

**AN INVESTIGATION INTO, AND AN INTERVENTION DESIGNED FOR,
DIFFICULTIES THIRD LEVEL NURSING STUDENTS HAVE WHEN MAKING
CLINICAL JUDGEMENTS**

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A Mini-thesis submitted in partial fulfilment of
the requirements for the degree of

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DECLARATION

I declare that **AN INVESTIGATION INTO, AND AN INTERVENTION DESIGNED FOR, DIFFICULTIES THIRD LEVEL NURSING STUDENTS HAVE WHEN MAKING CLINICAL JUDGEMENTS** is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

NAME : June Deanna Jeggels

DATE : June 1995

SIGNED :



ABSTRACT.

An Investigation into, and Intervention designed for, difficulties third level nursing students have when making clinical judgements.

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M Phil mini-thesis (Cognition and Teaching in Subject Specific Areas), Gold Fields Science and Mathematics Resource Centre, Faculty of Education, University of the Western Cape.

In order to establish the specific difficulties experienced by students, the researcher tested their clinical judgement skills on a fixed task.

Interviews were conducted using simulated clinical scenarios as problem statements and additional information was provided in the form of patient records.

Protocol analysis was done by using Feuerstein's cognitive map as a frame of reference. (Feuerstein, 1980) The results indicated that students displayed some cognitive operations but that there was little evidence of structured thought.

In order to streamline the students' approach and provide some measure of control, they were exposed to a "thinking procedure" that resembled Landa's problem solving heuristic. (Landa, 1976) They were allowed to internalize the heuristic procedure through practise, using the peer-pair think-aloud method described by Whimbey and Lockhead (1982).

Once again individual interviews were conducted to evaluate the effectiveness of the intervention.

Perkins & Salomon (1989) stressed the importance of this type of evaluation in measuring the value of teaching a domain specific heuristic.

The results of the study showed an improvement in the students' approach and management of clinical problems. The peer-pair sessions facilitated group interaction. Students also displayed a transferral of the judgement skills to real life situations. These findings were reflected by the positive response of participants to an evaluative questionnaire.

KEY WORDS / PHRASES.

Cognitive science

Clinical judgement

Nursing education

Heuristics

Peer-pair problem solving

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My brothers for their support.

DEDICATION.

This Minithesis is dedicated to the memory of my parents Manie and Anne Jeggels, the significant adults who, unwittingly, introduced me to mediated learning during my formative years.

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CHAPTER 1.

GENERAL INTRODUCTION

1.1 INTRODUCTION

" Many people in general and disadvantaged people in particular, learn with difficulty and many times not at all." (Mehl, 1989: 10)

This research was prompted by the concern about the poor judgement skills displayed by nurses in the clinical field. The researcher was often puzzled by the response of student nurses to the question " What is this patient's problem? " These ranged from " He has TB " to " I do not know the patient."

The patient's records would not be consulted, neither would a cursory assessment of his condition be made. However, when students were questioned about different aspects of the patient's condition and nursing care, they would often provide the correct information.

Similar encounters were frequently related by staff members involved with student accompaniment.

A perception developed that nurses experience difficulty with structured thought.

Little existed in local nursing research literature to indicate whether this phenomenon was the exception or the rule. The question that arose was whether thinking and problem solving skills could be taught.

In South Africa the problem of teaching and learning has been exacerbated by an educational system driven by apartheid legislation. The department of education was until recently fragmented with an unequal spread of both human and material resources.

This was compounded by the fact that subjects for matriculation were frequently chosen for the ease with which they could be learned by rote. (Abel, 1993) Rote learning require learners to memorize large chunks of material without stimulating them to analyze or explore the content. This produced individuals who found that once they have passed their matriculation examinations, they have neither the thinking skills nor the subjects needed to find jobs. (Rautenbach, 1992)

How then, do we address the backlog that learners bring to the tertiary learning institution ?

Mehl (1985), Wesso (1992), and Abel (1993) looked to employing the cognitive operations approach to the teaching of thinking in order to gain an understanding of the processes which underlie the acquisition and utilization of knowledge. They then proceeded to develop content-dependent intervention mechanisms to address the cognitive difficulties displayed by the learners.

The controversy that has developed around whether cognitive skills are context bound or not, is reflected in the variety of approaches to the teaching of thinking. (Perkins & Salomon, 1989)

1.2 APPROACHES TO THE TEACHING OF THINKING

Domain-independent approaches.

Programs for teaching thinking by utilizing domain-independent approaches ie. providing learners with general thinking skills, include : the Instrumental Enrichment program (Feuerstein, Rand, Hoffman & Miller, 1980); the C.O.R.T. Thinking program (de Bono, 1985) and Intelligence Applied (Sternberg, 1986).

A review of these and other interventions may be found in Nickerson, Perkins and Smith (1985).

Perkins and Salomon (1989: 18) make a case against domain-independent approaches by listing contrary findings under : the arguments from expertise, the arguments from weak methods and the arguments from transfer. However, after a critical examination of the cited arguments, they conclude that general strategies still have a place in the teaching of thinking.

Domain-specific approaches.

In this case the thinking or problem solving skills are identified, and then taught by imposing them on the subject content.

Programs that highlight this approach include :

Concept mapping (Novak & Gowin, 1984) where learners are presented with a tool that may be used to organize large amounts of information.

In the case of peer-pair problem solving (Whimbey & Lockhead, 1982) learners are exposed to the thoughts of expert problemsolvers.

Knowledge as design (Perkins, 1986) involves a structured approach to thinking, where learners have to answer four probing questions about subject content.

About the approach of choice, Perkins and Salomon (1989: 24) conclude that,

the approach that now seems warranted, calls for an intimate intermingling of generality and content specificity in instruction ... and that such an approach gets beyond educating memories to educating minds.

Nickerson, et al., (1985) highlight different approaches to the teaching of thinking, amongst others ; the cognitive operations approaches, heuristic oriented approaches and formal thinking approaches. They argue that the heuristic oriented approach could positively influence the individual's problem solving abilities. This however, is based on the assumption that the learner already possesses a knowledge base as well as basic cognitive skills.

It should also be noted that the heuristic oriented approach may be applied in domain-independent (de Bono, 1985), as well as domain-specific areas. (Whimbey & Lockhead, 1982)

The researcher looks to marrying two approaches in order to identify (cognitive operations) and address (heuristics) the difficulties students have when making clinical judgements.

1.3 THE TEACHING OF THINKING

The teaching of thinking is a relatively new concept. As recently as the late 70's Feuerstein (1980) developed a thinking skills program.

Nickerson, et al., (1985) expressed the need for a greater educational emphasis on the teaching of thinking. They emphasize the interdependency of thinking skills and knowledge and the fact that neither can be developed independent of each other.

Mehl (1985) states that although research literature considered the mental operations involved in problem solving in some detail, very little has been said about the way in which disadvantaged students approach problems in various content areas. He also provides an overview of why he considers students selected to the University of The Western Cape to be disadvantaged and why Feuerstein's methods could be employed to research the difficulties displayed by these students.

1.4 THE AIM OF THE STUDY

The aim of this particular study is to design an intervention to address some of the difficulties student nurses have with the making of clinical judgements.

Since most of the students included in this program are from a disadvantaged background, this study will focus firstly on identifying the difficulties displayed by students when making clinical judgements and secondly on addressing these difficulties through intervention.

The intervention is aimed at facilitating the application of a problem-solving heuristic in a domain specific area. Implicit in the exercise is the opportunity for students to interact with their peers. They are also given the chance to make judgements in a non-threatening simulated environment.

CHAPTER 2.

REVIEW OF RESEARCH LITERATURE

2.1 INTRODUCTION

In a survey on research priorities in the field of Nursing Education in the United States of America, the teaching of problem-solving strategies was identified as the second highest priority topic of a list of sixty three (Tanner & Lindeman, 1987). However, local research on the topic is limited to studies in the related fields of psychology, science and mathematics.

Loving (1993: 415) defines clinical judgement as "...the ability to make inferences from data gathered during the problem solving process." He also states that the term clinical judgement is frequently used interchangeably with clinical decision making. The latter statement is underscored by Tschikota's (1993: 389) view that clinical decision making refers to "... the selection of nursing interventions, and include the thoughts that precede choice."

It becomes clear that clinical judgement represents a complex process which entails the ability to make inferences (select interventions) from data collected during the problem-solving process. Students are expected to apply sound theoretical reasoning when extracting and interpreting data presented in various modalities ie. graphs depicting changes in the patients' vital signs, charts indicating their daily fluid balance and records reflecting the prescribed treatment.

Since it has been the researcher's experience that nursing students have difficulty when making clinical judgements, an attempt should be made to address these difficulties.

Klayman and Brown (1993: 98) state that "...human judgement may be well adapted but it is not always very adaptable."

They profess that errors in judgement "...can be viewed as indicative of mismatches between the cognitive processes people use and the tasks to which these processes are applied." (1993: 98)

"Tasks" in this study refer to clinical judgement skills.

Klayman and Brown (1993) suggest that one should try to modify the cognitive processes to fit the task by employing different strategies, amongst others, providing people with better cognitive tools, and training people in task specific processes, ie. domain specific heuristics.

This suggestion reiterates Perkins & Salomon's (1989: 23) earlier view that "...more experiments in teaching heuristics are needed that test whether gains in problem solving can be attributed directly to the use of heuristics." Furthermore, Perkins & Salomon (1989) state that the lack of problem-solving strategies (and the gains from applying heuristic rules) should be documented before and after such interventions.

Shayer and Adey, (1981) also stressed the need for matching material to learners. In their search for a model they argued that a model should be able to address both the learning material and the learner's thinking processes.

Even though they did not profess the cognitive domain to be the only variable, they restricted their research to cognitive matching. They grounded their model in the Piagetian developmental stage theory. The strategies suggested by them to improve the match were, to find an appropriate topic for the learner and/or to take the learner's developmental stage into account. (Shayer & Adey, 1981)

Because clinical nursing judgement is regarded to be cognitive in nature, the theoretical framework for this study is grounded in the cognitive sciences. (Loving, 1993: 415)

2.2 THEORETICAL OVERVIEW.

An overview of the relevant theories follows. The researcher will apply amongst others, Feuerstein's concept of cognitive modifiability and cognitive map, the information-processing approach of cognitive psychology and the heuristic approach to the solving of problems. In order to locate this research in theory, it is necessary to reflect on different paradigms of the century, amongst others: Behaviourism, Gestalt psychology, Constructivism and Cognitive science.

BEHAVIOURISM

The behaviourists focused mainly on the so-called "connections" between stimuli and response (S - R). Stimuli followed by positive response become reinforced and connections become stronger through exercise. This framework formed the basis of "drill and practice" instructional programs. (Knoers, 1994)

GESTALT PSYCHOLOGY

Early Gestalt psychology was based on the principle that a figure " Gestalt " can only be seen because it is etched against a background. Learning meant "... getting insight, discovering a structure." (Knoers, 1994: 2880).

However, the Gestaltists did contribute toward the development of problem-solving strategies by suggesting that an alternative approach should be sought if the first one did not lead to a solution.

CONSTRUCTIVISM

Constructivists were of the opinion that all learners build (construct) their own knowledge. Teaching should therefore not be construed as putting knowledge into learners' heads but rather as creating an opportunity for them to construct their own knowledge. However, in order to construct new knowledge, the learner relies heavily on what he already knows. (Resnick & Collins, 1994) This view is shared by cognitive researchers even though their theoretical framework vary.

CONSTRUCTIVIST THEORISTS

PIAGET AND VYGOTSKY

According to Kozulin (1994: 269) "the cognitive and sociocultural revolution in learning" was brought about by Jean Piaget of Switzerland and Lev Vygotsky of Russia.

He reviewed the commonalities and differences between the theories of these great psychologists.

Both share the view that a child cannot be regarded as a miniature adult displaying adult behaviour on a small scale.

They agree, to some extent, on the relationship between action and thought. However, Vygotsky takes the notion of interaction between the child and an object a step further. He argues that such an interaction forms part of a broader socio-cultural activity.

Piaget proposed that intellectual development proceeds through different stages and that every stage is characterized by particular patterns of thought. Furthermore, he believed that children's learning and development is a function of their own activity. Vygotsky (In Kozulin, 1994: 272) was of the opinion that "...mental development does not coincide with the development of separate psychological functions, but rather depends on changing relationships between them."

Their differences lie in their attitude towards learning. Piaget sees learning as the unassisted interaction between a child and his external world. Alternatively, Vygotsky places a significant adult, one who guides and transmits a culture, between the child and his world. With the concept of "zone of proximal development" (ZPD) he suggests that cognitive modifiability is possible under adult guidance or in collaboration with more capable peers.

"The ideas of discovery learning developed by Piaget, and that of guidance in learning developed by Vygotsky are of great importance to education" (Knoers, 1994: 2881)

COGNITIVE SCIENCE

Cognitive Science represents a complex and abstract field of study because thought processes are hidden from external observation and are often unconscious. (Landa, 1976)

The **cognitive psychology** approach focuses on the underlying cognitive processes that govern human behaviour. These processes are analyzed in order to explain behaviour.

The analysis considers the human being as an information processing system, and focuses on the cognitive processes, the cognitive structures, and strategies employed. (Knoers, 1994, 2882)

The **information processing** approach focuses on how the processing actually occurs. Within the framework of this model, it is assumed that information is stored in several memories having different capacities and accessing characteristics. Recently acquired information is kept in the processor's short-term memory (STM), and is directly accessible for processing. Information is stored in the individual's long-term memory (LTM) in the form of "chunks" - the latter will depend upon the individual's knowledge base and past experience. The learner's processing capacity is limited by the structure of and the relationship between the (STM) and (LTM). However, active processing takes place in the (STM). (Ericsson & Simon, 1984)

A belief exists that when a learner performs a problem-solving task the verbalization, occurring concurrently with the task, reveal the pattern of information that is attended to without altering the cognitive processes of the learner. (Ericsson & Simon, 1984).

The **heuristic** approach focuses on the strategies employed to facilitate the process of thinking and problem solving.

Whimbey and Lockhead state that "the ability to analyze material and solve problems, is a skill", and they suggest that learners be exposed to the sequences of thought of expert problem solvers. (1982: 21)

To structure and control their cognitive operations the researcher provided the learners with a "thinking procedure" with which to approach the problem solving exercise. The thinking procedure resembles Landa's problem-solving heuristic. (See Chapter 4)

Streamlining the approach to the problems, enables one to address some of the cognitive difficulties displayed by the learners.

COGNITIVE THEORISTS

FEUERSTEIN'S THEORY

Feuerstein, an Israeli clinical psychologist, holds the view that intelligence is a dynamic process that may be influenced through intervention. However, in order to effect such a change, the subject should be open to external influence ie. be modifiable.

Cognitive modifiability

The concept of structural cognitive modifiability is based on the assumption that human organisms are open systems and have the unique capacity of becoming cognitively modified. However, some do present with a reduced level of modifiability and this factor may be attributed to cultural deprivation.

The latter means that some children have been deprived of their own culture. (Feuerstein, et al., 1980) This occurs when a child is relocated at an early stage and is not exposed to the unique socialization processes of his/her own culture.

Mehl (1991) states that it is particularly true of the Southern African society where amongst others, the migrant labour system has caused a total breakdown in normal family life. Cultural transmission is perceived by young people as representing a perpetuation of inequality. These individuals may function well in normal day to day living, but as soon as they are confronted by new information they display reduced modifiability. However, it is important to distinguish between cultural deprivation, and cultural difference.

Individuals from the culturally different sub-groups often excel in their levels of cognitive functioning despite being different to the dominant culture. (Mehl, 1991)

Feuerstein bases the concept of cognitive modifiability on the theory of mediated learning experience.

Mediated learning experience

This theory contrasts with that of the Piagetian stimulus - organism - response approach in that it places a mediator between the stimulus and the organism. However, Vygotsky raised the idea of mediation earlier when he stressed the important role adults play in the transmission of culture to their children.

The aim of mediation is to transform a passive, dependent learner to an active autonomous one. The mediator manipulates the stimuli for the disadvantaged learner in order to facilitate learning.

Our contention is that mediated learning experience is the foundation upon which cognitive structures are built and that, even as late as adolescence, major and significant cognitive modifications are possible. (Feuerstein, et al., 1980: 19).

The three characteristics essential for meaningful mediation are:

Intentionality and Reciprocity.

The mediator should clearly state his intentions, clarify instructions, and encourage the learner to participate in the process of learning. He should also show an interest in the learner, and challenge their ideas, norms and values in a constructive way. Reciprocity may be regarded as an additional characteristic since it refers to the role of the learner in the mediatory process. The learner should display an active role by clarifying his needs and intentions.

Mediation of Meaning.

The mediator assigns a purpose or significance to the activity of learning. He places the stimulus/activity within a meaningful context for the learner, and attaches importance to the learning material.

Mediation of Transcendence.

Transcendence refers to the content-free approach to teaching. An interaction should not only satisfy the immediate need of the learner, but also change his scope for dealing with a diversity of activities.

Various other strategies exist, but Feuerstein (1980) insists that for mediation to take place, the above-mentioned three must be present.

Another important aspect of the mediated learning experience involves cognitive functions.

Cognitive functions

Deficient cognitive functions are the products of insufficient mediated learning experiences. They form the basis of poor cognitive performance, and should be targeted when assessing performance or when planning an intervention program. An elaborative list of deficient cognitive functions have been compiled by Feuerstein and others, and are categorized into the three main phases of the mental act namely Input, Elaboration, and Output. Feuerstein, et al., (1980: 73)

Input Phase.

This phase refers to the assessment/analysis of a problem ie. looking at the givens. Impairments that may occur at this level include: blurred perception, deficient need for accuracy in data collection, etc.

Elaboration Phase.

Deficiencies at this phase may indicate impairments in problem solving techniques, ie. the student does not know " how to work things out " and does not have the ability to use the data collected in the previous phase in a meaningful way.

Impairments include: the inability to select relevant cues in defining a problem; impaired planning behaviour etc.

Output Phase.

This phase may be marred by deficiencies relating to the verbalization of solutions eg. blocking, trial-and-error responses and the lack of verbal tools for communicating responses. A graphic model illustrates the relationships between these phases. [See Figure (i)]

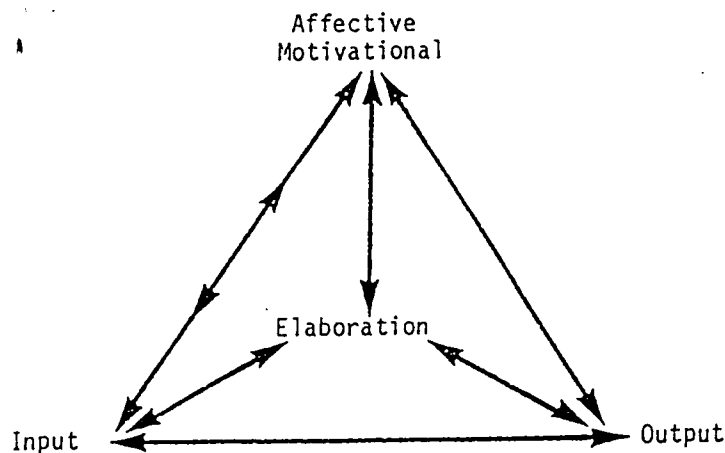


Figure (i) (Feuerstein, et al., 1980: 75)

Feuerstein attaches much importance to the elaboration phase, and regards the input and output as peripheral cognitive processes. The only reference to the affective - motivational factors is that they "...can combine negatively in such a way as to influence the attitudes of the disadvantaged." (Feuerstein, et al., 1980: 74).

Apart from the affective-motivational factors, the following is not well represented in Feuerstein's theory:-

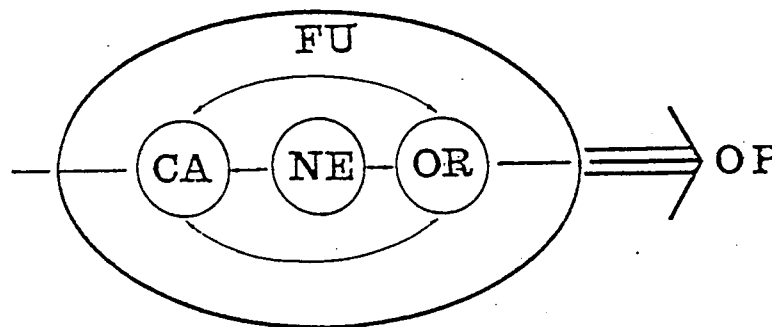
No reference is made to inert knowledge and skills eg. for individuals who are musically or artistically inclined.

Not enough emphasis is placed on the importance of basic / prior knowledge in the development of thinking skills.

Complex types of cognitive performance are not adequately addressed.

Rand (1991) suggests that the affective - motivational factors be incorporated within Feuerstein's list of pure cognitive functions, for example "lack of, or reduced need for pursuing logical evidence" suggests a measure of energy or inclination that is affective-motivational by nature, whereas, "pursuing logical evidence" may be viewed as the cognitive function.

The model that he suggests, shows the cognitive function (FU) and all of its basic components (CA, NE & OR) continuously interacting and mutually affecting each other. Operation (OP) refers to the behavioral outcome of the function and its components. [See Figure (ii)]



Cognitive Function (FU), capacity (CA), need (NE),
orientation (OR), and operation (OP)

Figure (ii) Integrative model (Rand, 1991: 87)

If this model is related to that of Feuerstein, the list of deficient functions should be re-formulated and those pertaining to non-cognitive components be added.

In the same vein Tzuriel (1991: 98) highlights the importance of affectional-motivational factors by quoting three clinical scenarios. He suggests that the four components MLE, cognitive modifiability, affective and motivational factors/processes operate in a transactional fashion. The latter implies that the factors mutually affect each other, and that the transformed component reacts differently on the trigger component. For example mediation may affect motivational aspects positively, thereby reinforcing or encouraging mediation to match the response. [See Figure (iii)]

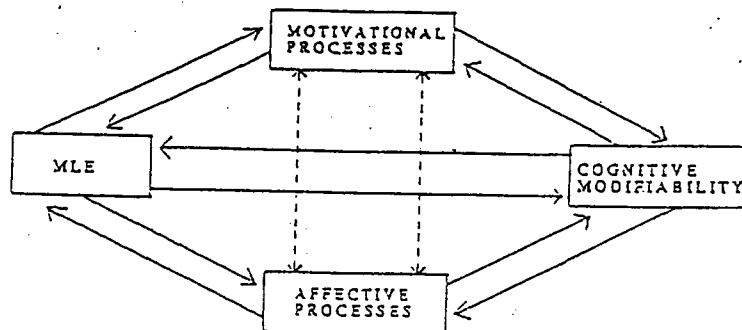


Figure (iii) Transactional model (Tzuriel, 1991: 106)

Tzuriel continues to list non-intellectual factors that affect MLE and cognitive modifiability processes, amongst others : the need for mastering, locus of control and fear of failure.

Various nursing educators have studied the relationship between locus of control and clinical decision making. (Tschikota, 1993; Neaves, 1989)