range of essential nursing practice skills; 5) apply the basic principles of pharmacology to the safe administration of drugs and patient medication; 6) examine personal strategies and approaches to lifelong learning, team membership and sensitivity to working with others in both classroom and practice settings. Also, recognising when further learning is required, and seeking support and supervision appropriately; 7) demonstrate basic numeracy skills for nursing practice and data management including safe and accurate drug calculation.

The module assessment comprised of: a written assignment (2000 words: 100% weighting); OSCE and oral examination (1 hour: pass/fail); Skills Inventory Booklet (pass/fail). All components of assessment had to be

successfully achieved in order to pas the module. Reassessment consisted of retrieval of the failed element.

3.2.4.2 The OSCEs

The OSCEs are a behavioural measure of competence in clinical skills in nursing. OSCEs are clinical in the sense that they focus on component psychomotor and communication skills used in the clinical situation. They are structured in the sense that each examination focuses upon a particular skill, for example, blood pressure measurement; temperature, pulse and respiration measurement; aseptic technique (preparation and procedure); oral medication; urinalysis or hand washing, which the student is required to demonstrate on a simulated patient in a controlled physical and temporal framework. The examination is objective in that trained examiners assess the student's performance using a structured assessment schedule that breaks the skill down into its component parts with marks allocated to these.

Five skills were taught on the Fundamental and Key Caring Skills module for assessment via the OSCEs. The module was taught over an 11-month period by clinical facilitators from the School of Nursing at the University of Chester. This period comprised of three trimesters. The three trimesters were divided equally between academic contact and placements. The taught clinical skills were: Clinical hand washing; Blood pressure measurement (BPM); Temperature, pulse and respiration (TPR); Oral medication administration; and Analysis of urine. These skills were assessed by an OSCE in Trimester three - at the end of the first academic year, by clinical facilitators at each site.

The OSCE required students to demonstrate competence in the range of core clinical skills that were taught, acquired, and evidenced in the Fundamental and Key Caring skills module. The students' knowledge, attitude, and performance of the skills were tested. This was done using a temporal and structured assessment schedule that broke down each skill into its component parts, with marks allocated to these based on the students competence and ability on the OSCE day (see appendix).

The OSCEs took place in the skills laboratories at each of the sites, followed by an oral examination. On the OSCE day students were not assessed on all five skills. Instead they were required to perform three out of the five basic skills, plus a calculation. These were allocated upon arrival for the examination via a station. There were three stations in total and students were randomly allocated to one of these upon entering the examination room, upon which they performed their OSCE. This was performed under exam conditions on a simulated patient who was anonymous to the student. Students conducted their OSCE wearing full uniform and had 30-minutes to perform the allocated skills at the station. The three assessed stations were: station 1) hand decontamination, TPR, BPM, early warning score; station 2) hand decontamination, urinalysis, calculation of fluid balance, BPM; and station 3) hand decontamination, administration of medication and drug calculation, TPR measurement and recording. All skills were marked out of 100. Students had to obtain a score of 70% or above on each skill and the calculation in order to pass the OSCE

3.2.4.3 Movement Imagery Questionnaire – Revised

Experimental participants were screened for imagery ability by administration of the Movement Imagery Questionnaire - Revised (MIQ-R; Hall & Martin, 1997). The MIQ-R is an eight-item inventory that assesses an individual's ability to perform visual and kinaesthetic imagery. The MIQ-R has been found to have acceptable concurrent validity when correlated with its earlier version, the MIQ, with r values of -.77, -.77 and -.87 for the visual sub-scale, kinaesthetic sub-scale, and overall score respectively (Hall & Martin, 1997). The negative correlation is due to a reversal in the scale since, in the original MIQ, the higher the rating, the harder a movement was to imagine for the respondent. Previous research (Smith & Collins, 2004), has excluded potential participants scoring lower than 16 (the mid-point, indicating moderate imagery ability) on either MIQ-R subscale due to an apparent lack of clarity in their imagery. In the present study this same benchmark was used as an indicator of an apparent lack of imagery ability. However, participants were not excluded from the study, and their performance and end results were closely monitored in respect to this.

3.2.4.4 PETTLEP-Imagery student handbook

A PETTLEP-imagery handbook was designed and provided to all experimental participants. The purpose of the booklet was to facilitate students learning experience and provide them with a hard resource to use in and outside sessions – as with a regular module handbook. It was an 84-page booklet that aimed to support them in using imagery. The handbook contained all resources from the sessions they received, along with additional material

that was geared towards structuring imagery training. The booklet was split into six sections: Section 1, Introduction and what is imagery?; Section 2, PETTLEP-imagery; Section 3, Tailoring your imagery; Section 4, Practising imagery; Section 5, Recording your imagery; Section 6, Additional information. The booklet provided structured information to guide each participant step-by-step through the imagery process, without actual contact (See appendix). It also contained key deadline and OSCE information and also the Wright et al. (2008) paper. The purpose of this was to provide students with evidence of the use of PETTLEP training with nursing skills in practice.

3.2.5 Procedures

Forty-three pre-registration nursing students received imagery training as an adjunct to their regular curriculum for the Key Fundamental Caring Skills module. This consisted of ten sessions, which took place across 3-trimesters in their first year of enrolment. Experimental participants were taken from two of the four University of Chester nursing sites. Arrowe Park and Leighton, both of which were the hospital based sites, were randomly selected as the experimental group in the investigation These sites received the exact same delivery and training, in the same weeks throughout the intervention. The control group (Chester and Warrington) had no knowledge of the investigation and received their regular curriculum as per the pre-registration programme.

3.2.5.1 Imagery training programme

The intended aim of the programme of imagery sessions was to provide a progressive and structured educational learning experience that would provide students with a basic theoretical and practical understanding of PETTLEP-imagery. The intention was they could then use this as an adjunct to their regular practice, in order to enhance their awareness, understanding and performance of skills.

Previously, nurse educators at the University had expressed concern regarding poor performance in the OSCEs, postulating that nerves and lack of confidence in the examination conditions were primarily responsible. Therefore, because of this Wright et al. (2008) conducted a small-scale research study that found positive results for the use of PETTLEP with some nursing psychomotor skills. Those results therefore underpin the rationale for this programme of research, in order to test the ideas further on other nursing skills.

3.2.5.2 Planning for imagery training programme

PETTLEP-imagery was implemented as part of the pre-registration nursing curriculum in attempt to further facilitate and enhance clinical psychomotor skill performance in the OSCEs. This had never been done before and was a broad task that required a lot of prior planning, preparation, and organisation. Planning for the intervention started in October 2007. This entailed contacting the four nursing sites and arranging a course of meetings with all the appropriate staff who taught on the first year foundation branch programme.

In these meetings the tutors were presented the proposed ideas and benefits of the research. They also were informed about the intended plan of imagery training and length of it. At that point the exact details of the content of the imagery training had not been devised, so proposed examples were provided which detailed the use of both practical and theoretical sessions.

All the staff was extremely receptive to the proposed ideas. Once they confirmed their participation the random selection of sites for experimental the conditions took place. Arrowe Park and Leighton were randomly selected as the experimental sites. This then meant liaising and organising advance contact dates, rooms and facilities with the specific site tutors across the 12-months. It was imperative that the dates of contact coincided in the same week for both experimental sites. The purpose of this was to rule out any potential biases and ensure that the experimental conditions were the same for both sites throughout. Preliminary dates were arranged across the 12-months. Therefore, contact with the experimental sites needed to be regular to confirm dates, rooms and also remind the tutors about the imagery training in particular sessions. Students were emailed to remind them of the sessions and also notices were put up in advance on the cohort notice boards.

3.2.5.3 Intended aims of the imagery programme

Given that the sessions were spread over 12-months, and that all students were new to the OSCEs and PETTLEP, it was imperative that the approach was simple. Therefore, the sessions aimed to be concise, informative, and progressive. It was also vital to provide appropriate examples and links to

nursing wherever possible. The purpose of this was to promote application and understanding of the taught ideas and principles.

The overall purpose of the programme was to 'ideally' educate students using a structured theoretical framework, to acquire a basic understanding of PETTLEP-imagery. From this it was intended that they could use and apply it both physically and mentally to aid actual and mental rehearsal for OSCE skills. It was also intended to create more awareness about skilled learning and how skills can be broken down into component parts, according to the senses used during these parts. This aimed to provide an increased understanding about the execution of skills and how to use the senses in relation to gaining feedback on correct and incorrect performance. The use of imagery also aimed to help students increase their confidence and reduce anxieties about performance in differing circumstances (e.g. exam conditions, on real patients etc).

As a whole the programme aimed to facilitate students' regular practice (e.g., practising the skill, reading about the skill, thinking about the skill), as previous research has shown that structured imagery – namely PETTLEP, in addition to normal practice can significantly enhance performance (Wright et al., 2008). It also aimed to increase knowledge and understanding about skilled performance, allowing students to become more confident in their psychomotor skill abilities. Also, the use and application of PETTLEP aimed to equip them with life-long learning skills that could be applied to other areas of skilled learning.

3.2.5.4 Programme of imagery sessions

Session 1 – January 08

This session was an introductory talk about the imagery programme. This took place in the students' second week of starting the pre-registration programme. The session lasted approximately 20-minutes, which was included as part of an introductory seminar to the pre-registration nursing programme. The purpose of the session was to introduce and inform the students about the OSCE process; and inform them about how imagery could help in the process of preparing for the OSCEs. This aimed to create interest and familiarity about the imagery training at an early stage. The students were given the opportunity to ask questions during the session. Following the session all feedback was very positive from both experimental sites.

Reflection upon the session

The session flowed as planned and students seemed extremely positive and receptive to the offer of additional support. However, as it was only the second week of enrolment, students were not familiar with the OSCEs and the expectations of that process. Therefore, it was considered that the OSCEs may have been unclear, and as a result students may not have fully understood what the aim of the PETTLEP support set out to do for them - despite the opportunity to ask questions. This was just a preliminary thought. A positive response from both experimental groups was apparent though, given they were new and were not to know the full expectations of the course at that early stage anyway. By targeting the cohort at that early stage it was

expected that they would be highly motivated and enthusiastic about starting the course. Therefore, it was anticipated that any additional opportunities would be embraced. As a result, it was felt that the session served its intended purpose.

Session 2 – February 08

Session two aimed to recap on what was discussed in the introductory talk. The purpose of this was to remind students about what the imagery sessions set out to do. This entailed giving a brief but detailed over view of the OSCEs. This had evidently not been done by the tutors, as all students had heard the term 'OSCEs', but didn't actually know the expectations of the process. The researcher spent 20-minutes describing the process, the assessed skills, and assessment expectations to the students based on the assessment schedule set out in their module handbook. Following this, students received an introductory lecture on PETTLEP-imagery (see appendix). The purpose of this was to educate and inform students at an early stage about imagery and its use, and more specifically PETTLEP-imagery. The lecture clearly outlined what imagery was; what PETTLEP-imagery was; how it could help improve performance; and finally the benefits of using it. The session refrained from going into all the theoretical underpinnings of PETTLEP (e.g., functional equivalence, psychophysiology), as it was felt students would be 'put off' and may misunderstand the content. Instead, the PETTLEP approach was presented as a framework of simulated practice, which offered alternative solutions to real practice. This was backed by practical examples which were demonstrated by the researcher (e.g., blood pressure measurement

demonstration, using equipment). This lasted for approximately 1-hour. Students were given a copy of the lecture slides as a hard resource. They were also informed they could ask questions at any point throughout the lecture. Students were also emailed a copy of the slides and given the opportunity to provide feedback on the lecture and its content after it had taken place.

Reflection upon session

The lecture went well and followed the proposed plan. However, a few considerations were made based upon observations within the session. Despite the material being simplified to a basic level, it was acknowledged that some students still may have found the content irrelevant or confusing. The reason being, the OSCE process had not been officially explained. Therefore, consideration is given to that fact that some students may have found it difficult to place the imagery material into context for its proposed purpose. Every effort was made throughout the session to convey clarity and understanding by using regular recaps and the use of appropriate nurse related examples.

The session might have worked better if students had received a full and thorough explanation of the OSCE process by the module tutors, prior to receiving the PETTLEP session. Upon reflection, this would have helped to reinforce the imagery ideas and its context. Therefore, a combined two hour session, with one hour dedicated to the OSCE process and the second to imagery and PETTLEP may have worked better. This may then have allowed

better understanding and application of the theory. This idea is only grounded in the assumption that maybe not all students followed the content effectively. Therefore, the session did follow the intended plan, although reflection promoted some ideas for improvement.

Session 3 – March 08

The purpose of this session was two-fold. Firstly, it recapped on imagery use and its benefits (from the previous session) - in light of the reflections made. This was an interactive recap where the researcher engaged the students by randomly selecting them to answer questions in relation to the keys points. The purpose of this was to engage their attention and also assess understanding from the previous session. This lasted approximately 20-minutes.

The second aim of the session was to look at how to measure imagery ability. This was a practical component in order to promote interest and application of theory. The purpose of this was to provide students with a measure of their current imagery ability and also broaden their awareness to using imagery. Therefore, students could experience using imagery in its different forms. Student's completed the Revised Movement Imagery Questionnaire (MIQ-R; Hall & Martin, 1997).

Students were each given a questionnaire and a work sheet. The questionnaire contained a brief introduction about the MIQ-R and the steps to completing it. The work sheet provided information in regards to what they

would achieve from completing the MIQ-R and what the information meant. It also contained instructions regarding what the students needed to do. Students divided themselves into groups of four and nominated one person to read out the instructions for each question. They then followed the procedures which were detailed on a handout and completed the task. Students were given 30-minutes to complete the MIQ-R. During this time the researcher observed and ensured all groups were completing the task properly. At the end of the task all questionnaires were then collected by the researcher for marking and would be returned to students in the next session. The purpose of this was to ensure that all scripts were scored properly. These were then returned in the next session to provide each student with an indicator of his/her current awareness and ability to use imagery. This session lasted approximately 1-hour in total

Reflection upon session

The session followed the intended plan well and the completion of the MIQ-R provided a practical element to the theory, which based on observations, students seemed to enjoy. It allowed greater promotion of awareness to imagery and its different forms (seeing and feeling) when performing skills and movements. It also allowed the students to engage in the task and apply the taught principles into a practical context. This promoted an appreciation of the practical application of imagery.

The purpose of this session was to focus on the individual assessed OSCE skills. Therefore, the focus had shifted onto the OSCEs as opposed to imagery. The intention behind this concerned the need to start assessing strengths and weaknesses in individual performance of nursing skills, in order to start structuring imagery training. In preparation for this session, a series of skills audits were designed. The purpose of these was to allow students to individually assess their own strengths and weaknesses for each OSCE skill - in relation to the marking criteria. There was a separate skills audit for each OSCE skill, which intended for each student to self-reflect on their current ability to perform each skill. By this stage all students had been taught all of the assessed skills by their tutors and performed the skills in both the academic and placement settings. On each skill audit, students were first instructed to rate themselves on their overall ability to perform each skill. Here, they had to tick next to the statement that they believed to best apply to their current ability at performing that skill. See example below:

Please tick next to the statement that you believe best applies to your current ability to perform testing and recording of urine:

☐ 1. Needs considerable attention
I struggle with this skill and need to put in considerable work to develop my performance of it

☐ 2. Needs attention
My ability to perform this skill needs to improve

☐ 3. Satisfactory
I am able to perform this skill well but my ability could be improved

☐ 4. Very Well *I feel confident in my ability to perform this skill and I can perform it consistently well*

Each skill was then broken down according to its individual task demands, as per the OSCE marking criteria. There were five categories of task demands: 1) verbal: *communication in the form of words;* 2) visual: *relating to vision or sight*; 3) motor: *the movement of body parts via contraction of the muscles*; 4) visuo-motor: *motor activity dependent on or involving sight or vision;* and 5) cognitive: *conscious intellectual activity such as thinking, judging, imaging or judging.* Therefore, the OSCE marking criteria for each skill were categorised according to their correct demand.

Students were each given an audit for the skills of hand washing and blood pressure measurement. They were also given a handout that contained the definitions for each task demand. The purpose of this was to clarify the meaning and elicit understanding about each category. Students were

explained the purpose and process of the audits prior to completion to ensure understanding. Students then had to rate themselves using the same likert-scale for each criterion listed in the category. See example for blood pressure measurement below:

Visuo-motor	1	2	3	4
Re-locate brachial artery and place stethoscope over the same				
Maintain good eye contact, and appropriate use of touch				
Check stethoscope to see if turned to diaphragm side				
Palpate radial pulse and inflate cuff until pulse disappears. Verbalise reading to examiner				
Inflate cuff between 20 to 30 mmHg above verbalised figure				
Deflate cuff slowly in controlled manner (2-3 mmHg/sec) whilst listening for systolic/diastolic readings – verbalise results to examiner				

A lower score (1-2) indicated that students felt their ability at that skill/aspect of the skill required attention; thus indicating a need to practise and improve. A higher score (3-4) indicated that students were content with their ability at that skill/aspect of the skill. However, they would still keep practising in order to further refine their performance.

At the end of each category students scored their total based on each criterion. The total depended on how many criteria were in each category, and this was then multiplied by four (the highest rating), in order to achieve a

grand total. A higher score (reflected by the grand total) indicated a higher

perceived ability in that category. A lower score (reflected by the grand total)

indicated a lower perceived ability in that category. See below for example:

	Verbal	**Visual**	**Motor**	**Visuo-motor**
Total				
	24	20	20	24

By using the totals from each skill audit, students could then identify the area

of task demands that required the most attention, according to their

judgement. Therefore, those areas would receive more attention when

structuring imagery for each skill in the later sessions. In doing this it meant

that imagery interventions would be individualised for each student – as per

the guidelines of PETTLEP. It also provided the student with a greater

awareness of how to break down skills into component parts, to identify their

stronger and weaker areas.

Students completed audits for the skills of hand washing and blood pressure

measurement. Students kept the completed skills audits for their reference

and were instructed to bring them along to the next session. The session

lasted 1-hour in total.

Reflection upon session

The session followed the proposed plan at one of the experimental sites. However, it slightly deterred at the other. Unknown to the researcher, the students at Arrowe Park had not yet seen the marking criteria for the OSCEs, despite having been taught the skills. Therefore, this made the task of the skills audits a lot harder than anticipated. The reason for this was because students had not yet seen the marking criteria in its complete procedure of events for all skills. As a result, there was some uncertainty about the skills audits as the criteria were all separated into separate task demands. The areas that seemed to cause the most uncertainty were the communication and visual aspects (e.g., observing patients/readings and verbalising the actions, talking through procedures whilst doing). Students had not yet encountered incorporating these aspects whilst performing the skill.

As a result of this, a lot of additional explanation was required, which resulted in the style of the session diverting to be more instructive and lecture based, as opposed to practical and letting to students get on with the task. Therefore, the audits took longer to complete than anticipated and the majority of students only got chance to complete one of them. Due to this factor, students were instructed to take the additional audit home to complete and bring it to the next session, where it would be checked.

Following the session, the researcher contacted the module leader at experimental site in question and sought permission to provide the students with copies of the marking criteria for each skill in the next session, which they

agreed to. The intention of this was to attempt to bring both experimental sites to the same level of exposure to material and presumably understanding.

Session 5 – April 2008

The planned purpose of this session was two-fold. Due to the issues at Arrowe Park though, the plan for this session was amended to accommodate for that. At the Leighton site, students were issued the remaining audits to complete for the skills of: temperature, pulse and respiration; oral medication administration; and analysis of urine. They were instructed to complete these in the same fashion as the previous two. Students had 40 minutes to do this. In the second part of the session students were issued their scored MIQ-R scripts, with a handout that explained the scoring and what it meant. Students could then identify their current level of imagery ability, in accordance to the scoring for the questionnaire. This reflected two separate scores for the two subscales (seeing and feeling). These scores would also be used by the researcher in order to monitor imagery use and final performance following the OSCEs.

Prior to issuing the questionnaires the researcher reminded the students that the MIQ-R was a subjective measure. Therefore, their individual scores represented the responses they gave, so individual scores could vary greatly as a result. At the end of the session each student was provided with a folder and instructed to keep all the completed skills audits, along with their marked MIQ-R script and bring it along to the next session.

At Arrowe Park, the session followed the same planned structure. However, upon starting the session, students were each issued with a copy of the OSCE marking criteria for each skill. The researcher used one skill as an example and instructed the group to refer to that marking schedule and skill audit. The researcher then worked her way through the marking schedule highlighting the procedures and the marks allocated to these. This was then linked to the skill audit in attempt to bridge understanding behind what the audits actually intended to do, in relation to the OSCE marking schedules. The researcher checked for understanding by providing opportunity for the group to ask questions. Also, questions were directed to the group about specific criteria and which category the belonged in and why. The purpose of this was to clarify understanding. The session then continued with the exact same procedures as the Leighton group. Arrow Park students were advised to start practising their skills in relation to the marking schedules, in order to become familiar with all of the assessed aspects.

The session lasted 1-hour in total. The next session was scheduled for June as students were on placement until then. Therefore, both groups were advised to keep practising their skills in relation to the marking criteria and also update their skill audits upon their last week of placement. The purpose of this was to monitor any improvement and be up-to-date in regards to areas for improvements upon starting the next session.

Reflection upon session

Both sessions followed the intended plan. However, the researcher's awareness was drawn to the fact that Leighton were at a slight advantage in regards to their understanding, given they had received the OSCE marking criteria sooner than Arrowe Park. This factor could well impact on their acquisition of the skills, as the Leighton group would be more familiar with the expected process. This factor could not be controlled for. However, appropriate measures were implemented upon its recognition. Therefore, this factor will be taken into consideration in the results and discussion.

Placements lasted for a period of six weeks in total. During this time the researcher sent out three emails to the students to prompt use of the material that had been provided so far. The first email was a summative email of the sessions so far. The purpose of this was to thank the groups for their attendance and hard work so far, and also prompt them to keep practising the skills and use the resources provided. All resources were attached in the email. The purpose of this was to account for misplacement of resources and also allow students to print new audits if they wished. Students were also informed that they could contact the researcher at any point with any questions, queries or feedback.

The second email was sent mid way through placement. The purpose of this was to check-in and remind students to keep practising their skills and keep referring to the information. It also reminded of the date for the next session and briefly outlined what the session intended. The final email was sent the

week prior to the scheduled session. The purpose of this email was to welcome the students back from placement and also remind them to bring all of their resources to the next session.

Session 6 – June 2008

The planned purpose of this session was to discuss the importance of practising the OSCE skills, despite the OSCEs still being 6-months away. The purpose of this was to raise awareness to the importance of the OSCEs assessment, to reinforce their importance, and keep students focused after being on placement. In the session students were instructed to use the information from the up-to-date skills audits, which they should have completed the week before. The purpose of this was to reflect upon their ability to perform the skills. The researcher acknowledged that not all students may have done this. Therefore, they were given the opportunity to do this at the end of the session. Students were instructed to split themselves into groups of four to discuss their practice efforts to-date. This included discussing whether breaking down skills into their task demands had helped in gaining greater awareness of individual strengths and weaknesses. Students were given 20-minutes to do this. During this time the researcher circulated around the groups to observe. At the end of the 20-minutes each group was then instructed to nominate a spokesperson to feedback their thoughts to the rest of the groups. This was informal discussion, geared more to benefit individuals that may not have started practising. Therefore, no data were collected based on the individual responses. This lasted for 40-minutes

in total. The remaining 20-minutes were then assigned to updating the skills audits, for those students that had not yet done so.

Reflection upon session

The design of this session was self-directed group work, with its purpose being to promote individual awareness to one's own and others progress so far. Based upon observations the session planned out as intended, as a lot of discussion and debate was generated amongst the groups. Upon reflection the session was useful and acted as a good way to break the students back into academic contact. However, it would have been useful to collect data based upon the group's responses.

At this point in the imagery programme, students had only received the background information about imagery and no structured imagery training had yet been provided. This was because upon starting trimester three in September (next scheduled session date), students were to receive their first full run through of the OSCE process by their module tutors. Therefore, structuring the imagery training to coincide with this would make the session more meaningful, relevant, and realistic for the students. Also, contact dates were more frequent from that point on as there was no placement. As a result, it was intended that things would piece together and start to make full sense from that point on in the run up to the OSCEs. Students went on placement and annual leave following this session until September.

Session 7 – September 09

Students had just returned from placement and were starting trimester three. Prior to this session, students had been formally introduced to the OSCE process by the Fundamental and key caring skills module leader. Here, they were provided with a hard copy of the OSCE marking criteria for each skill, and talked through what the OSCE process required and what to expect. The module leader had an OSCE station set up and demonstrated the procedure in full to them. This was the first time they had received this information from the module tutors.

At the start of the session students were each issued with a PETTLEP-Imagery resource handbook (see appendix). The purpose of the handbook was to act as a hard resource for students to refer to outside of lectures and sessions and support them in using imagery. The handbook contained all resources from the sessions to date, along with additional material that was geared towards structuring imagery training. The booklet was split into six sections: Section 1, Introduction and what is imagery?; Section 2, PETTLEP-imagery; Section 3, Tailoring your imagery; Section 4, Practising imagery; Section 5, Recording your imagery; Section 6, Additional information. Students were talked through the content of the booklet and each section. They were then directed to section three of the booklet and instructed to complete the activity by the following week.

The activity was response training (information in the brain which concerns stimulus, response and meaning propositions regarding the task at hand:

Lang, 1979), which entailed the student identifying and detailing the key senses they use during each OSCE skill. Each skill was tabulated and students were required to note down any: feelings (e.g., nerves, confidence), physiological sensations (e.g., heart beating fast, shaking hands), touch (e.g., tight grip on gauge), kinaesthetic sensations (e.g., muscle tension in fingers and arms), sights (e.g., ear pieces on stethoscope right way round), smells (e.g., antibacterial hand wash), sounds (e.g., velcro fastening on cuff), and talking (e.g., communication with patient, verbalising readings) they associated with each skill (see example below).

Skill: Blood Pressure Measurement

Senses	Key words associated with senses used during performance
Feelings	*E.g. Nervous/apprehensive about getting the reading right,*
Touch	*E.g. Tense and controlled fingers when releasing gauge, cold metal on stethoscope,*
Sight	*E.g. Arm resting comfortable in correct position; focus on gauge, eye contact when communicating with patient, check ear pieces on stethoscope right way round*
Smell	*N/A*
Sound	*E.g. Noise of velcro on cuff; pumping; pressure release; tapping sound for readings*

The purpose of the response training activity was to ensure all imagery content was individualised for each student, to ensure meaning once their imagery training was structured. The researcher talked students through what they were required to do and directed them to the examples in the booklet for ideas. The booklet also contained a 10-week count down until the OSCEs. This featured a weekly schedule, where students could record and monitor their practice and imagery in the run up to the OSCEs. Students were directed to this and awareness was drawn to the fact that they needed to record all practice and imagery. The purpose of this was so that they could review the amount of practice time they had engaged in and also allow the researcher to review their activity. This session lasted 1-hour in total.

Reflection upon session

The session fulfilled its intended purpose, which was supported by the official run through of the OSCEs process before hand. From observations it was apparent that students appeared very assertive throughout and began to ask more questions, compared to previous sessions.

Session 8 – October 08

This was a scheduled drop-in session which the tutors had arranged. The intention of the session was for students to practise their clinical skills with the three OSCE stations set up. Students were instructed to attend the session in their uniform. The purpose of this was to promote a professional and serious working environment. The equipment was available in the delegated room 9am – 4pm (drop in session) for practice purposes.

The intended aim of the imagery session was to work within the drop-in

session. Therefore, in between practising their skills students could break off

into small groups in order to run through tailoring their imagery and the

imagery process (see figure 6). The researcher was informed that an

academic member of staff would be present during the course of the session,

in order to assist students should they need it.

Step 1	Use the PETTLEP-imagery guidelines and look at the specific examples for skills	*Booklet p. 20 – 22*
Step 2	Use the information from the skills audits to identify your strengths and weaknesses	*Booklet p. 34 - 52*
Step 3	Use the key senses information you recorded and read over it before performing imagery of each skill	*Booklet p. 26 - 31*
Step 4	Image your way through the performance of each skill, focusing attention towards your weaker areas	
Step 5	To strengthen your imagery, perform the skill for real first, and then perform your imagery straight after. This will allow reflection on your performance	
Step 6	Do this process 3 times per week for the next 10-weeks & record it in your diary	*Booklet p. 61 - 71*

Figure 6: The imagery process

190

The imagery process was issued as an A5 handout. Its purpose was to act as an index to the handbook - hence the page numbers next to each step. It was designed so that students could navigate their way to the most important information in the handbook, which related to 'how' to perform their imagery. The remaining information contained within the booklet was still of good use though, and could support them in more depth in the process.

Step one of the process concerned the student using the PETTLEP-imagery basic guidelines and specific examples for skills, in order to create understanding and generate ideas for their imagery practice The PETTLEP-imagery guidelines concerned: wearing uniform during imagery (Physical component); adopting the correct stance as you would for each skill during imagery (Physical component); performing imagery in a realistic environment (Environmental component); using the specific equipment or implements during imagery (Physical component); imaging the skill as vividly as possible, attempting to recreate any feelings, touch, sights, smells, sounds, and talking associated with the skill (Physical, Task, and Emotional components); and imaging the task in the correct timing as when performing it (Timing component).

Using the basic guidelines, the specific examples for each skill then provided ideas of how students could potentially fulfil each PETTLEP component when performing imagery of the skill (See example below).

Blood Pressure	Example
*Ph*ysical	Wear uniform, use sphygmomanometer/stethoscope and hold pump or use something to hold in hand that you believe to resemble the feel of pump and image it as vividly as possible. Also image the smells you associate with the task, the sounds you would normally hear and the verbal information communicated, as vividly as possible
*E*nvironmental	Perform imagery on ward or in an environment that has some meaning to you for this skill
*T*ask	Attentional demands - e.g., Visual, motor, verbal, visuomotor, cognitive. See skills audits to identify your stronger and weaker areas. Focus imagery on weaker areas in particular
*Ti*ming	Image actions with correct timing (e.g., pumping, pressure, pulse count, release)
*L*earning	Image task a bit better than your ability of performing it
*E*motional	Imagine the relevant emotions/arousal you experience during the skill (e.g., hands shaking, heart beating fast etc)
*P*erspective	Image the sight and feel of the task in as much detail as possible

The purpose of the basic guidelines and specific examples was to remind students of the PETTLEP components and place then in context in relation to the skills and begin to utilise them.

Step two of the process required students to revisit the skills audits they completed in sessions four and six. These were also featured in the handbook as a refresher. From the skills audits students were required to recap on their individual strengths and weaknesses for each skill. Students were provided with a tabulated worksheet for them to bullet point their strengths and weaknesses for each skill. The purpose of this was so that they were all on one reference sheet. Students could then use that sheet prior to imagery without having to flick through the booklet or the individual skills audits.

Step three of the process then required students to refer to their response training for each skill. This was the activity they completed within the booklet. The purpose of this was to refresh their mind regarding the key senses they recorded as using during the performance of each skill prior to performing imagery. Following this, step four then instructed them to image their way through the skill as vividly as possible, focusing specific attention on the weaker areas identified in the skills audits. To further reinforce imagery, step five of the process recommended performing the skill for real first, followed by imagery straight after. This was to allow reflection upon actual performance and to strengthen the memory traces used during performance. Also, it would allow for correction of any mistakes immediately after. Step six instructed to perform the imagery process three times per week and record all efforts in an

imagery diary. The imagery diary was provided as part of the PETTLEP-imagery handbook. This guidance was consistent with previous PETTLEP work of Smith et al. (2007).

Once the imagery process had been explained, students were asked if they fully understood the process and were given the opportunity to ask any questions. Once all students had responded assertively to understanding the process, they were then instructed to carry on practising their skills in combination with performing the imagery process for the duration of the session. They were informed to perform the skill first, and then perform their imagery straight after using the guidelines. All students were informed of the imagery process during this session. A morning and afternoon register was taken to monitor student's attendance.

Leighton Set up

At the Leighton site students were set up in the clinical skills lab for the duration of the drop-in session. The clinical skills lab was a mock hospital setting with bed cubicles, curtains and full equipment. A tutor was present for the duration of the session. Students were instructed get into groups of three and take turns in adopting the following roles: 1) the nurse – to perform the skills under examination conditions; 2) the patient – the nurse would perform skills on and; 3) the assessor – mark the nurse accordingly using the OSCE marking criteria. Following the completion each skill, the student acting as the nurse would then make a list of points that they believed they had got wrong during their performance. They would then compare these with the assessor

and take note of areas for improvement. The group members would then swap roles. The session was a form of self-directed practice. However, the presence of the tutor allowed students to seek advice on anything they may have been unsure of. It also made the session more formal and also ensured they used the time properly.

Arrowe Park Set Up

At Arrowe Park site the allocated room was a classroom and there was no equipment present upon arrival. At the start of the session the tutor attended and informed the group that she would be in her office for the course of the day. All responsibility for the session was then appointed to the researcher. This entailed collecting the equipment, setting up the room into a mock-OSCE set-up, taking the register and also instructing the students on how they should proceed and use their time. This was not in the intended schedule, although the researcher adapted to meet the needs of the students.

Students were instructed about the procedures they should follow. These were based upon the observations made at Leighton site the day before. Students were instructed that they were to all see the researcher at some point within the session to go through structuring their imagery training.

As per the Leighton site, all students undertook the same activity. However, the absence of the tutor meant that students were directing specific skill based questions to the researcher. The researcher answered questions

where possible, although she could not be exact in her answers, given the tutor was to asses them finally and possessed a greater degree of specific knowledge. During the course of the session the tutor came in on a couple of occasion's check how everything was going.

Reflection upon session

Both site sessions followed the intended plan in regards to structuring imagery training. The small group explanations worked well and helped to control for individual understanding to a higher degree, compared to a large group discussion. Based on observations of student's responses, it appeared that the process and all the steps from the previous sessions had all clicked into place. The only measure for this was through the reinforcement of positive responses. Although, if the researcher felt that any student appeared unsure, she would continue to confirm the student's understanding until she felt satisfied.

In regard to the session set up and supervision available, it was anticipated that both would be identical for both sites. However, this was not the case. Awareness was drawn to the lack of supervision at the Arrowe Park site in comparison to Leighton. Arrowe Park was also a much bigger cohort in comparison to Leighton. Therefore, this factor would be observed and considered in relation to the end OSCE results.

Session 9 – November 08

This again was a drop-in session scheduled by the tutors at each site. It was to follow the same procedures and set-up as the previous session. Students were instructed to attend wearing their uniform and bring all their imagery resources with them. Students followed the same procedures as in the previous session and practised their skills and performed their imagery during the time they attended. The researcher observed throughout the session and would approach individual groups to see how they getting on and give them opportunity to ask questions. Students were reminded throughout the session not to hesitate in asking any questions regarding practising the skills or performing their imagery. A register was taken to monitor attendance.

Leighton set-up

The set-up was exactly the same as in the previous session in regards to the room, facilities, tutor presence and supervision.

Arrowe Park

The set-up was exactly the same as in the previous session in regards to the room, facilities, and tutor supervision. The researcher was again left responsible for setting up and directing the session. Although, the tutor did not attend the session and instead left a message on the whiteboard to advise that they were in their office should anybody require assistance.

Reflection upon session

Again, both site sessions followed the intended plan and mimicked the events

of the previous sessions. Although, the researcher was again drawn to awareness of the lack of tutor supervision at Arrowe Park, given the group was a lot larger. Also, it was observed that an increasing number of students were directing specific questions regarding the assessment process and technicalities of skills to the researcher. In a lot of cases the researcher was unable to provide definite answers, which led to students taking time out of practice to find the tutor. Also, it was thought that the students may not have taken the session as seriously due to the lack of tutor supervision. This was sensed by the change in the students' behaviour when the tutor would come into the room, as they appeared more assertive. The environment of the sessions was supposed to mimic a mock-examination, although without tutor presence this was hard to control for, as some students took it less seriously. Again, these are factors that will be taken into consideration in relation to the outcome of results and discussion of the results.

Session 10 – November 08

This was the final session prior to the mock OSCEs, which were to take place the following week. The real OSCEs were to take place the week after. Again, this was a compulsory session scheduled by the tutors where the equipment was available 9am-4pm and the OSCE stations were set up for the students to practise. As in the previous sessions, students attended wearing their uniform and practised their skills and performed their imagery during the time they attended. At the start of the session the researcher conducted a small talk to the students. This outlined the fact that it was the last session, and reiterated the key points of using the imagery process in conjunction with

regular practice - at least 3-times a week. The purpose of this was to prompt awareness to its importance and the additional benefits that could be achieved from it. Students then practised their skills and imagery in small groups, as in previous sessions. The researcher ensured that she spoke to each student individually during the course of the session. The purpose of this was to ensure they were up-to-date and were confident about using the imagery and knew exactly what to do. Following this session, students were no longer required to attend University for direct teaching time. Therefore, any other practice would have to take place in students' own time. Students were reminded to record this practice in their booklets, along with their imagery. They were then informed that the booklets would be collected in once they returned in January.

Leighton set-up

The set-up was exactly the same as in the previous session in regards to the room, facilities, tutor presence and supervision.

Arrowe Park set-up

The set-up was exactly the same as in the previous session in regards to the room and facilities. The researcher was again left responsible for setting up and directing the session. Although, the tutor did attend for the last hour in order to speak to the students prior to the mock OSCE.

Reflection upon session

Again, both site sessions followed the intended plan and mimicked the events of the previous sessions. However, the same observations were made at the Arrowe Park site. As previously acknowledged, these factors will be taken into consideration in relation to results and discussion of the results.

3.2.6 Data analysis

Analysis of Variance (ANOVA) was conducted in order to analyse between group differences of OSCE results from the experimental and control groups. A one-way ANOVA compared group differences in relation to overall performance of the three OSCE skills. A one-way ANOVA also compared group differences in relation to the performance on the three different OSCE stations. Independent t-tests were conducted to make comparisons between the experimental sites in regards to MIQ-R scores.

3.3 Results

The following section will present the results of the study. These will be described and presented according to each measure and type of analysis used.

3.3.1 MIQ-R

Independent t-tests were conducted to compare mean scores between the experimental groups for both the visual and kinaesthetic subscales. The t-tests revealed no significant differences between Arrowe Park and Leighton

on kinaesthetic imagery ability, $t(46) = .186$, $p > 0.05$ and visual imagery ability, $t(46) = .1.047$, $p > 0.05$.

3.3.2 OSCE results

A one-way analysis of variance was conducted on student's scores (skill 1; skill 2; skill 3) by allocated station between the control and experimental groups. Descriptive data revealed that students who were randomly assigned to station one for assessment scored higher on all three skills, compared to the other stations ($N = 34$, skill 1, 98.41±3.62; skill 2, 84.14± 22.02; skill 3, 86.79 ± 21.72). See descriptive statistics for skill x station below:

Descriptive Statistics

	Station	Mean	Std. Deviation	N
Skill1	HW/BP/TPR	98.4118	3.62748	34
	HW/BP/UR	97.0937	5.03125	32
	HW/TPR/MEDS	98.1714	5.36045	35
	Total	97.9109	4.72038	101
Skill2	HW/BP/TPR	84.1471	22.04971	34
	HW/BP/UR	72.8438	34.03709	32
	HW/TPR/MEDS	84.0857	18.47951	35
	Total	80.5446	25.75792	101
Skill3	HW/BP/TPR	86.7941	21.72944	34
	HW/BP/UR	82.2813	25.34184	32
	HW/TPR/MEDS	86.7714	18.76807	35
	Total	85.3564	21.88816	101

The following figures display the mean scores for students for the skills on each assessed station:
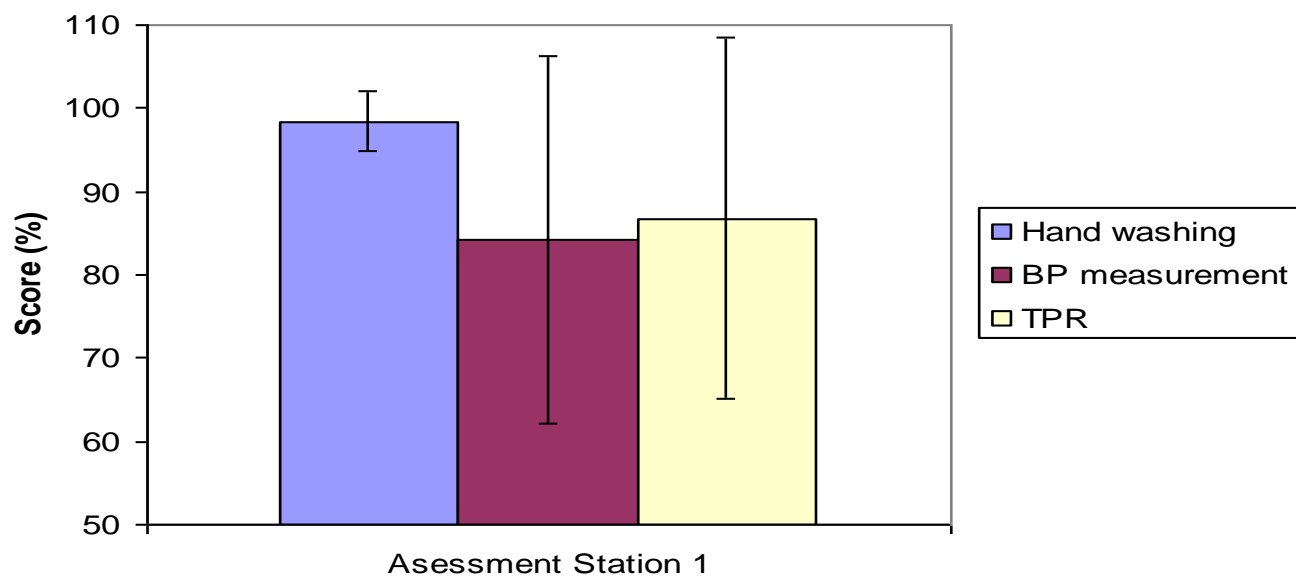
Figure 7: Mean skills scores for experimental and control students assessed on OSCE station one
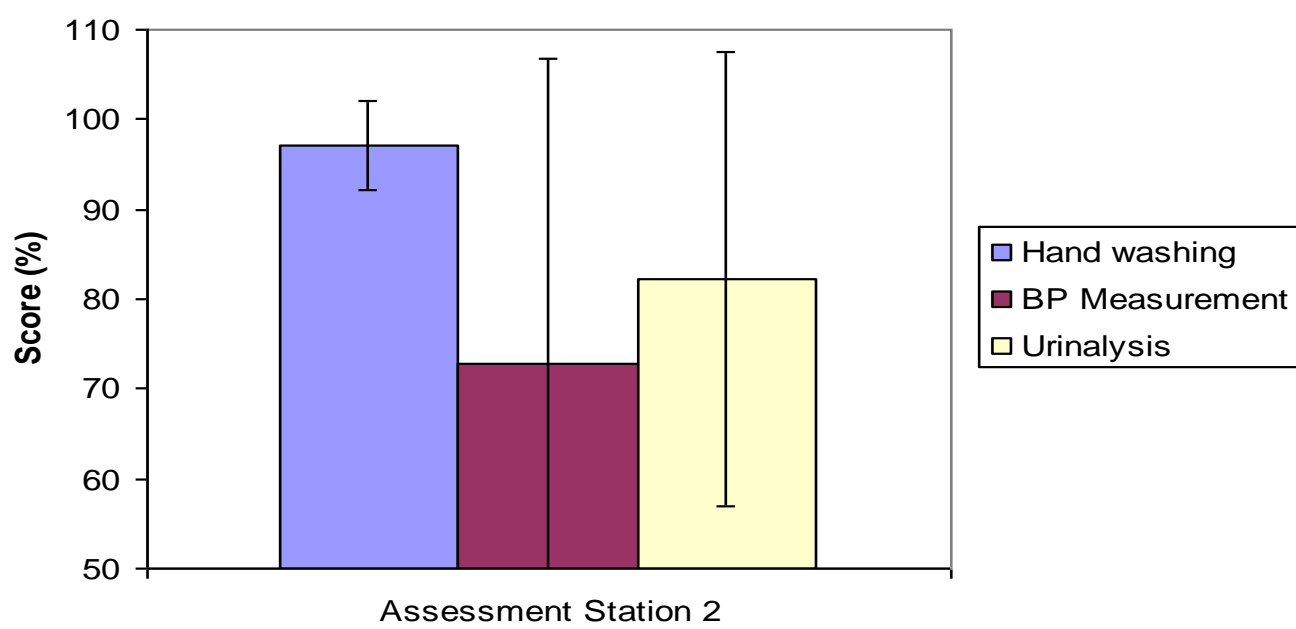
Figure 8: Mean skills scores for experimental and control students assessed on OSCE station two
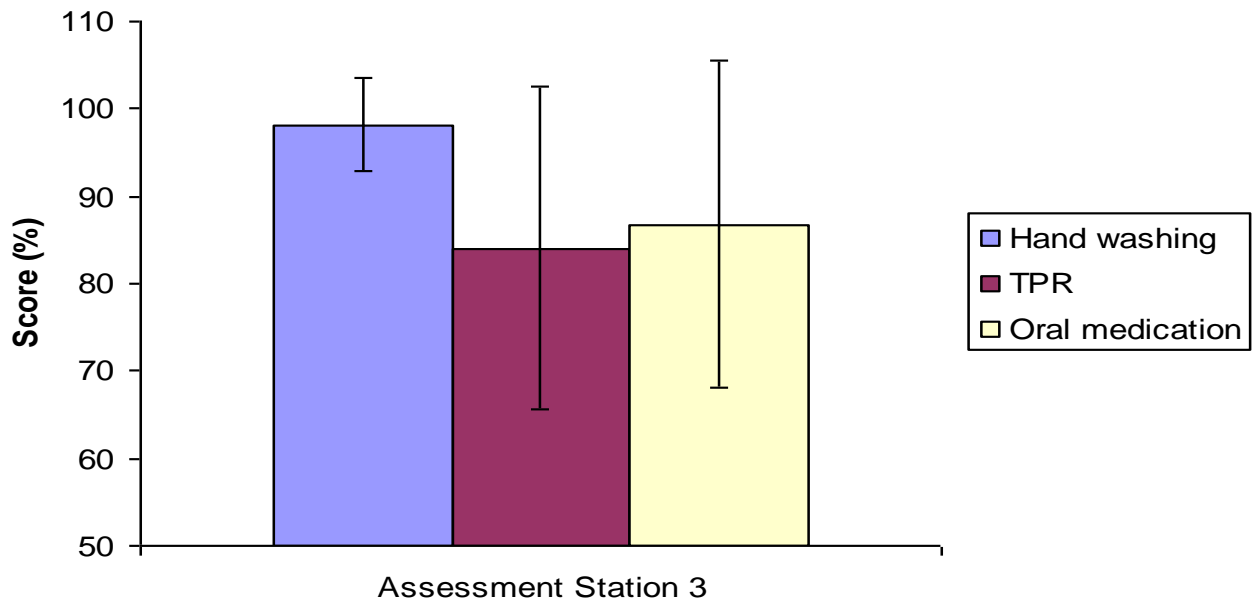
Figure 9: Mean skills scores for experimental and control students assessed on OSCE station three

However, the station x skill analysis showed no significant differences on performance of the three skills in regards to the three stations: skill 1, $F(2) = .554$, $p = .554$; skill 2, $F(2) = 1.973$, $p = .145$; skill 3, $F(2) = .327$, $p = .722$.

The ANOVA showed no significant between group differences for skill one (hand washing on all three stations), $F(1) = 9.19$, $p = .003$. The ANOVA also showed no significant between group differences for skill two (blood pressure measurement – station 1 and 2, temperature, pulse, respiration measurement – station 3), $F(1) = 2.78$, $p = 0.98$. Therefore, there were no significant differences in performance between the control and experimental groups for performance on skills one and two (across all stations) in their final assessment.

See descriptive statistics for group x skill below:

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Skill1	experimental	43	96.2791	5.94549	.90668
	Control	58	99.1207	3.08975	.40570
Skill2	experimental	43	75.3256	29.95053	4.56741
	Control	58	84.4138	21.61549	2.83825
Skill3	experimental	43	76.5116	28.61183	4.36326
	Control	58	91.9138	11.59898	1.52302

The following figures display the mean groups scores for overall assessment on each skill:
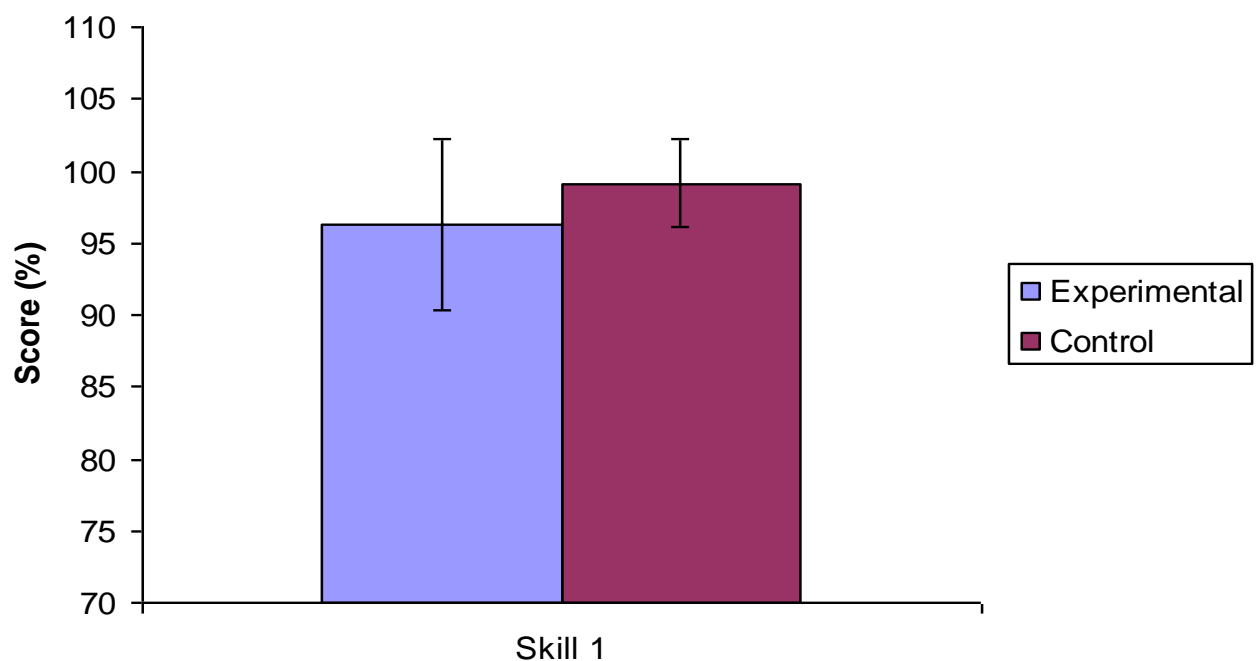
<u>Figure 10: Mean experimental and control group scores for assessment on skill 1</u>
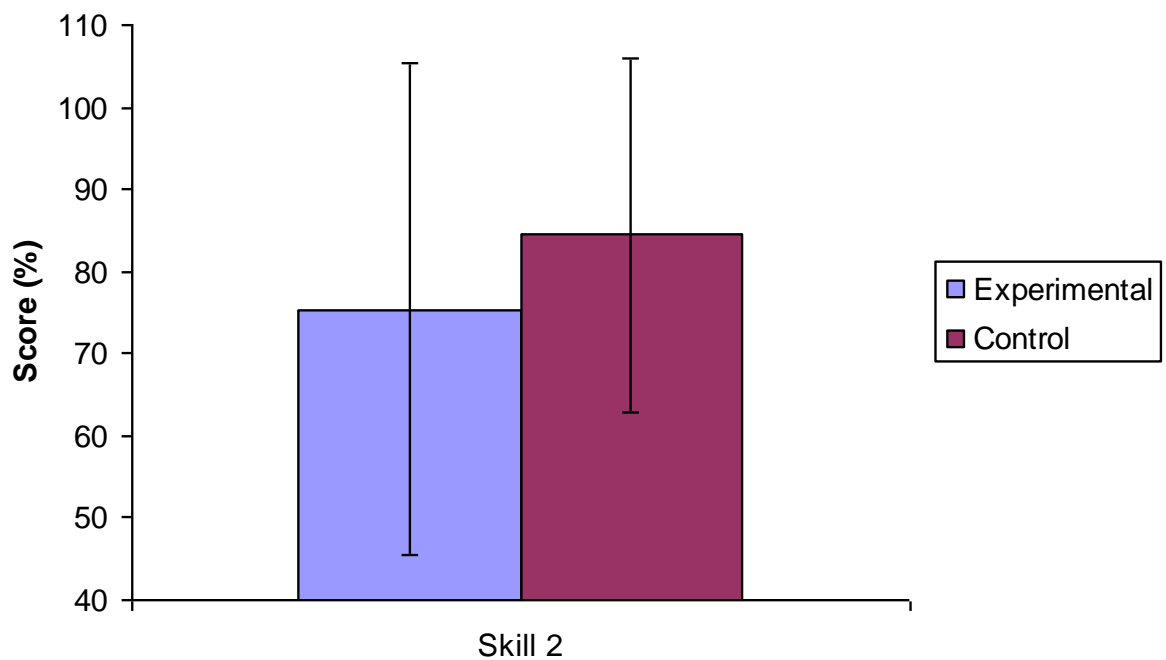
Figure 11: Mean experimental and control group scores for assessment on skill 2

The analysis for skill three (Temperature, pulse, respiration measurement – station 1; vs. analysis of urine – station 2; vs. oral medication administration – station 3) however was significant, $F(1) = 13.22$, $p = <0.01$. Therefore, a significant difference between the control and experimental group was apparent for performance on the third skill (across all stations) in their final assessment.
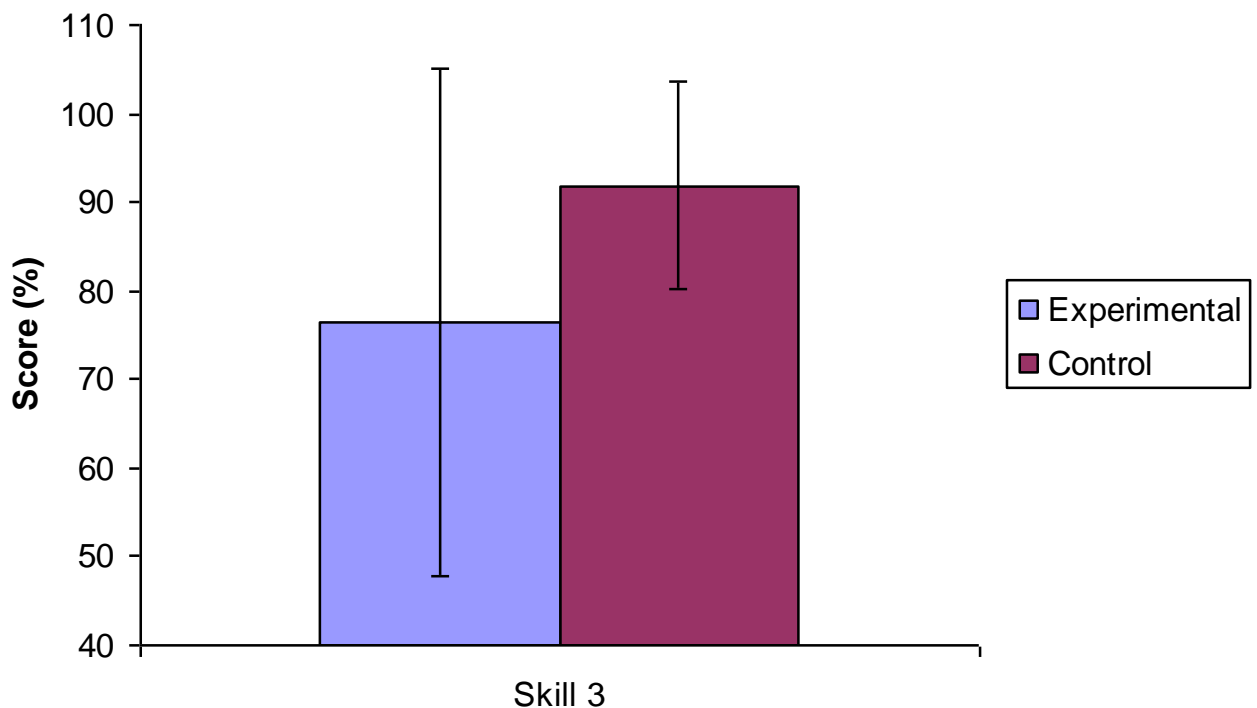
Figure 12: Mean experimental and control group scores for assessment on skill 3

3.4 Discussion

The results indicate that the PETTLEP imagery intervention did not significantly enhance OSCE performance for the experimental group compared to the control group. Mean data revealed that the control group actually performed better than the experimental group on all skills collectively. A significant difference was also evident on the performance of the third assessed skill for the control group. Despite this, the validity is questionable as the third assessed skill on each station was different. Therefore, variation in the nature and demands of the task would have been different, along with the marking schedules.

The assessment structure of the OSCEs meant that students were not assessed on all skills. Therefore, it was difficult to make direct comparisons between groups for performance on skills. This was only possible for skill one on all stations. Skill one was hand washing for all stations, as hand decontamination comes as the first procedure before the performance of any clinical skill in nursing.

It is fair to postulate that the curriculum must assume the complexity of all the OSCE skills to be equally matched. The reason for this is because students are only assessed on three out of five skills. Therefore, successful competence on the three randomly assessed skills on the assessment day assumes total competence on all skills. Consequently, in order for the curriculum to represent a fair, equal and valid means of assessment, it would not be acceptable to make the standards and expectations for some elements of the same assessment harder than others.

The philosophy underpinning the course and assessment procedures for the programme used in the present study outlines that the course is designed to ensure that completing students are fit for practice, fit for award, fit for professional standing and fit for purpose as laid down in statute rule 18A (NMC; Statutory instruments, 1989 No. 1456 (appendix 2) and published national reports – Fitness for practice (preach, 1999) and making a difference (D.O.H. 1999). If this is the case, a fair and equal assessment procedure is a logical assumption. Therefore, based on the programme's outlined philosophy it is assumed that the expectations and demands of the tasks at hand were

equal. However, the present results would be more valid and reliable should students have been assessed on each of the individual skills. This would have allowed greater direct comparisons of performance.

The present results were not consistent with the findings from the original pilot (Wright et al. 2008), which tested PETTELP on two clinical skills – namely blood pressure measurement and aseptic technique. The results of Wright et al. (2008) showed significant differences between the PETTLEP and the control group on the blood pressure measurement task, with the PETTLEP group performing significantly better. Wright et al. (2008) encouraged that PETTLEP should be further applied and tested on all clinical skills for the OSCEs. Individual skill comparisons therefore would have added more knowledge to the findings of Wright et al. who stipulated that PETTLEP-imagery may in fact work better on highly skilled nursing tasks (e.g. blood pressure), as opposed to those that rely more heavily on recollection of procedure (e.g. aseptic technique). This highlights the comparison between a controlled experimental design and real life.

Contrary, to the original hypothesis the overall results of the study were surprising. This was true in two respects given that: 1) there were no significant differences between the control and experimental group, and 2) the control group actually performed the best overall, in accordance with the descriptive data. This was unanticipated given that all sites were delivered the same compulsory curriculum. Also, the curriculum's intended purpose of

Fundamental and Key Caring Skills module was to prepare and equip pre-registration nurses to be fit for practice and to pass their OSCE assessment.

The experimental groups received an additional ten hours of extra tuition and additional detailed resources. It is a valid expectation that the curriculum alone should have been adequate enough to prepare students for passing their OSCE. With the previous positive research findings of PETTLEP to-date, it was logical to hypothesise greater performance by the experimental group when using the two methods together.

Therefore, it is postulated that the present results are concerned with one or more of the following: 1) the PETTLEP intervention; 2) the curriculum; or 3) other unknown factors.

At its most basic level it could have simply been that the PETTLEP intervention was not adequate enough to facilitate performance. However, the imagery training was structured and detailed in accordance with the proposed theoretical components and underpinnings of the PETTLEP-model. A major part of this concerned the inclusion of Lang's (1979, 1985) Bio-informational theory. This was the use of stimulus-response propositions to individualise imagery training in order to make it meaningful to participants. This was featured as part of the handbook that the experimental participants received as part of the intervention. The concept behind this was to strengthen the individual mapping of the internal representations of the motor programmes for OSCE skills (Schmidt, 1975). The rules of motor mapping indicate individual differences; thus interventions must be individually tailored to suit

learning needs. Research has shown that as learners practice is imperative to establish correct relationships between visual input and motor output, in order to then adapt to visuomotor arrangements (Schmidt, 1975). Therefore, once this is acquired, competent performance of the visuomotor arrangement may strengthen (Ghahramani & Wolpert, 1997), allowing familiarity in the internal representation of skills. Therefore, this enables the visual display/input and appropriate motoric response to be recognised and executed.

These are typical processes that are attributed to the acquisition of psychomotor skills in order to form a well defined kinematic "internal model" or schema. Therefore, the inclusion of response training in any PETTLEP research is imperative to elicit meaningful imagery training for participants.

This was a featured prerequisite in the design and use of the PETTLEP intervention. However, the amount of practice undertaken represents a key indictor of the success of S-R training (Lang, 1979). Upon reflection of the intervention, it became apparent that rather than being an experimental condition as such, it represented more of an educational initiative. This was largely due to the context it was used in, as the intervention had to mould to the structure of the curriculum. Therefore, the intervention had to accommodate for any last minute changes that were induced by the teaching staff of the curriculum. That meant it was harder to tightly control the intervention, as the curriculum dictated the contact time with participants and the length and frequency of that. However, this was a risk taken with the research, especially when applying an experimental research design into real life practice. As a result, compliance to the intervention proved a more difficult

task to control than anticipated. Upon reflection of the imagery diary data it was evident that there was a very low compliance for logging the training completed, hence its lack of inclusion in the results.

Therefore, if training was not logged it is assumed that compliance to doing it in accordance with the instructed guidelines was unlikely. If this was the case the representational model of imagery for skills may not have been developed for some students. Therefore, the stimulus-response propositions may not have been internally reinforced.

Lang advocated that an effective imagery programme must include both stimulus and response propositions in order to be meaningful and effective for the individual. This was satisfied in the present study as the response training was tailored individually through handbook activities and also small group workshops. Lang also proposed that frequent access of the response propositions for the scenario in question, and modification of them for their purpose, allows for increases in actual performance. The skills audits used in the intervention aimed to do this and allowed for personal observation and progression during the stages of learning. However, the overall power of the audits depended on student's individual motivation and compliance with the procedures. Given that overall compliance for the imagery diaries was poor, the use and effectiveness of the response training is also highly questionable.

The use of diaries to record practice followed procedures used in previous PETTLEP research (Smith et al. 2001, Smith et. al, 2009; Wright et al. 2008).

However, the sample size in the present study was a lot larger compared to those studies. Also, given the context of the experimental design, it proved a lot harder to control compliance compared to lab-based controlled PETTLEP research.

A key factor for discussion in relation to the findings concerns the environmental structure for practice and assessment of skills. At the institution in question, teaching staff had previously acknowledged that the simulated environment for the OSCEs had commonly been a factor that could have detrimental effects on OSCE performance. This was true for a number of cases across previous cohorts and was largely due to nerves induced by the simulated examination setting and the perceived requirement of having to 'act' in that environment. As a result, such factors underpinned the initial rationale for the Wright et al. pilot and the present empirical work.

Lang (1979) suggested that familiarising one self with environmental surroundings for the performance of tasks should more effectively access the correct motor representation. As a result, such behaviour should help to reduce stress and anxieties during real performance as the motor programme should be better formed and more familiar. Recent research has supported this in the sporting domain using PETTLEP-imagery. Such research has demonstrated the effectiveness of video and audiotape in enhancing imagery performance in golf putting (Smith & Holmes, 2004). Also, performing imagery and practice in the exact or similar environmental context has been shown to have greater performance enhancing effects compared to control conditions

using the normal scripts alone (Smith et al. 2007; Smith, Wright & Cantwell, 2008, Wright & Smith, 2007).

In light of the above research findings, observations during the intervention indicated that the assessment environment and practice environment (placement and academic settings) for OSCE skills differed some what in regards to their environment. As a result, the simulated OSCE setting appeared to off-guard some students in the lead up to the assessment. In skilled learning it has become increasingly evident that such environmental differences can directly affect behavioural activity (Naden, 1990). This is so, as the recall schema would be slightly different for each context. Consequently, if students struggle to apply their skills knowledge within the normal learning context, it could be argued that their schema based on the initial assessment conditions (e.g. the simulated OSCE assessment environment) could impact on behaviour to perform tasks as rehearsed in the classroom setting. Therefore, this may have had a direct effect on the overall result of the action (its success or failure).

Furthermore, if this relationship was not well formed from motor performance of the skills alone, then it would most definitely prove difficult to access the recall schema in an unfamiliar environment (Jeannerod, 1999). This is so, as internal mapping of the skill may not be developed competently. Consequently, recognition may then prove a difficult task when formulating central coding for motor imagery of the skills.

Another possible argument could concern the nature and characteristics of the skills. Closed skills are skills that take place in a stable environment and the performer knows exactly what to do and when, at self pace (Chaiken, Kyllonen, & Tirre, 2000). This is also known as closed loop theory (*see* Schmidt 1975, chapter 2)*.* Therefore, such skills are not affected by the environment and tend to be habitual and follow set patterns and procedures, with a clear beginning and end. Therefore, in practice the OSCE skills were closed skills as they followed set procedures as per the marking criteria and took place within the same classroom environment at self pace. However, it could be argued that what were closed skills in practice actually became open skills in the assessment environment.

Open skills are characterised by a constantly changing environment, so movements have to be continually adapted (Chaiken, Kyllonen & Tirre, 2000). Therefore, skills are predominantly perceptual and externally paced. Consequently, the assessment environment of the OSCEs was different to the practice environment, as: 1) students were not familiar with the surroundings; 2) students were not aware of the skills they would be allocated on the day; and 3) students were timed doing the skills as they had 20-minutes to complete the assessment process. As a result, the demands of the skills may have shifted as a result of the environment causing deviations from the regular schema.

Higher level schemas (broader representations) control the selection and activation of lower level schemas. Therefore, higher level schemas represent

action plans where the serial order of the movement needed to achieve the action are represented (Faillenot et al. 1997).Consequently, deviations from the rehearsed practice conditions can affect recall and the autonomy of the actions. Therefore, this may have been the case for some students when making the transition form the practice to assessment environment, consequently having a detrimental effect on their performance.

Another discussion point concerns the structure of the experimental design used. The lack of a base-line measure of performance made it difficult to measure any direct differences the PETTLEP intervention may have had on OSCE performance. This factor was considered in the initial planning of the present work. However, it was not possible to incorporate a pre-measure due to the changes to the curriculum structure. In light of this though, it was originally thought that the longitudinal design of the intervention would have had a measurable difference on performance of the experimental group compared to the control group.

Following the results, it has now become apparent that the validity and reliability of the local variant of the OSCEs used in the present study is questionable. The strength of the OSCEs as the main dependent variable has raised questions. Therefore, if the OSCEs are not a 'gold standard' reflection of clinical skills competence the true worth of the PETTLEP intervention used should not be totally ruled out.

Upon completion of the intervention with the experimental groups, one student had voluntarily written to the researcher:

> *Many thanks for your efforts in helping us with the imagery of the OSCEs. I have not completed the imagery diary in the booklet; however, found your input and the access to your information useful.*
> *I have read through the booklet and other information that you have given, and found having early awareness of the actual OSCE to be of a great benefit – including the breakdown of each task that you did with us.*
> *Your input has allowed me to realise the type of imagery I do use – when in a written exam I visualise the books and written work related to the subject, I am re-reading this information in my head.*
> *Regarding the practical exam, I found that I used the breakdown sheets that you provided for the OSCE really well, in addition to practising the knowledge of the individual tasks performed. I did pass my OSCE first time and I would like to thank you for your assistance in that – it helped! Many thanks again.*

This suggested that despite the results being non-significant, the intervention may still have helped some students more so than the curriculum could have done alone. Such inferences are difficult to make given the OSCEs were used as the main dependent measure for the intervention. The use of qualitative methods of investigation in conjunction with the experimental design would have given more breadth to the study. This could have revealed more data

about the worth of the intervention. The collection of such data after the intervention was completed - as opposed to when it was ongoing, would allow greater reflection upon the process as a whole. Further research could look to do this using a questionnaire or short interviews, in order to gain more understanding in regards to the use of the content and structure of the intervention.

Further PETTLEP research using similar real life designs would certainly be beneficial to the area, in order to measure the true applicability of the model to other ecologically valid settings. Also, to test whether model does in fact work in open environments as opposed to closed controlled laboratory settings. Such research should look to incorporate both pre- and post measures of performance in the design, in order to better asses the effects of intervention. Also, the validity and reliability of the dependent measure used should also be thoroughly tested prior to investigation.

The encouraging results of Wright et al., assumed that the OSCEs would serve as an ample measure of performance for the present design. However, upon reflection this may not have been entirely true. The validity and reliability of the OSCEs is a major research niche of its own and is extremely worthy of investigation. Future researchers in this field are greatly encouraged to pursue such lines of investigation to test and further develop quality assurance within nursing education.

In the broader context the results are suggestive of potential shortfalls within the core curriculum. The imagery programme was provided as an additional learning aid to compliment the core curriculum preparation. However, it would appear that the curriculum did not fully fit its intended purpose for some students. The PETTLEP programme was not in any way responsible for the initial teaching and delivery of the skills. This point is supported by the control group condition - in that they only received the normal curriculum. Therefore, the curriculum alone was assumed to provide sufficient enough support for passing the OSCE. The intended aim of PETTLEP then was to facilitate the principles and procedures taught by the curriculum, in order to develop new initiatives and strategies for training and learning.

The descriptive and raw data indicated that the site that performed best overall was Warrington (control site), and the site that performed the poorest was Arrowe Park (the bigger of the two experimental sites). Both of these sites had the largest intakes across the four sites. However, on the whole there was a larger number of fails than anticipated. Warrington was the best performing site. However, upon the reflection of the results the teaching staff acknowledged that there were more fails than expected. The staff at Arrowe Park also claimed that the present results were the worst they had seen in a long time and the cohort was one of the most nervous they had ever encountered on assessment day.

With reference to this research by Yule, Flin, Paterson-Brown and Maran (2006) found that many underlying causes in the performance of trainee

surgeons originated from failures in non-technical aspects of performance rather than a lack of expertise. Results revealed communication to be a causal factor in 43% of errors made in surgery. Also, cognitive and diagnostic errors represented 27% of claims against a health organisation. Therefore, the findings are suggestive that technical skills are necessary but are not sufficient to maintain high levels of performance over time. Yule et al., proposed that in order to achieve and maintain high surgical performance, attention needed to be paid to cognitive and internal modes of behaviour. More specifically, higher order functions that control behaviour and directly relate to the technical aspects. This is true of the OSCEs as performance is not just based on the technical aspects of skills. It is also based on knowledge and behaviour, which includes communication. Therefore, there is a combination of open and closed skills simultaneously incorporated within the assessment process. The present study focused solely on the refinement of the closed skill aspect – namely the nursing skills, in attempt to condition higher order functions used for mapping the skills. Therefore, the communication and knowledge aspect was not considered in this. However, that still may have impacted on overall performance and possibly failure.

Another factor that may have induced poor performance in relation to the assessment process and the environment is stress. Previous research has investigated stress management skills for nursing students for their examinations and found imagery to be a helpful means amongst other techniques. Charlesworth, Murphy and Beutler (2006) assessed the effectiveness of a 10-session, 5-week, group-administered stress

management program for nursing students in preparation for their examinations. The stress management group included sessions on progressive relaxation, deep muscle relaxation autogenic training, visual imagery and modified systematic desensitization. Ten students participated in the stress management group and eight served as a control group. State and trait anxiety measures were taken before the group began and immediately prior to both mid-term and final examinations. Results revealed that the stress management group effectively reduced trait anxiety ($p < 0.05$), while the control group's trait anxiety levels remained relatively unchanged. The experimental group also showed a reduction in state (test-taking) anxiety from mid-semester to final examinations, while the control group showed a slight increase from mid semester to final examination.

Taking these findings into consideration and the comments made by the staff at Arrowe Park, it is postulated that psychological initiatives may be a beneficial addition to the curriculum. This could reduce examination anxieties and aid technical abilities more so for students. The PETTLEP intervention partially aimed to do this. However, other factors became apparent at the Arrowe Park site that may have led to students feeling under prepared and therefore more nervous. This concerned curriculum preparation.

During the delivery of the intervention evident differences in supervision at the experimental sites were observed during skills practice sessions. This is an interesting factor in respect to the results as Arrowe Park actually performed

the poorest overall. This is an important factor to consider in discussion of the results as differences in supervision can indeed impact on performance.

Bondy (1984) proposed that assistance and supervision are key processes in the stages of skilled learning in nursing, as reflected in the three criterion based definitions for clinical skills acquisition. These definitions are centrally concerned with varied levels of achievement during clinical skills performance. These are reflected by standard procedure, quality of performance and cues. The five attainable levels of the three areas then all refer back to the need for supervision and assistance during the learning process in order to progress.

In light of the observations made at Arrowe Park, it is suggested that the Arrowe Park group were at a disadvantage compared to the Leighton group. The Leighton cohort was one third of the size of the Arrowe Park group, meaning more available contact time for each student at Leighton. Also, given that all sessions were fully supervised at Leighton, students could acquire assistance and supervision more readily for help or advice.
The supervision of the sessions at Leighton also meant that practice time was more formal and structured and portrayed more clarity in regard to the set-up and expectations of the OSCE process. The sessions at Leighton also took place in the skills lab which was where the actual OSCE assessment was conducted. At Arrowe Park on the other hand, sessions were conducted in a seminar room. However, the real OSCE assessment was conducted in the clinical skills lab. Therefore, differences in the practice environment could

have affected performance due to differences in the internal representation of the practice and assessment settings.

Previous research has explored the role of the teacher/lecturer in practice in adult nursing (Aston, Mallik, Day & Fraser, 2000). The study was conducted due to increasing concern over the widening theory-practice gap and evidence of problems in providing quality practice education. Data were gathered from documents, individual and focus group interviews with lecturers, practitioners and students in five schools of nursing and midwifery. Results revealed a role labelled as 'link lecturer' to be most common approach acknowledge by all respondent groups. Also, despite the overt commitment to the practice role by schools of nursing and midwifery, findings indicated that lecturers tended to be unprepared, unsupported and unmonitored. The data also revealed that students and practitioners had very variable experiences and expressed a strong need for a better organised approach, which would provide consistent and sustained support in the practice setting.

The main finding highlighted a lack of strategic management of the practice role by University Schools of Nursing and Midwifery and strongly recommended for more active management of the practice curriculum to be implemented as part of any future proposed reforms for nurse education. Given the present study was not investigating such issues, it is not possible make direct inferences such as the above. However, there were evident

differences between the sites in regards to the support and preparation available.

Other research has also looked at student nurses' perceptions of independence of supervision during clinical nursing practice (Lofmark, Carlsson & Wikblad, 2001). The study examined Swedish student nurses' perceptions of independence and explored the extent to which they had opportunities to practice different tasks during clinical practice. Data was collected on weekly self-assessment forms during the first and final clinical courses on a three year nursing programme for 108 students.
Results revealed that the majority of students rated themselves as being independent of supervision to a great extent both at the beginning and throughout the clinical courses. However, some students reported no or few opportunities to practice certain tasks during the courses. It was concluded that factors such as preparation before clinical courses and the importance that students give to certain tasks may well influence independence of supervision. Also, it was recommended that clinical practice should be carefully planned and individualised to facilitate students' opportunities to practice different tasks.

These points have important implications and raise valuable questions in regards to the quality assurance of the curriculum in the present study. Given the four sites all were part of the same awarding institution; there was an expectation that the quality, standards and procedures would be exactly the same at each. However, the results indicated discrepancies that were not

originally accounted for as limiting factors in the research design. No observations were made at the controls sites, as they were left to conduct their normal schedule under the assumption that all sites received the exact same supervision and support. Therefore, the experimental group received manipulation to their normal schedule with the assumption that there would be measurable differences compared to the control group.

Upon reflection, it is apparent that it would have been beneficial to observe procedures at the control sites to identify whether they were coherent.

Further research to follow up these findings is most definitely required to further identify the extent to which inter-site differences and discrepancies are apparent. Such differences could be putting students at risk of academic failure and impacting on the quality assurance of the curriculum. Future research could investigate both staff and student perspectives and expectations of the curriculum and their perceptions of the levels of support provided and required. This could then formulate a comparative analysis between staff and student expectations of the curriculum and its content, to assess whether it is actually meeting students needs.

Another point to consider is that the cohorts used in the present study were the first to encounter the new curriculum structure for the Fundamental and Key Caring Skills module. The schedule for teaching the module had changed and was spread across three trimesters instead of the usual one trimester. Previously, students undertook the module intensely within one trimester (3-months). However, the new structure implemented a slower and more

progressive process for teaching the skills. During this students were taught the skills across a 12-month period. Therefore, it was difficult to use a baseline measure of performance as it was would have been hard to identify a point in time where students were all a similar level of learning. In the Wright et al. study this was achieved through the use of the mock OSCEs, which were scheduled 3-weeks prior to the real assessment. This meant student had sufficient time to use the PETTLEP. However, in present design the mock OSCEs took place one week prior to the real OSCE. Therefore, it was not possible to achieve any significant measurable effects of PETTLEP on performance in that time.

The new module structure could be deemed as a trial and error process as the module had never been taught under that structure before. Therefore, the different patterns of teaching and learning the skills could be a factor that contributed to the outcome of the results. However, these are speculations at this stage and would require further investigation to structure firmer arguments.

The curriculum for the Fundamental and Key Caring Skills module has undergone persistent changes to its assessment over the past few years. The OSCEs are still the assessment tool within curriculum framework, although the criteria and expectations have undergone several changes across the past three years. Reasons for the changes have been attributed to 'quality assurance' in order to improve assessment standards. However, exam results have remained consistently average or poor despite many changes.

One key change to the structure concerned the removal of skills in the assessment schedule - namely aseptic technique. Reasons for such change concerned the fact that the execution of aseptic technique accounted for two parts – namely preparation and procedure. Therefore, performance of that skill accounted for a full OSCE assessment due to its timely and complex nature. As previously acknowledged, the OSCEs do not assess students on all taught skills. Therefore, the quality assurance of the assessment design is questionable. It is a logical expectation that students should be assessed on their competence at all taught skills - particularly in such an important profession when dealing with lives.

Previous research has expressed growing concerns about newly-graduated nurses' skill acquisition and their ability to transfer skills into the work place (Gerrish, 2000; Heslop et al. 2001; Neary, 1997; Stevenson, 1996). Also, similar research has reported concerns over the inadequacy of skill development in nursing programs (Heslop et al. 2001; Holloway, 1999; Spitzer & Perrenoud, 2006). Therefore, taking the former into account, cause for concern is raised in regard to the curriculum assessment not covering all taught practical aspects. To acquire complete competence and achieve quality assurance it is a logical expectation that students should be assessed on all taught aspects. The current results back up this point as a large proportion of students failed to even pass three out of the five skills. This is most definitely something that needs to be addressed in future revisions of the OSCE assessment schedule

Taking the poor examination results into account (some with the additional aid of PETTLEP), it begs the question whether the results may have been worse subject to students being assessed on all taught skills. Furthermore, would the experimental group have performed poorer subject to not receiving additional training? Finally, would Warrington have performed even better subject to receiving the additional training? These are all valid and interesting questions that would indeed serve as valuable follow-up studies to this investigation. However, due to time constraints and access to participants it was not possible to conduct such investigations in the present programme of work. Therefore, the direction of the research pursued investigation into possible underlying factors influencing performance, as it was believed there may be other contributing factors in between the curriculum and the individuals engaging in it.

In summary, the findings did not support the original hypothesis. There were no significant differences between the control and experimental group conditions in the OSCE results. Also, descriptive data revealed that the control group performed best overall on the assessed OSCE skills. Upon reflection of the research the design of the study was quite ambitious, given it was an experimental design undertaken in a real life setting. Therefore, the meaning and purpose of PETTLEP may have been lost during the intervention However, this was a risk taken with the research. Despite this though, some more interesting and important factors have surfaced from the investigation that were previously unrecognised and may have major implications on learning and performance.

The curriculum assessment structure appears to have underlying flaws, in that students are not assessed on all taught components. This is of great concern given the high level of expertise that is required for such an important profession. Therefore, the ongoing changes to the curriculum do not appear to be narrowing the gap towards quality assurance. As a result, if students are struggling to pass by using the core curriculum training, it is not surprising that the PETTLEP intervention was not effective. Once the fundamental flaws in the core programme have been addressed with effective solutions, then PETTLEP may indeed stand a greater chance of being used effectively.

Finally, the differences between supervision and assistance at the sites during practice learning are concerning. All sites should be conducting and providing the exact same procedures and support to its students. This finding has influenced the direction of the empirical work somewhat. The course of the research will now explore avenues in respect of these more pressing issues – namely the nursing curriculum and its provision for students in training and how it may be impacting on their development. This will aim to contribute new knowledge to this arena by exploring and identifying potential shortfalls in nurse education. This will aim to identify factors that may be acting as 'missing links' and effecting students' development, behaviour and academic performance.

CHAPTER 4.0 - STUDY 2: The OSCEs aftermath: investigating students' preparation and performance using a skills training questionnaire

4.1Introduction

The present study is an extension from study one of this programme of empirical work. The unanticipated results from the first study prompted the need for further investigation into poor OSCE performance. Non-significant differences between the control and experimental groups were apparent, despite the implementation of a detailed PETTLEP intervention for the experimental group. The intervention was coupled with the regular curriculum, which intended to fully prepare and equip nurses for the OSCEs alone. However, results across all sites were relatively poor. Therefore, this changed the direction of the empirical work, in order to investigate more pressing concerns – namely what factors actually contributed to poor performance overall. The experimental group actually performed the poorest overall, according the descriptive data. As a result, this justified the need for further investigation in order to explicate the plausible reasons and factors that could be attributed the non-significant findings and be affecting students behaviour and performance.

The aim of this study was to investigate students' preparation for the OSCEs in relation to individual performance. The rationale for this was to explore any further factors that may have been associated with the results of study one, in order to further explicate the results seen. This was done using a skills training questionnaire. The purpose of using this approach was to understand

more about how students felt about and prepared for the OSCEs. Also, it aimed to understand more about the PETTLEP intervention and how students felt about it in preparation for the OSCEs.

4.2 Design and methods

4.2.1Participants

Thirty four pre-registration nursing students took part in the study. These were all experimental participants across the two sites (Leighton n=8; Arrowe Park n=26) from the previous study. All participants sat their OSCE in December 2008 following the delivery of the regular curriculum and a programme of PETTLEP imagery training to prepare them for the process. All participants had received their OSCE results prior to taking part in the study. All participants provided informed consent and were aware the present study followed on from study one and concerned their OSCE results.

4.2.2Instrumentation

4.2.2.1Post-OSCE skills training Questionnaire

A post OSCE skills training questionnaire was designed for students to complete (see appendix). The purpose of this was to explore students' opinions and actions in regard to their preparation for and performance in the OSCEs. The skills training questionnaire comprised of 18-items, each presented on a 5-point likert scale. The purpose of the likert scale was to assess level of agreement or disagreement with various items. It acted as a bipolar scaling method in order to assess positive or negative responses to

statements associated with OSCE preparation and skills training experience. The items explored were: preparation for the OSCEs; contentment with OSCE performance; curriculum preparation; use of PETTLEP-imagery; relevance of PETTLEP-imagery; beneficence from PETTLEP-imagery; understanding of PETTLEP-imagery; enjoyment of PETTLEP-imagery; and the worth of OSCEs as an assessment method. It also contained a narrative section for additional comments, if students had any. It aimed to act as a reflective tool for students to complete after receiving their OSCE results.

4.2.3 Procedures

Thirty four pre-registration nursing students completed a skills training questionnaire. This was completed in January 09 - the first week of their second year of study. Students had just received their OSCE assessment results, which were sat at the end of their first year of study in December 08. All participants had received a programme of PETTLEP training and the regular curriculum for the Key Fundamental Caring Skills module, in preparation for the OSCE assessment.

Each student was given a copy of the questionnaire to complete. This was one piece of A4, printed on both sides (see appendix). Prior to its completion, the researcher explained the purpose of the questionnaire, its content, and also the steps for completing it. The questionnaire also contained instructions along with an example of how to answer a question using the likert scale to facilitate understanding. Students were instructed to answer all questions as honestly as possible. They were also instructed to select one statement only

and to clearly ring the statement that best applied to them in answer to the question. The researcher assured all participants that their responses would be kept confidential and only be accessible by the research team and not by the academic staff from their teaching site. Students were given 20-minutes to complete the questionnaire and were informed that could ask questions at anytime. At the end of the 20-minutes the researcher collected the completed questionnaires and gave the participants the opportunity to ask any questions or share any comments they may have had about the questionnaire or the OSCE process as a whole.

4.2.4 Data analysis

A Chi-squared test was used to analyse the rank numerical data from the post-OSCE skills training questionnaire. The chi-squared test distinguishes whether emphasis on a particular likert category occurred by chance or a real inclination in respondents. When using a likert scale the expected chance result would have an equal distribution across likert categories for each question. Chi squared therefore compares this expected distribution with what actually occurred, in order to support inclinations to particular rankings.

The qualitative data gathered from the skills training questionnaire were analysed using inductive content analysis. Raw data from these were organised into interpretive and meaningful themes and categories using the analysis methods of Scanlan *et al.,* (1989), which developed lower and higher order themes from quote selection.

4.3 Results

The results are presented as frequency tables according to the number of responses to each question on the skills training questionnaire. This is followed by chi-squared analysis indicating the observed differences in the distribution of responses.

Question 1: Did you prepared for the OSCEs

Category	Frequency
Well prepared	2
Quite well prepared	24
Somewhat prepared	5
A little prepared	3
Not prepared	0

Chi-squared revealed a significant difference between participants' perceived preparation for the OSCEs, χ^2 (4, N = 34) = 65.23, p < 0.05, with the majority feeling 'quite well prepared' (76%). Therefore, the distribution of this ranking was high, indicating a real inclination that overall participants felt quite 'well prepared' as opposed to being by expected chance.

Question 2: Are you happy with your performance in the OSCEs?

Category	Frequency
Very happy	10
Happy	13
Ok	6
Unhappy	4
Very unhappy	1

A significant difference in participants' happiness with their overall performance was also revealed, χ^2 (4, N = 34) = 14.26, p < 0.05, with most participants either feeling 'very happy' (35%) or 'happy' (30%) with their overall performance.

Question 3: Do you feel you practised enough for the OSCE

Category	Frequency
Yes	30
No	4

A significant number of participants also felt that they practised enough for the OSCEs, χ^2 (2, N = 34) = 19.88, p < 0.05, with 96% answering 'Yes'. Again, indicating a more true inclination in the outlying rankings, rather than expected chance.

Question 4: To what extent did the curriculum prepare you for the OSCEs?

Category	Frequency
Fully	3
Mainly	13
Only partly	15
Very little	3
Not al all	0

There was no significant difference between the extent to which participants felt the curriculum had prepared them for the OSCEs (p >0.05). Therefore, the expected chance result represented an equal distribution for participants across the likert categories for curriculum preparation. Although despite this, the interval data revealed that mostly participants felt that the curriculum had 'mainly' (30%) and 'only partly' (50%) prepared them for the process.

Question 6: Did you attend all clinical skills sessions?

Category	Frequency
Yes	34
No	0

A significant number of participants reported to have attended all clinical skills practice sessions, χ^2 (2, N = 34) = 34, p < 0.05.

Question 7: Did you find them help helpful?

Category	Frequency
Very helpful	9
Helpful	20
Fairly helpful	4
Not very helpful	1
Not helpful	0

A significant difference was also apparent in how helpful participants found the sessions, χ^2 (4, N = 34) = 16.00, p < 0.05, with the majority finding them 'very helpful' (30%) and 'helpful' (54%). Therefore, suggesting a true inclination toward the sessions being beneficial, thus proving their worth.

Question 8: Did you find the PETTLEP imagery training potentially useful?

Category	Frequency
Very useful	3
Useful	16
Fairly useful	13
Not very useful	2
Not useful	0

In regards to the PETTLEP-imagery training on the other hand, there were no significant differences in how useful and relevant participants' found it (p >0.05). Therefore, the expected chance result had an equal distribution for participants across the likert categories indicating no apparent inclination for

how useful PETTLEP was. However, interval data showed that the majority of

participants' found it 'useful' (43%) and 'fairly relevant' (42%).

Question 9: Do you feel you actually benefited from the additional training?

Category	Frequency
Definitely benefited	4
Benefited	17
Benefited somewhat	11
Benefited very little	2
Didn't benefit	0

In regards to the perceived beneficence of the training however, a significant

difference was apparent, χ^2 (4, N = 34) = 11.32, p < 0.05, with most

participants feeling they 'benefited' (42%) and 'benefited somewhat' (38%).

Question 10: Did you feel you were able to understand the PETTLEP training?

Category	Frequency
Fully understood	16
Mainly understood	13
Partly understood	2
Very little understood	3
Didn't understand at all	0

Significant differences were also revealed in participants' understanding of the PETTLEP training, χ^2 (4, N = 34) = 13.4, p < 0.05, with 58% 'fully' and 34% 'mainly' understanding it. This was encouraging, as it represents a real inclination that the intervention conveyed the information in a way which was accessible and understandable.

Question 11: did you enjoy using the PETTLEP training?

Category	0
Very enjoyable	5
Mainly enjoyable	16
Partly enjoyable	10
Very little enjoyable	3
Not at all enjoyable	0

No significant differences were found in regards to participants' enjoyment of the PETTLEP training (p >0.05). However, interval data showed that participants mostly found it 'mainly' (48%) and 'partly' (23%) enjoyable.

Question 12: Do you think the OSCEs are a good method of assessment for clinical skills ability?

Category	Frequency
Very good	6
Good	13
Somewhat good	8
Very little good	3
Not at all good	5

In respect to participants' thoughts on the OSCEs as a good assessment tool, no significant differences were apparent (p>0.05), indicating mixed views for participants. Interval data indicated though that participants' thought the OSCEs as an assessment method were: 'very good' (15%); 'good' (27%); 'somewhat good' (27%); 'very little good' (12%); and 'not at all good' (19%).

Question 13: Do you think the OSCEs are a fair assessment method?

Category	0
Very fair	0
Fair	13
Somewhat fair	12
Not very fair	9
Not at all fair	0

Similar trends were apparent for participants' thoughts on the OSCEs as a fair assessment method. Chi squared revealed no significant differences between participant's responses. However, interval data indicated that participants mostly thought the OSCEs as an assessment method were: 'fair' (27%); 'somewhat fair' (38%); and 'not very fair' (35%).

4.3.1 Inductive content analysis

Figure 13 presents the results of the inductive content analysis from the data gathered in response to the question, *'to what extent did the curriculum prepare you for the OSCEs - why?'* and also the additional comments section.

Discussion flows from higher order themes, then to lower order themes and finally back to the original quotation. However, this approach characterised the reverse order that the analysis took place, to allow final categories to be traced back to the initial quotations.

a/b	1 / 2	A / B	II

Didn't feel there was enough time spent on practical sessions for OSCE training

I feel we did not have enough practice time in the skills lab. We were only in the skills lab once in the 1st year

Practice sessions were left to students alone

Paper work was not given early enough. Skills sessions were good but not long enough

It was all theory – no practical

More time needed on practical skills

Not enough practical sessions within class More practical sessions would have helped me prepare better

More time in class to practice

Practical lectures were poor and insufficient

— Practice time —

The setting in the OSCE is nothing like a real situation in practice

I feel that the practical sessions did not reflect and were not thorough enough for the OSCE assessment

The OSCEs should be done on a ward, as the skills lab is not realistic and creates a more tense/exam environment

I found the OSCE 'role-play' unrealistic and this made me more nervous and added to extra pressure

I feel the OSCEs are not realistic, though if you can pass in the artificial scenario measuring BP, temperature and urinalysis can be done under any pressure you may be under

— Practice environment —

I did not feel we received adequate training on skills such as taking blood pressure

The paper work to go with the skills was not properly explained

I feel clinical skills sessions were not long enough and the students not given enough supervision or time to acquire the basics of the skills

I found group simulations at home with fellow students to be the most beneficial help – a lot more so than what we received in class anyway!

— Support/training —

Skills practice — Curriculum content/ preparation

I learn skills by imagining doing the skill before PETTLEP anyway

Didn't quite understand fully what PETTLEP was. I wasn't sure if it was same as what I do already – image the skill whilst doing it

— Conflicted imagery use —

I thought the PETTLEP was very useful for individuals who are able to image themselves actually doing an activity

PETTLEP was useful and a good extra resource

— Positive imagery use —

Understanding — Learning

<u>Figure 13 – Qualitative questionnaire responses</u>

4.4 Discussion

The aim of the present study was to further explore the unanticipated results from study one. A post-OSCE skills training questionnaire was designed to explore various aspects of the skills training process. The purpose of this was look to identify any potential factors that may have contributed to poor performance and be directly affecting students' development and learning. This included exploring preparation for the OSCEs – curriculum and personal; contentment with performance; PETTLEP imagery – use, relevance, understanding and beneficence; and the OSCEs – worth, purpose and fairness as an assessment method. The results will be discussed in order.

4.4.1 OSCE preparation

Preparation is a key concept for any form of assessment. In the present study the post-OSCE skills training questionnaire addressed this in two different paradigms; – personal: in terms of own practice and contentment with that practice; and the curriculum: in terms of its content (theory and practice), delivery, and support.

Personal preparation

The skills questionnaire indicated that overall most participants felt 'quite well prepared' for the OSCEs, with a significant difference between the observed responses according to the bipolar likert scale. This was the second highest ranking on the bipolar likert scale, which serves as a positive indicator in regards to perceived preparation. However, the items on the skills training

questionnaire were subjective measures. Therefore, individual interpretation could vary somewhat in terms of what one would deem as being 'prepared'.

The second item addressed contentment with OSCE performance. Again, significant differences between the responses according to the statements on the bipolar likert scale were apparent. Overall the majority of participants either felt 'very happy' or 'happy' with their performance, which is a positive indicator. However, the subjectivity of the measure should again be considered in this result. For example, one participant could be 'very happy' with their performance because they scored 100% on all assessment elements. However, on the other hand another participant may be 'very happy' with their performance just because they passed, regardless of how highly. As students were not assessed on all skills – only three out of the five, those student who may not have prepared as well could be 'very happy' because they were not assessed on a skill that they had difficulty in performing competently. Evidence for this arose in study one, with many students stating in the preparatory sessions, *'I hope I don't get blood pressure measurement'.* Therefore, the results should be interpreted with caution as there was no objective means for directly assessing preparation for each student.

Curriculum preparation

In terms of curriculum preparation for the OSCEs, the skills training questionnaire revealed that most participants felt that the curriculum (theory lectures, practical lectures and all resources) 'mainly' and 'only partly'

prepared them for the OSCE process. Results revealed no significant differences between the observed responses according to the bipolar likert scale, which indicated that the observed frequencies could be due to chance alone. However, qualitative data gathered about the reasons behind participants rating for this question indicated some very interesting findings.

The analysis of these data created a number of higher order themes, which were broken down into lower order themes, then finally back to the original quotations - represented as the raw data. This approach was characterised in the reverse order. Therefore, the discussion will follow the same course.

The main higher order theme that emerged from that analysis concerned the curriculum content and preparation – namely theory but more so practice. Practice in this case was represented in terms of 'skills practice', which accounted for the time during academic contact to learn and acquire skills. This definition was based upon the responses from the participants, which will be addressed later. When broken down further, the higher order theme was then made up of three lower order themes. These represented common topics which emerged from the raw data as the participants statements. The themes were: 1) practice time; 2) practice environment; and 3) support and training. Each of these will be discussed individually and then be traced back to the original quotations that sourced them.

Practice time

Practice time in this instance refers to actual time spent on practising skills, which was commonly cited in the qualitative section of the questionnaire. With reference to the original question *'to what extent did the curriculum prepare you for the OSCEs and why?'* a number of interesting explanations were provided, which began to formulate the common themes. A selection of participants explained that:

'I did not feel that there was enough time spent on practical sessions for OSCE skills training'

'I feel we did not have enough practice time in the skills lab – we were only in the skills lab once in the first year!'

'Practice was left to students alone – unsupervised!'

'There was not enough practical sessions within class – more practical sessions would have helped me prepare much better'

'Practical lectures were poor and insufficient –more time in class to practice would have been a lot more helpful'

From the above data the matters of 'practice' and 'time' were commonly acknowledged together, which formulated the theme of 'practice time'. Upon tracing back to individual participants responses an interesting observation

emerged. The observation concerned the fact that all participants who had acknowledged concerns regarding 'practice time' were all actually from the same experimental site from the first study. Therefore, this opened a new line of thought when reflecting upon the OSCE data from the first study. This will be discussed collectively following discussion of the remaining themes.

Practice environment

Practice environment in the present instance refers to the physical environment of which practice takes place. More specifically it relates to the expectations of the OSCEs in relation to the environment and conditions they were performed in - compared to real life practice. Participant awareness of the discrepancies between the practice conditions of the OSCEs and the 'real world' (e.g., on placement and in the academic setting) was apparent. This raised questions in regard to whether the environmental conditions of the OSCEs actually do fully allow students to bridge and apply their skills learning effectively. The nature of practising, acquiring, and performing skills in the academic or placement setting was evidently a great deal different to the expectations set in accordance with the marking criteria. Some participants explained that:

'The setting in the OSCE is nothing like a real situation in practice'

'I feel that the practical sessions did not reflect, and were not thorough enough for the OSCE assessment and its expectations'

'the OSCEs should be done on a ward, as the skills lab and classroom conditions are not realistic and creates a more tense examination environment'

'I found the OSCE 'role plays' unrealistic and this made me more nervous and added extra pressure'

'I feel the OSCEs are not realistic, though if you can pass in the artificial scenario, your skills can be done under any pressure you may be under!'

From the above, it is evident that there were concerns over the environment within which skills learning took place and was assessed. This appeared to directly reflect the OSCEs, although the present study classes it as practice environment as a whole. The purpose for this was because the assessment procedures were embedded within the curriculum for preparing students to become fully trained professionals (higher order theme).

It was a compulsory requirement that all students undertook their OSCE. However, the structure and procedures of the OSCE were out of their control. If some students were highly capable of performing their skills, but were highly affected by the environmental conditions of the examination, it is fair to assume that this could be a plausible explanation for some instances of poor performance.

With reference to the results of the previous study of this thesis, one of the intended aims of the PETTLEP-imagery programme was to facilitate performance and minimise such instances. The rationale for this arose from concerns from academic nursing staff about students' poor performance due to examination anxieties. Therefore, awareness of the practice environment being a debilitative factor to performance has been acknowledged for some time. Therefore, the PETTLEP programme aimed to assist in minimising anxieties and concerns relating to the examination conditions. However, the overall results of the study did not reflect this – hence the current investigation.

During the course of the present study, it became apparent that potential problems may in fact be embedded within curriculum preparation and assessment procedures. Therefore, if this was the case, the implementation of additional strategies (e.g., PETTLEP) would indeed struggle to prove their true worth if problems existed in the compulsory frameworks that they were working within. For example, the PETTLEP-imagery intervention was provided as an adjunct to the regular curriculum. The purpose of the regular curriculum was to fully prepare students for the OSCE process – from start to finish. However, the PETTLEP programme was designed to complement the core content of the curriculum with additional ideas and resources. If students performed poorly upon receiving the regular curriculum in conjunction with the additional training, it begs the question did the regular curriculum prepare them as it should?

On the other hand, one of controls sites performed the best overall out of all sites. This site had received the regular curriculum alone, with no additional training. Therefore, the curriculum must be fulfilling its purpose in some instances but not in all – although this should not be the case and it raises questions as to what is affecting behaviour for individuals.

Support and training

The final lower order theme that emerged from the analysis concerned support and training. Support and training in this instance refers to the provision and services of the academic staff responsible for teaching the students. Support and training are fundamental factors that contribute to students' overall ability to learn and perform. The nursing curriculum clearly aims to provide student centred and reflective learning for all – which stems from delivery by qualified, trained and experienced professionals. However, responses from some students highlighted a few concerns, which specifically related to support and training in skills learning:

> '*I did not feel we received adequate training of skills such as taking blood pressure'*

> *'The paper work to go with the skills was not properly explained, which threw me on the exam day'*

'I feel clinical skills sessions were not long enough and we were not given enough supervision or time to acquire the basics of the skills – let alone become competent in them'

'I found group simulations at home with fellow students to be the most beneficial help – a lot more so than what we received in class anyway!

These are some individual concerns that related to the support and training students felt they received. It is fair to acknowledge that these are individual views that amount to a small proportion of all participants. However, they are still factors which may have contributed to poor performance and therefore cannot just be dismissed without further question.

Following the discovery of such responses in the analysis, it was logical procedure to again trace back to individual participant responses. Interestingly, participants were all from the same experimental site. This was the same site that was identified during the discussion of theme one, when tracing back the original responses. In relation to this and drawing back to observations made in the design and methods section of study one, the researcher acknowledged that one of the experimental sites provided a lot less supervision during clinical skills sessions compared to the other. In most instances the researcher was in fact responsible for primarily supervising the sessions, despite not having the clinical skills expertise. This is an important factor that has come to light, given that all students are meant to receive

exactly the same support in accordance with the curriculum aims and objectives for assessment.

Further reflections upon the OSCE data from study one have also highlighted the fact the site in question actually performed the poorest overall out of all the nursing sites. This is an important issue to arise, as all students are supposed to receive the same curriculum and support across all four nursing sites. Therefore, such discrepancies are a major cause for concern, especially if it is affecting students' behaviour and performance. Poor performance has a knock on effect upon the structure and hierarchy within the awarding institution. Therefore, even minor differences in provision of support and training could impact on overall performance and therefore need to be identified.

Obviously, not all participants acknowledged the factors of practice time and levels of support and training. Therefore, it would be in accurate postulate that as the sole variable associated with OSCE results. As a result, it may be one issue amongst a series that may have contributed to overall poor performance. As acknowledged in the discussion of study one, the nursing curriculum at the institution used in the investigation had undergone successive annual changes. The OSCE assessment structure and components of assessment had seen regular and consecutive moderations prior to the intake of new cohorts. Given the nursing intake is three times annually, this amounts to a lot of moderations without maintaining consistency for a great period of time. This in itself suggests there must be flaws in the

structure and design of the Fundamental and Key Caring Skills module. Therefore, it begs the question: does the curriculum actually do a thorough job of integrating theory and practice together, in order for students to learn and acquire skills properly and become competently prepared for their assessments and the real world of nursing?

As acknowledged in the discussion of study one, the students were not actually tested on all taught skills – yet examination performance was still poor. Therefore, the question arises - would the results have been even poorer if they were tested on all skills? In order for the curriculum to progress and 'quality assurance' it is vital that such discrepancies are addressed.

A number of students also mentioned 'practice time' in their responses. The assumption in the present study is that practice time is 'time spent practising skills'. This definition is drawn from the language used in participants' responses, although it begs to question: 'is what students define as practice time actually concurrent with the curriculum definition, or vice versa? These are grey areas, which certainly need addressing in order to investigate some interesting factors that appear to have never been addressed and could indeed by having an affect on students development and learning.

In summary of the above discussions, four lines of further thought have become apparent that may contribute to explaining the results seen in study one. Firstly, the structure of assessment and training contained within the curriculum may not actually best reflect the expectations of the OSCE

assessment process and procedures. Therefore, this may confuse or deter students somewhat during the final OSCE assessment.

Secondly, the content of the curriculum – namely 'skills practice time' may not be adequate enough for students to acquire and learn skills competently for assessment purposes and also future professional use. Also, definitions and expectations of the curriculum and its content may indeed differ between students and its educators. Therefore, discrepancies would most definitely be apparent if definitions and expectations vary.

Thirdly, differences in the levels of support and training between the sites have become apparent, which could well reflect differences in OSCE performance. All the sites operate individually. Therefore, students at one site would not know what was being provided at another. Therefore, the assumption is probably made that the exact same operations are being implemented. This may be true to some extent as all the sites followed the same curriculum and content. However, support and supervised contact time may vary somewhat, which could affect learning and performance. Future research could look to investigate this further by evaluating the quality of teaching of nursing within awarding institutions, in order to test quality assurance.

Finally, in looking at the curriculum as a whole, and the broader scheme of things, attention is drawn to whether the framework in place actually promotes opportunity to bridge all its content together. Does the theory feed into the practice and vice versa to facilitate and back up learning? How is this done

within the curriculum? Do students understand how to make the application of theory into practice? These questions pose fundamental arguments, which require investigation. The reason for this is that students may identify differently to curriculum and its expectations. For example, one nurse may be a very practical learner and is able to acquire the practical skills side with competence and ease. On the other hand he or she may struggle to understand the theoretical content of the course and question its relevance.

The OSCEs are a test of skills knowledge, performance and understanding. Therefore, a student may perform a skill 100% according to its technical procedures. However, when questioned on a theoretical element that is related to that skill he or she may not know the answer, resulting in an overall fail. This is a classic example of how theoretical knowledge and practical learning in the curriculum bridge together, which is examined in the OSCE process. However, students' ability to bridge the theory with practice is not directly considered with in the curriculum and is just assumed to be a process which happens. Consequently, the inability to do this may well be a plausible explanation for poor examination performance.

4.4.2 PETTLEP-imagery

The results of the skills training questionnaire indicated that overall most participants felt that the PETTLEP-imagery training was 'useful' and 'fairly relevant' for the OSCEs preparation process. However, there were no significant differences. In regards to the perceived beneficence of the training, a significant difference was observed, with the majority of participants stating

that they 'benefited' and 'benefited somewhat' from the training. These results serve as positive indicators, given that the concept of the training was new to participants. Therefore, it could be assumed that some students may have actually benefited from the training and performed better than they would have without it. However, again, the subjectivity of the scale method could be questioned, as there is no direct hypothetical evidence to suggest that students did actually benefit from the training.

Results also revealed a significant difference in participants understanding of the PETTLEP training, with the majority of participants either 'fully' or 'mainly' understanding it. This is highly encouraging, as the programme of imagery was a new and fairly detailed concept to implement to a new audience. Therefore, it is encouraging to know that most participants reported to be able to understand its purpose and content.

Results from the inductive content analysis also revealed some findings regarding the PETTLEP-imagery programme, which were represented by additional comments on the questionnaire. The analysis of these data created one main higher order theme, which was then broken down into lower order themes, then finally back to the original quotations - represented as the raw data. The main higher order theme that emerged from the analysis was 'learning' as the programme of PETTLEP-imagery was centred towards this concept. Learning was then broken down into 'understanding' which was shown to branch one of two ways: 1) positive use of imagery and 2) conflicted

use of imagery. In regards to conflicted use of imagery one participant commented:

'I learn skills by imaging to do the skill anyway, before PETTLEP'

This is positive in one regard in that some participants appeared to be engaging in imagery use - whether conscious or unconscious. Therefore, they were already applying themselves to additional means of aiding performance. Also, prior use of imagery may have aided their understanding and appreciation towards the PETTLEP training. On the other hand though the introduction of the PETTLEP training may have interfered or conflicted with what they already do. One participant reported:

'Didn't quite understand fully what PETTLEP was. I wasn't sure if it was the same as what I do already – image the skills whilst doing it'

As a result, it must be acknowledged that PETTLEP may not be the right tool for everyone, as people may already have their own strategies in place that work for them. However, PETTLEP is a good starting point and framework for those willing to try and apply themselves to additional means. As the delivery of PETTLEP was included as a compulsory part of academic time in study one but engaging in its use wasn't, it is fair to acknowledge that conflicted imagery use may have been apparent for some participants. Therefore, some participants may have subconsciously or consciously already used their own imagery. So, introducing PETTLEP may have interfered or disrupted this.

On the other hand, positive instances of imagery use were also apparent as a result of the PETTLEP programme. Participants reported:

'I thought PETTLEP was very useful for individuals who are able to image themselves actually doing an activity'

'PETTLEP was useful and a good extra resource which I will use again in the future'

Although the above represents the view of only a handful of participants, it is encouraging to see that programme of training made a positive impression on them. Study one conducted an experimental design in a real-life setting. Therefore, given that fact it proved more difficult to control and monitor the intervention in isolation. This was due to variables which were part of the 'real life setting' and could not be prevented. That coupled with using the OSCEs as a perceived 'valid and reliable' dependent measure, now indicates that group differences were not going to be very likely. Upon reflection, the programme of PETTLEP training was more representative of a learning experience than an experimental condition. This is mostly due to the unknown curriculum based problems that have surfaced along the course of the empirical work. Based on the findings of study one, it should not be assumed that PETTLEP does not work in other contexts. Despite being representative of only a small sample of the participants, the results from the inductive content analysis are encouraging. Also, in light of the other interesting and

underlying findings from this investigation, PETTLEP should not be dismissed as a facilitative tool for skilled performance in this field. However, further research is required to test its use in open environments as opposed to closed laboratory settings.

Collectively, the results of the skills training questionnaire have generated some new and extremely interesting findings. These findings have aided in further exploring plausible factors associated with poor examination performance - as seen in the results of study one of this empirical work. Despite the subjectivity of the skills training questionnaire – which was previously acknowledged, the tool was able to generate interesting lines of investigation without being time consuming, intense, or a repetitive tool to complete. Access to participants for its completion was also relatively simple compared to the previous study, as it was a single data collection.

The main factors to surface have generated four specific lines of questioning, which will be followed up and explored in the proceeding investigations of this thesis. These concern the assessment structure and expectations contained within the curriculum; the content of the curriculum and clarity of definitions of that content between those who deliver and receive the curriculum; levels of support and provisions of training between the delivering sites. Then finally, the application of theory and practice and students identity with the content in regards to how it influences their development and identity as a nurse.

CHAPTER 5.0 - STUDY 3: THE PROFESSIONAL PERSPECTIVE ON THEORY AND PRACTICE IN THE CURRICULUM

5.1 Introduction

This study is centred upon the main factors that surfaced from the previous investigation. These concerned the curriculum, namely - its content and the clarity and definitive nature of that content by the professionals who deliver the curriculum. Also, exploration into levels of support and training between sites were pursued. The purpose of this was to follow up the results from studies one and two in order to further elaborate on their findings.

The previous two studies identified flaws within the curriculum structure, which were revealed through: poor examination performance, general observations and also student feedback from the post-OSCE skills training questionnaire. The present study aimed to investigate the content of the curriculum – namely theory and practice, from the professional point of view. The purpose of this was to investigate whether professionals' opinions in regard to the curriculum were consistent and in line with student and curriculum expectations. Therefore, allowing investigation into how the professionals' responsible for teaching the course related to the methods of theory and practice within the curriculum. A qualitative design was selected for this study using interviews as the main investigative tool. The purpose of this was to add depth and richness to any data gathered. This was done using a combination of both open and closed questions in order to further probe opinions and beliefs.

5.2Design and methods

5.2.1 Participants

Four nursing professionals took part in the investigation. Two of these were academics and site leaders from two of the nurse teaching sites used in the studies one and two. These participants were responsible for the teaching, facilitation, and assessment of students during the delivery of the fundamental and key caring skills module in the academic setting. The other two participants were clinical facilitators who worked at the Countess of Chester hospital. They were responsible for the supervision and assessment of students during placement in the hospital setting, as well as being active nurses.

5.2.2Instrumentation

5.2.3 Semi-structured interviews

A short semi-structured interview was conducted with each participant lasting approximately 20-30 minutes. The purpose of the interview was to explore participants' perspectives on the curriculum that they taught and also the content of that curriculum. This was mainly focused upon theory and practice, which are the key constituents of the nursing curriculum.

The interview contained twelve open questions which were initially based around: 1) individual definitions of theory and practice; 2) the importance of theory and practice; 3) the perceived ratio of theory and practice in the curriculum; 4) the consistency of theory and practice in the current curriculum;

5) the importance of theory and practice from a students perspective; and 6) the value of learning from theory and practice. These questions were all developed and based on observations, comments, statements and concerns expressed by students across the previous two studies. The purpose of this was to gain clarity on what the students were referring to and also assess whether views were coherent with staff responsible for the curriculum delivery.

5.2.4 Procedures

Interviews were arranged at the participants' convenience. These took place in the work place of the participants, namely the academic setting for the teaching staff and in the hospital setting for the clinical facilitators. The researcher clearly explained the purpose and objectives of the interview and then informed consent was gained from each participant prior to starting the interview. Each participant was informed that she could stop the interview or ask questions at any time during the interview. Each interview took place in a quiet and informal setting. Permission was sought from each participant to record the interview. Participants were asked to elaborate on any information given during their answers. The purpose of this was to gain in-depth quality information to and better understand and encapsulate what each participant had said. This was done through active listening (Rollnick & Miller, 1995) by understanding, interpreting and evaluating what the participant had said by paraphrasing their words.

5.2.5 Data Analysis

All interviews were recorded and transcribed and information was organised using inductive content analysis (Thomas, 2003). This concerned three stages: 1) condensing the raw text data into brief, summary format; 2) established clear links between the research objectives and summary findings derived from the raw data; and 3) developing a model or theory about the underlying structure experience which are representative in the raw data. The purpose of this was to arrange the data into interpretive and meaningful categories for analysis, which will be presented in tables, then discussed.

5.3 Results

The following section presents the results from the interviews. Each interview was transcribed and coded and the key quotations for each question were using content analysis. The following tables present the results of the content analysis for each interview question.

5.3.1 Content analysis results

Q.1 What does the integration of theory and practice mean to you?
"Teaching underpinning theory of a skill and going into the skills lab to carry out the practical component of that"
"Demonstration and practice – putting the 2 together in the University setting"
"It represents a model of 3 domains: psychomotor element (what you are doing), cognitive element (theory) and the effective element (which I teach myself)"
"Doing the psychomotor but utilising the underpinning theory to create a gold standard foundation"
"The integration means using background learning and interpreting it in real circumstances experienced in everyday practice"

Q. 2 What knowledge or disciplines do you feel the integration of theory and practice in nursing is derived from?
"Literacy because they need to complete documentation correctly"
"Knowledge of anatomy and physiology, some basic psychology and sociology and communication skills absolutely"
"It's biology, applied biology, physiology, anatomy, humanities, sociology and psychology"
"Anatomy, physiology, sociology, psychology, with areas to give foundation – it's all about bringing in other elements to give total patient care"

Q. 3 What would you refer to as theory?
"The underpinning elements they needs to carry out the skill itself effectively"
"Using their knowledge so they can relate it in making sense of what the result means"
"Not practical!"
"Supporting evidence that is going to be used and is derived from knowledge, research and experiences"
"Evidence, background knowledge and research that has been developed"
"Support that turns into patient care and practical aspects of patient care"

Q. 4 What would you say the importance of theory is in the curriculum?

"Very essential – If you carried out the skill and it's purely a psychomotor thing, then if they didn't understand why they were doing it or what the results might mean, it would be dangerous because they would carry out the skill but not take action when action is indicated or other important aspects like communication – they must have an appreciation of that"

"Absolutely essential!!"

"Very important, background knowledge is needed to support judgements in patient care!"

"Vital! It wouldn't be possible to facilitate knowledge in placement time alone, so the theoretical component is imperative"

Q. 5 What would you refer to as practice?

"There's practice in that what they'll do in their placements areas, so carrying out clinical skills as a practical thing – psychomotor element actually doing the physical skill"

"How they deal with someone and their manner, which relates to the cognitive aspects"

"Suppose when you think of practice – the practical part of the course goes as that"

"The performance of nursing and actually carrying out nursing care"

"Anything that can be utilise or is directly involved with patients which could be used in the patient care setting"

Q. 6 What would you say the importance of practice is in the curriculum?

"Absolutely essential – nursing is a practical job!"

"Absolutely essential, theory without practice is blind! People refer to a theory practice gap but I think there is a practice theory gap"

"It is as equally important as the theory – they go hand in hand"

"It is vital, as is theory – a good nurse must have a firm grasp of the two and their application"

Q. 7 What would you say the current ratio of theory: practice is in the current curriculum?

"I think in the first year module I do 50:50, however, I don't think all sites are using that method. I think that on other sites there may be a lot more theory"

"It's currently 50:50 and I think that's how it should be and has always been"

"It's designed to be 50:50, but obviously desegregated and will become more so as we separate the practice module out from the theory modules, but it's 50:50 on paper anyway."

"An equal split – it would seem nonsense to have it any other way!"

Q. 8 What does theory in the current curriculum consist of?
"If you ask the students they say there's too much ethics, psychology, and sociology"
"I think with the theory unfortunately there's too much duplication and that's a shame because I think that rather that duplicating theory we could put more practice in"
"Applied biology, the utilisation of sociology, psychology, ethics, professionalism"
"Academic contact and theoretical teaching time – lectures and seminars"

Q. 9 What would you say practice in the current curriculum consists of?
"Teaching basic skills in the first year during the fundamental and key caring skills module"
"Presumably it's included in the curriculum – their other practice is what they get on their placements, because as far as I know there in not much else practice"
"Placements in the community care setting – using the skills from academic time. We don't really know what the skills are they learn on practice though, if any"
"Teaching basic skills and using them in the real-life context on placement"

Q. 10 Which in your eyes would you say is the most important out of theory and practice?
"You can't have one without the other to be honest because I think with practice, they have got to learn the practice skills – it's essential, but without the underpinning theory it wouldn't be good enough, so they have to have knowledge"
"That's difficult because they're equal – there are many people that are good in practice that can't achieve the academic requirement but would make fantastic nurses, and if they continued with practice could acquire the knowledge and skills in a way that was more achievable for them. If someone is good academically and isn't very good in practice they are the people that are never likely to be good nurses"
"With practice you can develop your theory as well whilst you are practising – you have got to have both, but you can't just have theory without practice"
"They are as equally important – you can't have one without the other!"

Q. 11 From a students perspective which would you say is more important out of the two?
"The majority practice! It hits them harder when they go into placement and they don't know how to do something"
"It may be their impression as well, when they start the course that they will be doing lots of practical skill, and if that doesn't happen they are disappointed by it"
"Practice! Students feel like they need a lot of practice to master their abilities and skills to be able to be competent as newly qualified nurses"
"They always say practice – they want more practical skills. I think that the way that we teach things such as biology, we don't apply it enough. Students like doing the skills but they don't connect the two. I would love to develop a model where they couldn't do a skills without demonstrating the theory"

Q.12 Which do you believe you learn more from and why?
"They both go together and compliment one another because you can't have one without the other"
"Understanding the theory might be more complicated for some, but they do need it to make their practice effective"
"The nature of nursing tends to be more practical and with like human nature we learn from our experiences more directly. So, I believe reflection upon practice is better for learning, in that it will retain information for a longer time. So, practice will reinforce learning more really"

Figure 14 presents the results of the quotation analysis in a tree diagram to formulate the professionals' perspective on the integration of theory and practice in nurse education.

THE INTEGRATION OF THEORY AND PRACTICE

The utilisation of underpinning theory with real practice

KNOWLEDGE AND DISCIPLINES DERIVED FROM

Literacy, anatomy and physiology, psychology, sociology, communication, ethics

THEORY

Background evidence, knowledge and support put into patient care

PRACTICE

Carrying out patient care that directly involves patients and the performance of psychomotor skills

MOST IMPORTANT - PROFESSIONAL

Can't have one without the other!
You can develop theory with practice but can't develop theory with practice alone – the compliment each other

IMPORTANCE IN CURRICULUM

An essential and imperative component

IMPORTANCE IN CURRICULUM

Absolutely essential
"Theory without practice is blind"

MOST IMPORTANT - STUDENTS

Practice every time! "Student struggle to connect the two though"

THEORY: PRACTICE RATIO IN CURRENT CURRICULUM

50:50 "although at some sites I think there is a lot more theory!"

BETTER FOR LEARNING

Equally as important – you can't have one without the other

"practice will reinforce learning more readily"

CONTENT IN CURRICULUM

Lectures/seminars in the academic setting: biology, sociology, ethics
"Students think there is too much emphasis on it"
"There is a lot of duplication in the content which could be spend on practice"

CONTENT IN CURRICULUM

Placements in the community setting and using skills in real life contexts

Figure 14: The professional's perspective of the integration of theory and practice in the curriculum – quotation analysis

267

5.4 Discussion

The results of the interviews revealed some interesting and common trends amongst the professionals' perspective in regard to the curriculum. The discussion of these will follow in the order of the questions from the interview.

The results revealed that the integration of theory and practice has common associations with the application of underpinning theory to nursing practice (e.g., carrying out nursing skills). Also, references to the psychomotor element were made by two of the participants. One participant explained that:

> '*The integration of theory and practice represents a model of three domains – psychomotor element (what you are doing), cognitive element (theory) and the effective element (which I teach myself)'. This underpins the theoretical with the practical'.*

This encapsulates the complex essence of nursing in respect to integrating the theoretical expectations with the complex demands of tasks. In the OSCE process used in study one the students were assessed on their integration of theory and practice within the objective framework. However, as acknowledged in the discussion of study two, the successful application and integration of theory and practice may not have been clear cut for some students.

Ellis and Whittington (1981) developed a model called the 'action-focus model', which addressed the application of theory to practice. Therefore, it

aimed to promote that the work that students do in the academic setting should make sense when they are working out in practice. Thus, the written assignments, written assessments, role plays and other activities that occupy students during their course should be seen as relevant to their work when out on placement (Ellis, 1980).

From the former studies of this thesis it has become evident that this may not be true for all nurses in training, as results revealed common concerns that there was 'too much theory' and 'not enough practice time'. Therefore, the academic contact and delivery of theoretical concepts was not always deemed as relevant and appropriate to their work out in practice.

At a higher level, the action-focus model refers to the integration of various kinds of knowledge that is derived from a range of academic disciplines. Some of which comes from the body of knowledge that the profession has and some may arise before, during, and after professional practice. Therefore, their integration may simply be theoretical in that one fact or theory relates to another across disciplines, but is usually expected to be, in part, practical (Ellis, 1980). This suggests that thought and speculation should affect practice and vice versa. Therefore, multidisciplinary knowledge is applied through practical actions and can be affected according to the circumstances of those actions.

The present results are supportive of such in nursing as knowledge is drawn from multiple disciplines. The common disciplines acknowledged in the results

concerned anatomy and physiology, psychology, sociology, humanities and communication skills. Therefore, students are required to learn, understand, apply and use the basic principles of theory for these disciplines. The purpose of this is to best utilise the apparent theoretical principles according the practical nature of the task or situation under question. Therefore, this takes shape by extracting the information that best underpins the practical task at hand. One participant explained:

> *"The way I generally organise my sessions is I teach the underpinning theory of a particular skill, then we go into the skills lab and carry out the practical component of that. I usually do a demonstration of the skill in the lecture theatre, and then we go into the skills lab and actually practice the skills, so the two things are put together in the university setting. We then slot in the theoretical knowledge around that".*

When asked about the current ratio of theory and practice in the curriculum, the participant continued:

> *'I think in the first year module its 50:50 and I ensure it is 50:50. However, I don't think all sites are using that method. I think that on other sites there may be a lot more theory and the practical suffers as a consequence'*

In one respect this is positive as it supports the integration of theory and practice, as it provides evidence that the underpinning knowledge is being

utilised practically, in order to compliment and support its intended purpose. In another respect though, it further evidences concerns about different teaching methods across the nursing sites used in study one. This was previously acknowledged in studies one and two as a factor that could be accountable for affecting student's learning, development and performance. As a result, the theory-practice gap for some students is wider, which is partly due to the teaching methods in place and support provided. This certainly requires change, in order for quality assurance to be achieved and maintained within the curriculum.

According to Ellis (1980) practice refers to the range of observable activities carried out by the professional or the apprentice professional in providing a service for clients. Theory on the other hand concerns the content of academic disciplines deemed to be relevant for professional practice. Therefore, students are required to master the principles of the theory and relate their relevance and meaning to professional practice. Results from the interviews indicated that mainly participants referred to theory as 'the underpinning knowledge and evidence to support the practical aspects of patient care'. Results also indicated that participants deemed the importance of theory to be 'absolutely essential' to nursing and the curriculum. One participant stated:

> 'It's *very essential – If you carry out the skill and it's purely a psychomotor thing, then you wouldn't understand why you were doing it or what the results might mean. So, it would be dangerous because*

you would carry out the skill but not take action when action is indicated'

This is an important point to consider because the OSCEs are a test of knowledge, competence and understanding – not just competence alone. Therefore, students can fail on any of these aspects. Consequently, students must be able to apply the theory to the practice in order to elicit competency and understanding of procedures, as well as their implications for patients. The successful application of this process in teaching is vital. However, whether the curriculum actually does this in its framework is questionable.

The theory-practice gap has been the subject of much debate within nursing. A study by Corlett (2000) explored the perception of nurse teachers, student nurses and preceptors of the theory-practice gap in nurse education. Such issues have included: where the gap is, whether it is a positive or negative phenomenon and whether attempts should be made to bridge it. The study adopted an innovative approach to exploring the theory-practice gap by investigating it from the perspectives from three different groups: nurse teachers, nurse students and clinical preceptors. Combing the perceptions of these groups allowed a more complete picture of the theory-practice gap compared to examining one group's perspective alone. Twenty-three group interviews were conducted and content analysed to identify common themes, Mutual concerns were identified groups which concerned: shortness of clinical placements, sequencing of theory and practice, lack of collaboration between clinical areas and educational institutions, and the lack of clarity regarding link

272

teacher roles. Results revealed that all interviewees felt that a theory-practice gap does exist, and whilst this could be viewed positively as a means of improving students' problem solving skills, attempts should be made to minimise its impact. It was suggested that ways to achieve this could include: the development of an innovative curriculum allowing closer sequencing of theory and practice, evaluating the effect length of clinical placements has on knowledge and skill acquisition; improving collaboration between clinical areas and educational institutions and developing preceptors' lecturing roles.

In light of the results of the this thesis so these are all valid suggestions, as the results from the empirical work have all indicated short comings which are related to the suggestions made.

Following the work of Corlett (2000) another study investigated factors influencing theoretical knowledge and practical skill acquisition in student nurses (Corlett, Palfreyman, Staines & Marr, 2003). This followed on from the ideas and findings from Corlett (2000). The theme for this study was how the theory-practice gap could be closed which was translated into three factors: 1) the effect of whether a nurse teacher or preceptor taught students theoretical elements relating to a clinical speciality; 2) whether the nurse teacher preceptor collaborated on the content of what was taught to students and; 3) whether students went straight to, or delayed the clinical speciality following theoretical input. A full factorial experimental design was used to study the effects of these factors on theoretical knowledge and practical skills acquisition in a sample of first year undergraduate student nurses from one

institution of higher education (n=19). The results revealed that preceptors were more effective than nurse teachers in promoting theoretical knowledge relating to their clinical speciality. Collaboration between the preceptors and nurse teachers on teaching content was ineffective at increasing theoretical knowledge. It was concluded that delay between theoretical input and clinical experience was not detrimental for medical placements and rehabilitation placements. This was evidenced in improved theoretical knowledge in some cases.

Therefore, this highlights that the theory-practice gap is a complex issue and may surround a number of factors that may be different for each individual student.

It could be speculated that on paper the curriculum assumes that the application of theory to practice happens automatically. The results indicated that one site leader actively engaged in such practice during their teaching. However, it begs to question whether such procedures were reinforced elsewhere at other sites. If it was not the case, then hypothetically there would be differences in results due to varied levels of understanding and ability to apply the curriculum content.

Results also indicated that participants mainly referred to practice as 'carrying out care that directly involved patients and the performance of psychomotor skills'. In regards to the importance of practice, results indicated that participants again deemed it as 'absolutely essential' for competent nursing. One participant explained:

"Practice is absolutely essential, theory without practice is blind! People refer to a theory practice gap but I think there is a practice theory gap"

At its most basic level Ellis (1980) identified practice as behaviour and theory as the complex of unobservable, more or less conscious, thoughts or internal processes which each professional may lay claim to or be assumed to have. In this sense we are all theorisers whatever our level of education or understanding. As a result, it is a reasonable assumption that all humans not only behave and may be observed doing so but also they consciously reflect on their behaviour; that is they theorise about what they might do, what they are doing, and what they have done. Following this, every professional might be assumed to have, at the very least, a body of personal theory about the events they perceive and their own behaviour. Therefore, if this theory was then to be made explicit, it would be in the form of a series of propositions about behaviour and the circumstances in which it occurs (Ellis, 1980). Taking this into account, these propositions may refer to individual events but also include generalisations about categories of events and their interrelations.

As such this concept relates to identity and the construal of events and agents, and how these reflect judgements and behaviour under given circumstances. Referring back to chapter two with specific emphasis on identity and personal construct theory, the ideas of Kelly (1955) complement this paradigm of explaining conscious internal behaviour. At the base of Kelly's theory was the image of the person-as-scientist – a view that

emphasised the human capacity for meaning making, agency, and ongoing revision of personal systems of knowing across time. Therefore, individuals are seen as creatively formulating constructs, or hypotheses about the apparent regularities of their lives, in attempt to make them understandable, and to some what predictable. However, Kelly proposed that predictability was not pursued for its own sake, but instead sought as a guide to practical action in concrete contexts and relationships. Therefore, this implies that people engage in continuous extension, refinement, and revisions of their systems of meaning as they meet with events that challenge, or invalidate their assumptions, prompting their personal theory toward greater adequacy. This could well be an explicating factor in regards to the learning, development and behaviour of students that could explain the theory-practice gap in nurse education - given further investigation.

The above ideas refer back to the primary theoretical underpinnings discussed at the beginning of chapter two – namely internal representation of behaviour. In light of study one, it was assumed that propositions of behaviour related to psychomotor performance in the OSCEs may be generalised and interrelated to the ideas and propositions of PETTLEP and the circumstances of which they occur. However, if behaviour propositions in the acquisition phases of theory and practice for the OSCEs were not well formulated and integrated, the incorporation of PETTLEP may have not formed any significant association with the behavioural propositions in place. Therefore, students' identity with the knowledge in both the curriculum and the PETTLEP training may have lacked meaning.

In line with the curriculum 'gold standard' expectations, behavioural propositions would demonstrate a well grounded understanding and ability to integrate the taught theoretical components with the practical, and vice versa. Therefore, students are expected to fuse and apply their learning from all the taught domains, in order to inform their behaviour. However, the curriculum does not objectively test that until the final assessment stages, which is often too late to identify.

Results from the interviews indicated a common trend of the belief towards students deeming the practical element of learning to be more important than the theoretical. One participant explained:

'It hits them harder when they go into placement and they don't know how to do something, so they think practice is the vital ingredient in nursing'

Also, another participant explained:

'They always say practice is most important – they want more practical skills. I think that the way that we teach things such as biology, we don't apply it enough. Students like doing the skills but they don't connect the two. I would love to develop a model where they couldn't do a skill without demonstrating the theory'

This is suggestive that the curriculum itself may indeed struggle to properly integrate its components. The successful integration of the theory and

practice allows proper planning, implementation and evaluation – which are key components of the action-focus model (Ellis & Whittington, 1981). Implementation is the central part of a professional work – namely the things he or she does for, with, or to patients. Planning is the process of deciding what will be done – namely evaluation of whether the determined action has achieved the desired objectives. Reflection is an important observable element in each of these stages, in order for evaluation and adaptation of the action to take place. Evidence of reflection is required in the process and could take the form of a set of statements. For example, propositions concerning the behaviours and events in question. Problems with integrating theory and practice could well be considered as the requirement to integrate propositions from established bodies of knowledge and those involved in planning and evaluation. Therefore, if this integration is not fused, practice will be severely lacking due to the inability to access propositions from bodies of knowledge required for planning, implementing and evaluating actions.

In relation to this, the results revealed that participants commonly believed that theory and practice were deemed as equally important for the curriculum in nursing. One participant explained:

> *'You can't have one without the other to be honest because I think with practice, they have got to learn the practice skills – it's essential, but without the underpinning theory it wouldn't be good enough, so they have to have knowledge'*

On the same note but with an interesting slant, one participant said:

> *"That's difficult because they're equal – there are many people that are good in practice that can't achieve the academic requirement but would make fantastic nurses, and if they continued with practice could acquire the knowledge and skills in a way that was more achievable for them. If someone is good academically and isn't very good in practice they are the people that are never likely to be good nurses'*

This in an interesting and very valid point to consider that is not currently considered in the curriculum structure and framework. Everybody learns differently. Therefore, despite being presented with the same curriculum individuals will interpret, apply and use that curriculum in relation to their personal 'theorising of it'. However, there are no measures in place that may aid to assist the more theoretical learners more with their practical learning or the more practical learner with their academic achievements. The assumption is that the curriculum will 'shape' students to be well rounded competent professionals, when in fact it the body of results in this thesis have supported that it is not actually that clear cut. Each individual has their own style of learning that they will identify best with. In light of this, some individuals will learn best by doing (practical learners) and others by absorbing (theoretical learners).

The results of the interviews indicated that a few slight differences in opinion in regards to which you learn more from – theory or practice, but the overall

judgement was concurrent. Generally, it was deemed that theory and practice both go together, and you can not have one without the other as they inform each other. However, an interesting point arose from one participant:

> *'The nature of nursing tends to be more practical, and with like human nature we learn from our experiences more directly. So, I believe reflection upon practice is better for learning, in that it will retain information for a longer time. So, practice will reinforce learning more really'.*

Previous research by Ferguson (1994) investigated the concept of integrating what is taught with what is practised in the nursing curriculum. Ferguson recognised that the discrepancy between nursing as it is taught in the classroom (theory) and nursing as it experienced by students in the clinical setting (practice) has long been a source of concern for teachers, practitioners and learners. In the study, she firstly conducted a review of the literature of the theory-practice gap, and drawing upon the findings, designed a comprehensive model to integrate theory and practice for use by curriculum planners. Fundamental to the model was the notion of collaboration between education and service staff at all stages of the curriculum process. The model highlighted eight key areas for curriculum teams to consider the curriculum model to be used, which included: sequencing of the taught content of clinical practice; the content of the course; teaching methods to be used; assessment criteria; the roles of tutors in the learning process; the contribution of the service staff; and the influence of the hidden curriculum. She postulated that

only though the integration of such a comprehensive model, could integration of theory and practice within the curriculum be achieved. However, the adoption of the model would require considerable individual and organisational commitment, which may prove hard to provoke or control for. This is a good point, as all responsible curriculum parties would have to work together in order to understand, implement, and achieve the same end product. In light of the findings of the present and previous studies of this thesis, it has become increasingly apparent that use of the current curriculum has been difficult to organise across the four sites. This has become evident through the differences in teaching and levels of supervision available. Therefore, if such initiatives were to be introduced to the curriculum the fundamental problems that currently exist, and their underpinnings, must be addressed first. The ideas of the model serve as beneficial factors when it comes to rooting the theory-practice gap to be concerned with the curriculum organisers. Also, the concept towards collaboration between education and service staff at all stages of the curriculum process would serve to be an extremely facilitative step towards a more holistic approach to theory and practice. This was evident in the interviews as one participant said in response to the question, 'what does practice in the current curriculum consist of':

> *Placements in the community care setting – using the skills from academic time. We don't really know what the skills are they learn on practice though, if any"*

This therefore suggests a blind spot between the educators and service staff, which should not be the case – given they are working together and should be consistent with the same organisation, knowledge and commitment. Consequently, it is evident that ongoing curriculum development is vital and required in nursing.

Later research by Fealy (1998) also investigated the theory-practice relationship in nursing, in regards to contemporary discourse. Fealy recognised that the nature of nursing practice, the nature and origins of nursing theory, and the issues of the relationship between theory and practice, to all be issues that continued to generated extensive discourse within nursing. Fealy recognised that there had been few attempts to bring together, and summarise the various ways in which the theory-practice relationship is understood in nursing. The purpose of Fealy's work was to try and offer a description of the principle ways in which the theory-practice relationship was commonly understood in the modern nursing literature. This was done by exploring contemporary and scholarly discourse within the nursing literature, to surface points to evidence that the theory-practice relationship was understood in a number of different ways. Foremost amongst these was the tendency to think of nursing as an applied-science and a tendency to think of theory and practice as separate endeavours. The content of the discourse also suggested a tendency to view the relationship as one in which the basis for practice lies in the collective 'common sense' understandings of practitioners engaged in practice. It was also acknowledged that the relationship was understood in terms of nursing being

an 'ethical' activity in which practical wisdom, deliberation, judgements and choices were required for the conduct of practice. Also, other discourse evidenced views that attempted to contextualise nursing in its social reality and conceive the theory-practice relationship in ways congruent with the recognition that nursing practice is a human and social enterprise that is inherently 'problematic'. It appeared that these contemporary conceptualisations of the theory practice relationship had evolved through a process in which each new conception has been accommodated with and assimilated into the already existing understandings. Therefore, fitting into each other and allowing coherency.

Fealy proposed that ways of expressing the theory-practice relationship were commonly expressed either explicitly or, or in many instances, were implicit in and recoverable from expressions of views, beliefs or assumptions. In conclusion Fealy felt that the best state of thinking with respect to the theory-practice relationship was one of eclecticism (use of multiple assumptions, ideas, and theories) and pluralism (multiple benefits) and a general openness to the contribution of different paradigms of knowing epistemological (the theory of knowledge) development.

In light of the present results, it has become apparent that for some students, rather that engaging equally in both the practical and theoretical content of the course, some in fact disclose themselves more so to one side of the content or the other. The present results supported this by all participants

acknowledging that students generally think the practical element is more important than the theoretical:

> *"It hits them harder when they go into placement and don't know how to do something, so the majority think practice is more important"*

> *"the students seem disappointed by it if we are not always doing practice in the academic setting"*

It would prove extremely beneficial to further investigate such instances with students, in order to establish reasons behind such learning preferences and how individuals come to identify with the curriculum content. This could act as a very interesting follow-up investigation to the present study, in order to gain the students' slant on the theory-practice realm in nursing.

Severinsson (1998) looked at the use of a supervision programme for helping nursing students to bridge the gap between theory and practice. A supervision programme was provided to a group of 28-nursing students during the second semester of their education, which was their first year of nursing practice. The supervision programme consisted of weekly, individual, tutorials and question and answer sessions. The purpose of these was to facilitate application and understanding. Students completed a form with open questions and a 24-item questionnaire at the end of the programme. Analysis of their responses was a combination of factor analysis and grounded theory approach, based on comparative analysis. The results indicated two specific effects of the

programme: personal growth and integration the process of creating knowledge. Also, the process of creating knowledge included four stages: awareness of concepts and phenomena, development of a 'language of caring', development of a 'model' of communication, and reflection gained as an effect of the intervention. The nursing students reported that reflection was a way to bridge the gap between theory and practice. Also, students' views of the effects of supervision showed high values for the following three factors: improved interpersonal skills, improved professional skills, and improved communication skills.

With reference to the present results, such supervisory programmes would be very beneficial and encouraging for students – given the differences of supervision evident at the experimental sites. Such a programme would enforce a supervision framework, which could evidently aid student development in many aspects of their professional identity.

In summary it has become apparent that integration of theory and practice is a vital element for competent performance. The participants have evidenced common trends in their beliefs about the nature, use and importance of theory and practice to nursing, highlighting that both elements are as important as each other for nursing. It has also become apparent that the content of the theory, which is used to inform practice, is drawn from a range of key academic and theoretical disciplines. Therefore, students are expected to learn and apply a vast range of knowledge into their practical execution.

Therefore, skills are not based on competence alone, and require a degree of prior knowledge and awareness, in order to effectively execute skills and inform their proceeding actions. This in part may be attributed the poor OSCE results, as students may not have acquired the appropriate underpinning knowledge required to fully inform the action under assessment.

Therefore, it has become apparent that students may in fact identify differently with elements of the curriculum. Therefore, this will directly affect their behaviour either practically – namely performing skills, or academically – namely written assessments or informing knowledge. This may be largely due to the curriculum's inability to integrate theory and practice effectively and bridge the two together, instead of them being perceived as separate entities. This created a novel and interesting line of investigation for the next study to pursue - namely the complex world of nursing for students. This would explore their identity and construals in regards to the elements of nursing and how they place these in regard to their broader lives. This would allow exploring and identifying the individual motivations underlying nurses in training, which may explain their allegiances to the curriculum, its content, and their overall performance as a nurse in training.

CHAPTER 6.0 - STUDY 4: IDENTITY IN NURSING DEVELOPMENT – TOWARDS A TYPOLOGY OF CONSTRUAL

6.1 Introduction

The results of the previous studies have highlighted that students may in fact appraise and apply themselves to the curriculum differently. Therefore, its content may possess varied significance to students and directly influence and affect their behaviour differently both internally and/or externally. Consequently, the aim of this study was to investigate this notion and explore how student nurses construe their world of nursing and how this may affect their development, behaviour and identity. ISA/Ipseus (Weinreich & Saunderson, 2002) was used to explore how participants applied themselves to various aspects of nursing in the contexts of health care and broader affiliations, and how these fitted into their broader sense of identity.

Ipseus was used to explore identity in the framework of ISA. An Ipseus is built around entities - objects of thought and feeling, and constructs - bipolar concepts that are used about entities. This was presented in the form of a questionnaire using a computer software programme, where respondents applied bi-polar constructs to a number of entities. This was a new and in depth method of analysing identity, based on a complex theoretical framework.

Despite the hypotheses of study one not being supported, the results and the proceeding investigations have revealed some more interesting findings, which have helped to explicate the unexpected results.

All pre-registration students are presented with a compulsory curriculum, which should comprise of 50% theory – taught within the university setting, and 50% practice – in the form of a placement in the health care setting (Diploma in Higher Education Nursing Pre-Registration, Programme Handbook, 2006). On paper, the curriculum assumes successful integration and application of these components by students, so that they are able to back-up theoretical knowledge with practical application, and vice versa in the academic and practical settings. However, it has become apparent from the results of the previous studies in this thesis that in reality this may not actually be the case for a number of students. Therefore, they often struggle to bridge theory and practice together.

As documented in study two, some students mainly at one of the experimental sites, cited a number of concerns about practical elements of the course. The concerns that were commonly voiced were that there was not enough time spent on practical skills and there was little application and explanation of the practical skills to the OSCE expectations and assessment.

Despite particularly poor results from one of the experimental groups in particular, on the whole there was a quarter of fails across the three sites with the larger intakes. Although this could be said to be expected with larger numbers, the site leaders were still concerned and anticipated better results. Across the four sites there was a 30% failure rate - taking into account that students were allowed a certain leeway for error; needed to score 70% or above to pass; and were also not examined on all skills. Correspondence with

the site leaders post the OSCE re-sits and final results revealed that they were concerned about the overall failure rate and would obviously like this improve.

The results from studies two and three created a new line of thought that concerned the integration of theory and practice in the curriculum and students ability to absorb and apply its the content. Initially, it was a logical assumption that the standard and methods of teaching the curriculum were the same across all four sites, given that the sites represented the same qualifying institution. However, this appeared to not actually be the case, given the findings of the first study one and the proceeding follow-up studies. These indicated discrepancies in the amount of supervision and the methods of teaching applied in the academic setting.

As a result, this set up the rationale for the present study to investigate identity – namely the students' construal of the complex world of nursing. The previous studies have evidenced that the curriculum is not as clear-cut as it may actually appear to be on paper. In accordance with the curriculum students are: 1) delivered theoretical knowledge in the academic setting; 2) put into practice in the hospital setting; 3) progressively assessed on the two; then 4) become a competent professional – as measured by their exam performance. However, over the course of this programme of empirical work it has become apparent that there is a lot of other less obvious and underlying factors - such as, knowledge, supervision, facilitation, beliefs - that can impact upon development.

This present study aimed to elaborate on these factors by exploring how student nurses associated with and applied themselves to various aspects of nursing in the contexts of health care and broader affiliations of life, and how these associations fit into their broader sense of identity. As previously acknowledged the essence of nurse training is typically centred on theoretical knowledge – delivered in the academic setting, and practice – carried out in the health care setting, as a placement. The successful integration of these two components reflects a complex web of construals, including constructions of nursing, theory and practice, health care, knowledge and human relations. Therefore, the introduction of a new intervention as addition for learning – namely PETTLEP, may not have had the power to facilitate skilled performance when some students already struggle to use and apply the content of the regular curriculum.

The investigation aimed to explore students' identity in regards to the complex web of expectations and skills they are required to master from the regular curriculum alone, in order to become a qualified and competent professional. Therefore, the study explored whether there are various identities for student nurses in training, and whether they form certain categories within these for practice learning. These ideas link to those discussed in study three, where by beliefs about nursing are sometimes drawn from individual discourses, as opposed to drawing on eclecticism and pluralism of different paradigms for theory of knowledge (Fealy, 1997).

6.2 Design and methods

6.2.1 Preparation and design of the research instruments

ISA/Ipseus requires two types of information. The first is the bipolar constructs which are used to construe oneself, other people and the social world generally. Second, are the social groups and individuals who influence one's life - these are represented as entities. Weinreich (1980) recommended the interview method for generating personal constructs, with the purpose being to gather reliable and relevant discourse and use specific dialect in regards to the topic under investigation. The constructs then consist of the sourced information from the interviews. The semi-structured interview has been used successfully in a number of studies involving ISA, in order to determine the influential people in individuals under questions' lives (entities) and the discourses used to construe them (constructs). This is an ample procedure for ISA work according to Weinreich and Saunderson (2002).

The present study used ethnographic interviews with professionals responsible for the delivery, supervision, and facilitation of theory and practice in the curriculum for the students under question. These were the interviews previously used from study three. The purpose of these was to capture relevant discourse and vernacular for the development of relevant themes and domains for entities and constructs in the Ipseus. Also, observations of student behaviour and considerations of past and current topical issues in nursing from the literature were used as a basis for certain domains.

Four semi-structured interviews were conducted in total. Two participants were site leaders and senior lecturers at the University of Chester, whom were responsible for the delivery of theory in the academic setting, which included the Fundamental and Key caring Skills Module that students undertook in study one of this thesis. The other two were Practice Education Facilitators, whom were both active nurses working at the Countess of Chester hospital and also dealt with student placements from the University.

The interviews aimed to gather the views of the active professionals on the integration of theory and practice in nursing. Results of study two indicated that some students felt that there was not enough 'practice time' and felt the curriculum was mostly theory. Some students deemed this to be a factor associated with poor examination performance in the OSCEs. This led to study three examining the questions: 'what actually is theory?' and 'what actually is practice?' and 'how are these represented in the curriculum?' Also, 'are definitions of theory and practice the same for students and the professionals implementing and delivering the curriculum', and 'what do students deem as the most important essence of good nursing: theory, practice, or both equally?' These are questions which had not been both explored or answered before in previous research. However, they were actually very important, particularly for educators of nursing and students in training.

6.2.2 Postulates for investigation

The key postulates for the investigation were derived from the key issues arising from the discourse interviews from study three and also feedback from the students from study two. The curriculum aims to provide equal exposure to theory and practice, although it has become increasingly evident over the course of the empirical work that students could well fit into three distinct categories: 1) the more academic and theoretically orientated student; 2) the more practical and socially able student; or 3) a combination of the two.

Observations and interview data have suggested that generally the mature students' appear to be more 'hands on' and able to get to grips with the job on the ground when it comes to practice, but often exploit anxieties in regards to the academic side of the course. On the other hand, some younger students are able to apply themselves well to the theoretical side more readily but find the transition of that into practice more difficult compared to some of the mature students. These were cases that were identified within the interviews by both the academic staff and active nursing professionals.

Postulate 1: Scientific identity

Theoretical knowledge constitutes of 50% of the nursing curriculum, where students are taught underpinning theory for a range of concepts in the academic setting. It was hypothesised that a more theoretically and academically driven nurse would reflect a more scientific endorsed approach to nursing and exhibit high patterns of scientific identification, as reflected in technical, academic and integral themes of the constructs.

Postulate 2: Humanistic identity

Practice in the form of a placement constitutes 50% of the nursing curriculum, where students are expected to put what they learn in the academic setting into practice in a real healthcare context. It was hypothesised that a more practically driven nurse would reflect a more humanistic endorsed approach to nursing and exhibit high patterns of humanistic identification, as reflected in more social and caring themes.

Postulate 3: Holistic identity

With the nursing curriculum being equally split between the delivery of theoretical knowledge and practice in the form of a placement, it was hypothesised that those nurses, who exhibited an equal approach to both practical and theoretical concepts, would reflect a holistic endorsed approach to nursing. They would exhibit equal patterns of humanistic and scientific identification, as reflected in the former themes from postulates one and two. Therefore, one would exhibit a more eclectic understanding to the taught concepts of the curriculum.

6.3 Method

6.3.1 The identity instrument entities

The ISA instrument included a number of mandatory entities: facets of self (past self, current self, ideal self) and also positive and negative role models (an admired person, and a disliked person).In addition to these mandatory entities, alternative self-images (e.g. a student in university, a nurse on

placement, at leisure) were also included to allow analysis of situational effects on identity parameters.

In order to investigate issues surrounding the postulates concerning scientific and humanistic endorsed nurses, aspects of identity in relation to technical and social aspects of nursing were explored using the entities: 'a technically skilled nurse' and 'a socially skilled nurse'. Also, in order to investigate broader affiliations of professional identity in relation to nursing, other health care professionals (medical consultant, health care assistant, personal academic tutor) and alternative professionals (professional in the business world) were included among the entities. Also, exploratory dimensions of identity were investigated through the use of entities such as 'a difficult patient', 'an incompetent nurse', and 'the self when making an important but rapid decision under pressure' The entities were developed to reflect common existences or of the students everyday and nursing lives, from past to future. See entity list below:

Entities in the world of nursing: a student's perspective

1. The person I'd ideally like to be… (ideal self)

2. Me, as I would not like to be…

3. Me, before I went into nursing…

4. Me, at leisure…

5. Me, as a student in University…

6. Me, as a student nurse on placement…

7. Me, when I have to make an important but rapid decision under pressure

8. Me, as my friends see me…

9. A celebrity I dislike…

10. A celebrity I admire…

11. My Mother…

12. My Father…

13. My best friend…

14. A difficult patient…

15. An incompetent nurse…

16. A socially skilled nurse…

17. A technically skilled nurse…

18. A professional in the business world…

19. My personal academic tutor…

20. A medical consultant…

21. A health care assistant…

6.3.2 Constructs

In the ISA framework the parameter 'structural pressure' estimates the centrality or uncertainty of the respondents' values and beliefs as represented by the constructs used within the ISA instrument. However, selecting the constructs for the instrument and their wording required careful consideration. It was imperative that the vernacular and content was accessible to the target audience. The purpose of this was to ensure understanding of the true meaning of the judgement. The aim was to include constructs that tapped the beliefs, attitudes, and values pertinent to key issues concerning the world of nursing. As the results from study two suggested issues surrounding the curriculum content – namely theory and practice, the instrument included constructs that dealt with:

Nursing and learning*:*

1. Finds that learning proceeds more effectively by way of knowing about basic principles // finds that learning proceeds better by getting to grips with the job on the ground

2. Thinks the patient knows best // thinks the professional knows best

3. Believes nurses are born not made // believes nurses are taught

4. Believes learning is more about social skills than technical skills // believes nursing is more about technical skills than social skills

<u>Theoretical content of nursing:</u>

5. thinks the science behind evidence based patient care is most important //
thinks there's to much emphasis on science and evidence based patient care

<u>The Practical content of nursing:</u>

6. believes practical skills must be based on theory // believes practical skills
must be based on common sense

7. thinks practical learning is more important than academic learning for
nursing // thinks academic learning is more important than practical learning
for nursing

Also, as nursing is a caring profession the instrument included constructs that
dealt with relations with other people:

8. thinks nursing is essentially about human relationships // thinks there's too
much emphasis on human relationships in nursing

Finally, the instrument included constructs that dealt with general traits that
were related to identity, which may have situational differences depending on
the entity in question, and also related to the broader context of life and
nursing:

9. *Likes to take risks // usually plays it safe*

10. *Likes to let their hair down and have a good night on the town // prefers a night in with a good film or book*

11. *Would take shortcuts to achieve a target // would make sure everything is done thoroughly*

12. *Is factual and scientific // is creative and artistic*

13. *Thinks success in life is determined by hard work // thinks success in life is determined by luck*

14. *Is dependent on others to make decisions // always makes their own decisions*

15. *Is emotionally involved and empathetic towards others // maintains some emotional distance*

16. *Is serious and straight-laced // like a laugh and a joke*

17. *Is usually confident //often has self-doubts*

18. *Seeks out social situations // prefers their own company*

19. Regards work as the most important thing in life // values their home life above everything

20. Puts the needs of others first // takes care of personal needs

21. Prefers to be a team player // prefers to work as an individual

22. Always keeps in budget // lets costs take care of themselves

23. See the future optimistically // sees the future as uncertain

6.3.3 Participants

A total of fourteen participants took part in the investigation. These were a sample of students taken from the same cohorts across the four teaching sites from the study one of this thesis (Arrowe Park $n = 4$, Chester $n = 4$, Leighton $n = 2$, Warrington $n = 4$). All participants provided written informed consent prior to participation.

6.3.4 Procedures

All participants were sent an initial email that invited them to take part in the research. This detailed the aims and objectives of the research and also instructed participants on what to do. All participants were given a period of 28-days to complete the tool at their leisure. The ISA/Ipseus tool featured as a hyper-link on the email and was available to access and complete online.

Upon clicking on the hyperlink, this directed participants to the ISA/Ipseus powered online portal where the tool was available to complete. The first page participants viewed detailed information about the tool and the steps to completing it. Upon reading this information participants were instructed to complete the information section. These were demographic variables that requested their: name; site; age; passed OSCE first attempt Y/N; number of years of experience in nursing; and whether they had any dependents Y/N. These variables would then be used when considering the the results.

Once participants had finished entering their data they then had to click 'continue' were directed to the actual tool to start completion. Participants were faced with 483 judgements to make in total. This consisted of the each entity presented with each construct (21 entities x 23 constructs).
Each judgement was presented on a nine point scale, where by the entity represented the self in question (existence) and the construct was the judgement to be made (bipolar decision in regards to the entity). Participants would select the judgement by clicking on one of the nine points on the scale. Once they were satisfied with their answer they would then click 'ok' to move onto the next judgement.

Completion of the tool took between 30-45 minutes, if done properly. This was found to be the average completion time in the pilots that were conducted prior to finalising the instrument.

Upon completing the tool participants would receive a 'thank you' message on the screen then the data were sent automatically to the researcher's data portal. The researcher would receive an email to inform that a participant had completed the tool. This email would detail the exact demographic data completed by the participant.

Data was automatically analysed within the software programme, which produced a 25-page profile for each participant. The results of the profile were then analysed in respect to the ISA/Ipseus parameters of identity in order to explore the true meaning in terms of what the data was representative of from the responses.

The following section will present the results as idiographic case studies and explore the ISA/Ipseus parameters based on the responses from case.

6.4 Results and case discussions

The results are presented and then discussed per case to make inferences based on the typologies postulated. Each case is identified as 'student' with a corresponding letter.

Student A

Student A displayed much ego-involvement with a socially skilled nurse, her self as student and as a nurse on placement. Her evaluation of these was positive. However, her evaluation of a difficult patient and incompetent nurse was negative, as exhibited by low and moderate ego-involvement with these entities. She idealistically identified most highly with a medical consultant (0.70) and a socially skilled nurse (0.70) in regard to the attributes she wished to possess; but contra-identified most highly with an incompetent nurse (0.26). This value was relatively low, but was still the highest for entities within contra-identification. Therefore, this indicated a frequent tendency to select the midpoint for identity judgements with each construct.

Before student A went into nursing she empathetically identified equally highest with her parents, a socially skilled nurse and a technically skilled nurse. As a student in university, her empathetic identity with these increased, along with a socially skilled nurse and technically skilled nurse being equal highest (0.85). As a nurse on placement these entity values again increased, exhibiting full empathetic identification with a socially skilled nurse (1.00).

This indicates a high degree of positive similarity in regards to her current self-image as a nurse on placement, as reflected in the highly positive evaluation of a socially skilled nurse.

In terms of the emotional significance of the constructs used, student A was very emotionally involved with '*making sure everything was done thoroughly'*, '*always keeping in budget'*, '*preferring to be a team player'*, and '*seeing the future optimistically'*. This demonstrated consistency in her use of these constructs with the entities. Sometimes though, depending on circumstances and the entity in question, she exhibited low-negative structural pressure with the constructs '*liking to let their hair down'*, '*being emotionally involved'*, '*seeking out social situations'*, and '*practical skills being based on common sense'*. This indicated a common tendency to swing from acting in accordance with the orientation to acting in accordance with its opposite depending on the entity in question.

Discussion

The results of student A demonstrated an appreciation towards both the practical and theoretical aspects of nursing. This was reflected by her high ego-involvement with a socially skilled nurse, herself as a student in University, and as a nurse on placement. Therefore, this suggests that she associates a high level of positive understanding and significance to those entities in terms of their importance to her identity, indicating invested personal meaning. This was evident by her positive appraisal subjected to them during the appraisal. In terms of her idealistic identity she exhibited

highest association with the perceived attributes of a medical consultant. This suggests that she highly regards the identity of a medical consultant and aspires to ideally resemble such identity status or attributes. In regards to the original postulates of the investigation, her use of the constructs reflected a holistic approach to the principles of nursing – in terms of her beliefs towards theory and practice. Polarity of the bipolar constructs (favoured connotations), related to the original postulates, revealed that she thought that '*nursing was essentially about human relationships'*; *'the science behind evidence based patient care was most important in nursing*'; *'learning proceeds better by getting to grips with the job on the ground';* and '*nurses are born not made'*. These patterns of polarity of the constructs suggested that both the practical and theoretical concepts of nursing were important in the construal of her identity overall. These patterns complement the findings of her prominent 'idealistic identity' with a medical consultant, but prominent 'empathetic identity' with a socially skilled nurse and technically skilled nurse. Therefore, this would suggest an integrated identity with the connotations of both the technical and theoretical aspects of nursing and the curriculum.

Student B

Student B was much ego-involved with a professional in the business world and an incompetent nurse. Whilst her evaluation of a professional in the business world was high, her evaluation of an incompetent nurse was low – indicating a negative construal of her attributes in accordance with their own values.

She idealistically identified with a professional in the business world (0.74), as per her positive ego-involvement and evaluation of their attributes. However, she contra-identified highest with an incompetent nurse, in regards to perceived attributes.

Before she went into nursing she empathetically identified most highly with a professional in the business world (0.53). However, this diminished somewhat when she became a student, and her empathetic identification with a technically skilled nurse over took this (0.62). As a nurse on placement her empathetic identity with a technically skilled nurse continued to increase (0.70) and remained the highest in respect of the other entities. Therefore, this highlighted a high degree of perceived similarity of positive attributes with her then current self-image. In terms of emotional significance, she exhibited high involvement with thinking that, *'the science of evidence based patient care is most important'*, *'success is determined by hard work'*, and '*making sure that everything is done thoroughly'*. Despite all constructs having some emotional involvement with her, she exhibited high structural pressure in regards to, '*practical learning being most important'*, '*liking to take risks'*, and *'taking care of personal needs first'*. Therefore, this indicated a tendency to swing between orientations depending on the entity in question in regard to her evaluation of the construct.

Discussion

The results of student B indicated a high positive regard towards her identity with a professional in the business world. This suggests a high extent of

knowledge and significance associated with this entity in regards to her understanding towards them and its importance to her. This was reflected in terms of her high ego-involvement and high evaluation of that entity, as well as her high idealistic identity with a professional in the business world. Therefore, suggesting a high extent to which she perceived the attributes of a business professional to reflect herself, and therefore resembled an aspired identity to her. The high ego-involvement and low evaluation towards an incompetent nurse signified a high extent to which the attributes of 'an incompetent nurse' reflected the attributes she would wish to disassociate from. Therefore, this suggests that she would not wish to be like an incompetent nurse or resemble such perceived attributes.

In regards to the original postulates of the investigation, her use of the constructs reflected a scientific endorsed approach to the principles of nursing – in terms of her judgements towards theory and practice. Polarity of these constructs revealed that she mainly believed that, *'practical skills must be based on theory'*, *'nurses are taught'*; '*learning proceeds better by getting to grips with the job on the ground'*; '*the science behind evidence patient care is most important'*; and '*nursing is essentially about human relationships*'. Those patterns of polarity of the constructs are suggestive that the theoretical and scientific concepts of nursing were mainly important in the construal of her identity overall. Those patterns could be complimentary to the findings of her prominent idealistic identity with a business professional. This is so, as one could assume that in a profession such as business, professionals require greater underlying knowledge in regards to their planning and execution of actions (e.g. business plans).

Student C

Student C was much ego-involved with their Father and a medical consultant, and with how they would not like to be. Whilst her evaluation of her Father and a medical consultant were positive, her evaluation of how she would not like to be was negative. Student C displayed low ego-involvement with an incompetent nurse – with low evaluation, but high ego-involvement with a medical consultant - with moderate evaluation. She idealistically identified with her parents, a medical consultant and a health care assistant quite highly in respect to their attributes. However, she contra-identified with a difficult patient and incompetent nurse in regards to their perceived attributes.

Before going into nursing she empathetically identified with her Father and personal academic tutor most highly. However, at leisure that diminished somewhat. As a student in University she displayed close empathetic identification again with their Father and personal academic tutor, but to the same degree with her best friend.

As a nurse on placement, her empathetic identity diminished somewhat with her Father and increased to a higher extent with her Mother and a health care assistant. In terms of emotional significance of the constructs used she exhibited high regard to, *'the professional knowing best'*, and '*making sure that everything is done thoroughly'*. Therefore, structural pressure in regards to the overall strength of the excess of compatibilities between evaluative connotations of the construct in question were consistent with one's overall evaluation of each entity in turn.

Discussion

The results of student C indicated a high positive regard towards her identity with a medical consultant and her father. This suggests a high extent of knowledge and significance associated with those entities in regards to her understanding toward them and their importance to her. This was evidence by her high ego-involvement and evaluation of those entities. Therefore, this suggests that there is a high extent to which she perceives the attributes of her Father and a medical consultant to reflect herself. The results also indicated a high ego involvement with the entity 'me, as I would not like to be', with a highly negative appraisal, along with a highly negative appraisal with an incompetent nurse. This would suggest that she would wish to dissociate from such attributes linked to those entities. Her idealistic identification with her parents and a medical consultant would also suggest highly self aspired identity characteristics liked to those entities.

In relation to the original postulates of the investigation, her use of the constructs reflected a scientific endorsed approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of those constructs revealed that she mainly believed that, 'practical skills must be based on theory'; learning proceeds better by getting to grips with the job on the ground'; the science behind evidence based patient care is most important'; thinks nursing is essentially about human relationships. Those patterns may be reflective of technical and scientific aspects of nursing that are mainly important in the construal of her overall identity. This may be

complimentary of her high ego-involvement and idealistic identity with a medical consultant, due to the theoretical nature of such a professional role.

Student D

Student D was very much ego-involved with an incompetent nurse and a difficult patient, with her evaluation of these being low. Her evaluation of a technically skilled nurse and their best friend on the other hand was very high, with their ego-involvement being moderately low. She idealistically identified equally highest with a professional in the business world (0.55), a difficult patient (0.55), and a medical consultant (0.55) in regards to their attributes. She contra-identified with an incompetent nurse (0.41) in regards to the attributes and qualities one would wish to dissociate.

Before going into nursing, she empathetically identified most highly with a health care assistant (0.83). Interestingly, at leisure she displayed the highest empathetic identification with a difficult patient and incompetent nurse (0.71). This may be related to her idealistic identification with a difficult patient and therefore reflective of similar attributes to such when at leisure.
As a student in university she exhibited highest empathetic involvement with a socially skilled nurse and a professional in the business world (0.67). As a nurse on placement her empathetic identity with a business professional remained consistent. However, her identity with a socially skilled nurse increased to its highest across all entities (0.89).

In regards to emotional significance of the constructs used, she exhibited high effect towards *'making sure everything was done thoroughly'*, *'seeing the future optimistically'*, *'usually playing it safe'*, and *'seeking out social situations'*. These constructs were of high emotional significance. However, sometimes – depending on circumstances, she tended to swing from acting in accordance with an orientation to acting in its opposite. For example, seeking out social situations as a nurse and a student, but preferring ones own company when at leisure.

Discussion

The results of student D indicated a moderately high regard towards her identity with her best friend and a technically skilled. This suggests a moderately high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her ego-involvement and evaluation of those entities. Therefore, suggesting a moderately high extent to which she perceived the attributes of her best friend and a technically skilled nurse to reflect herself. The results also indicated high ego involvement with a difficult patient and an incompetent nurse, along with a highly negative evaluation. This would suggest that she would wish to dissociate from such attributes linked to those entities.

Interestingly, she exhibited highest idealistic identification with a medical consultant and a difficult patient. Therefore, suggest self aspired identity characteristics likened to those entities. This is interesting as they are quite

contrasting in regards to their roles and objective from those roles, and are quite conflicting. However, her results indicated high empathetic identity with a difficult patient when she is at leisure. This suggests a high similarity in the attributes between a difficult patient and their resemblance to her current self image, when at leisure. Therefore, she may possibly exhibit behaviour similar to that of a difficult patient when at leisure.

In relation to the original postulates of the investigation, her use of the constructs reflected a humanistic endorsed approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills are based on common sense'; learning proceeds better by getting to grips with the job on the ground'; there is too much emphasis on science and evidence based care'; and 'there is too much emphasis on human relationships in nursing. These patterns are interesting, given she exhibited highest idealistic identity with a medical consultant and difficult patient, and the polarity displayed a more humanistic endorsed approach to nursing. An interesting reflection point concerns her polarity towards thinking that there is 'too much emphasis on human relationships in nursing'. This may be related to her empathetic identity with a difficult patient at leisure and could well be reflective of a past experience as a patient. However, this is just speculation based on what the outputs are representing. The Ipseus data only provides the outputs, without any explanation. Therefore, in such cases further exploration would be highly interesting and beneficial in order to formulate a greater picture in regards to patterns of identity construals.

Student E

Student E was much ego-involved with an incompetent nurse and a celebrity they admired. Whilst her evaluation of an incompetent nurse was highly negative, her evaluation of a celebrity they admired was highly positive. Their evaluation of a technically skilled nurse was also highly positive, although she only displayed moderate ego-involvement with this entity.

She displayed high idealistic identity with a celebrity they admired (0.87), which was followed by idealistic identity with a technically skilled nurse (0.74) - in respect to their attributes. On the other hand, she displayed high contra-identification with an incompetent nurse in regards to their attributes of which she would wish to dissociate.

Before going into nursing, she showed high empathetic identity with her Mother (0.89) and the metaperspective of how her friends saw her (0.95). Upon becoming a student in University, these decreased slightly, but still remained strong (0.86) and (0.91). As a nurse on placement these again diminished very slightly but still remained high. Therefore, indicating consistent empathetic identity trends across those entities.

In regards to emotional significance of the constructs used, she displayed high involvement with, *'liking to take risks'*, *'being emotionally involved'*, *'usually being confident'*, and *'always keeping in budget'*. On the other hand, she also exhibited negative structural pressure in regards to *'liking to take risks'*. Therefore, this indicated a tendency to drastically fluctuate between polarities in regards to the entity in question. For example, favouring highly

towards liking to take risks at leisure and how her friends saw her but as a student on placement always playing it safe.

Discussion

The results of student E indicated a moderately high regard towards a celebrity she admires. This suggests a moderately high extent of knowledge and significance associated with that entity in regards to her understanding towards them and their importance to her. This was evidenced by her high ego-involvement and evaluation of that entity. Therefore, suggesting a high extent to which she perceived their attributes to reflect her. The results also indicated high ego involvement with an incompetent nurse, along with a highly negative evaluation. This would suggest that she would wish to dissociate from such attributes linked to an incompetent nurse

She exhibited highest idealistic identification with a celebrity she admires and a technically skilled nurse. Therefore, this would suggest self aspired identity characteristics likened to those entities.

In relation to the original postulates of the investigation her use of the constructs reflected a holistic endorsed approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills must be based on theory'; 'learning proceeds better by getting to grips with the job on the ground'; the science behind evidence based patient care is most important', and 'nursing is essentially about human relationships'. Based on

314

polarity, these patterns indicated an appreciation for both the theoretical, practical and humanistic aspects of nursing, suggesting a rounded approach.

Student F

Student F was much ego-involved with an incompetent nurse, a difficult patient and a celebrity she admires. Whilst her evaluation of a celebrity she admires was positive, her evaluation of an incompetent nurse and difficult patient was negative. She idealistically identified highly with a celebrity she admires (0.74) and a technically skilled nurse (0.74), in regards to their perceived attributes. However, she contra-identified with a celebrity she dislikes (0.83) and an incompetent nurse (0.83) in regards to their attributes that she would wish to dissociate.

Before going into nursing, she empathetically identified with a celebrity she disliked and an incompetent nurse (0.91). When at leisure, she identified highly with the metaperspective of how their friends saw her (0.92). As a student in University, she exhibited the highest empathetic identification with her mother (1.00) and a medical consultant (1.00), closely followed by a technically skilled nurse (0.93). As a nurse on placement, these identifications diminished slightly (mother 0.85; technically skilled nurse 0.80, medical consultant 0.80). However, they still remained the highest amongst all of the entities.

In terms of emotional significance of the constructs, she exhibited high emotional significance towards, *'putting the needs of others first'*, *'making sure*

everything is doe thoroughly', and *'believing success is determined by hard work'.* In respect to the constructs that represented emotional significance to the case, certain circumstances influenced her behaviour to swing from acting in accordance with orientations to acting in accordance with its opposite. For example, at leisure believing the patient knows best but as a nurse on placement believing the professional knows best.

Discussion

The results of student F indicated high regard towards a celebrity she admires. This suggested a high extent of knowledge and significance associated with that entity in regards to her understanding towards them and their importance to her. This was evidenced by her high ego-involvement and evaluation of that entity. Therefore, indicating a high extent to which she perceives their attributes to reflect her. The results also indicated high ego involvement with an incompetent nurse and a difficult patient, along with a highly negative evaluation. This would suggest that she would wish to dissociate from such attributes linked to these entities. She also exhibited highest idealistic identification with a celebrity she admires and a technically skilled nurse. Therefore, this would suggest self aspired identity characteristics likened to those entities.

Interestingly, the results revealed that before she went into nursing she empathetically identified most highly with an incompetent nurse and a celebrity she disliked. This would suggest a high extent to which the attributes of those entities reflected her self at that time. Therefore, in the case of an

incompetent nurse, she may have exhibited low self appraisal of her capabilities as a nurse.

In relation to the original postulates of the investigation her use of the constructs reflected a scientific endorsed approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills must be based on theory'; 'learning proceeds better by way of knowing about basic principles'; 'the science behind evidence based patient care is most important', and 'nursing is essentially about human relationships'. Based on polarity, these patterns indicate a more prominent appreciation for the theoretical aspects of nursing, suggesting a more scientific approach.

Student G

Student G was very much ego-involved with themselves at leisure and as a student in University. Her evaluation of these entities was both highly positive. She idealistically identified most with her respected parents (0.76) in regards to her attributed qualities and exhibited very slight contra-identification with her best friend and an incompetent nurse (0.12).

Before going into nursing she empathetically identified most highly with her best friend. As a student in University that diminished slightly and her identity with her parents became more so apparent (0.86). As a nurse on placement this again increased (1.00) and her identity with a socially skilled nurse, technically skilled nurse, professional in the business world, medical

consultant, and health care assistant all increased to equal levels of identification (0.89).

In regards to the emotional significance of the constructs used, she displayed high emotional involvement with, *'nurses being born not made'*, '*the science behind evidence based patient care being most important', 'practical skills being based on theory'*, and *'usually being confident'*.

Discussion

The results of student G indicated high regard towards herself at leisure and as a student in University. This suggested a high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her high ego-involvement and evaluation of that entity. Therefore, indicating a high extent to which she perceived their attributes to reflect her self. In terms of idealistic identity, the results revealed that she identifies most highly with her respected parents. This would suggest a high extent to which the attributes of her parents reflect the attributes of her ideal self. This would therefore suggest that she has a close relationship with her parents and aspires to be like them as a person. The results also revealed slight contra-identification with her best friend and an incompetent nurse. In the case of her best friend this is an interesting finding, as it suggests a small extent to which the attributes of her best friend reflect attributes of which she would wish to dissociate.

In relation to the original postulates of the investigation her use of the constructs reflected a holistic approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills must be based on theory' and 'the science behind evidence based patient care is most important'. In regards to the other postulated constructs concerning the science behind evidence based patient care and human relationships in nursing, polarity indicated neither favoured nor disfavoured disposition. Therefore, this indicates that she selected the midpoint on the judgement of these constructs every time, suggesting neither a favoured nor disfavoured belief in regard to these. Such instances are a disadvantage when using ISA as this limits the results and interpretive nature of the data. However, this cannot be helped if certain cases beliefs towards particular constructs are construed this way.

Student H

Student H was much ego-involved with themselves as a student and at leisure. Her evaluation of these identities was highly positive and she exhibited no negative evaluation. She idealistically identified most highly with her personal academic tutor. However, this is only 0.45, in respect to their attributes. She slightly contra-identified with a health care assistant – which was the only entity displaying such identification. However, this was very low (0.05).

Before going into nursing, she displayed full empathetic identity with all entities apart from an admired and disliked celebrity (0.57). At leisure this then diminishes somewhat, where she identified most highly with their PAT, a medical consultant and a professional in the business world – although these values were all low. As a student in University, she displayed highest empathetic identification with her personal academic tutor, although again this value was low. As a nurse on placement these trends shifted to match the empathetic identity of her past self, displaying full empathetic identity with all entities apart from an admired and disliked celebrity.

In regards to emotional significance of the constructs used, she exhibited high regard to, *'making sure that everything is done thoroughly'* and *'preferring to be a team player'*. She exhibited no emotional significance in regards to *'believing that nursing is essentially about human relationships'*, *'the science of evidence based patient care being most important'*, and *'seeing the future optimistically'*.

Discussion

The results of student H indicated high regard towards herself as a student and herself at leisure. This suggests a moderately high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her high ego-involvement and evaluation of that entity. Therefore, indicating a high extent to which she perceived their attributes to reflect her self.

She also exhibited highest idealistic identification with her personal academic tutor, although this value was only moderate. Therefore, this would suggest moderate self aspired identity characteristics likened to them. This ideal identity may well be reflective of her high ego-involvement and evaluation of herself as a student, due to her personal academic tutor being a key person based in the university setting for learning.

In relation to the original postulates of the investigation her use of the constructs reflected a holistic approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills are based on common sense' learning proceeds more effectively by way of knowing about basic principles'. In regards to the other postulated constructs concerning the science behind evidence based patient care and human relationships in nursing, polarity indicated neither favoured nor disfavoured disposition. Therefore, indicating that she selected the midpoint on the judgement of these constructs every time, suggesting neither a favoured nor disfavoured belief in regard to these. Such instances are again a disadvantage when using ISA as this limits the results and interpretive nature of the data. However, this cannot be helped if certain cases beliefs are construed that way.

Student I
Student I was much ego-involved with her parents and her self as a student and nurse on placement. Whilst her evaluation of their Mother and self as a student and nurse were very much positive, her evaluation of her Father was

negative. She idealistically identified most highly with how her friends saw her, her Mother, and a technically skilled nurse; in regard to their attributes. However, she contra-identified with their Father in regards to the attributes she would wish to dissociate from.

Before she went into nursing, she empathetically identified most highly with how her friends saw her (0.73), followed by her Mother (0.64). As a student in University and a nurse on placement her empathetic identification increased (Mother 0.86, 0.86; Friend 0.95, 0.91). As a student in university and a nurse on placement she empathetically identified most highly with a technically skilled nurse. Her evaluation of this was highly positive; thus suggesting that she perceived her self to possess a high degree of similarity between the qualities they posses and those of her current image as a nurse and student.

In regards to emotional significance of the constructs used, she exhibited high significance in regards to, *'thinking success is determined by hard work'*. This was closely followed by *'usually playing it safe'* and 'preferring to be a team player'. The structural pressures of those constructs were all highly positive, demonstrating consistency in evaluations of the construct with each entity.

Discussion

The results of student I indicated high positive regard towards her Mother, herself as a student and a nurse on placement. This suggests a high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced

by her high ego-involvement and evaluation of those entities. Therefore, indicating a high extent to which she perceives their attributes to reflect her. Interestingly, the results also revealed high ego-involvement with her Father, with a highly negative evaluation. This suggests that she exhibits a negative investment in her Father, in terms of her understanding towards him, and his importance to her. Therefore this would suggest some animosity towards him, in the overall construal of her identity. This is further supported by her high contra-identification towards him, as evidenced in the results. Consequently, this indicates a high regard towards not wanting to be like him as a person.

In relation to the original postulates of the investigation her use of the constructs reflected a holistic approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills are based on common sense' learning proceeds more effectively by way of knowing about basic principles'; the science behind evidence patient care is most important'; and 'nursing is essentially about human relationships'. Based on polarity, these patterns indicated an appreciation for both the theoretical, practical and humanistic aspects of nursing, suggesting a rounded approach.

Student J

Student J was much ego-involved with an incompetent nurse, difficult patient and medical consultant. Whilst her evaluation of all of these was negative, she exhibited moderately high ego-involvement with a socially skilled nurse – even more so than their ideal self, with her overall evaluation of these being

moderate. She idealistically identified with a socially skilled nurse and a healthcare assistant very highly in regard to their attributes, but contra-identified with an incompetent nurse and a medical consultant in regards to their perceived attributes.

Before she went into nursing she empathetically identified highly with a socially skilled nurse and a healthcare assistant. When at leisure those identifications remained consistent. As a student in University she displayed close empathetic identification with how her friends saw her and a socially skilled nurse and health care assistant.

As a nurse on placement, her empathetic identity with her Mother further increased and her identification with a socially skilled nurse and healthcare assistant remained consistently high.

In terms of emotional significance of the constructs used, she exhibited high emotional significance in regards to *'liking to take risks'*, *'always making their own decisions'* and *'preferring to be a team player'*. These constructs were of high emotional significance to her. However, sometimes – depending on circumstances, she tended to swing from acting in accordance with its opposite. For example, taking risks at leisure, but always playing it safe as a student in University. In this case, positive structural pressures were encountered by negative structural pressures on the identity dimension contributing to the dilemma, when the outcome structural pressure were low but nevertheless being of high emotional significance to them.

Discussion

The results of student J indicated high regard towards her self as a socially skilled nurse. This suggests a moderately high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her high evaluation and idealistic identity of that entity. Therefore, indicating high value towards them and a high extent to which she respects and wishes to resemble the attributes of socially skilled nurse. In terms of ego-involvement the results revealed a high negative involvement with an incompetent nurse, difficult patient and medical consultant. This suggests that she exhibits a negative investment in those entities, in terms of her understanding towards them and overall importance to her.

In relation to the original postulates of the investigation her use of the constructs reflected a humanistic approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills are based on theory'; 'learning proceeds better by getting to grips with the job on the ground'; 'there is too much emphasis on the science of evidence patient care'; and 'nursing is essentially about human relationships'. Based on polarity, these patterns indicated an appreciation more so towards the practical and humanistic aspects of nursing. This connotation could be supported by her idealistic identity and her consistent empathetic identity with a socially skilled nurse.

Student K

Student K was much ego-involved with an incompetent nurse and a celebrity she admires. Whilst her evaluation of an incompetent nurse was highly negative, her evaluation of a celebrity she admires was positive. She idealistically identified with how her friends saw them (0.87), followed by a socially skilled nurse (0.65), in regards to their qualities and attributes. Although, contra-identified with a celebrity she disliked (0.74) and an incompetent nurse (0.65) with respect to their qualities and attributes.

Before going into nursing she empathetically identified most with her best friend (0.62) and a difficult patient (0.57). As a student in University, she empathetically identified most with how her friends saw her (0.79). As a nurse on placement this remained consistent and was closely followed by a socially skilled nurse (0.69). In regards to emotional significance of the constructs used, they exhibited high involvement with thinking that, *'success is determined by hard work'*, *'putting the needs of other first'*, and *'usually playing it safe'*, and *'being confident'*. Structural pressure indicated though that in certain instances she could swing between orientations, particularly in the notions of *'nurses being born not made'* and *'believing that the science behind evidence based patient care is most important'*.

Discussion

The results of student K indicated high regard towards a celebrity she admires. This suggests a moderately high extent of knowledge and significance associated with that entity in regards to her understanding

326

towards them and their importance to her. This was evidenced by her high evaluation and ego-involvement with that entity. The results also indicated high ego-involvement with an incompetent nurse, with a negative evaluation. This was further supported by her contra-identification with that entity. Therefore, suggesting negative regard to the attributes and qualities of that entity.

In relation to the original postulates of the investigation her use of the constructs reflected a holistic approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills are based on common sense'; 'learning proceeds better by getting to grips with the job on the ground'; 'the science behind evidence based patient care is most important'; and 'nursing is essentially about human relationships'. Based on polarity, these patterns indicated a rounded appreciation towards both the practical and theoretical aspects of nursing.

Student L

Student L was much ego-involved with a professional in the business world, an incompetent nurse, a medical consultant and a difficult patient. Her evaluation of a difficult patient and incompetent nurse were negative. However, her evaluation of a medical consultant and professional in the business world were positive. She idealistically identified most with a medical consultant and a professional in the business world in regard to their attributes but contra-identified with an incompetent nurse and a difficult patient.

Before going into nursing, she empathetically identified most highly with a healthcare assist and an incompetent nurse. At leisure she empathetically identified most highly with a medical consultant and her self as her friends saw her. As a student in University this shifted somewhat and she exhibited higher empathetic identity with her personal academic tutor and a medical consultant (0.50). As a nurse on placement, these patterns shifted greatly and she exhibited high empathetic identity with a medical consultant (0.87).

In terms of emotional significance of the constructs used, she exhibited high emotional significance in regards to, '*valuing their home life above everything*', '*practical skills being based on theory*', and '*thinking success is determined by hard work*'. These constructs were of emotional significance to her, but sometimes she tended to swing from acting in accordance with its opposite. For example, thinking there was too much emphasis on the science of evidence based patient care but also thinking the professional knows best. In this case positive structural pressures were encountered by negative structural pressures on the identity dimension contributing to the dilemma.

Discussion

The results of student L indicated high positive regard towards a medical consultant and a professional in the business world. This suggests a high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her high evaluation and ego-involvement with those entities, along with her idealistic identity - particularly with a professional in the

business world. The results also indicated high ego-involvement with a negative evaluation towards a difficult patient and incompetent nurse. This was further supported by her contra-identification with those entities. Therefore, this would suggest negative regard to the attributes and qualities that they are representative of.

In relation to the original postulates of the investigation her use of the constructs reflected a scientific approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills must be based on theory'; 'learning proceeds better by way of knowing about basic principles'; 'the science behind evidence based patient care is most important'; and 'nursing is essentially about human relationships'. Based on polarity, these patterns indicated a favoured appreciation towards the theoretical aspects of nursing that reflect the underpinning science and knowledge. This orientation could be reflective of her idealistic identity with a professional in the business world and a medical consultant - based upon the degree on knowledge attributed and associated to such professional roles.

Student M

Student M was very highly involved with a difficult patient and an incompetent nurse. Her evaluation of these was negative, indicating a negative construal of their attributes in relation to ones own values. She evaluated her best friend and a socially skilled nurse in high positive regard and exhibited moderate ego-involvement with these. She idealistically identified most with her

personal academic tutor in regard to the attributes she would wish to possess as part of her ideal self-image. Although, she contra-identified most highly with a difficult patient (0.50) and an incompetent nurse (0.50) in regards to the qualities and attributes that she would wish to dissociate

Before she went into nursing she empathetically identified most highly with her Father (0.81), a technically skilled nurse (0.81) and her personal academic tutor (0.81). When a student in University this identification increased somewhat and she exhibited equal levels of empathetic identity with her Father, a socially skilled nurse, technically skilled nurse and her personal academic tutor (0.86). As a nurse on placement this identity again further increased, exhibiting full empathetic identification with her personal academic tutor, a technically skilled nurse, and her Father. This indicated a high degree of positive similarity between their attributes and her current self-image in that role.

In terms of emotional significance of the constructs used, she demonstrated high regard to *'thinking nursing is essentially about human relationships'*, *'practical skills being based on theory'*, '*seeing the future optimistically'*, and *'thinking the science behind evidence based patient care is most important'*. Despite all constructs being of some emotional significance, she exhibited low negative structural pressure in regards to *'always making her own decisions'* and *'being emotionally involved'*. Thus, indicating a tendency to swing in regards to the polarity of the construct, depending on the entity in question.

Discussion

The results of student M indicated high negative regard towards a difficult patient and an incompetent nurse. This would suggest a high extent of knowledge and significance disassociated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her high negative evaluation and ego-involvement with those entities, along with the highest level of contra-identification exhibited towards them. In terms of idealistic identification, the data revealed highest identification with her personal academic tutor, suggesting high regards in terms of how much that entity reflects the person she would ideally like to be. This was reflected in the high consistency in her empathetic identification across most entities.

In relation to the original postulates of the investigation her use of the constructs reflected a holistic approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills must be based on theory'; 'learning proceeds better by getting to grips with the job on the ground'; 'the science behind evidence based patient care is most important'; and 'nursing is essentially about human relationships'. Based on polarity, these patterns indicated a favoured appreciation towards both the practical and theoretical aspects of nursing, reflecting a rounded approach to the underpinning science and practical execution.

Student N

Student N was highly ego-involved with her self at leisure and her exploratory self, and moderately ego-involved with a medical consultant and professional in the business world. Whilst her evaluations of herself at leisure, exploratory self and medical consultant were positive, her evaluation of a professional in the business world was negative. She idealistically identified most highly with a medical consultant and her Mother (0.63), in regard to their attributes. However, she contra-identified most highly with a professional in the business world (0.58), and a difficult patient (0.58).

Before going into nursing, she empathetically identified equally highest with a health care assistant, her best friend, and Mother (0.50). At leisure this trend remained consistent. As a student in University her identity with their Mother remained the highest (0.75). This was closely followed by her best friend and a medical consultant (0.63). When on placement, these trends again remained consistent.

In terms of emotional significance of the constructs used, she favoured towards *'usually being confidence'*, *'seeing the future optimistically'* and *'making sure everything is done thoroughly'*. These notions were of high emotional significance. However, sometimes depending on circumstances she tended to swing from acting in accordance with orientation to acting in accordance with its opposite. For example, being a team player and preferring to work alone at leisure. In this case positive structural pressures were

encountered by negative structural pressures on the identity dimension contributing to the dilemma.

Discussion

The results of student N indicated high positive regard towards herself at leisure; exploratory self; and a medical consultant. This would suggest a high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her highly positive evaluation and ego-involvement with those entities. In regards idealistic identification, the data revealed highest identification with her Mother and a medical consultant. This suggests high regard in terms of how much those entities reflect the person she would ideally like to be. On the other hand, the data revealed that she contra-identified most highly with a professional in the business world and a difficult patient. This suggests that she would not wish to reflect such attributes that those entities were associated with.

In relation to the original postulates of the investigation her use of the constructs reflected a scientific endorsed approach to the principles of nursing, in terms of her overall beliefs towards theory and practice. Polarity of these constructs revealed that she mainly believed that, 'practical skills must be based on theory'; 'learning proceeds better by way of knowing about basic principles'; 'the science behind evidence based patient care is most important'; and 'nursing is essentially about human relationships'. Based on polarity, these patterns indicated favoured appreciation towards the

theoretical aspects of nursing, reflecting more favourably towards the

underpinning science of nursing.

6.5 Synthesis of Discussion

Based on the idiographic case results and discussions this section will synthesise the discussion as a whole, in order to infer what was collectively found.

The overall findings indicate a varied approach to the overall construal of nursing. The sample used in the present study was only small. Therefore, strong implications can not be formulated based on the original postulates and current findings. However, some trends in regards to the overall construal of nursing, in terms of its theoretical and practical content are evident.

With reference to the previous investigations in this thesis, which have led to the current study, it has become evident that the curriculum and its content are key facets to the production of competent nursing professionals. In the preparation of nursing students, it has become evident from the previous investigations that it is vital that programmes deliver instruction and provide supervision in the most effective and efficient manner possible. Also, to better ensure that all nursing students have an opportunity for success, diversity in students learning needs should also be considered. Currently, it is evident that the current curriculum does not fully support this, and expects students to build the application between theoretical knowledge and practical execution themselves.

The findings of the previous and present studies support this, as it has become evident that students can construe their world of nursing very

differently - in accordance to the different connotations related to their identity. The connotations related to identity were based on a number of internal representations of behaviour, of which were assessed by the ISA/Ipseus tool. These surrounded various domains of typologies which could be attributed to nursing, based on the findings of the previous studies.

The present investigation set out to investigate identity, in order to distinguish whether in fact students are representative of a particular strands or categories when acquiring skills and knowledge in nursing education. The postulated categories were reflective of the demands of the curriculum, in terms of the practical and social expectations; theoretical and scientific driven expectations; or a combination of the two.

Previous research by Noble, Miller and Heckman (2008) has looked at the cognitive style of nursing students, in regards to educational implications for teaching and learning. Noble, Miller and Heckman (2008) acknowledged that in order to better ensure that all nursing students have an opportunity for success during training; diversity in their learning needs must be considered. With reference to the curriculum used in the current programme of research, it would appear that diversity in learning needs was not considered.

Nurse education researchers have endeavoured to identify individual differences that influence learning and mastery content. Such differences include academic preparation, personal demographics, non-cognitive variables (personality, self-concept), and cognitive variables (locus of control,

learning style, and cognitive style). Noble, Miller and Heckman (2008) investigated field preference as a function of cognitive style for learning in nursing. Field preference is well established in the psychological and educational literature as a variable that effects how students learn and process information. It is characterised by a learner's approach to the perception, acquisition, processing, organisation and application of information (Messick, 1984).

As with ISA/Ipseus, field preference is represented by a set of bipolar traits, with field dependence and field independence at opposing ends of a continuum (Witikin, Moore, Goodenough & Cox, 1977). In most cases, an individual will favour one style but may display varying degrees of preference in either direction. Also, field dependence-independence affects not only an individuals functioning in an educational setting, but also many other aspects of life and personality. This strategy represents a similar function of ISA and Ipseus in the present context, in that connotations or judgements that are based on a number of aspects can vary across contexts in ones broader life.

Individuals with a field-dependent cognitive style prefer vocations featuring human contact, where as field-independent individuals prefer solitary vocations (Witkin et al, 1977). This could be said to be representative of the postulates in the current investigation, in that the scientific endorsed nurse is representative of a field independent learner, and the humanistic endorsed nurse a field dependent learner.

Research has shown that field preference characteristics are relatively stable over time and pervasive across many aspects of personality (Wicken et al. 1977). Also, field dependence-independence does not correlate to intelligence; instead it is one determinant of the methods an individual uses for information acquisition (Messick, 1984). Therefore, rather than focusing on 'how much' is learned, this cognitive style focuses instead on 'how it is' learned (Wicken et al. 1977).

The previous studies in this programme of empirical work have indicated that the curriculum under scrutiny in the research lacks in applying its theoretical background to its practical counterpart, and vice versa. Therefore, adopting the principle of how things are in fact learnt could well be a key principle in bridging the gap in the theory-practice deficit.

For example, field-dependent learners use or depend on the context in which information is obtained. Therefore, they may attend to environmental features and cues that are salient, but irrelevant to a learning task. Therefore, such learners have a difficulty in separating a larger whole into component parts. As a result, this causes them to rely on the organisation embedded within the information they are learning (Kahatz & Kling, 1999).

Field-independent learners on the other hand have an analytical style evidenced by their ability to grasp the whole as a sum of its individual parts. They are able to identify elements and impose their own structure upon the learning environment, especially in learning situations where the structure is

less obvious. As a result, they are independent learners with a strong internal frame of reference and sense of separate identity.

With reference to the postulated categories in the current investigation that have stemmed back to skilled learning from the previous studies, it could be proposed that the more scientific endorsed nurse may be more representative of a field-independent learner. This may be so as, the underpinning theoretical knowledge is representative of individual parts of the sum of a technical skill or aspect of nursing. All skills are taught with reference to the underpinning theory. However, in the academic and practical setting this is not always facilitated enough. With reference to study three in this programme of research, it was documented by the professionals that theory represents the sum of practice.

Research has shown that field independent learners tend to be better problem solvers, and because of their analytical approach they are able to generate hypotheses for testing and determining the problems for learning (Hsu & Wedman, 1994). Field independent learners are also better in impersonal lecture and autonomous learning environments, and they do not seek interaction with the instructor or their peers as a fundamental part of their learning process. For example, Hodson (1985) compared the clinical skills behaviours of field-independent and filed-dependent nursing students and found that field independent students spent less time interacting with their instructors than their field-dependent peers.

Field-dependent students on the other hand learn best in an environment that provides a high degree of structure and organisation in the presentation of context. Therefore, they rely on the instructor to clear objectives, task directives, and an organised presentation of information. As a result, field-dependent students do not learn well in a lecture environment, in part due to a lack of interaction with the instructor (Noble, Miller, & Heckman, 2008).

With reference to studies one and two within this programme of empirical work, it is now increasingly evident that an appreciation towards such teaching strategies could well prove extremely beneficial within nursing programmes. This is so, as there are evident discrepancies in students' ability to learn and acquire information, based on the concepts included in the field dependent-independent approaches. By addressing differences in the learning capabilities of students, this may then aid in bridging the gap in failure rates and achieving greater competence overall. Noble, Miller and Heckman (2008) back up this valid point condoning that field dependent learners may be at risk of academic failure due to their cognitive processing requirements. Therefore, greater instructional strategies tailored to students' needs should be incorporated into the curriculum.

With reference to the findings of the present study, it is evident that there are differences in students' identity to their approaches of learning and development in the nursing curriculum. Despite the sample size being small, there are evident differences and examples of students fitting into the postulated categories in the current investigation. In order to make greater

implications towards such differences, further research using the same ISA/Ipseus method would be extremely beneficial using greater samples sizes, in order to make more substantial group comparisons. Such work could then support the implementation of greater instructional strategies that are tailored to students needs in the curriculum. This would then help to prevent results as seen in the first study of this thesis, which led to the consecutive follow up investigations to uncover the other factors affecting behaviour.

CHAPTER 7.0 – STUDY 5 - IDENTITY IN NURSING DEVELOPMENT – TOWARDS A TYPOLOGY OF CONSTRUAL: CASE STUDY FOLLOW-UP

7.1 Introduction

The aim of the present study was to follow up two individual case results from the previous investigation. The purpose of this was to gain more depth of knowledge behind the Ipseus results. As previously acknowledged, the data output from an Ipseus reveals a lot about participants within the recognised parameters. However, one of the limitations is that the data does not actually disclose the meaning and reason behind the results. Therefore, the purpose of the present investigation was to add depth to the ISA/Ipseus data for two individual cases. This will be done by conducting in-depth follow up interviews. The purpose of this was to encapsulate the meaning behind the findings, in order to add more knowledge and understanding to their individual construals towards the postulates from the ISA/Ipseus tool.

7.2 Method

7.2.1 Participants

Two participants from study four were used as follow-up cases. Case one was a nineteen year old female from the Chester site and case two was a forty five year old female from the Arrowe Park site. Both participants were recruited upon a voluntary basis via their response to a recruitment email. These were the only two to respond to the email out of the fourteen participants used in the previous study – hence the low case sample size.

7.2.2 Procedures

Upon completing the ISA/Ipseus used in the previous study participants were sent a personal email that invited them to take part in a 1-hour follow-up interview for a twenty five pound incentive payment. The purpose of the incentive payment was to attempt to attract a greater response rate, in order to generate more data.

The email explained the full purpose of the interview; along with the arrangement procedures should they wish to participate. The email advised that participation was entirely voluntary and that confidentiality would be assured. The email also advised that should anyone be interested in taking part, he/she should respond to the researcher and then a time and date would be arranged at their convenience. All participants were given a ten day window to respond to the email.

Upon attending the interview, participants were fully explained the procedures of the interview and completed an informed consent form. This detailed the full procedures of the process and participants were informed that they could terminate the interview at anytime should they wish. All interviews were recorded using a Dictaphone.

7.2.3 Interviews

The interviews were scheduled for a maximum of one hour and were semi-structured using open questions. The interview comprised of two parts. The first part focused more on the issues surrounding the studies featured in part one of this programme of empirical work. This comprised of seven core questions which reflected upon the issues found in the proceeding studies. These were open questions, which allowed for further elaboration around the answers of the questions through open discussion. These concerned the course in regards to its expectations, content, and assessments methods – see below:

1. *How have you found the course since starting?*
2. *What do you think about the methods of assessment?*
3. *How did you find the OSCEs?*
4. *Do you feel the curriculum prepare you enough for the OSCEs?*
5. *Is there anything you would change about the OSCEs, and why?*
6. *Do you feel the amount of teaching/practice time is adequate for what you expected, and why?*
7. *Is there anything about the course you would change, and why?*

Part two then moved on to investigate more closely the polarity of the judgements made using the constructs from the ISA/Ipseus used in study four. These were largely concerned with the postulates of the investigation that were nursing orientated in their content. This consisted of questioning the reasons behind the favoured polarity of each constructs, in order to trace

meaning behind each judgement. Despite ISA/Ipseus being an extremely sophisticated tool in identity exploration, the outputs do not show the rationale behind judgements. Therefore, the use of qualitative methods can assist in substantiating the findings for the ISA/Ipseus output. The constructs under question were as follows:

1. *believes practical skills must be based on theory // believes practical skills are based on common sense*
2. *believes nurses are taught // believes nurses are born*
3. *believes nursing is mainly about social skills // believes the essence of nursing is technical skills*
4. *finds that learning proceeds better by getting to grips with the job on the ground // finds that learning proceeds better by way of knowing about basic principles*
5. *is factual and scientific // is creative and artistic*
6. *maintains some emotional distance // is emotionally involved and empathetic towards others*
7. *thinks the patient knows best // thinks the professional knows best*
8. *thinks the science behind evidence based patient care is most important // thinks there is too much emphasis on science and evidence based patient care*
9. *thinks nursing is essentially about human relationships // thinks there is too much emphasis on human relationships in nursing*

7.2.4 Data analysis

All interviews were transcribed and coded. The key points per each question were then presented in a table to allow comparisons and also trace the initial response further meaning for discussion. The results from the ISA/Ipseus output that concerned the ISA/Ipseus identity parameters were also tabulated in order to present the findings.

7.3 Results

The results are presented per case in four different tables. These are:

1) The key demographic variables about each case;

2) The interview quotation analysis for each case. This appears separately for each case and documents the key quotations for each question asked in the interview. This was done in two phases using the initial quote and then further responses to the initial quote.

3) The polarity for each case on the postulated constructs. This documents the construct, the favoured polarity, followed by an explanation behind the choice for the favoured polarity.

4) The ISA/Ipseus parameter results. This documents each ISA/Ipseus parameter, defines each parameter, and presents the results of that parameter for the case.

The decision was made to tabulate the results as more data can be presented clearly and concisely in order to monitor comparisons between cases.

Table 1: Case one demographic variables

Site	Chester
Age	19
Case from study 2	Student J
Postulated category from study 2	Humanistic
Passed OSCE first attempt?	Yes

Table 2: Case two demographic variables

Site	Arrowe Park
Age	40
Case from study 2	Student D
Postulated category from study 2	Holistic
Passed OSCE first attempt?	No

Table 3: Case 1 - interview quotation analysis

Question	Initial response	Further response
How have you found the course since starting?	" It wasn't 100% what I expected"	"I think it was the theory work, it's not that there was a lot, but its hard theory work"
What do you think about the methods of assessment?	"The assessment on placement is really good – it covers everything you do really… I don't like the written assignments though"	"I find the assignments tough because of the range of things we have to be able to do… I'm not an academic – I hate theory, but love the practical"
How did you find the OSCE?	"umm, I didn't actually mind it"	" I passed first time, I had TPR, hand washing and the medications, and that was the hardest one because you had to know all the drugs you were given and they were asking questions and that's what I struggled on"
Did you feel the curriculum prepared you enough for the OSCEs?	"Umm not really… we hardly did anything on medications"	"I'd never come across that medication before and just went blank but he sort of helped me along a bit because we're not expected to know everything"
Is there anything you would change about the OSCEs?	"I think it's good because it puts you under pressure, because it prepares you for your further years when you are put under pressure"	" I do think the questions were quite hard for first year students though… it is 3rd year students that were our patients and mine said to me after 'oh god I didn't know the answer to any of them… fair play to you' "
Do you feel the amount of teaching/practice time is adequate to what you expected, and why?	"I think it's about equal, I don't find the theory time very resourceful – death by power point is what we call it"	"we spend 3-hours in a class room being talked at and you don't remember any of it, you know it is really hard going… may be that's because I'm not very academic though"
Is there anything about the course you would change, and why?	"Umm, not splitting up our lectures so much… I mean we're in twice now before Christmas"	"In my first year, I had never done anything in the caring profession, I'd come straight from school and it was such a big shock doing 4-weeks of theory they being thrown into 4-weeks of placement, I was like 'what the hell!'"

Table 4: Case 1 – ISA/Ipseus polarity results

Construct	Favoured polarity	Explanation
Practical skills must be based on theory // practical skills are based on common sense	Practical skills must be based on theory	*"nursing skills are not common sense, you need to learn how to do things before you do it so you are doing it safely, properly, and confidently"*
Nurses are taught // nurses are born	Nurse are born	*"anyone can learn if they want to but I think nurses are born because the important thing in nursing is your communication and personality and whether you want to be there – it's not the most highly paid glamorous job after all, so a lot of the people there have always wanted to be nurses"*
Nursing is mainly about social skills // the essence of nursing is technical skills	Nursing mainly about Social skills	*"the majority of what you do on the ward is socially based and all technical skills must be accompanied by social skills anyway"*
Learning proceeds better by getting to grips with the job on the ground // learning proceeds better by way of knowing about basic principles	Learning proceeds better by getting to grips with the job on the ground	*"I am hands on and wasn't born to sit in a class room… I'm a 100% practical learner, that's how my brain works"*
Is factual and scientific // is artistic and creative	Factual and scientific	*"facts and science are important in nursing, I love learning about the human body and I like straight facts… you know, this is the patient and these are the facts about the patient"*
Maintains some emotional distance // is emotionally involved and empathetic towards others	Emotionally involved and empathetic towards others	*"I don't think you would come into nursing if you didn't care about people, and emotion and empathy are caring traits"*
The patient knows best // thinks the professional knows best	The patient knows best	*"in certain cases the professional knows best, but the patients knows their own body, they know their own personality and beliefs, and they know what they feel and what they want… sometimes they may not want to put medical drugs into their body, despite the professionals opinion"*
The science behind evidence based patient care is most important // thinks there is too much emphasis on science and evidence based patient care	Too much emphasis on science and evidence based patient care	*"I don't think the science of patient care is most important, however I don't think there is too much emphasis on science and evidence based care either… things like the social skills and caring aspects are more important than just science and evidence though"*
Nursing is essentially about human relationships // there is too much emphasis on human relationships	Nursing is essentially about human relationships	*"the essence of nursing is social and communication skills, if we can't communicate properly we can't find out what is wrong and what a patient needs"*

Table 5: Case 1 – ISA/Ipseus parameter results

ISA PARAMETER	DEFINTION	RESULTS (entity or construct)
Ego involvement (towards an entity) (0.00 to 5.00)	*"overall responsiveness to others in terms of extensiveness both in quality and strength of the attributes one construes the other as having"*	*Highest* *Moderate* *A difficult patient* *Socially skilled nurse* *An incompetent nurse* *Ideal self* *A medical consultant*
Evaluation (-1.00 to +1.00)	*"overall assessment of the other in terms of the positive and negative evaluative connotations of the attributes one construes in that other, in accordance of ones value system"*	*Positive* *Negative* *Socially skilled nurse* *a difficult patient* *Ideal self* *an incompetent nurse* *A medical consultant*
Ambivalence (towards an entity) (0.00 to 1.00)	*"The ratio of negative to positive attributions"*	*Personal Academic Tutor (0.95)*
Dissonance (0.00 to 5.00)	*"the overall significance of the entity in question for the individual, that is ones ego-involvement with the entity"*	*Highest* *Exploratory self 3.69*
Splitting (0.00 to 1.00 no split to total split)	*"the ratio of deficiency in actual overlap possible between attributed characteristics to the total possible overlap, given the set of constructs one uses to construe them both"*	*Highest split 0.98* *Me as I would not like to be, and ideal self*
Idealistic Identification (0.00 to 1.00)	*"the similarity between the qualities one attributes to the other and those one would like to possess as part of one's ideal self-image"*	*Highest* *Socially skilled nurse (0.74)* *Healthcare assistant (0.74)* *Mother (0.70)*
Contra-identification (0.00 to 1.00)	*"the similarity between the qualities one attributes to the other and those from which one would wish to dissociate"*	*Highest* *Incompetent nurse (0.70)* *Medical consultant (0.65)* *Difficult patient (0.65)*
Empathetic Identification (0.00 to 1.00)	*"the degree of similarity between the qualities one attributes to the other, whether good or bad, and those of one's current self image"*	*Highest levels of empathetic identity evident with a socially skilled nurse and a health care assistant across appraisal of self. These were highest compared to the other entities and remained consistent across the self.*
Identification conflict (0.00 to 1.00)	*"a multiplicative function of one's current empathetic identification and contra identification with that other*	*Moderate levels of conflicted identity evident with best friend across appraisal of self. This was the highest compared to other entities*
Identity diffusion (0.00 to 1.00)	*"the overall dispersion and magnitude of one's identification conflicts with others "*	*Low identity diffusion*

Structural pressure (-100 to + 100)	*"the overall strength of the excess of compatibilities over incompatibilities between the evaluative connotations of attributions one makes to each entity by way of the one construct and one's overall evaluation of each entity"*	*Dissonance for exploratory self = -ve structural pressure* *Fluctuations in construct use evident in regards to:* *1. always makes own decisions* *2. takes care of personal needs first* *3. likes to take risks* *4. is usually confident*
Emotional Significance (0.00 to 10.00)	*"the strength of affect associated with the expression of the construct"*	*Highest* *1.Likes to take risks* *2. Always makes own decisions* *3. prefers to be a team player* *4. Seeks out social situations* *5. makes sure everything is done thoroughly*

Table 6: Case 2 - Interview quotation analysis

Question	Initial response	Further response
How have you found the course since starting?	*"It's been quite tough, but I've been getting through it – just about!"*	*"It's a lot to learn and apply and I find the practical side is lacking – too much theory and not enough practice"*
What do you think about the methods of assessment?	*"I think the OSCEs are a poor assessment method – I'm not just saying that because I failed! There are a lot of people in our class that thought the same"*	*"the assessment set up is unrealistic, and is some what lacking in terms of an assessment that is meant to reflect 'real' nursing practice".*
How did you find the OSCE?	*"The day of the exam I was unable to think and function properly – not because I didn't know the skills but because the whole mock up of it totally threw me off course! I came away extremely disappointed with myself and it has knocked my confidence slightly"*	*"Well I'll always remember the OSCEs for that reason, especially because I'm a bit older too – that's why it knocked me confidence! It's not nice failing exams that you have hard worked for, and then having to tell people as well!"*
Did you feel the curriculum prepared you enough for the OSCEs?	*"No, although we were taught the skills, there wasn't enough emphasis on what to expect from the set-up for the OSCEs"*	*"we rarely had any practice time that was supervised properly. Also, the OSCE process only really got explained properly to us in September… I can see now how what you were doing with us all came to play though once that had been properly done. However, I still feel there was not enough preparation for the assessment"*
Is there anything you would change about the OSCEs?	*"Yes, I would definitely change the mock set up of them, because it was all so unnatural and just added more pressure to the exam"!*	*"We should also be assessed on all of the taught skills – if we have to learn them all, assess us on them all because we will be performing all of them in real practice! I know of some people who hadn't put the practice in, and managed to dodge getting skills they were not so good at, and then passed!"*
Do you feel the amount of teaching/practice time is adequate to what you expected, and why?	*"I thought we would get more practice time to be honest - given that lectures were sometimes 3-hours long. When we were actually on placement it was almost a different practice"*	*"All I can recall from University is theory, theory, theory! I'm hands on though and learn better by doing, and when there's not a lot of doing it can get a bit monotonous"*
Is there anything about the course you would change, and why?	*The OSCEs most definitely and more practice in the university setting!!*	*"by putting the theory with practical and showing application through practising skills and balancing the two"*

Table 7: Case 2 – ISA/Ipseus polarity results

Construct	Favoured polarity	Explanation
Practical skills must be based on theory // practical skills are based on common sense	Practical skills are based on common sense	*"You don't have to be theoretically knowledgeable to perform nursing skills – you know, if you think about nursing back in the times of Florence nightingale it was bedside nursing, learning on the job and just doing. There were no lectures or seminars or theoretical instruction in place in those times"*
Nurses are taught // nurses are born	Nurse are born	*"I think nursing is a profession that you must want to do, through the love of caring and helping others. I believe that these are traits that people are born with"*
Nursing is mainly about social skills // the essence of nursing is technical skills	The essence of nursing is technical skills	*"When you are dealing with peoples lives it is more important to get the skills and procedures technically right. As a patient you want to feel safe knowing that you are getting the right treatment and care"*
Learning proceeds better by getting to grips with the job on the ground // learning proceeds better by way of knowing about basic principles	Learning proceeds better by getting to grips with the job on the ground	*"I learn better by doing as opposed to listening. When you are doing you are automatically engaging more in the task and what it entails – you get a feel for the task! If someone was to just explain the task without letting you get stuck in and have a go, it makes learning a lot harder. That's why I would have preferred more practical in the teaching time, with supervised instruction/guidance"*
Is factual and scientific // is artistic and creative	Factual and scientific	*"If you look at the surgeons and medical consultants for example, science and facts are the essence of their work and I guess nursing comes under the same umbrella. Also, in general, I appreciate facts more so than abstract thoughts or situations that can bare numerous explanations. I like to know clear answers!"*
Maintains some emotional distance // is emotionally involved and empathetic towards others	Maintains some emotional distance	*"In order to remain professional I think it's important to maintain some emotional distance with your patients - it almost protects your professionalism! Sometimes patients can try and take liberties and play on nurses that they believe to be soft! I've seen it on placement and I even do it myself as a patient if I believe I am right about something and I am not getting the treatment I believe I should be!"*
The patient knows best // thinks the professional knows best	The patient knows best	*"Well, putting myself in the patients shoes I know my body best, so when I'm explaining what is wrong with me I would see it as though I know the symptoms better than the professional"*
The science behind evidence based patient care is most important // thinks there is too much emphasis on science and evidence based patient care	Too much emphasis on science and evidence based patient care	*"Nursing is not all about science and evidence based patient care quite simply – it's important but it's not everything!"*
Nursing is essentially about human relationships // there is too much emphasis on human relationships	There is too much emphasis on human relationships	*"Nursing is essentially about performing skills and procedures in order to treat ill health. Therefore, that is the most important factor in my eyes. Communication with patients is an important part but when you break to down to the nitty-gritty, it's the skills and treatment that is its essence"*

Table 8: Case 2 – ISA/Ipseus parameter results

ISA PARAMETER	DEFINTION	RESULTS (entity or construct)
Ego involvement (towards an entity) (0.00 to 5.00)	*"overall responsiveness to others in terms of extensiveness both in quality and strength of the attributes one construes the other as having"*	_Highest_ _Lowest_ An incompetent nurse Past self An difficult patient Me as I would not like to be
Evaluation (-1.00 to +1.00)	*"overall assessment of the other in terms of the positive and negative evaluative connotations of the attributes one construes in that other, in accordance of ones value system"*	_Positive_ _Negative_ Ideal self past self Technically skilled nurse incompetent nurse Best friend Mother
Ambivalence (towards an entity) (0.00 to 1.00)	*"The ratio of negative to positive attributions"*	Past self (0.71)
Dissonance (0.00 to 5.00)	*"the overall significance of the entity in question for the individual, that is ones ego-involvement with the entity"*	_Highest (0.00 – 5.00)_ An incompetent nurse (4.03) A difficult patient (3.03)
Splitting (0.00 to 1.00 no split to total split)	*"the ratio of deficiency in actual overlap possible between attributed characteristics to the total possible overlap, given the set of constructs one uses to construe them both"*	_Highest split 1.00_ Ideal self / celebrity I dislike Me, as a nurse on placement / a celebrity I dislike Me, as a nurse on placement / an incompetent nurse A celebrity I dislike / a socially skilled nurse A celebrity I dislike / a technically skilled nurse My mother / an incompetent nurse An incompetent nurse / my personal academic tutor
Idealistic Identification (0.00 to 1.00)	*"the similarity between the qualities one attributes to the other and those one would like to possess as part of one's ideal self-image"*	_Highest_ A difficult patient (0.55) A professional in the business world (0.55) A medical consultant (0.55)
Contra-identification (0.00 to 1.00)	*"the similarity between the qualities one attributes to the other and those from which one would wish to dissociate"*	_Highest_ Incompetent nurse (0.41) A difficult patient (0.32) A celebrity I dislike (0.32)
Empathetic Identification (0.00 to 1.00)	*"the degree of similarity between the qualities one attributes to the other, whether good or bad, and those of one's current self image"*	***Highest level*** Past self A healthcare assistant (0.83) At leisure difficult patient & incompetent nurse (0.71) As a student A socially skilled nurse (0.67) As a nurse a socially skilled nurse (0.89)
Identification conflict (0.00 to 1.00)	*"a multiplicative function of one's current empathetic identification and contra*	Moderate levels of conflicted identity evident with a difficult patient and an incompetent nurse across

	identification with that other	*appraisal of self. This is the highest compared to other entities and remains consistent across the self.*
Identity diffusion (0.00 to 1.00)	*"the overall dispersion and magnitude of one's identification conflicts with others "*	*Low levels of diffusion between Me, at leisure and Me, as a nurse on placement (0.29, 0.17) and Me, as I would not like to be and Ideal self (0.28, 0.23)*
Structural pressure (-100 to + 100)	*"the overall strength of the excess of compatibilities over incompatibilities between the evaluative connotations of attributions one makes to each entity by way of the one construct and one's overall evaluation of each entity"*	*Fluctuations in construct use evident in regards to:* *1. Seeks out social situations* *2. Academic learning most important in nursing* *3. is factual and scientific* *4. thinks nursing is more about technical skills*
Emotional Significance (0.00 to 10.00)	*"the strength of affect associated with the expression of the construct"*	<u>*Highest*</u> *1. makes sure everything is done thoroughly* *2. Sees the future optimistically* *3. Usually plays it safe* *4. Is usually confident* *5. seeks out social situations*

7.4 Discussion

The results have indicated some common views in terms of the course and its expectations, content, and assessment methods. In terms of its expectations the results indicated that participants found it harder than anticipated, which was largely attributed to the theory content of the course. For one participant this concerned the multiple disciplines of theoretical content:

> *"I struggle with more the holistic care, care plans, ethics and things like that rather than the anatomy and the body – the facts I can cope with, because they are hard facts and you can learn them. It's the dilemmas and the judgements I struggle with because, you know there could be two sides to an argument or decision and it's definitely to do with confidence. You need to feel confident what you are talking about and you need to know enough to back up your decision"*

Also, the theoretical content within assessment presented concerns for case two in regards to their age:

> *"The written assignments can be tough at times because it's not only applying the theory and using it correctly – it's putting that across on paper and trying to make sure you are using the right words and literacy. Because of my age, I'm a bit out of practice when it comes to writing coursework etc – things have changed since I was in school! Thank god for spell check! On placements we are assessed*

progressively, which I think is better as your whole performance

doesn't depend on one assessment"

Despite this being the point of view of just one person, it is an interesting one, as it could well represent the view of many other mature students re-entering education as student nurses. Previous ISA work has investigated identity in regards to adults returning to education. Irvine (in Weinreich & Saunderson, 2003) found that for both men and women psychological transitions are related to their return to education. However, the nature of such transitions is somewhat different for men and women. Women returnee's are concerned about their occupational and social identity. They aspire to social position and power and being successful in public as well as their private life. Men on the other hand, appear to be less concerned with social identity and social mobility. Rather, they see educational achievement as a means of achieving self-respect, and recognition and respect from others.

The results of the present study could lend support to this, particularly for women in relation to the OSCEs assessment. Case two explained:

"The assessment set up is unrealistic, and is somewhat lacking in

terms of an assessment that is meant to reflect 'real' nursing practice.

The day of the exam I was unable to think and function properly – not

because I didn't know the skills but because the whole mock up of it

totally threw me off course! I came away extremely disappointed with

myself and it has knocked my confidence slightly! I'll always remember

the OSCEs for that reason, especially because I'm a bit older too –

that's why it knocked me confidence! It's not nice failing exams that you

have hard worked for, and then having to tell people as well!

However, due to the small sample size the present results are merely

suggestive and would require further thorough research to substantiate the

present findings. Further research investigating mature nursing student's

identity upon returning to education could well contribute worthy knowledge to

the theory-practice debate. It could also assist in looking at alternative

teaching strategies to bridge gaps in areas that require more confidence

building for students.

The results also indicated a coherent view in both cases in terms of the

amount of practice to theory time in the curriculum. Case one said:

"The theory time I don't find very resourceful – its death by power point

what we call it – laughs! We spend three hours in a class room being

talked at and you don't remember any of it, you know it is really hard

going! May be that's because I'm not very academic though!"

When asked about how the theory could be made more interesting, case one

responded:

"If there was a practical element, such as role play, we could be delivered the theory and then break up the session with a scenario role play or something… you know, my first year, I had never done anything in the care profession, I'd come straight from school and it was such a big shock! We had like 4-weeks of theory in the first year, then you go straight onto a placement for 4-weeks and it was a complete shock, I didn't know what to expect… I was like 'what the hell'… I was in a nursing home looking after people with dementure and I was thinking 'oh my god' I don't know what I am doing! Doing bed baths and stuff – I mean we went over doing bed baths but you don't know until you're there faced with it what to expect.

I do wish they did theory and then a role-play to back it up. I can't learn by looking at a power point, I'm more hands on – we're nurses not braincases – I learn by doing, that's why we're there because we want to be out there doing, rather than sat there listening.

I can't learn by someone just talking at me! It's as if you are learning it from scratch when you look back at your power points for an assignment or something, it's as though you've never seen it before!"

This case supports the work of Allmark (1995) who acknowledged that the theory-practice gap is built upon the principle that theory can and must be directly applied to nursing practice, otherwise it is irrelevant. The interviews revealed this to be true for case one, as when asked about whether there was anything she would change about the course she stated:

"Umm, not splitting up our lectures so much… there are big gaps between the academic time sometimes and you get out of the swing easily!"

The results also indicated that more practice time was required with the academic contact time, although this was something that has already been addressed in studies one to three.

The following section will discuss the Ipseus results for each individual case. These will then be used to contextualise the interview data, in order to aid explanation and gain further depth and understanding.

Case one

The Ipseus results of case one revealed that she was much ego-involved with an incompetent nurse, difficult patient, and medical consultant. Whilst her evaluation of all of these was negative, she exhibited moderately high ego-involvement with a socially skilled nurse – even more so than their ideal self, with her overall evaluation of these being moderate. She idealistically identified with a socially skilled nurse and a healthcare assistant very highly in regard to their attributes, but contra-identified with an incompetent nurse and a medical consultant in regards to their perceived attributes.

Before she went into nursing, case one empathetically identified highly with a socially skilled nurse and a healthcare assistant. When at leisure those identifications remained consistent, indicating consistency in her identity with

the associated qualities and attributes of those entities. Case one explained in the interview:

"I have always wanted to be a nurse since I was little, I have never thought of anything else and I can't imagine doing anything else!"

This was evident in the high empathetic trends in her past self and also when at leisure, indicating consistency in her cognitions about nursing and particular types of nurses (e.g. socially skilled nurse).

As a student in University, she displayed close empathetic identification with how her friends saw her, and again with a socially skilled nurse and health care assistant. As a nurse on placement, her empathetic identity with her Mother further increased, which may be a reflection upon the caring role she was undertaking. Also, her identification with a socially skilled nurse and healthcare assistant remained consistently high, indicating similarity in the qualities she attributed to those roles in regard to her current self image.

In terms of emotional significance of the constructs used, she exhibited high emotional significance in regards to *'liking to take risks'*, *'always making her own decisions'* ,*'preferring to be a team player'*, *'seeking out social situations'*, and *'making sure everything is thoroughly'.* These constructs were of high influence to her in the general construal of her overall identity. However, sometimes – depending on circumstances, she tended to swing from acting in accordance with its opposite for some constructs. For example, taking risks at

leisure, but always playing it safe as a student in University. In this case, positive structural pressures were encountered by negative structural pressures on the self entity contributing to the dilemma. Therefore, the outcome structural pressure was low but nevertheless still of high emotional significance to her. This indicates situational differences in her identity construals for given instances.

The results revealed that case one exhibited high regard towards herself as a socially skilled nurse. This suggests a moderately high extent of knowledge and significance associated with that entity in regards to her understanding towards it and its importance to her. This was evidenced by her high evaluation and idealistic identity with a socially skilled nurse. Therefore, this shows a high value and extent to which she respects and would wish to resemble the attributes of that entity. This was evident by her favoured polarity to the more humanistic driven constructs within the postulates for the investigation. When questioned about the polarity toward the more humanistic judgements about nursing she explained:

> "*You must be person centred in this profession. You need to be confident in speaking and things like that when you are in hospital, you know, you've got to speak to the patients and build relationships and if you are all embarrassed saying something you are not going to be very good and taken seriously and professionally!*
> *You know, people fail – I've heard today that someone failed a placement in their third year because she was too shy, and it's like that*

is such a shame because it's a personality trait, so there should be

some methods in the curriculum to try and make you more confident –

you know, we don't do anything about your personality and personal

development and I think that needs to be looked at. You get people

being over confident and a bit cocky, you know - that needs to be

addressed too"

The above quotation provides a good example of how students can construe their world of nursing differently and prioritise what aspects are most important for the job, resulting in individual differences when learning. The theory-practice relationship and the use of communication and interpersonal skills have been recurrently identified as issues causing concern.

Brereton (1995) conducted a study that looked at communication in nursing and the theory practice relationship. The study used the views of nurse teachers, mentors, and students about the theory-practice relationship with regard to the communication and interpersonal skills theme of the project 2000 Common Foundation Programme (CFP) for British nursing students. Brereton adopted a method of hierarchical focusing, which involved individual interviews with teachers and mentors, and small group interviews with students. Results revealed that it was agreed that communication was fundamental to nursing and that the socialisation process strongly influenced the development of communication and interpersonal skills. Also,

communication could greatly influence the theory practice relationship - prompting greater application of knowledge underpinning practice.

Therefore, the study of development using identity – as in study four and present study, could well serve as a beneficial underpinning tool for nurse education. The rationale for this is that it could identify individual conscious and subconscious internal construals in regards to what is important to the individual in the learning process.

In terms of ego-involvement, case one displayed a high negative involvement with an incompetent nurse, difficult patient, and medical consultant. This suggests that she exhibited a negative investment in these entities, in terms of her understanding towards them and their overall importance to her. Therefore, indicating limited overlap in the attributes of those entities and those which she saw herself as possessing.

Polarity of the postulate constructs used in the Ipseus revealed that she mainly believed that, *'practical skills are based on theory'*; *'learning proceeds better by getting to grips with the job on the ground'*; *'there is too much emphasis on the science of evidence patient care';* and *'nursing is essentially about human relationships'*. Based on her favoured polarity, these patterns indicated an appreciation more so towards the practical and humanistic aspects of nursing. This connotation could be supported by her idealistic identity and her consistent empathetic identity with a socially skilled nurse.

When questioned about the reasoning behind the polarity of the postulated constructs, she explained:

"I'm hands on and wasn't born to sit in a class room… I'm a 100% practical learner, that's now my brain works"

Also, her polarity indicated that she believed that there was 'too *much emphasis on the science of evidence based patient care'*. This was supported by her explaining that:

"The social skills and caring aspects are far more important that science and evidence alone – you must be able to communicate before doing anything!"

Polarity of the postulates also revealed that she believed that *'nursing was essentially about human relationships'*. This was justified by her belief that:

"The essence of nursing is social and communication skills; if we can't communicate properly we can't find out what is wrong and what a patient needs. There's a lot of emphasis on the academic side of things, you know though, that's what your medical consultants, doctors, surgeons are for. They are the academically skilled people but not necessarily as socially skilled. You know, they are getting rid of the diploma and it's daft! I'm a practical person and basically everyone in my class is practical people and we learn in practice, we don't really

learn in uni. If we wanted to sit in class all the time we'd do an academic degree, but we're not interested in doing all the writing and listening to the lecturer's… we want to get out there and listen to nurses that have got experience and they'll teach you what they know but giving you their prior knowledge and experience"

This is an extremely interesting factor as it provides evidence of a cognitive theory-practice gap within case one. This is a factor that needs to be acknowledged on a broader scale, in order to identify if such instances are common amongst nursing students in training.

Case two

The Ipseus results for case two revealed she was very much ego-involved with an incompetent nurse and a difficult patient, with her evaluation of these being low. Her evaluation of a technically skilled nurse and her best friend on the other hand was very high, with her ego-involvement being moderately low. She idealistically identified equally highest with a professional in the business world, a difficult patient, and a medical consultant, in regards to the attributes she admired and would wish to possess. However, she contra-identified with an incompetent nurse in regards to the perceived attributes and qualities she would wish to dissociate from.

Before going into nursing, case two empathetically identified most highly with a health care assistant. Interestingly, at leisure she displayed highest empathetic identification with a difficult patient and incompetent nurse. This

could well relate closely to her idealistic identification with a difficult patient and therefore it was postulated that she may reflect similar attributes to such when at leisure.

With reference to this, the researcher questioned case two in regards to her identity with a difficult patient and incompetent nurse. This then revealed some interesting findings in regards to her construals about certain concepts associated with nursing:

> "*My mother was ill about 10 years ago she received treatment that I believe was not correct. Mum is the type of person to not speak up when something is not right because she likes to keep the peace, where as I am the opposite. So, you could say I was questioning a few things to the nurses and consultants when to it came to her treatment - you know in this world if you don't ask, you don't get, and I wanted answers about things…*"

This was further questioned to examine whether this meant that case two had an appreciation for a difficult patient, in which she explained:

> "*Yeah I do, you know – for them to be difficult there must be something they are not happy about or with and if it is something related to what you are doing you need to know! There are cases when people are just difficult in general but you've got to expect that in the nursing profession and be ready to deal with such cases. If they see you are*

awkward about dealing with them, they will probably play up even more

so!"

This suggests that experiences can have a direct influence on internal behaviour, development and construals that may be underlying cognitions and judgements. This also related to her polarity towards *'maintaining some emotional distance'* she explained:

"In order to remain professional I think it's important to maintain some emotional distance with your patients. I think this almost protects your professionalism, and sometimes patients can try and take liberties and play on nurses that they believe to be soft! I've seen it on placement and patients certainly try and do it to us as student nurses! I even do it myself as a patient if I believe I am right about something and I am not getting the treatment I believe I should be. Also, for things such as ethics it's important to not get too involved with the patient in order to maintain your authority and assertiveness when it comes to making judgements"

As a student in University she exhibited highest empathetic involvement with a socially skilled nurse and a professional in the business world indicating similarity in the qualities she would attribute to herself and those entities. As a nurse on placement her empathetic identity with a business professional remained consistent. However, her identity with a socially skilled nurse

increased to its highest across all entities, suggesting close associations and similar attributes with that entity when in practice.

In regards to emotional significance of the constructs used, she exhibited high effect towards *'making sure everything was done thoroughly'*, *'seeing the future optimistically'*, *'usually playing it safe'*, and *'seeking out social situations'*. These constructs are of high emotional significance, indicating high strength and influence to her when construing her identity.
However, sometimes – depending on circumstances, she tended to swing from acting in accordance with its opposite for some constructs. For example, seeking out social situations as a nurse and a student, but preferring ones own company when at leisure. In this instance, positive structural pressures were encountered on negative structural pressures depending on the entity contributing to the judgement. This indicates situational differences in her identity construals for given instances.

The results also showed moderately high regard towards her identity with her best friend and a technically skilled. This suggests a moderately high extent of knowledge and significance associated with those entities in regards to her understanding towards them and their importance to her. This was evidenced by her positive ego-involvement and evaluation of those entities. Therefore, this suggests a moderately high extent to which she perceives the attributes of her best friend and a technically skilled nurse to reflect herself. The results also indicated high ego involvement with a difficult patient and an incompetent nurse along with a highly negative evaluation. This would suggest that she

would wish to dissociate from such attributes linked to those entities, which may be related to her previous experience that was discussed earlier. This creates identity conflict, given her high empathetic identity with those entities, despite not wishing possess such attributes.

Also, her high idealistic identification with a medical consultant and a difficult patient would suggest self aspired identity characteristics likened to those entities. This is interesting as they are quite contrasting, in regards to their roles as they are quite conflicting. However, the situation with her mother's illness would explain her idealistic identity and empathetic identity with a difficult patient when at leisure.

In relation to the original postulates of the investigation, case two represented a more holistic endorsed nurse. Therefore, she presented an appreciation towards both the practical and scientific domains of the profession. Although, there was some evident cross over with the construals of case one. With respect to the constructs used for the postulates the results indicated that case two also found that *'learning proceeded better by getting to grips with the job on the ground'*. In her rationale for this she explained:

> *"When you are doing you are automatically engaging more in the task and what it entails – you get a feel for the task! If someone was to just explain the task without letting you get stuck in and have a go, it makes learning a lot harder. That's why I would have preferred more practical in the teaching time, with supervised instruction/guidance"*

Such polarity in both cases supports the discussion points from study four in regards to differences in cognitive styles for learning and teaching (Noble, Miller & Heckman, 2008). Therefore, this is an area that requires close attention in nursing programmes, in order to promote best learning for all.

Case two also believed there to be '*too much emphasis on the science of evidence based patient care'*. In her rationale for this she explained:

> *"Nursing is not all about science and evidence based patient care quite simply – it's important but it's not everything!"*

This implies that she sits between science and evidence based patient care being the most important aspect in nursing, but does acknowledge an appreciation towards its place in nursing.

Finally, polarity also indicated that she believed there was *'too much emphasis on the human relationships in nursing'*. Her rationale for this explained:

> *"Nursing is essentially about performing skills and procedures in order to treat ill health. Therefore, that is the most important factor in my eyes. Communication with patients is an important part but when you break it down to the nitty-gritty it's the skills and treatment that is its essence"*

Collectively the implications of these cases are highly interesting; as it is evident identity construals can differ considerably and are grounded in experiences related to individuals. Given the power of these construals to individual judgements about nursing and its concepts, it is a fair assumption that these construals ground cognitions and approaches to learning in the profession. As a result, they may act as highly influential underlying factors in regards to student's individual development and attainment.

The present investigation is by no means substantial enough to make direct inferences and generalisations from the results and never intended to do so. Its purpose was to simply act as a small exploratory follow-up to study four, in order to attempt to establish more meaning and understanding to the data and the role of identity processes in nursing students' development.

From the explanations uncovered and with reference to the typologies, the results are suggestive of different cognitive styles, construals, and beliefs about nursing and its concepts. Such typologies are seen to be associated with student's ability to utilise and appreciate the content of the curriculum, which has an effect on their overall learning and development in the profession.

Given that identity represents just one of the three core elements of this body of research, the results were discussed in more general terms, as opposed to making theoretical research implications. Future research using ISA/Ipseus in this and other similar domains are strongly encouraged to use such similar

exploratory follow-ups using greater sample sizes. The purpose of this is to add more depth to the findings and make strong inferences from the data. This could make a significant contribution to knowledge and act as a major step towards re-thinking the approaches of nurse education.

CHAPTER 8.0 – CONCUSION AND RECOMMENDATIONS

The aim of this section of the thesis is to synthesise the findings of the series of studies as a whole. Collectively, the programme of work has shown that underlying issues that are embedded in the curriculum are highly likely contributing factors to the poor examination performance evident in study one Study one looked at using PETTLEP-imagery to help enhance examination performance in the OSCEs. The rationale for this was based on the positive results of the Wright et al. (2008), which examined the use of PETTLEP on two named nursing skills. The findings of Wright et al. suggested that future research should further extend and test the use of PETTLEP on nursing skills and in the clinical fields. Therefore, this acted as an underlying aim for the present thesis.

Despite this, the results were surprising in a number of respects. Firstly, there were no significant differences between the control and experimental groups – as originally hypothesised. Also, one of the control sites actually performed the best; and one of the experimental sites the worst overall. Therefore, it became evident that further investigation was required, in order to identify other factors that could be affecting behaviour and performance. The explicit choice was made for the programme of research to follow this course and attempt to explicate the results from study one further.

Study two used a post-OSCE skills training questionnaire to investigate preparation for and perceptions of the OSCEs. Results revealed some

common concerns which related to practice time, practice environment, and support and training. These three key themes all came under the same higher order theme, which represented 'i.e. the curriculum as a whole'.

With respect the results of study one, support and training, and practice time represented the most common causes for concern for students. This was primarily observed by the researcher during the implementation phases of the intervention. It became increasingly evident during the latter stages of the intervention that differences in the supervision and practice during skills practice training were apparent between the experimental groups. These observations were then substantiated by the data collected in study two. Therefore, it was postulated that the Arrowe Park site was disadvantaged compared to the other sites. This postulate was further backed up by the fact that Arrowe Park also performed the poorest overall despite receiving the curriculum and the PETTLEP training. This would suggest that curriculum did not serve its purpose correctly.

The findings of study three added further strength to this thought. The results revealed that the same curriculum was followed by both the teaching and nursing staff involved in the course. However, it became apparent that there were discrepancies between the sites with regard to how the theory and practice were being applied in the academic setting. Also, the transition of theory and practice into the placement setting appeared to be a blind area for some teaching staff – in that they were not entirely sure what skills were used and learnt in the placement setting. In light Ferguson's (1994) concepts would

prove extremely advantageous in anticipation of any future curriculum developments. Such concepts would concern concreting an interest in integrating what is taught with what is practised in the nursing curriculum by bridging the gap between nursing as it is taught in the classroom (theory) and nursing as it experienced by students in the clinical setting (practice).

Ferguson's ideas of utilising eight key areas (for curriculum teams to consider using) is logical and from the present findings much needed. These areas included: sequencing the taught content of clinical practice; the content of the course; teaching methods used; assessment criteria; the roles of tutors in the learning process; the contribution of the service staff; and the influence of the hidden curriculum. The adoption of such structured techniques would mean a more evidenced-based and integrated approach to the content of the course and the contexts within which it is taught. It would also allow issues such as practice time, practice environment, and support and training - as identified in study two, to be considered and addressed more directly and collectively.

In regards to the experimental group's OSCE results in study one, study two also indicated that a number of students felt that there was not enough practice time for skills and there was too much theory. Further to this, study thee explored further the core curriculum programme and specifically investigated its content from the delivering professionals' perspective.
The results revealed that the ratio of theory to practice in the curriculum was 50:50. However, some interesting factors surfaced in regards to students' ability to utilise and apply the knowledge. Collectively, all participants in study

three acknowledged that theory and practice were both equally important concepts in the delivery, preparation and training for nursing. However, the results indicated that students' predominantly deemed the practical side as the most important aspect.

This led to further queries in regards to whether students may actually have different conceptions about nursing, which they therefore use to map their internal beliefs and influence their behaviour. For example, the work of Fealy (1998) looked at the theory-practice relationship in contemporary nursing literature. This highlighted that the nature of nursing practice, the nature and origins of theory, and the relationship between theory and practice all required further exploration in regards to their combined influential properties. The work specifically drew upon the conceptions of nursing as an applied-science and practice as a separate endeavour. Also, it drew upon a basis for nursing as 'common sense' in terms of practitioners engaging in practice.

The findings of study three showed that students do actually have different conceptions about nursing – compared to the professionals' teaching it, and that they often struggle to understand how theory and practice fit together. Therefore, such underlying conceptions may have been an influential and underlying factor in students' ability to learn, apply, and use the skills taught in the curriculum.

Therefore, this in conjunction will discrepancies in the levels of support could have influenced performance, development and learning. As a result, the

present results are supportive of the assumption that on paper and in practice the curriculum is not fulfilling its full intended aims and purpose.

Study four followed on from this issue to explore students' internal construals of behaviours in regards to how they identify with a number of issues in regards to nursing and the broader contexts of their lives. Early work by Miller (1985) recognised that definitions of many of the beliefs and assumptions underlying nursing appeared to contribute to a divergence between nursing theory and nursing practice. Miller believed that nurses who are theorists and educationalists, and nurses who are engaged in nursing practice tend to use different vocabularies, to have different perceptions of patients and nursing, and to value different kinds of nursing knowledge.

The results of study three indicated burgeoning attention to this factor, in that students may in fact identify differently with nursing and its concepts. No research to date had extensively investigated such issues using such a sophisticated measure as ISA/Ipseus. Therefore, study four investigated this avenue providing a novel and innovative approach to that area of research.

The postulates of the investigation were based around the configured discourse ideas related to the work of Fealy. The postulates explored nursing identity in regards to how participants internally mapped their behaviour over time and from differing perspectives, on their beliefs about the essence of nursing. This allowed the generation of typologies in regards to individual judgements on what was important in nursing. These were identifiable within the ISA/ipseus identity parameters, which were discussed as individual cases

in study four. The cases revealed some interesting findings showing emergent patterns towards the postulates in question. However, the sample size was only small which meant the data could not form strong inferences in terms of those that engaged in a more: scientific endorsed approach (theoretical and science orientated beliefs); humanistic endorsed approach (practical and socially skilled care beliefs); and holistic endorsed approach (an accumulation of scientific, practical, and social beliefs) to nursing.

Early work by Clarke (1986) supports existence of typologies by presenting three issues related to theory and practice in nursing which were continuously problematic. These concerned the separation of theory from practice; reality vs. the ideal; and nursing adherence to a scientific paradigm versus nursing adherence to an arts paradigm. Clarke concluded that applying Shotter's theory of personal action (See Shotter, 1974; 1975) could form the basis for a resolution of the three issues. Through applying this approach a nursing action could be defined as an action which was literally thought out and which had as its goal the benefit of the patient and client. The deliberate thought and goal of the action, which is an integral part of it, then could form the basis of nursing theory, which concerns reasons for and reflections upon action. This therefore, immediately unites theory and practice as two components of using action.

With reference to this, PETTLEP presented an ample means to complement such a model for uniting theory and practice. However, until underlying issues

regarding to the core curriculum are addressed, the addition of such techniques are not beneficial – as seen in study one.

It was evident from the ISA/Ipseus case designs that participants' construals of nursing were contextualised within a number of differing individual entities and constructs. Also, polarity of the constructs informed the postulates of the investigation, which indicated some initial underlying rationale. In the broader scheme and tracing back through the studies, it became evident that such predisposed construals may in fact greatly influence behaviour (both internally and externally) in regards to the curriculum and individual development. This concerns all aspects, in particular the course content concerned with learning and assessment.

Study four identified preliminary evidence of typologies in the beliefs about nursing. These findings filtered back to the results of study three, which explicated the gap between theory and practice, along with individual differences in its application and integration. From the results of studies one and two it has become evident that students' behaviour is directly affected by the type of content used for learning. Therefore, based on such individual differences learning should be channelled to recognise this, in order to reach and engage all learners respectively.

The discussion of study four highlighted this in respect to the recent work of Noble, Miller and Heckman (2008), which looked at cognitive styles of student nurses in regards to educational implications for teaching and nursing. Here it

was recognised that diversity in students learning must be considered. The results of this thesis have most definitely evidenced diversity in students' learning and also the delivery of that learning. This is a crucial factor, given that students may actually be at risk for academic failure as a result. Therefore, based on the present body of results suggest that instructional strategies tailored to students' needs should be incorporated into the nursing curriculum.

The results of study five also indicated that internal beliefs and behaviour towards nursing may in fact be rooted prior to even beginning the profession. Results of this study also suggested that personal experiences may also shape beliefs and identity with in nursing and therefore influence cognitions and behaviour towards its practice. The ISA/Ipseus was able to encapsulate such inferences, which allowed for specific issues to be followed up. Future research should most definitely look to conduct similar investigations using ISA/Ipseus with greater sample sizes and further case study follow-ups. This would make a significant contribution to the nursing literature, in order to provide firmer evidence regarding typologies.

In summary, although the first study produced some surprising results, this thesis has made a very useful and interesting contribution to some pressing issues within nursing. The series of studies have coherently aided in formulating explanations to underpin the unanticipated results and identify further factors affecting development and performance. This was done using a

funnelled approach in order to further refine the results and establish inferences of cause and effect.

The initial rationale for the thesis concerned investigating internal representation using imagery and identity, and then examining the effects of these on both internal and external behaviour in nursing. The studies originally aimed to contribute to current knowledge of PETTLEP-imagery, and investigate clinical skills behaviour and identity in regards to using PETTLEP. Therefore, the studies never intended to provide an exhaustive examination of possible measures of internal representation on behaviour. Such examination would be well beyond the scope of any thesis.

Study one used the OSCEs as an external measure of behaviour in relation to using PETTLEP imagery. A number of limitations were apparent following the completion of the study. A fundamental problem for this study was its location in a real life setting, rather than in a laboratory. Therefore, the advantages of high ecological validity were undermined by the difficulties of maintaining strict control over the study. However, this was a risk thought worth taking. Despite this though, the use of an experimental design within a 'real' life setting added originality to the work as this had never been done before using PETTLEP.

Despite the non-significant findings, future PETTLEP research should most definitely look to use and apply PETTLEP in further 'real life' scenarios and settings, in order to test and prove it's applicability to areas beyond 'controlled laboratory settings'.

Also, the prospect of using PETTLEP as an educational tool in branching disciplines would most definitely be worthy of further investigation. However, use of a 'gold standard' outcome measure of performance, using both pre- and post measures is strongly recommended.

The current research recognised a series of flaws related to the OSCEs. This was accompanied with observed differences in levels of support between teaching sites. Future research should look to investigate the validity and reliability of the OSCEs and assessment methods used within in the nursing curriculum. Future research could also look to investigate coherency and standards of teaching within nursing. Given the present findings, a comparative analysis between institutions or sites within the same institution would serve as an extremely worthy programme of research. This would allow analysis of quality assurance, in order to identify whether students are in fact at risk of academic failure due to factors which are out of their control.

The series of studies also highlighted evidence in regards to the on-going nursing issue of theory and practice application. Also, the investigation of identity provided preliminary evidence of different cognitive construals towards the beliefs about and orientations towards nursing. These factors were shown to directly affect internal behaviour and development in relation to the nursing. However, the sample sizes in these studies were small as they were exploratory investigations that followed from the previous studies, based on the results and issues encountered. Therefore, the generalisability of the results is limited.

Future research is strongly recommended further explore the connotations of these issues further using ISA /Ipseus using larger samples. Such work could incorporate the use of different groups of nursing students or a combination of nursing students and the professional staff, using pre- and post measures to monitor direct identity changes. This could formulate greater comparisons and inferences from the results.

Finally, results from such studies could provide evidence regarding the need for re-development of teaching and learning strategies in nursing. This may entail developing a programme for training for educators, in order to inform knowledge behind different principles and styles of delivery that is geared towards different learning strategies of students. Such a programme could be developed through further research into nursing identity but on a larger scale than in the present studies, in order to better identify and support typologies. The instructional strategies could then be centred upon the particular typologies, with evident overlap between the styles.

The demands of the curriculum and the expectation to effectively integrate and apply knowledge between disciplines using different learning methods are evidently a challenging task. Therefore, it is believed that both students and trainers would benefit substantially from a revision in the structure of teaching that acknowledges individual differences. This would be one that reaches students at all levels that may even involve branched options within the course. This could then further refine individual aspects of learning that may be lacking for individuals. Also, an invested emphasis on feeding and applying

practical aspects into their theoretical counterparts and vice versa would serve as valuable additions for both students and educators.

Future research could investigate the teaching structure of the curriculum. For example, by examining whether weekly combinations of academic and placement time in the curriculum (e.g., 3 days university setting, 2 days placement setting) could better facilitate learning and application than the current isolated scheduled blocks of time (e.g., 6 weeks university setting, 6 weeks placement setting). Such research could assess whether students are better able to apply the theory they are taught into its practical counterpart or vice versa compared to the current structure. This may then provide evidence to substantiate changes and possibly provide a step in the right direction to revising the future of nurse education.

In summary, this thesis has found the application of PETTLEP imagery to clinical nursing skills to be insignificant for OSCE performance. The initial methods of testing this applied an experimental design – a structured programme of imagery, in to a real life setting – a nursing curriculum. Upon reflection this was an ambitious task and it could be postulated that PETTLEP imagery only works in controlled laboratory environments (as previously tested), as opposed to open real life scenarios that are harder to predict and control.

Contrary these findings some more interesting results were revealed. These involved some common student concerns regarding the structure of the

curriculum, its content and the delivery of that content. To follow up these concerns study two investigated students' perceptions of and preparation for the OSCEs using a skills training questionnaire. Results revealed common concerns, specifically related to skills practice. Furthermore these concerned the amount of practice time provided; the practice environment; and the amount of support and training during teaching.

In light of these findings, study three pursued a contrasting and comparative investigation from the professionals' perspective on the curriculum. This specifically examined perceptions of the assessment structure and expectations within the curriculum; the content of the curriculum; levels of support and provision for training; and the application of theory and practice. This aimed to identify any coherent or conflicting views between the students' receiving the curriculum and the staff delivering the curriculum.

Results revealed coherency in the professional view that theory and practice were equally as important for nurse education. However, students commonly perceived practice as the most important aspect. Also, some students often struggled to apply theory to practice and vice versa. In light of this it became apparent that students may in fact identify differently with the content of the curriculum. Therefore, appraisal of the content may have different significance for students and affect behaviour differently both internally and/or externally.

Study four investigated this using Identity Structure Analysis (ISA)/Ipseus (Weinreich & Saunderson, 2003).This explored how students applied

themselves to the various aspects of nursing in the contexts of healthcare and broader affiliations, and how these fitted into students' broader sense of identity. It also looked at typologies within nursing and whether identity fitted into three distinct categories depending on construals.

Study five followed this up using two individual case studies. The purpose of this was to encapsulate meaning behind individual construals and typologies and explicate the findings of ISA/Ipseus and the implications for nurse education. Results found that construals are grounded in experiences which can affect development, behaviour and identity towards nursing and the broader affiliations in individuals' lives.

In conclusion identity in nursing should be investigated further in order to provide stronger evidence in regards to typologies and how these may be influencing students' behaviour and development in nurse education. Such research could have extremely important implications for the future of nurse education and be a positive step towards future curriculum revisions, so that the curriculum is reaching the needs of all students at all levels.

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APPENDIX A

University of Chester

School of Health & Social Care

DIPLOMA IN HIGHER EDUCATION NURSING

Objective Structured Clinical Examination

Cohort:	Date:	Student Examination Number:

Skill - Consistent, reliable competent demonstration of socially clean

HANDWASHING.

		Component elements of the skill	Marks		
Please circle the appropriate options					
	1	Remove all jewellery except plain band wedding rings	-2	1	2
	2	Wet hands/apply solution	-2	1	2
	3	Apply 3 – 5mls.	-2	1	2
	4	Rub hands palm to palm x 5	-2	1	2
	5	Backs of both hands right palm over left dorsum and vice versa x 5	-2	1	2
	6	Palm to palm with fingers interlaced x 5	-2	1	2
	7	Backs of both hands with fingers interlaced	-2	1	2
	8	Backs of fingers gripped to opposing palms interlaced x 5	-2	1	2
	9	Both thumbs, using rotational manner, with opposing clasped fingers	-2	1	2
	10	Rub both palms with fingertips and tip of thumb	-2	1	2
	11	Rinse all surfaces thoroughly	-2	1	2
	12	Shake off excess water	-2	1	2
	13	Turn off tap without contaminating hands	-2	1	2
	14	Dry all surfaces thoroughly	-2	1	2
	15	Procedure to last minimum of thirty seconds	-2	1	2
	16	Dispose of paper towels correctly, using pedal of pedal bin	-2	1	2
	17	Carries out all actions in a safe and logical sequence	-2	1	2
		Totals			
		Total Marks			
		% of total			

0 = Not attempted/unsafe practice

1 = Attempted, but not completed/ out of sequence

2 = Competently achieved

Comments:

	Pass	Fail

Name of Examiner_____ Signature of Examiner
_____

Name of Moderator_____ Signature of Moderator
_____

University of Chester

DIPLOMA IN HIGHER EDUCATION NURSING

Objective Structured Clinical Examination

Cohort:	Date:	Student Examination Number:

Skill - Consistent, reliable sequencing and competent practice in the taking and recording of BLOOD PRESSURE

		Component elements of the skill	Marks		
Please circle the appropriate options	1	Introduction to patient giving name, designation and gain consent	-2	1	2
	2	Checks patient identity (verbally and ID label)	-2	1	2
	3	Wash hands in the appropriate systematic manner	-2	1	2
	4	Checks to see if patient has experienced procedure before	0	1	2
	5	Maintains good eye contact, and appropriate use of touch	0	1	2
	6	Clear explanations, no jargon used	0	1	2
	7	Ensures patients arm is comfortable	0	1	2
	8	Locates brachial artery, bladder of cuff placed centrally around upper arm.	-3	1	2
	9	Cuff is applied firmly all restrictions/obstructions are removed	-3	1	2
	10	Stethoscope ear pieces cleaned before and after use	0	1	2
	11	Checks stethoscope to see if turned to diaphragm side	0	1	2
	12	Ensures Sphygmomanometer is visible	0	1	2
	13	Palpates radial pulse and inflates cuff until pulse disappears. Verbalises reading to Examiner.	0	1	2
	14	Deflates cuff fully	-1	1	2
Students Reading:	15	Re-locates brachial artery and places stethoscope over the same	-1	1	2
	16	Inflates cuff between 20 to 30 mmHg above verbalised figure	-1	1	2
Examiners Reading:	17	Cuff deflated slowly in controlled manner (2-3 mmHg/sec) whilst listening for systolic/diastolic readings – verbalises results to Examiner	-2	1	2
	Examiner verbalises result back to student for confirmation				

418

	18	Student's verbalised reading of BP correctly matches Examiner's reading, + or – 10 mmHg	-11	1	2
	19	Student charts verbalised figure accurately including time & date	-11	1	2
	20	No more than three attempts at inflating cuff	-4	1	2
	21	Patient left comfortable	0	1	2

Totals			
Total Marks			
% of total			

0 = Not attempted/unsafe practice

1 = Attempted, but not completed/ out of sequence

= Competently achieved

PTO

Comments:

Pass	Fail

Name of Examiner_____ Signature of Examiner _____

Name of Moderator_____ Signature of Moderator _____

University of Chester

School of Health & Social Care

DIPLOMA IN HIGHER EDUCATION NURSING

Objective Structured Clinical Examination

Cohort:	Date:	Student Examination Number:

Skill - Consistent, reliable sequencing and competent practice, working within infection control guidelines, in TESTING AND RECORDING URINE

		Component elements of the skill	**Marks**		
Please circle the appropriate options	1	Check patient identity (verbally and ID label) against sample	-2	1	2
	2	Wash hands in the appropriate systematic manner	-2	1	2
	3	Select appropriate equipment	0	1	2
	4	Put on apron and gloves	-2	1	2
	5	Ensure reagent strips are in date	-2	1	2
	6	Observes/notes smell and colour of the urine	-2	1	2
	7	Dips reagent strip covering all test areas and removes immediately	-2	1	2
	8	Wait the specified time as per manufacturer's instructions before reading (seeks confirmation of time if no instructions present)	-2	1	2
	9	Reads results as per the grading scale on reagent bottle	-2	1	2
	10	Verbalises results to examiner	-1	1	2
	11	Dispose of reagent strip into yellow bin	-2	1	2
	Examiner verbalises result back to student for confirmation				
	12	Dispose other equipment used in appropriate yellow bin bag	-2	1	2
	13	Removes glove from writing hand	0	1	2
	14	Documents results accurately	-7	1	2
	15	Wash hands after completing skill	-2	1	2
		Totals			
		Total Marks			
		% of total			

0 = Not attempted
1 = Attempted but incomplete
2 = Competent

Comments:

421

Name of Examiner_____ Signature of Examiner
_____

Name of Moderator_____ Signature of Moderator
_____

University of Chester

School of Health & Social Care

DIPLOMA IN HIGHER EDUCATION NURSING

Objective Structured Clinical Examination

Cohort:	Date:	Student Examination Number:

Skill - Consistent, reliable sequencing and competent practice in measurement and recording of TEMPERATURE, PULSE, RESPIRATION

		Component elements of the skill	Marks		
Please circle the appropriate option	1	Introduces self to patient giving name and designation. Gains consent.	-2	1	2
	2	Checks patient identity verbally and against ID label	-2	1	2
	3	Washes hands in the appropriate systematic manner	-2	1	2
	4	Maintains good eye contact and appropriate use of touch	0	1	2
	5	Clear explanations used (no jargon)	-1	1	2
Students Readings	6	Electronic equipment checked for low battery	0	1	2
	7	Places cover on probe	-2	1	2
T P R	8	Thermometer placed gently in patients ear/mouth	-2	1	2
	9	Measurement taken and results verbalised to examiner	-2	1	2
Examiners Readings	10	Documented result to be consistent to that displayed within 0.5 degrees	-10	0	2
T P R	11	Removes cover without contaminating hands and discards in appropriate receptacle	0	1	2
	12	Ensures patient's arm is resting comfortably	0	1	2
	13	Locates radial pulse	-3	1	2
	14	Counts pulse for 60 seconds	-2	1	2
	15	Conducts unobtrusive observation of chest movements	0	1	2
	16	Count respirations for 60 seconds and verbalise results of pulse and respiration to examiner	-2	1	2
	Examiner simultaneously undertakes activity with student and verbalises students results back to student for confirmation				
	17	Verbalised results consistent with findings of examiner (+/- 5 for pulse and +/- 2 respirations)	-10	1	2
	18	Charts pulse and respiratory observations accurately	-10	1	2
	19	Patient left comfortable	0	1	2
			Total Marks		

0 = Not attempted/unsafe practice

1 = Attempted, but not completed/ out of sequence

2 = Competently achieved

Comments:

	Pass	Fail

Name of Examiner_____ Signature of Examiner
_____

Name of Moderator_____ Signature of Moderator
_____

School of Health & Social Care

DIPLOMA IN HIGHER EDUCATION NURSING

Objective Structured Clinical Examination

Cohort:	Date:	Student Examination Number:

Skill - Consistent, reliable sequencing and competent practice in the administration of

ORAL MEDICATION

Component elements of the skill			*Marks*		
Please circle the appropriate options	1	Introduces self to patient giving name, designation. Gains consent.	-2	1	2
	2	Washes hands in the appropriate systematic manner	-2	1	2
	3	Checks patient identity: verbally; with ID label ; with prescription chart	-10	1	2
	4	Checks for known allergies: verbally with patient; with prescription sheet	-2	1	2
	5	Drug sheet – verbalises checking of medications due. Lists drug name, date, time due and drug dose and appropriate signature	-10	1	2
	6	Checks mode of administration	-3	1	2
	7	Drug bottle - Checks drug name – Verbalises action	-10	1	2
	8	Drug bottle - Checks expiry date– Verbalises action	-3	1	2
	9	Drug bottle – Checks drug strength– Verbalises action	-10	1	2
	10	Drug to container using non touch technique	-2	1	2
	11	Drug sheet and container to patient	-2	1	2
	12	Patient is offered a drink to assist with swallowing medication	0	1	2
	13	Student to verbalise actions in assuring patient has taken drug	-2	1	2
	14	Accurately records drug given with date and signature on drug sheet	-10	1	2
	15	Obtains counter signature from examiner	-3	1	2
	16	Disposes of equipment appropriately	0	1	2
		Totals			
		% of total			

0 = Not attempted/unsafe practice
1 = Attempted, but not completed/ out of sequence

Comments:	Pass	Fail

Name of Examiner_____ Signature of Examiner
_____

Name of Moderator_____ Signature of Moderator
_____

APPENDIX B
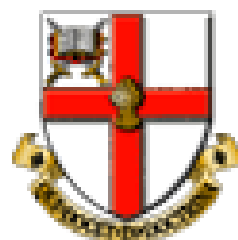
Fundamental and Key Caring Skills (NM4 001) Module

01/08 OSCE Preparation

PETTLEP-imagery Resource Booklet

Student name/no:………………………………………………

Leader: Clare Parry

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Tel: 01244 513422 (Chester Campus)

CONTENTS PAGE

INTRODUCTION

This booklet has been designed to provide you with additional information about a technique that will help you better acquire, learn, and understand the clinical skills that are assessed in your Fundamental and Key Caring skills module.

The purpose of this booklet is two-fold. First, it aims to act as a resource that will provide you with a general background understanding of what 'imagery' actually is, and how it has been previously used to help improve skilled performance. Second and more importantly, it aims to then guide and provide you with step-by-step information on how to use and apply imagery yourself. This will be specific to the clinical skills that are taught in the Fundamental and Key Caring Skills module. The purpose of this is to further aid and prepare you for your OSCEs in December.

During the OSCEs you will be assessed on your knowledge, behaviour and performance by demonstrating your proficiency in the key skills taught on the Fundamental and Key Caring Skills module. This will take place in a formally assessed environment, which can often induce feelings of nerves and apprehension. As a result, such feelings can often take their toll in examinations and have a negative effect on your ability to perform your best.

This booklet will support you in preparing for this process by providing you with additional training in the form of psychological skills. This additional training serves to benefit you in a number of ways. Such benefits include improving your confidence, awareness and understanding; self-reflection and evaluation; and also your competence to perform proficiently. These are fundamental skills that are essential for success not only in your OSCEs, but also in the future in your professional career.

429

WHAT IS IMAGERY?

430

Upon completion of this section you should be able to:

1.1   Define what imagery is

1.2   Identify and understand what imagery is used for

1.3   Identify the benefits of using imagery

1.4   Measure imagery ability

WHAT IS IMAGERY?

Imagery is mentally representing or recreating a thing in the mind

It is a conscious and deliberate act that serves to recall information about the image in question

It has been described using several definitions:

"Using all the senses to re-create or create an experience in the mind" (Vealey & Greenleaf, 2001, p.248)

"A representation of the self in action, with the subject feeling himself executing a given action" (Jeannerod, 1994, p.189).

An expansion of these definitions clarifies that:

A) An image can be created in the mind in the absence of any external stimuli *(the actual physical object, person, place etc)*

B) An image may involve one or all of the senses *(e.g. sight, smell, sounds, touch, feelings)*

C) An image is created from information stored in the long-term memory

WHAT IS IMAGERY USED FOR?

- Imagery is commonly used to enhance skilled performance in fields such as: sport, music, dance, acting and dentistry.

- It involves rehearsing or practicing a task in the mind without actually physically performing the task for real

- When used in conjunction with actual practice, imagery can effectively enhance performance

- Imagery by itself is more effective than no practice, and in some circumstances is as effective as actual practice

- Imagery is extremely effective for activities that that require thinking and planning. Therefore, it helps to structure your thought processes prior to and during performance of a task.

- It also helps you to reflect upon your performance of a task

THE BENEFITS OF USING IMAGERY

- **It enhances preparation strategies**

  It helps you to run through procedures in a more logical way. This then allows you to become more familiar with what you are doing.

- **It can enhance learning and understanding of skilled performance**

  Imagery helps to structure your thought processes more easily and fluently

- **It can regulate arousal and help control emotions, particularly in stressful environments**

  If thought processes are more structured prior to and during the performance of tasks, arousal should be lower as you become more familiar with performing the task

- **It can enhance self-confidence and awareness**

  If arousal is lower, confidence in your own ability should become higher. Therefore, your awareness throughout the task should improve greatly

MEASURING IMAGERY ABILITY

Imagery ability can be measured using the Movement Imagery Questionnaire (MIQ-R). You may remember that you completed this back in March.

What is the MIQ-R?

The revised Movement Imagery Questionnaire (Hall & Martin, 1997) is used to assess one's imagery ability. The purpose of the MIQ-R is to evaluate an individual's ability to see (visual imagery) and feel (kinesthetic imagery) movements. This questionnaire consists of 8 questions, 4 visual and 4 kinesthetic, each question being a separate movement.

How do you complete it?

Completing a question on the MIQ-R requires several steps. First, you should perform the movement exactly as described. Second, you should then image the same movement either visually (attempt to see) or kinesthetically (attempt to feel), depending on which the question is asking you to do (no movement is actually performed during this process). Third, you should then assign a value from the seven-point rating scale to indicate the ease/difficulty of imaging the movement. A low rating indicates that the movement was difficult to image and a high rating indicates that the movement was easy to image. After completing all the questions a visual score (seeing) and a kinesthetic score (feeling) is obtained by summing the items. Therefore, each of the two scores can range from 4-28.

What does my end rating tell me?

A score of **16** indicates moderate imagery ability

A score **below 16** indicates an apparent lack of ability to image (finds it harder to)

A score **above 16** indicates a moderately high ability to image (finds it easier to)

Remember…

The MIQ-R is a subjective self-report measure. Therefore, the score you accumulate is based upon the individual answers you give to each question based on your own ability. The score you come out with will represent a true reflection of your imagery ability if:

a) You take the task seriously

b) Answer the questions honestly

On the next page is a copy of the MIQ-R. Have a go at completing it again and see if your imagery ability has improved since March.

Movement Imagery Questionnaire Revised

(Hall & Martin, 1997)

Instructions

   This questionnaire concerns two ways of mentally performing movements which are used by some people more than others, and are more applicable to some types of movements than others. The first is attempting to form a visual image or picture of a movement in your mind. The second is attempting to feel what performing a movement is like without actually doing the movement. You are requested to do both of these mental tasks for a variety of movements in this questionnaire, and then rate how easy/difficult you found the tasks to be. The ratings that you give are not designed to assess the goodness or badness of the way you perform these mental tasks. They are attempts to discover the capacity individuals show for performing these tasks for different movements. There are no right or wrong ratings or some ratings that are better than others.

   Each of the following statements describes a particular action or movement. Read each statement carefully and then actually perform the movement as described. Only perform the movement at a single time. Return to the starting position for the movement just as if you were going to perform the action a second time. Then depending on which of the following you are asked to do, either (1) form as clear and vivid visual image as possible of the movement just performed, or (2) attempt to feel yourself making the movement just performed without actually doing it.

After you have completed the mental tasks required, rate the ease/difficulty with which you were able to do the task. Take your rating from the scale featured at the top of each page. Be as accurate as possible and take as long as you feel necessary to arrive at the proper rating for each movement. You may choose the same rating for any number of movements 'seen' or 'felt' and it is not necessary to utilise the entire length of the scale. Please circle the rating you select.

Ratings Scales

```
  7      6      5      4      3      2      1
|---|------|------|------|------|------|---|
```

7 = Very easy to see/feel   **6 = Easy to see/feel**
 5 = Somewhat easy to see/feel   **4 = Neutral (not easy or hard)**
 3 = Somewhat hard to see/feel   **2 = Hard to see/feel**
 1 = Very hard to see/feel

1.   Starting Position: Stand with your feet and legs together and your arms by your sides.

Action: Raise your right knee as high as possible so that you are standing on your left leg with your right leg flexed (bent) at the knee. Now lower your right leg so that you are again standing on two feet. Perform these actions slowly.

Mental Task: Assume the starting position. Attempt to feel yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.

Rating: **7**   **6**   **5**   **4**   **3**   **2**   **1**

2.   Starting Position: Stand with you feet slightly apart and your hands at your sides.

Action: Bend down low and then jump straight up in the air as high as possible with both arms extending above your head. Land with your feet apart and lower your arms to your sides.

Mental Task: Assume the starting position. Attempt to see yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.

Rating: **7**   **6**   **5**   **4**   **3**   **2**   **1**

437

Ratings Scales

7	6	5	4	3	2	1

7 = Very easy to see/feel   **6 = Easy to see/feel**
    5 = Somewhat easy to see/feel   **4 = Neutral (not easy or hard)**
3 = Somewhat hard to see/feel   **2 = Hard to see/feel**
1 = Very hard to see/feel

3.   Starting Position: Extend the arm of your non-dominant hand straight out to your side so that it is parallel with the ground, palm down.

    Action: Move your arm forward until it is directly in front of your body (still parallel to the ground). Keep your arm extended during the movement and make the movement slowly.

    Mental Task: Assume the starting position. Attempt to feel yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.

Rating: **7   6   5   4   3   2   1**

4.   Starting Position: Stand with your feet slightly apart and your arms fully extended above your head.

    Action: Slowly bend forward at the waist and try to touch your toes with your fingertips (or if possible, touch the floor with your fingertips or hands). Now return to the starting position, standing erect with your arms extended above your head.

    Mental Task: Assume the starting position. Attempt to see yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.

Rating: **7   6   5   4   3   2   1**

Ratings Scales

```
7        6         5         4         3         2         1
```

7 = Very easy to see/feel   **6 = Easy to see/feel**
  5 = Somewhat easy to see/feel   **4 = Neutral (not easy or hard)**
3 = Somewhat hard to see/feel   **2 = Hard to see/feel**
1 = Very hard to see/feel

---

5.   Starting Position: Stand with your feet slightly apart and your hands at your sides.

Action: Bend down low and then jump straight up in the air as high as possible with both arms extended above your head. Land with your feet apart and lower your arms to your sides.

Mental Task: Assume the starting position. Attempt to feel yourself making the movement just performed without actually doing it. Now rate the ease/difficulty with which you were able to do this mental task.

Rating: **7**   **6**   **5**   **4**   **3**   **2**   **1**

---

6.   Starting Position: Stand with your feet and legs together and your arms by your sides.

Action: Raise your right knee as high as possible so that you are standing on your left leg with your right leg flexed (bent) at the knee. Now lower your right leg so that you are again standing on two feet. Perform these actions slowly.

Mental Task: Assume the starting position. Attempt to see yourself making the movement just performed with as clear and vivid a visual image as possible. Now rate the ease/difficulty with which you were able to do this mental task.

Rating: **7**   **6**   **5**   **4**   **3**   **2**   **1**

Ratings Scales

7	6	5	4	3	2	1

7 = Very easy to see/feel   **6 = Easy to see/feel**
   5 = Somewhat easy to see/feel   **4 = Neutral (not easy or hard)**
3 = Somewhat hard to see/feel   **2 = Hard to see/feel**
1 = Very hard to see/feel

7.   Starting Position: Stand with your feet slightly apart and your arms fully
                        extended above your head.
       Action: Slowly bend forward at the waist and try to touch your
                        toes with your fingertips (or if possible, touch the floor
                        with your fingertips or hands). Now return to the starting
                        position, standing erect with your arms extended above your
                        head.

       Mental Task: Assume the starting position. Attempt to feel yourself
                        making the movement just performed without actually
                        doing it. Now rate the ease/difficulty with which you
                        were able to do this mental task.

Rating: **7**   **6**   **5**   **4**   **3**   **2**   **1**

8.   Starting Position: Extend the arm of your non-dominant hand straight out
                        to your side so that it is parallel with the ground, palm down.
       Action: Move your arm forward until it is directly in front of
                        your body (still parallel to the ground). Keep your arm
                        extended during the movement and make the movement
                        slowly.
       Mental Task: Assume the starting position. Attempt to see yourself
                        making the movement just performed with as clear and
                        vivid a visual image as possible. Now rate the
                        ease/difficulty with which you were able to do this
                        mental task.

Rating: **7**   **6**   **5**   **4**   **3**   **2**   **1**

PETTLEP IMAGERY

Upon completion of this section you should be able to:

1.5   Define what PETTLEP stands for

1.6   Understand the components of PETTLEP

1.7   Understand how to use PETTLEP

1.8   Identify ways and examples of using the components of PETTLEP for imagery of the OSCE skills

WHAT DOES PETTLEP STAND FOR?

PHYSICAL

ENVIRONMENTAL

TASK

TIMING

LEARNING

EMOTIONAL

PERSPECTIVE

COMPONENTS EXPLAINED

PHYSICAL: Consideration of movement, posture, equipment, clothing, sights/smells/sounds associated with the skill = personal relevance and meaning

ENVIRONMENTAL: Use of multi-sensory environmental cues to address similarity in actual performance – performing imagery in a similar environment to real skill performance, wearing your correct clothing.

TASK: Consideration of attentional components of task = visual/motor; conscious/unconscious (see skills audits for list of task demands)

TIMING: Key component of effective performance. Works very closely with the physical component - concerns the correct timing with which skill is performed

LEARNING: Imagery must be updated to accommodate for learning. Therefore, you should image a bit better at the time of performing imagery

EMOTIONAL: Experience of the emotions and arousal associated with performances. Your senses play a key role in this for detecting and recalling relevant feelings (see activity p.26)

PERSPECTIVE: The way you view your imagery – attempting to see and feel the movements as you would from when performing them for real

THE PRINCIPLES BEHIND PETTLEP

- Imagery and actual movement have been shown to involve the same neural networks in the brain

- Therefore, PETTLEP-imagery aims to closely match actual performance in order to strengthen the neural networks involved in performing and imaging the OSCE skills

- The purpose of this is to make you more familiar with the thought processes required to perform effectively

- The idea of PETTLEP is to include important elements from the real task in imagery of the task, in order to make imagery more realistic and closely matched to the neural networks involved in actual performance

- The 7 PETTLEP components are a framework to guide your imagery in order for it to be as similar and relevant to actual performance as possible

- PETTLEP-imagery is a skill and technique you can use after the OSCEs in other areas of skilled performance in life e.g. driving, presentations, interviews etc.

BASIC PETTLEP-IMAGERY GUIDELINES FOR OSCE SKILLS

1. Wear your uniform to perform imagery of each skill (**Physical component**)

2. Stand in the correct stance as you would to perform each skill (**Physical component**)

3. Perform your imagery in an appropriate environment if possible. For example, before of after your shift on the ward, next to a bed in your home or anywhere that appears to be similar to the actual environment where you perform the task (**Environmental component**)

4. Hold the appropriate equipment or something that meaningfully resembles the equipment used in the task (**Physical component**)

5. Image the task as vividly as possible, attempting to recreate any feelings, touch, sight, smells, sounds or talking that you associate with each skill (**Physical, Task and Emotional components**)

6. Image each skill in the correct timing that you would normally perform it (i.e. 'real time') (**Timing component**)

7. Update and modify your imagery to accommodate for your improved ability at each skill (**Learning component**)

SPECIFIC EXAMPLES OF COMPONENT USE IN OSEC SKILLS

1.

Hand washing	Example
Physical	Wear uniform, turn tap on for background noise or image the smells and sounds you would normally hear and resemble with the task
Environmental	Perform imagery on ward/near a basin in home
Task	Attentional demands - e.g., Visual, motor, verbal, visuomotor, cognitive. See skills audits to identify your stronger and weaker areas. Focus imagery on weaker areas in particular
Timing	Image actions with correct timing (x 5 repetitions for each phase, minimum 30 seconds for whole skill)
Learning	Image task a bit better than your ability of performing it
Emotional	Image relevant emotions/ arousal experienced during skill
Perspective	Image the sight and feel of the task in as much detail as possible

2.

Blood Pressure	Example
Physical	Wear uniform, use sphygmomanometer/stethoscope and hold pump or use something to hold in hand that you believe to resemble the feel of pump and image it as vividly as possible. Also image the smells you associate with the task, the sounds you would normally hear and the verbal information communicated, as vividly as possible
Environmental	Perform imagery on ward or in an environment that has some meaning to you for this skill
Task	Attentional demands - e.g., Visual, motor, verbal, visuomotor, cognitive. See skills audits to identify your stronger and weaker areas. Focus imagery on weaker areas in particular
Timing	Image actions with correct timing (e.g., pumping, pressure, pulse count, release)
Learning	Image task a bit better than your ability of performing it
Emotional	Imagine the relevant emotions/arousal you experience during the skill (e.g., hands shaking, heart beating fast etc)
Perspective	Image the sight and feel of the task in as much detail as possible

3.

Urinalysis	Example
Physical	Wear uniform, use test strip/something you believe to resemble the test strip or image it as vividly as possible. Also image the smells you associate with the task (lucozade in this instance!), the sounds you would normally hear and the verbal information communicated, as vividly as possible
Environmental	Perform imagery on the ward or in an environment that has some meaning to you for this skill
Task	Attentional demands - e.g., Visual, motor, verbal, visuomotor, cognitive. See skills audits to identify your stronger and weaker areas. Focus imagery on weaker areas in particular
Timing	Image actions with correct timing
Learning	Image task a bit better than your ability of performing it
Emotional	Imagine the relevant emotions/arousal you experience during the skill (e.g., hands shaking, heart beating fast etc)
Perspective	Image the sight and feel of the task in as much detail as possible

4.

Oral medication	Example
*P*hysical	Wear uniform, use medication containers/something you believe to resemble the medication containers or image them as vividly as possible. Also image the smell you associate with the task, the sounds you would normally hear and the verbal information communicated and written information recorded, as vividly as possible
*E*nvironmental	Perform imagery on the ward or in an environment that has some meaning to you for this skill
*T*ask	Attentional demands - e.g., Visual, motor, verbal, visuomotor, cognitive. See skills audits to identify your stronger and weaker areas. Focus imagery on weaker areas in particular
*T*iming	Image actions with correct timing
*L*earning	Image task a bit better than your ability of performing it
*E*motional	Imagine the relevant emotions/arousal you experience during the skill (e.g., hands shaking, heart beating fast etc)
*P*erspective	Image the sight and feel of the task in as much detail as possible

5.

TPR	Example
*P*hysical	Wear uniform, use correct equipment (thermometer/something you believe to resemble the equipment or image it as vividly as possible. Also image the smells you associate with the tasks, the sounds you would normally hear and the verbal information communicated, as vividly as possible
*E*nvironmental	Perform imagery on the ward or in an environment that has some meaning to you for this skill
*T*ask	Attentional demands - e.g., Visual, motor, verbal, visuomotor, cognitive. See skills audits to identify your stronger and weaker areas. Focus imagery on weaker areas in particular
*T*iming	Image actions with correct timing
*L*earning	Image task a bit better than your ability of performing it
*E*motional	Imagine the relevant emotions/arousal you experience during the skill (e.g., hands shaking, heart beating fast etc)
*P*erspective	Image the sight and feel of the task in as much detail as possible

TAILORING YOUR IMAGERY

LEARNING OUTCOMES

Upon completion of this section you should be able to:

1.9   Identify the key senses you use during the performance of each OSCE skill

1.10 Identify and define the individual task demands in OSCE skills

1.11 Judge your own strengths and weaknesses

IDENTIFYING THE KEY SENSES USED DURING OSCE SKILLS

ACTIVITY

The following activity requires you to carefully think about each individual OSCE-assessed skill.

We now know that imagery involves using **ALL** the senses to re-create or create an experience in the mind. Also, that PETTLEP involves incorporating elements of the real task into imagery.

Using the tables on the following page you should now consider the senses (*touch, sight, smell, sound, talking, kinaesthetic feelings: the sense of movement of the body, and emotions)* that you use and experience during the performance of each OSCE skill.

Consider each sense used during the skill then note down in the key words column any words that are of relevance to you for the involvement of that sense when performing the skill in question.

There are no right or wrong answers and you may not have a word for each sense. It is important though that the words you do write down are your own that 'spring to mind' and are personal and meaningful to you.

These words will be later used for reference purposes when performing your imagery so make sure you take time to think carefully when completing this activity.

The first table will be an example in order for you to understand the nature of the task and to get you started.

EXAMPLE

Skill: Blood Pressure Measurement

Senses	Key words associated with senses used during performance
Feelings	E.g. Nervous/apprehensive about getting the reading right,
Physiological sensations	E.g. Increased heart rate, Increased body temp (sweaty palms)
Touch	E.g. Tense and controlled fingers when releasing gauge, cold metal on stethoscope,
kinaesthetic sensations	E.g. Muscle tension in fingers and arms
Sight	E.g. Arm resting comfortable in correct position; focus on gauge, eye contact when communicating with patient, check ear pieces on stethoscope right way round
Smell	N/A
Sound	E.g. Noise of Velcro on cuff; pumping; pressure release; tapping sound for readings
Talking	E.g. Communication with patient; talking through procedure; ensuring patient comfort

Please complete the following tables:

Skill1: Hand washing

Senses	Key words associated with senses used during performance
Feelings	
Physiological sensations	
Touch	
kinaesthetic sensations	
Sight	
Smell	
Sound	
Talking	

Skill2: Blood Pressure Measurement

Senses	Key words associated with senses used during performance
Feelings	
Physiological sensations	
Touch	
kinaesthetic sensations	
Sight	
Smell	
Sound	
Talking	

Skill3: Temperature, Pulse and Respiration (TPR)

Senses	Key words associated with senses used during performance
Feelings	
Physiological sensations	
Touch	
kinaesthetic sensations	
Sight	
Smell	
Sound	
Talking	

Skill4: Analysis of Urine

Senses	Key words associated with senses used during performance
Feelings	
Physiological sensations	
Touch	
kinaesthetic sensations	
Sight	
Smell	
Sound	
Talking	

Skill5: Oral Medication

Senses	Key words associated with senses used during performance
Feelings	
Physiological sensations	
Touch	
kinaesthetic sensations	
Sight	
Smell	
Sound	
Talking	

TASK DEMANDS FOR OSCE SKILLS

- Skills can be broken down depending on their individual task demands. This can be helpful when learning complex skills, as it enables you to process the task into smaller and more manageable parts. In doing this, it can help you to assess more readily your individual strengths and weaknesses

- On the following page is a list of task demands and their definitions. These are the key task demands in the OSCE skills that are required for skilled performance.

- Take time to read and understand each demand and its definition. Then have a think about where each demand may fit into each skill

Key definitions

Verbal:

- *Communication in the form of words*

Visual:

- *Relating to vision or sight*

Motor:

- *The movement of body parts via contraction of the muscles*

Visuo-motor:

- *Motor activity dependent on or involving sight or vision*

Cognitive:

- *Conscious intellectual activity such as thinking, remembering, imaging or judging*

JUDGING YOUR OWN STRENGTHS AND WEAKNESSES

- As previously mentioned, breaking down tasks into component parts is a valuable way of assessing your individual strengths and weaknesses in the performance of skills

- On the following pages are the skills audits that you completed back in March for the 5-assessed OSCE skills

- Please complete them again and see if your perceived ability has improved since then

Hand Washing
Skills audit

This audit is designed for you to reflect on your current ability to perform the OSCE assessed skills

Please tick next to the statement that you believe best applies to your current ability to perform Hand washing:

☐ **1 Needs considerable attention**
I struggle with this skill and need to put in considerable work to develop my performance of it

☐ **2 Needs attention**
My ability to perform this skill needs to improve

☐ **3 Satisfactory**
I am able to perform this skill well but my ability could be improved

☐ **4 Very Good**
I feel confident in my ability to perform this skill and I can perform it consistently well

Individual scored criteria of task
Self-audit

Below are the marking criteria for the skill of hand washing. The criteria has been categorised according its individual demands and allocation of marks when assessed. Please rate your current ability to perform each criterion in the specific category and add up your score upon completion.

1 = Needs considerable attention   **2 = Needs attention**

3 = Satisfactory   **4 = Very Good**

Verbal

	1	2	3	4
Introduce to patient giving name, designation and gain consent				
Check patient identity (verbally)				

Visual

	1	2	3	4
Check patient identity (ID label)				

Motor

	1	2	3	4
Remove all jewellery except plain band wedding rings				
Wet hands/apply solution				
Shake off excess water				
Turn off tap without contaminating hands				
Dry all surfaces thoroughly				
Dispose of paper towels correctly, using pedal of bin				

Visuo-motor (seeing and doing)

	1	2	3	4
Apply 3-5 mls of solution				
Rub hands palm to palm x 5				
Backs of both hands right palm over left dorsum and vice versa x 5				
Palm to palm with fingers interlaced x 5				
Backs of both hands with fingers interlaced				
Backs of fingers gripped to opposing palms interlaced x 5				
Both thumbs, using rotational manner, with opposing clasped fingers				
Rub both palms with fingertips and tip of thumb				
Rinse all surfaces thoroughly				

Cognitive

	1	2	3	4
Procedure to last minimum of thirty seconds				
All actions carried out in safe logical sequence				

Total

Verbal	Visual	Motor
8	4	24

Visuo-motor	Cognitive
36	8

Blood Pressure Measurement
Skills audit

This audit is designed for you to reflect on your current ability to perform the OSCE assessed skills

Please tick next to the statement that you believe best applies to your current ability to perform blood pressure measurement:

☐ **1 Needs considerable attention**
I struggle with this skill and need to put in considerable work to develop my performance of it

☐ **2 Needs attention**
My ability to perform this skill needs to improve

☐ **3 Satisfactory**
I am able to perform this skill well but my ability could be improved

☐ **4 Very Good**
I feel confident in my ability to perform this skill and I can perform it consistently well

Individual scored criteria of task
Self-audit

Below are the marking criteria for the skill of blood pressure measurement. The criteria has been categorised according its individual demands and allocation of marks when assessed. Please rate your current ability to perform each criterion in the specific category and add up your score upon completion.

1 = Needs considerable attention   **2 = Needs attention**

3 = Satisfactory   **4 = Very Good**

Verbal

	1	2	3	4
Introduce to patient giving name, designation and gain consent				
Check if patient has experienced procedure before				
Check patient identity (verbally and ID label)				
Clear explanations, no jargon				
Ensure patient's arm is comfortable				
Student's verbalised reading of BP correctly matches examiner's reading				

Visual

	1	2	3	4
Check patient identity (verbally and ID label)				
Ensure patient's arm is comfortable				
Cuff applied firmly, all restrictions/obstructions are removed				
Ensure sphygmomanometer is visible				
Patient left comfortable				

465

Motor

	1	2	3	4
Wash hands in the appropriate systematic manner				
Cuff applied firmly, all restrictions/obstructions are removed				
Deflate cuff fully				
Student charts verbalised figure accurately including time and date				
Stethoscope ear pieces cleaned before and after use				

Visuo-motor

	1	2	3	4
Re-locate brachial artery and place stethoscope over the same				
Maintain good eye contact, and appropriate use of touch				
Check stethoscope to see if turned to diaphragm side				
Palpate radial pulse and inflate cuff until pulse disappears. Verbalises reading to examiner				
Inflate cuff between 20 to 30 mmHg above verbalised figure				
Deflate cuff slowly in controlled manner (2-3 mmHg/sec) whilst listening for systolic/diastolic readings – verbalise results to examiner				

	Verbal	**Visual**	**Motor**	**Visuo-motor**
Total				
	24	20	20	24

Oral Medication
Skills audit

This audit is designed for you to reflect on your current ability to perform the OSCE assessed skills

Please tick next to the statement that you believe best applies to your current ability to perform Oral medication administration:

☐ **1 Needs considerable attention**
I struggle with this skill and need to put in considerable work to develop my performance of it

☐ **2 Needs attention**
My ability to perform this skill needs to improve

☐ **3 Satisfactory**
I am able to perform this skill well but my ability could be improved

☐ **4 Very Well**
I feel confident in my ability to perform this skill and I can perform it consistently well

Individual scored criteria of task
Self-audit

Below are the marking criteria for the skill of oral medication administration. The criteria has been categorised according its individual demands and allocation of marks when assessed. Please rate your current ability to perform each criterion in the specific category and add up your score upon completion.

1 = Needs considerable attention   **2 = Needs attention**

3 = Satisfactory   **4 = Very Well**

Verbal

	1	2	3	4
Using the appropriate communication skills greet and identify patient giving name, designation and gain valid consent				
Check patient identity (verbally)				
Consult prescription chart and ascertain by verbalising to the examiner:				
The **Right** patient				
The **Right** medication				
The **Right** time				
The **Right** dose				
The **Right** route				
Check for known allergies with patient (verbally)				
Take medication/prescription chart to the client/child and **confirm his/her identity**				
Assess the client/child/family's knowledge of the medication offered, if faulty/incorrect; offer explanation of its use/action/potential side effects, as appropriate for the client/child/family				
Assist the client/child in taking the medication, ensuring all medication is administered and **verbalises action**				

Visual

	1	2	3	4
Check patient identity (ID label)				
Check for known allergies with prescription sheet				
Consult prescription chart and ascertain:				
The **Right** patient				
The **Right** medication				
The **Right** time				
The **Right** dose				
The **Right** route				
Check for known allergies (prescription sheet)				
Check legibility and validity of prescription				
Take medication/prescription chart to the client/child and **confirm his/her identity**				

Motor

	1	2	3	4
Take medication/prescription chart to the client/child and confirm his/her identity				

Visuo-motor

	1	2	3	4
Apply universal precautions in relation to infection control: Clean equipment, and wash hands				
Unlock medicine trolley, cupboard or cabinet				
Select the required medication by checking the medicine container against the prescription chart and check expiry date, check any special observations or requirements relating to the medication (e.g. before/after food or monitoring pulse/BP				
Calculate how much is needed and **empties required dose into a medicine container/holding device, avoiding contact with the preparation. Repeat above steps for all medicines due at this time (locks cupboard/cabinet or trolley at this point if not taken to client)**				
Assist the client/child in taking the medication, ensuring all medication is administered and verbalises action				
Accurately record drug given with date and signature on drug sheet with black ink - obtain counter signature from examiner				
Disposes of equipment appropriately				

Cognitive

	1	2	3	4
Calculate how much is needed and empties required dose into a medicine container/holding device, avoiding contact with the preparation. Repeats above steps for all medicines due at this time (lock cupboard/cabinet or trolley at this point if not taken to client)				

	Verbal	**Visual**	**Motor**	**Visuo-motor**
Total				
	44	40	4	28

Cognitive

Temperature, Pulse, Respiration
Skills audit

This audit is designed for you to self-reflect on your current ability to perform the OSCE assessed skills

Please tick next to the statement that you believe best applies to your current ability to perform Temperature, Pulse, and Respiration:

1 Needs considerable attention
I struggle with this skill and need to put in considerable work to develop my performance of it

2 Needs attention
My ability to perform this skill needs to improve

3 Satisfactory
I am able to perform this skill well but my ability could be improved

4 Very Well
I feel confident in my ability to perform this skill and I can perform it consistently well

Individual scored criteria of task
Self-audit

Below are the marking criteria for the skill of temperature, pulse, and respiration. The criteria has been categorised according its individual task demands and allocation of marks when assessed. Please rate your current ability to perform each criterion in the specific category and add up your score upon completion.

1 = Needs considerable attention   **2 = Needs attention**

3 = Satisfactory   **4 = Very Well**

Verbal

	1	2	3	4
Using the appropriate communication skills greet and identify client/patient giving name designation and gain valid consent				
Check patient identity (verbally)				
Clear explanations (no jargon)				
Ensure client/child's comfort before, during and after the procedure (**verbal check**)				
Further explain the process to ensure understanding/compliance				
Read thermometer display accurately following the manufacturers instructions (digital display/colour change of tempa dot) **results verbalised to examiner**				
Count respirations for 60 seconds and **verbalise results of pulse and respiration to examiner**				
Inform client/child/family/carer of findings if appropriate and thank him/her – close the contact/encounter appropriately				

Visual

	1	2	3	4
Check patient identity (ID label)				
Ensure client/child's comfort before, during and after the procedure				
Read thermometer display accurately following the manufacturers instructions (digital display/colour change of tempa dot)				
Patient left comfortable				

Motor

	1	2	3	4
Clean or cover probe where appropriate				

Visuo-motor

	1	2	3	4
Apply universal precautions in relation to infection control: Clean equipment, and wash hands				
Maintain good eye contact and appropriate use of touch				
Check equipment for battery status and mode setting as appropriate				
Assess client/child; identify potential risks and choose equipment appropriate to the client and environment				
Place chosen thermometer in optimum position				
Ensure thermometer remains in place for the recommended length of time according to the manufacturers instructions (an audible sound heard/correct length of time) remain with client during this time				
Discard probe cover/Tempa dot in line with universal precautions without contaminating hands				
Assess client/child and locate an appropriate pulse site ensuring patient's arm is resting comfortably				
Apply correct finger position using sufficient pressure on the chosen site				
Conduct unobtrusive observation of chest movements by continuing to hold the child's/clients wrist as if taking the pulse				
Charts pulse and respiratory observations accurately including date and time using black ink and completes early warning score				

Cognitive

	1	2	3	4
Count pulse for full 60 seconds				
Count respirations for 60 seconds and verbalise results of pulse and respiration to examiner				
Charts pulse and respiratory observations accurately including date and time using black ink and **completes early warning score**				

	Verbal	**Visual**	**Motor**	**Visuo-motor**
Total				
	32	20	4	44

Cognitive

12

Testing and recording of urine
Skills audit

This audit is designed for you to reflect on your current ability to perform the OSCE assessed skills

Please tick next to the statement that you believe best applies to your current ability to perform testing and recording of urine:

☐ **1 Needs considerable attention**
I struggle with this skill and need to put in considerable work to develop my performance of it

☐ **2 Needs attention**
My ability to perform this skill needs to improve

☐ **3 Satisfactory**
I am able to perform this skill well but my ability could be improved

☐ **4 Very Well**
I feel confident in my ability to perform this skill and I can perform it consistently well

Individual scored criteria of task
Self-audit

Below are the marking criteria for the skill of testing and recording of urine. The criteria have been categorised according its individual task demands and allocation of marks when assessed. Please rate your current ability to perform each criterion in the specific category and add up your score upon completion.

1 = Needs considerable attention   **2 = Needs attention**

3 = Satisfactory   **4 = Very Well**

Verbal

	1	2	3	4
Using the appropriate communication skills greet and identify client/patient giving name designation and gain valid consent				
Check patient identity (verbally)				
Assess the client/child's understanding of the explanation and adjust communication/explanation accordingly				
Ensure privacy/dignity and comfort for the client/child before during and after the collection process (asking)				
Read results as per the grading scale on reagent bottle – verbalise to examiner				
Inform client/child/family/carer of findings if appropriate and thank him/her – close the contact /encounter appropriately				

Visual

	1	2	3	4
Check patient identity (ID label)				
Ensure reagent strips are in date and stored in accordance with manufacturers instructions				
Ensure privacy/dignity and comfort for the client/child before during and after the collection process				
Observe and note the smell, colour and presence of any debris in the urine				
Read results as per the grading scale on reagent bottle				

Motor

	1	2	3	4
Remove glove from writing hand				

Visuo-motor

	1	2	3	4
Apply universal precautions in relation to infection control: Clean equipment, and wash hands and put on gloves and apron				
Collect and prepare appropriate equipment				
Test urine with reagent stick according to manufacturer's guidelines. Ensure stick is completely immersed in the urine and removed immediately				
Dispose of clean and used equipment appropriately				
Document results accurately in black ink including date and time				
Clean and replace equipment used – apply universal precautions				

Cognitive

	1	2	3	4
Wait the specified time as per the manufacturer's instructions before reading (seek confirmation of time if no instructions present)				
Carries out everything in a safe, logical sequence				

	Verbal	**Visual**	**Motor**	**Visuo-motor**
Total				
	24	20	4	24

	Cognitive
	8

478

PRACTICING YOUR IMAGERY

Upon completion of this section you should be able to:

1.12 Identify the three possible stations you may encounter in your OSCE

1.13 Understand the steps to take to carry out your imagery

1.14 Practice your imagery according to the three possible OSCE stations

THE THREE OSCE ASSESSED STATIONS

- On the day of your OSCE you will be assessed on your knowledge, behaviour and performance by demonstrating your proficiency in the skills taught on the Fundamental and Key Caring Skills module.

- You will not be assessed on all skills. However, you will be assessed on a randomised combination of 3 of the skills and also be asked to do a calculation.
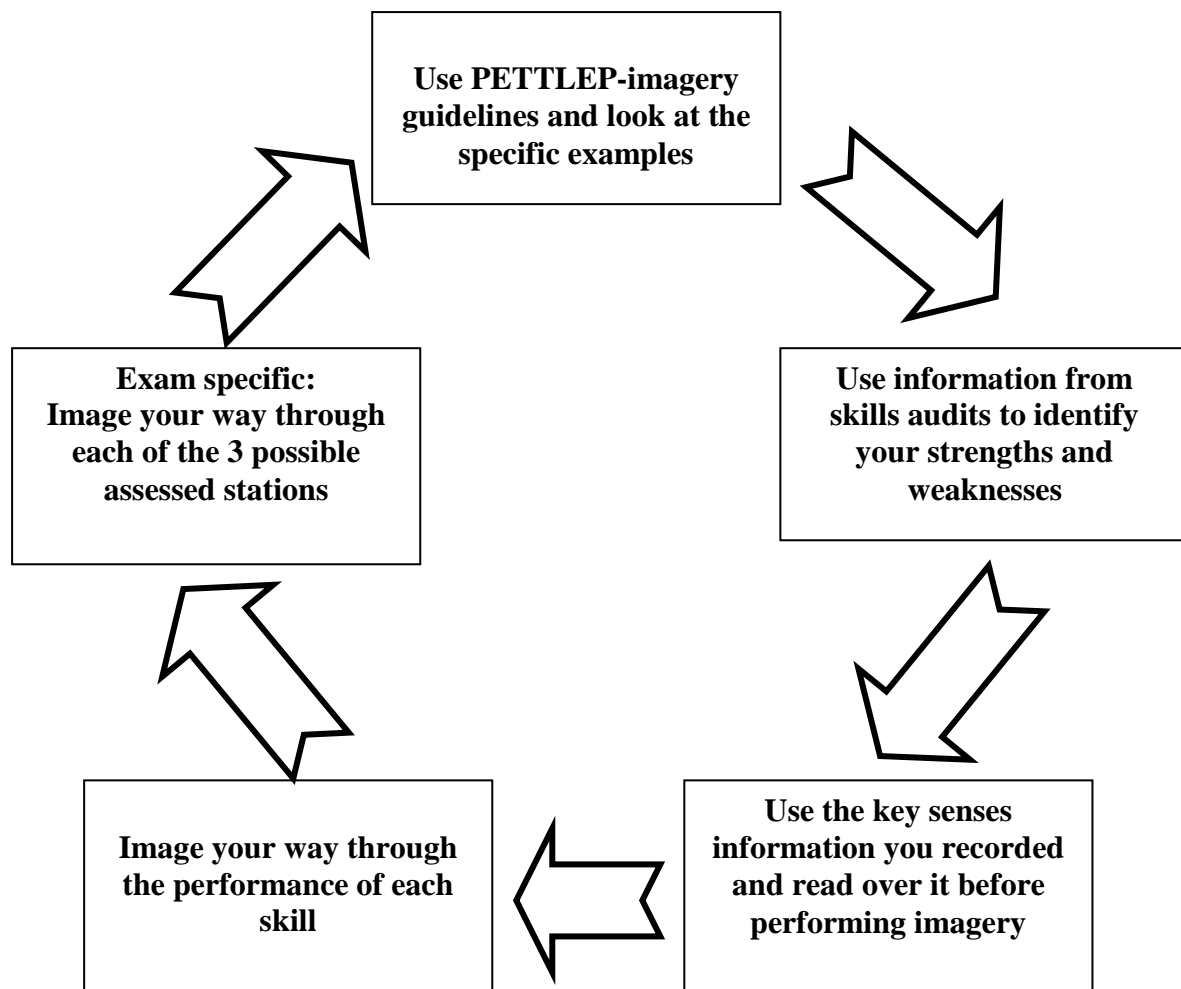
The assessed stations are as follows: -

Station 1	Hand decontamination	TPR and blood pressure measurement	EWS (early warning score)
Station 2	Hand decontamination	Urinalysis and calculation of fluid balance	Blood pressure measurement and recording
Station 3	Hand decontamination	Administration of medication and drug calculation	TPR measurement and recording

STEPS TO CARRYING OUT YOUR IMAGERY

Step 1.   Use the basic PETTLEP-imagery guidelines (p.21) and fulfil each step of the guidelines where possible. Look at the specific examples (p.22, 23) for ideas of how to fulfil the components

Step 2.   Use the information from your skills audits to identify your strengths and weaknesses for the task component in PETTLEP. When performing your imagery aim to picture your weaker areas in as much detail as possible, familiarising yourself with the processes and type/s of attention required to perform them

Step 3.   Before performing your imagery of each skill, use the key senses information you recorded in the tables for each skill (p. 26 – 31). Glance over the information for each skill before imaging it, attempting to recreate the feelings associated with, and senses used during actual performance.

Step 4.   Then start to image your way through the performance process of the skill. To reinforce your imagery even more in your mind, perform the skill for real first, then perform your imagery straight after. This will allow you reflect better on you performance.

Step 5. To make the examination process even more realistic and become even more mentally prepared, image your way through each of the three possible stations. Image the skills in each station from start to finish, using the correct timing. You will have an allocated time of 30-minutes to undertake your OSCE, so attempt to perform you imagery for each station within this time frame.

```
          ┌─────────────────────────┐
          │   Use PETTLEP-imagery    │
          │  guidelines and look at  │
          │    the specific examples │
          └─────────────────────────┘
```

Use PETTLEP-imagery guidelines and look at the specific examples

Use information from skills audits to identify your strengths and weaknesses

Use the key senses information you recorded and read over it before performing imagery

Image your way through the performance of each skill

Exam specific:
Image your way through each of the 3 possible assessed stations

SECTION 5

RECORDING YOUR
IMAGERY

Upon completion of this section you should be able to:

1.15 Understand why you need to record your imagery practice

1.16 Understand how to record your imagery practice

WHY RECORD YOUR IMAGERY PRACTICE?

- As well as performing your imagery, it is important to also record how often you have performed it

- The reason for this is to find out how often you have used it, and to what extent its use has had on your performance compared to others in the group. All this information will be confidential

- It will also aid in finding out how helpful you have found using imagery as an additional tool to learning the OSCE assessed skills

HOW TO RECORD YOUR IMAGERY PRACTICE

- When recording your imagery practice it is important to give as much detail as possible.

- On the following page is a diary/log, which has been designed for you to use following your imagery practice

- After you have imaged you should record details in the diary/log regarding:

    - Day/date
    - Time
    - Place of imagery
    - Equipment you may have used during imagery
    - If you were wearing your uniform
    - Any notes/ thoughts about your imagery
    - Any additional types of practice used (E.g. reading, full rehearsal)

- Upon receiving this booklet (22nd September) there are 10 weeks until your final OSCEs take place (1st December). The following diary is a 10-week count down to that process. It is expected that you should try and image all the skills at least 3-times per week. Please record honestly the amount of imagery you perform.

Week 1

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 2

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 3

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			489
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 4

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 5

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			491
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 6

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			492
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 7

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			493
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 8

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			494
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 9

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			495
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

Week 10

	Imagery practise 1	Imagery practise 2	Imagery practise 3
Day/date			496
Time			
Place of imagery			
Equipment used (if any)			
Wearing uniform Y/N			
Notes/thoughts			
Additional practise (detail type e.g., reading, full rehearsal)			

ADDITIONAL

INFORMATION

LEARNING OUTCOMES

In this section you will find:

1.17 The dates for drop in sessions to help you with your imagery

1.18 OSCE pilot study similar in the Journal of Advanced Nursing

1.19 Closing comments

ADDITIONAL INFORMATION

- For your interest, on the following page is a pilot study that was conducted at Chester. This was the study upon which the PETTLEP work with you and your OSCEs is built upon.

- This pilot study is due be published in the Journal of Advanced Nursing, which highlights the significance and interest in the use of imagery with nursing skills.

The effect of PETTLEP imagery on performance in OSCEs: Some preliminary results.

Wright, C., Smith, D., Hogard, E., & Ellis, R. *(in Press)*

Imagery can be defined as "using all the senses to create or recreate an experience in the mind" (Vealey & Greenleaf, 2001, p.248). It is well documented that imagery can be effective at improving the performance of motor skills (Weinberg, 1981; Smith, Holmes, Whitemore, Collins & Devonport, 2001). It is used regularly in the sporting arena with the specific aim of improving performance and athletes, especially elite athletes, use imagery extensively (Hall, Mack, Paivio & Hausenblas, 1997). However, despite the prominence of imagery in sport, some authors have questioned whether the technique employed optimises the effectiveness of the imagery. However, neuroscience research findings examining the relationship between brain activity and imagery may provide useful information in this regard. Studies using techniques such as electroencephalography and positron emission tomography have found similar cortical neuronal activity prior to and during imagery and physical performance (Decety, 1996; Jeannerod, 1997). Neuroscientists have concluded that there exists a 'functional equivalence' between imagery and physical performance, and this may explain imagery's performance enhancing effects.

Holmes and Collins (2001) developed a model of imagery, based on neuroscience research, which aims to improve the performance of motor skills: the PETTLEP model. PETTLEP is an acronym, with each letter standing for an important practical consideration when delivering an imagery intervention. These are **P**hysical, **E**nvironment, **T**ask, **T**iming, **L**earning, **E**motion and **P**erspective. For imagery to produce the greatest improvement in performance, each of these components need to be considered.

The PETTLEP model has begun to undergo testing within the field of sport psychology, with very positive results (Smith, Wright, Allsopp & Westhead, in press). However, Holmes and Collins (2001) explain that the model would benefit from comprehensive testing in a variety of settings.

The completion of OSCEs (Objective Structured Clinical Examinations) during pre registration nursing training involves the completion of several skilled procedures, including blood pressure measurement (BPM) and aseptic technique. OSCEs are well-established assessment methods in medical education and training, nursing and the professions allied to medicine (Prakash, 1999; Van der Vleuten, 2000). The OSCEs are an approach to the assessment of clinical competence in which the components of competence are assessed in a well planned or structured way with attention being paid to productivity (Harden, 1988). The original purpose of the OSCEs provided a means of examining the skills acquisition of medical students, which led some years later to the development of OSCEs into pre-registration nursing curricula (Major, 2005). OSCEs are clinical in the sense that they focus on component psychomotor and communication skills used in the clinical situation. They are structured in the sense that each examination focuses upon a particular skill, for example, blood pressure measurement; temperature, pulse and respiration measurement; aseptic technique (preparation and procedure); oral medication; urinalysis or hand washing, which the student is required to demonstrate on a simulated patient in a controlled physical and temporal framework. The examination is objective in that trained examiners assess the student's performance using a structured assessment schedule that breaks the skill down into its component parts with marks allocated to these.

Research into the performance of clinical motor skills by nurses (e.g., blood pressure measurement) has recognised that errors in measurement may have a

significant impact on the investigation and treatment of patients (Armstrong, 2002).

As a result, the marking criteria for the OSCEs are rapidly becoming stricter within many institutions, with increasing emphasis being placed on quality assurance within the assessed clinical skills. With reference to this knowledge, it may be thought that additional teaching and learning methods could of considerable benefit to trainers and the student nurses themselves, in pursuit to optimise the quality of the teaching and learning experience. Previous research (Bauer & Huynh, 1998) has investigated nurses performance in blood pressure measurement following different teaching and learning interventions. Here, first year nursing students' adherence to the recommended auscultatory blood pressure measurement procedure following three different forms of instruction (conventional classroom demonstration of the technique, a self instructional CD-ROM tutorial program, and a combination of both methods) was investigated. Results suggested that the CD-ROM was no substitute for real life, hands on experience, although when used as an adjunct to traditional teaching methods, it could enhance learning. With this in mind, PETTLEP imagery may well be an effective adjunct for facilitating performance in clinical motor skills, when coupled with physical practice, due the multi-sensory involvement that aims to mimic the physical task and optimise functional equivalence.

It is not apparent that any research has been undertaken with regard to the possible effect of psychological skills training on these examinations. This is surprising, considering the similarities between OSCEs and elite sport, as they both require the accurate performance of a highly skilled motor task in a pressured environment.

The present study focuses on the effect of PETTLEP based imagery on the performance in the OSCEs. We hypothesise that the PETTLEP imagery group will

score significantly higher on the OSCE examinations than the control group for blood pressure measurement and aseptic technique.

Method

Participants

Forty pre-registration nursing students were recruited voluntarily from the University of Chester. All participants provided informed consent.   None of the nurses had previously received imagery training.

Instruments

Movement Imagery Questionnaire – Revised (MIQ-R; Hall & Martin, 1997).

The MIQ-R is an eight-item inventory that assesses an individual's ability to perform visual and kinaesthetic imagery. The MIQ-R has been found to have acceptable concurrent validity when correlated with its earlier version, the MIQ, with *r* values of -.77, -.77 and -.87 for the visual sub-scale, kinaesthetic sub-scale, and overall score respectively (Hall & Martin, 1997). The negative correlation is due to a reversal in the scale since, in the original MIQ, the higher the rating, the harder a movement was to imagine for the respondent. As per previous research (Smith & Collins, 2004), potential participants scoring lower than 16 (the mid-point, indicating moderate imagery ability) on either MIQ-R subscale were excluded from the study due to an apparent lack of clarity in their imagery.

The OSCEs

Procedure

Prior to the study, all participants completed the MIQ-R and were randomly assigned to one of two groups: A PETTLEP imagery group and a control group.

The blood pressure measurement task used in the study involved following a set of procedural guidelines in order to calculate a patients blood pressure

measurement in the appropriate manner. The aseptic technique task involved the preparing and administering of a dressing without causing contamination. An external examiner assessed both of these tasks and the nurses were awarded points for the correct completion of each of the elements of the skill.

The PETTLEP imagery group were interviewed after a practice session of the OSCEs. This was to gain information about their individual experience of the skill. For the PETTLEP imagery participants, this information was used to produce their individualised imagery scripts. Based on these scripts, the participants in the PETTLEP imagery group received response training (Lang, Kozak, Miller, Levin & McLean, 1980), as advocated by the PETTLEP model. This involves focusing the participant on their own responses by reinforcing verbal reports of physiological and behavioural involvement in the scene, for example, hearing the systolic and diastolic changes. The intervention for this group was based around the 7 PETTLEP components. The participants were instructed, wherever possible, to perform their imagery dressed in their uniform and holding the pump. This made the environment as realistic as possible, as the feel of the pump, and the stance required to perform the task were included in the imagery. The nurses imaged completing the task three times per week for the four weeks prior to the examinations. The control group continued with their preparation in the usual manner, but none of them recorded the use of conscious or intentional imagery. Diaries were also given to participants to record the number of interventions that they completed. The OSCE scores were taken as a measurement of effectiveness.

Results

Blood Pressure Measurement

The mean scores can be seen in Figure 1. A one-way ANOVA showed that the PETTLEP imagery group scored significantly higher on the blood pressure measurement OSCE than the control group, $F(1,36) = 4.62$, $p<0.05$.

Aseptic Technique

The mean scores can be seen in Figure 2. A one-way ANOVA showed that the PETTLEP imagery group did not score significantly higher on the aseptic technique OSCE than the control group, $F(1,16) = 0.17$, $p>0.05$. This was true of both sections of the technique taken in isolation, and a calculated average of the two scores.

Discussion

The results of these preliminary experiments partially support the hypotheses. The results of the blood pressure measurement interventions strongly support the use of the PETTLEP model when preparing for this skill-based examination. This may be due to the high number of PETTLEP imagery components employed during the imagery of this task, which may have produced a higher level of functional equivalence.

However, the PETTLEP imagery interventions were not significantly beneficial in the aseptic technique OSCEs. This may be because the blood pressure measurement is a highly skilled task, whereas the aseptic technique relies more heavily on the recollection of procedure, and therefore did not follow the same neuron firing pattern each time it was completed.

Further research is needed to examine the effect of PETTLEP imagery on skill-based tasks within the nursing and medical arena. This could further examine

505

the effects of imagery on skill-based, compared to procedural, OSCE techniques. It

could also be extended to examine the effect of PETTLEP imagery on less clinically-

based OSCEs, such as those aimed at improving communication skills. However,

further research is also needed to support these preliminary findings on clinical-
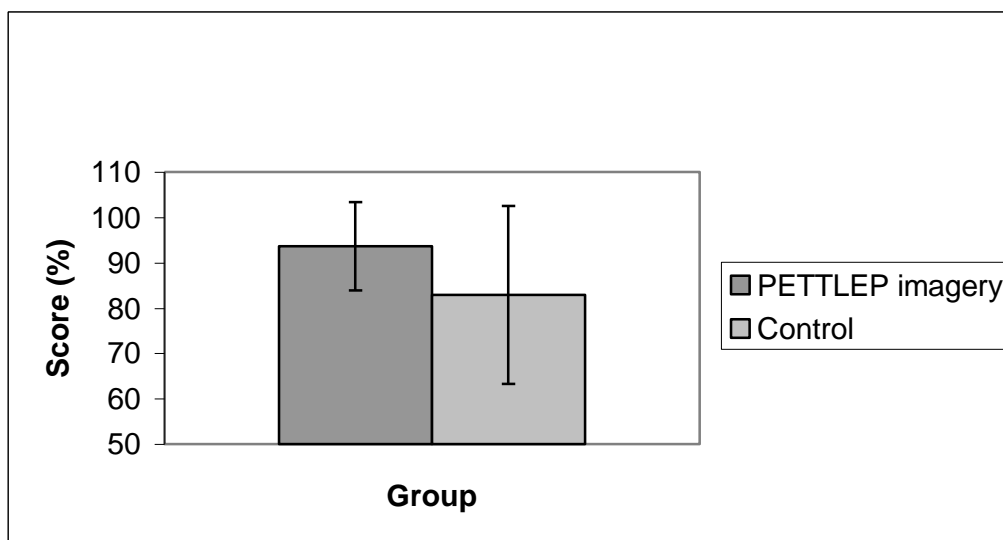
based highly skilled OSCE techniques.

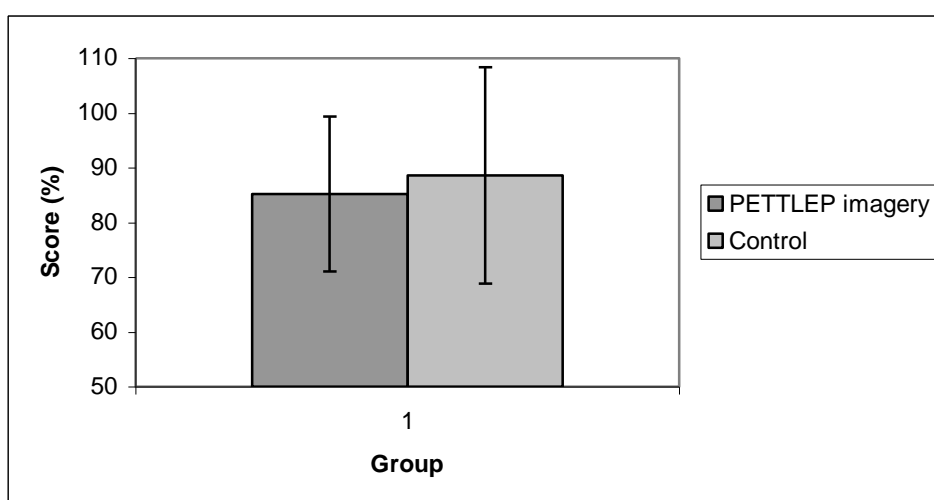*Figure 1: The effect of PETTLEP imagery interventions on the blood pressure measurement scores in the OSCEs*

Figure 2: A graph to show the effect of PETTLEP imagery on aseptic technique OSCEs

CLOSING COMMENTS

- As mentioned at the beginning, this booklet has been designed as an additional resource for you to use in preparation for your OSCEs.

- It is intended and hoped that you find the booklet useful in the important preparation process for your OSCEs.

- Just by having this booklet, you are already at an advantage in preparing for your OSCEs compared to the Chester and Warrington sites.

- Reading the booklet and using the information in it carefully will put you at a more distinct advantage compared to the other two sites.

- The information and activities within the booklet is all relevant and of good use so USE IT!

- If you have any questions of queries regarding anything within the booklet please do not hesitate to contact me via the detail on the front cover

University of
Chester

Skill Training Questionnaire

Name……………………………………….

Date of Birth…..../……/……

Please answer the following questions by circling the appropriate answer:

1. Reflecting back, did you feel prepared for the OSCEs?

Well prepared	Quite well prepared	Some what prepared	A little prepared	Not prepared

2. Are you happy with your performance in the OSCEs?

Very happy	Happy	Ok	Unhappy	Very unhappy

3. Do you feel you practised enough for the OSCEs?

      Y   N

4. To what extent did the curriculum (theory lectures/practical lectures, hand booklets **NOT INCLUDING PETTLEP**) prepare you for the OSCEs?

Fully	Mainly	Only partly	Very little	Not at all

Why?

5. Outside of lectures, did you practise your skills?

All the time	Regularly	Sometimes	Once or twice	Didn't practise

6. Did you complete optional clinical skills practice in self-study time?

      Y   N

7. Did you find optional clinical skills practice in self-study time helpful?

Very helpful	Helpful	Fairly helpful	Not very helpful	Not helpful

8. Did you find the PETTLEP imagery training potentially useful?

Very useful	Useful	Fairly useful	Not very useful	Not useful

9. Do you feel the imagery training was relevant to your OSCEs?

Highly relevant	Relevant	Fairly relevant	Not very relevant	Irrelevant

10. Do you feel you actually benefited from the additional PETTLEP training?

Definitely benefited	Benefited	Benefitted somewhat	Benefitted very little	Didn't benefit

11. Did you find you were able to understand the PETTLEP training?

Fully understood	Mainly understood	Partly understood	Very little understood	Didn't understand at all

12. Did you enjoy using the PETTLEP training?

Very enjoyable	Mainly enjoyable	Partly enjoyable	Very little enjoyable	Not at all enjoyable

13. Do you think PETTLEP will be useful in your nursing future?

Very useful	Useful	Somewhat useful	A little bit useful	Not at all

14. Do you feel the OSCEs are a good method of assessment for clinical skills ability?

Very good	Good	Somewhat good	Very little good	Not at all good

15. Do you think the OSCEs are a realistic assessment method?

Very realistic	Realistic	Somewhat realistic	Not very realistic	Not at all realistic

16. Do you think the OSCEs are a fair assessment method?

Very fair	Fair	Somewhat fair	Not very fair	Not at all fair

17. Please place the following items in rank order in how helpful they were for the OSCE module (1 being the most helpful; 8 being the least helpful)

…… Practical lectures with demonstrations

…… Module handbook

…… Theory lectures

…… PETTLEP imagery lectures

…… PETTLEP handbook

…… Reading

…… Practice on placements

…… Optional skills practise sessions (self-study)

16. Any further comments?