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Questioning strategies: Their use by clinical teachers

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QUESTIONING STRATEGIES: THEIR USE BY CLINICAL TEACHERS

BY

Sue Sellappah, Diploma in Nursing Education, Bachelor of Health Science (Advanced Nursing), Graduate Diploma in Health Science (Nursing).

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Abstract

This study examined clinical teachers' use of questioning and the variations in their use of questioning as a teaching strategy. By using questioning and other appropriate teaching strategies, clinical teachers can facilitate the development of critical thinking, decision making, and problem solving in students. Effective use of questioning strategies involves asking low level and high level questions to facilitate recall of classroom knowledge and promote application of the knowledge to solve patient problems in varying clinical situations. Using a comparative descriptive design, this study used a convenience sample of 26 clinical teachers from one University School of Nursing to examine questioning during post-clinical conferences, which were audio taped. Questions asked by the clinical teachers at two post-clinical conference were identified and transcribed by the researcher. Using Craig and Page's (1981) framework, these questions were categorised by the researcher and an independent rater. Inter rater reliability for 850 of the questions asked was established at 85.6%. The remaining 143 questions were categorised following deliberation between the researcher and the independent rater. Data analysis was carried out using non parametric tests, which included Wilcoxon Matched-Pairs Signed ranks test, Mann Whitney U test, Kruskal Wallis test, and Spearman's rho. The findings of the study indicate that, although there was variation in the number of questions asked, this group of clinical teachers asked more low level questions. There was a significant difference in the number of low level questions asked between the two post clinical conferences, but no significant difference in the number of high level questions asked. There was no significant difference between the number of low level and high level questions asked at post-clinical conferences held in three different semesters. There was also no significant

relationship between clinical teachers' academic qualifications and the types and levels of questions asked ($p > .05$). There were variations in the relationship between the professional experience of clinical teachers and the levels of questions asked. Based on the findings of the study, it is recommended that clinical teachers are taught how to ask questions, particularly high level questions.

DECLARATION

"I certify that this thesis does not incorporate, without acknowledgment, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text".

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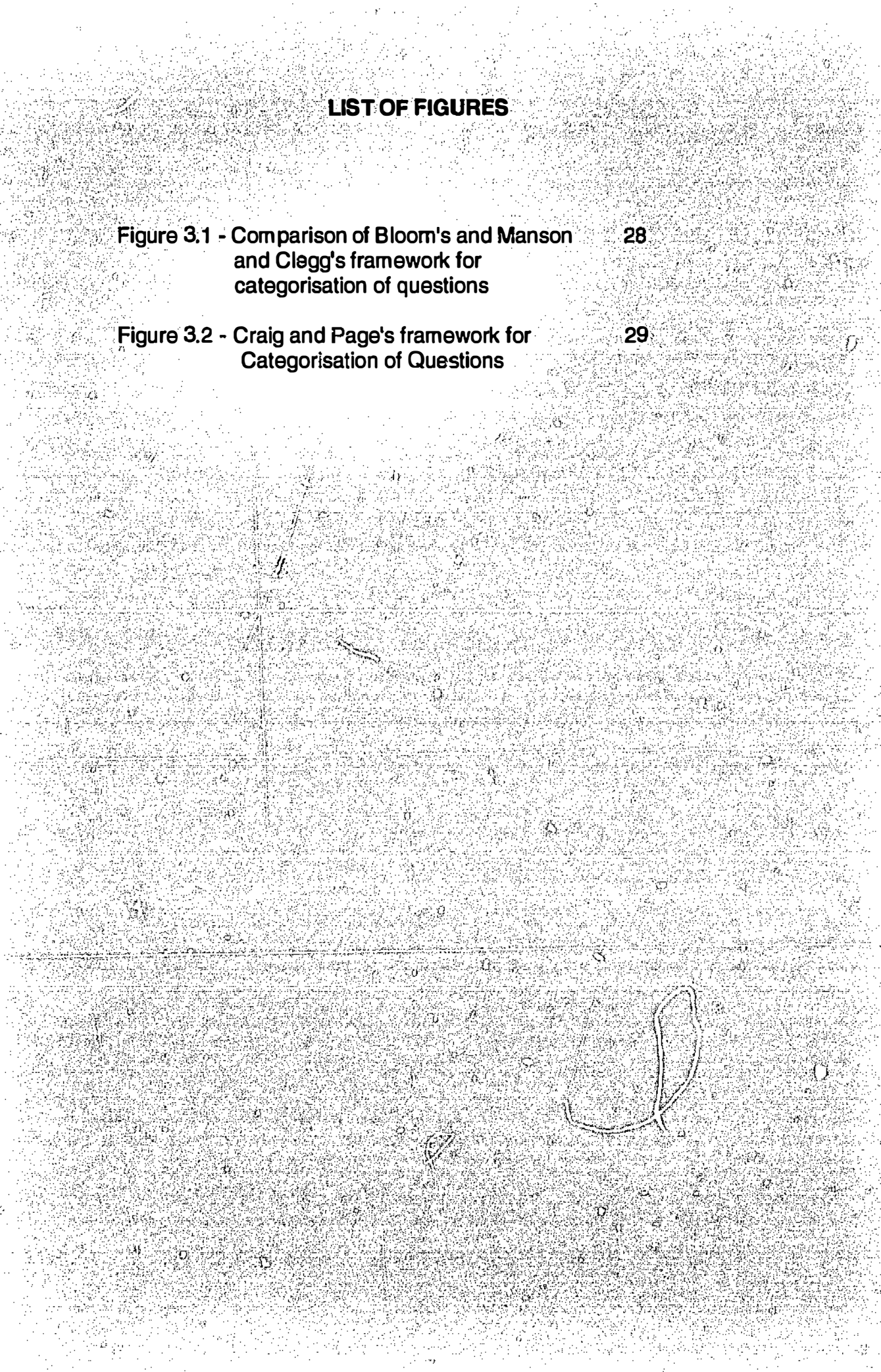


CHAPTER 1 - INTRODUCTION

This study examined clinical teachers' use of questioning strategies. Specifically, it examined the types and levels of questions that the clinical teachers asked during post-clinical conferences.

Background

Asking questions is an integral part of clinical teaching. According to House, Chassie, and Spohn (1990) questions stimulate interest, challenge learners, and direct their thinking process. To do so, questions asked must stimulate different levels of cognitive activity in the learner.

Bloom's (1956) taxonomy of the cognitive domain has been commonly used to classify questions according to the level of cognitive activity required. This includes knowledge, comprehension, application, analysis, synthesis, and evaluation questions. Knowledge questions facilitate recall of information whereas comprehension questions encourage students to interpret data and extrapolate meaning. Application, analysis, evaluation, and synthesis on the other hand, are classified as high level questions because they encourage students to think and use knowledge at a higher cognitive level. For example, application questions demonstrate the extent to which students can transfer learned knowledge to solve new problems, whereas analysis question will help students to break down a situation into its components, and understand how they work together as a whole. Evaluation questions on the other hand, encourage students to determine the effectiveness of the care they had implemented. Synthesis questions motivate students to be creative and development of new ideas (DeYoung, 1990; Reilly and Oermann, 1992; Wink, 1993). Bloom's (1956) taxonomy also provides a format for processing

information inductively or deductively. That is, commencing at the knowledge level, and asking at questions at increasingly higher levels, information can be processed inductively. To process information deductively, the questioning sequence is reversed (Hunkins, 1989).

DeTornay and Thompson (1982) have classified questions as being factual or descriptive, clarifying, and higher order questions. Factual or descriptive questions can be equated with knowledge questions, while clarifying questions are those asked when the student is required to go beyond a superficial response (DeTornay and Thompson, 1982; House, Chassie, and Spohn, 1990). Higher order questions can be equated with Bloom's (1956) analysis, synthesis, and evaluation questions.

Questions can also be classified as either convergent or divergent. Convergent questions are used to verify learner retention or for reviewing material recently covered. They are classified as low level questions. Divergent questions on the other hand, generate novel applications, make inferences, or hypothesise, and are classified as high level questions (DeTornay and Thompson, 1982; Demetrulias and Shaw, 1985; House, Chassie, and Spohn, 1990).

Although various classifications have been used to categorise questions, the type of cognitive activity required determines whether they are low level or high level questions. According to Burnard (1989), Jones and Brown (1991), Klassens (1988), Malek (1986), Pond, Bradshaw, and Turner (1991), and Tiessen (1987), critical thinking skills and problem solving ability are deemed as necessary if nursing students are to solve complex patient problems. Creedy, Horsfall, and Hand (1992), and Gerrish (1992) further add that the student nurse is expected to synthesise knowledge derived from nursing,

biological, behavioural and social (ethics and research) sciences, and apply this to varying patient situations. Such cognitive activity necessitates that high level questions have to be asked. Meleca, Schimpfauser, Witteman, and Sachs (1981), Pond, Bradshaw, and Turner (1991), and Gerrish (1992) suggest that appropriate use of questioning strategies can facilitate development of critical thinking skills and decision making ability. These skills are necessary to solve patient problems.

To be able to problem solve and make clinical judgements about patient care during clinical experience, students have to recall, transfer, and apply classroom theory to patient situations. DeTornay (1989) and Wong (1979) have stated that students' ability to transfer classroom theory to clinical practice is not automatic. The role of the clinical teacher is to facilitate the student's ability to recall, transfer, and apply classroom theory to clinical practice. Schank's (1990) suggestion of the use of questions to stimulate higher cognitive processes such as: "What do we know? How do we know? What do we accept or believe? What is the evidence for?" (p. 87), are examples of questions which would facilitate recall, transfer, and application of classroom theory to clinical practice. Therefore, clinical teachers have to ask both low level and high level questions.

Clinical teachers play a dominant role in assisting students to develop their critical thinking skills and decision making ability (Malek, 1986; Tanner, 1993). To do so, clinical teachers need to adopt teaching strategies, such as questioning, that will facilitate integration of knowledge from a variety of sources as well as relate theory to practice. But, as stated by Karuhije (1986) and Myrick (1991), many of the clinical teachers are sessional staff who are unfamiliar with the school's curriculum, have varying years of clinical experience, varying years of clinical and/or classroom teaching experience,

teaching qualifications and academic qualifications. In spite of these differences, all are expected to facilitate the ability of the student to recall, transfer and apply classroom theory to varying patient situations, develop critical thinking skills, and make decisions.

Significance of the study

Graduates of nursing programmes today are expected to think critically and make clinical decisions about patient care which can undergo dramatic changes quickly. The care that is implemented, therefore, must be congruent to the change in patient status. Students need to be taught how to recognise a change in patient status by appropriate assessment, critically analyse the data obtained, then determine and implement appropriate nursing interventions. One way of facilitating this development is for clinical teachers to ask questions at different cognitive levels to promote conscious awareness of these processes in the student's mind, that is reflection. There are several available conceptual frameworks, such as Bloom's (1956) cognitive taxonomy, and Mason and Clegg's (1970) conceptual framework, to classify questions at different cognitive levels. Clinical teachers need to be familiar with the available conceptual frameworks in order to pose questions effectively at different cognitive levels. It is also assumed that a clinical teacher would be familiar with a conceptual framework and use it to ask questions.

At the present time, the minimum requirements for clinical teachers in the state where the study was conducted, are current registration with the Nurses' Board of Western Australia, recent clinical experience, if possible, and in some instances, experience in the clinical speciality where they are employed to teach. Teaching qualifications, such as a Diploma/Certificate of Education, is not a formal requirement, and therefore, it would be naive to

conclude that every clinical teacher will be familiar with a conceptual framework and use it to ask questions. At the same time, it cannot be assumed that a clinical teacher with a teaching qualification, who may be familiar with a conceptual framework, will use it to ask questions. Similarly, it cannot be assumed that a clinical teacher with a higher degree in nursing, such as Master of Nursing, who may be familiar with a conceptual framework, will use it to ask questions unless they had completed a major in education. However, there are very few Masters programme that offer educational majors. Oermann and Jamison (1989) following exploration 139 Master's programmes, concluded that only 10% of Masters programmes offered a major in nursing education. Consequently, they advocate that to function effectively as a clinical teacher, a registered nurse not only requires knowledge of nursing skills, but also teaching skills. This notion is supported by Reilly and Oermann (1985) who have stated:

> "Knowledge of the subject matter and clinical competence are critical, but knowing how to teach is important. A teacher with knowledge and expertise in clinical practice is not a teacher if unable to communicate that knowledge to students and initiate learning" (p. 94).

Existing nursing curricula in Western Australia (W. A.) do not offer studies in teaching or clinical teaching. Hence, clinical teachers will bring to their teaching, a varying range of professional/academic qualifications and professional experience. It is for all of the above reasons that this study is significant. At this point in time, in this state, it is not known how clinical teachers use questioning to facilitate learning. Nor is it known if differences can be attributed to other clinical teacher variables such as teaching qualifications, years of clinical experience, years of classroom teaching experience, years of clinical teaching experience, and years of classroom and

clinical teaching experience. This study seeks to address this gap in knowledge. The study will firstly, describe clinical teachers use of questioning strategies, and secondly, examine the variation in clinical teachers use of questioning as a teaching strategy.

Research questions

The study asks the following questions:

1. What are the types and levels of questions that clinical teachers ask?

2. Are there any differences in the types and levels of questions asked by clinical teachers between rotations in a four rotation course of experience?

3. Are there any differences in the types and levels of questions asked by clinical teachers between the three final semesters (4, 5 and 6), in a six semester programme?

4. Is there a relationship between clinical teachers' teaching qualifications and the types and levels of questions that they ask?

5. Is there a relationship between clinical teachers' years of clinical experience and the types and levels of questions that they ask?

6. Is there a relationship between clinical teachers' years of clinical teaching experience and the types and levels of questions that they ask?

7. Do clinical teachers who are concurrently involved in classroom teaching and clinical teaching ask more high level questions than those who are only involved in clinical teaching?

Operational definitions

The operational definitions of the major variables are as follows:

1. Clinical teacher (C. T) - a nurse employed by the University where the study was conducted, to teach, observe, and evaluate students during clinical experience.

2. Clinical experience - planned and unplanned activities that the students engage in when providing nursing care to patients either in a hospital (ward) or clinic.

3. Post-clinical conference - a discussion immediately following clinical learning experience. Students and teachers discuss and evaluate patient care, and also analyse the clinical learning experience. The clinical teacher clarifies the relationship between theory and practice (Carpenito and Duespohl, 1985).

4. Preceptor - a registered nurse who, in a clinical setting, serves as a role model and teacher for students and new graduates through a one-to one relationship (Reilly and Oermann, 1985).

5. Clinical rotation - a set period of clinical experience to which students are posted exclusively, such as: adult nursing, paediatric nursing,

psychiatric nursing. In this study, each rotation comprises of a total eight days (two days per week) over a four week period.

6 Semester - a period of time. In one year, there are two semesters. The duration of each semester is 16 weeks.

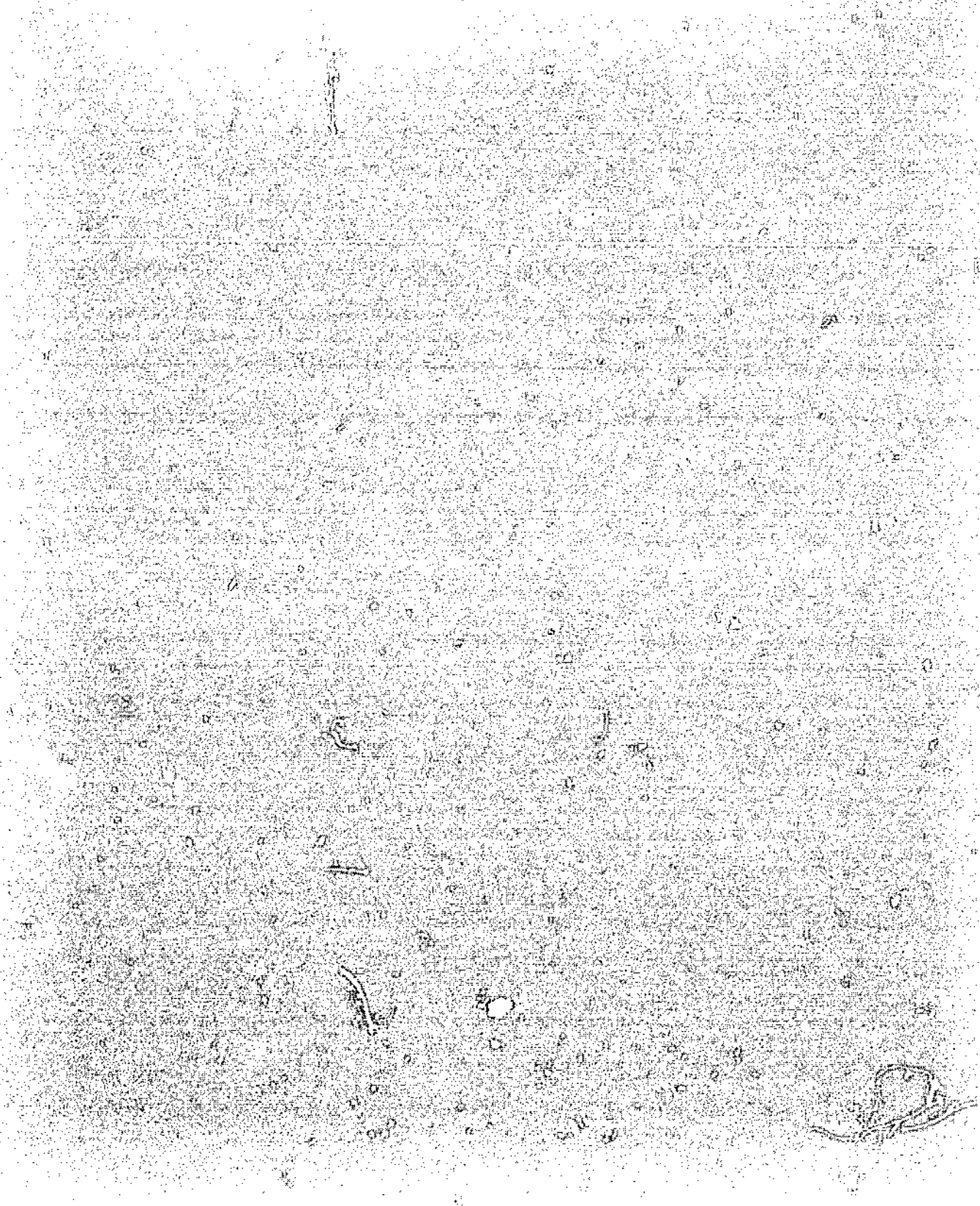
7. Level of questions - types/categories of questions asked that stimulate specific levels of cognitive activity. They are grouped as low level questions, high level questions (DeYoung, 1990). The most commonly used classification system is based on Bloom's (1956) taxonomy. The categories within the taxonomy are knowledge, comprehension, application (low level), analysis, evaluation, synthesis (high level).

8. Types of questions - questions asked for a specific purpose (DeTornay, 1990).

Organisation of the thesis

Chapter 1 provides an introduction and discussion of the significance of the study, and identifies the aim and relevant research questions. Operational definitions of major variables are then provided. Chapter 2 begins with an overview of clinical practice, followed by a discussion of decision making and clinical judgement. It then continues with a discussion related to critical thinking. Discussion then focuses on experience. Review of literature related to the use of questioning strategies in nursing education is followed by a review of relevant literature related to the preparation of clinical teachers. Chapter 3 discusses the conceptual framework that has been used to categorise questions asked by clinical teachers. Chapter 4 describes the methodology which includes the research design used, selection of clinical teachers

(subjects/participants) for the study, ethical considerations, the method of data collection, data analysis, and ethical considerations. The findings of the study using non parametric statistics and tables are provided in Chapter 5. Discussion related to major findings, implications for nursing education, recommendations, limitations, and recommendations for further research is then presented in Chapter 6.



During clinical practice, students learn to solve patient problems by the application of the problem solving process. This requires, as stated by Chang and Gaskill (1991) "propositional (theoretical) knowledge and procedural (how to) knowledge, of both the problem-solving process itself and the principles and process of nursing" (p.814). Sound theoretical knowledge enables the student to comprehend a problem and determine the best solution to solve the problem (Dliion, 1988; Reilly and Oermann, 1985). Benner and Tanner (1987); Benner and Wrubel (1982); Reilly and Oermann, (1985); and Schank (1990) describe the factual information or knowledge as 'knowing that' and the application of the factual information as 'knowing how'. Integration of the two concepts ('knowing that' and 'knowing how') during clinical practice assist the student to integrate theory and practice.

Classroom lectures and textbooks provide students with the necessary knowledge to comprehend a problem. To solve a problem, the student must be able to apply the knowledge. As stated by Reilly and Oermann (1985); Infante (1985); and DeTornay (1990), the learner must be able to recall relevant concepts and principles learned, understand the relationship between the principles, then apply the principles to solve patient problems. The student not only has to have the relevant knowledge, but develop the ability to transfer, organise, and process the knowledge which Carroll (1988) describes as effective functioning of the cognitive schema.

The clinical teacher can facilitate the development of the student's cognitive schema by using appropriate teaching strategies, including questioning. This requires, as suggested by Craddock (1993), a clinical teacher with adequate teaching preparation and clinical credibility. The clinical teacher can then facilitate the student's systematic collection of data or cues, followed by identification of problem(s). Solutions are then determined,

implemented, and evaluation of the solution is carried out (Berger, 1984; Gagne, 1977; Reilly and Oermann, 1985; Townsend; 1990; Yura and Walsh, 1988). The results of Frederickson and Mayer's (1977) study, demonstrated that clinical teachers were not facilitating development of student's cognitive schema Each participant in their study, which consisted of 28 students from five baccalaureate degree programmes and 27 students from three associate degree programmes, viewed films from the Verhonick nursing problem series. They were then instructed to think aloud. Each participant's response was recorded on a tape. To assess their general problem solving ability, each participant completed a standardised test consisting of 100 items. The content of the test was not specific to any field. A summary of the general steps used in problem solving were categorised into four major steps which included collection of data, defining the problem, postulation of solutions, and solution evaluation. The results indicated that most students used three of the four problem solving steps frequently. Although most of the students in both groups used three of the four steps frequently, they were used in random order and according to individual cognitive style, rather than in a logical sequence. The last step, solution evaluation, was used infrequently. The results of their study indicated that students lacked comprehension and systematic application of the problem solving process. A possible explanation for the results, as suggested by Frederickson and Mayer (1977) was that clinical teachers were providing students with solutions to the problems that students had identified rather than holding them accountable to solve the problems. To develop student's ability to assume responsibility to use the problem solving process efficiently, and therefore, be able to solve patient problems, Frederickson and Mayer (1977) suggest that clinical teachers ask questions. Specifically, they suggest the use of clarifying questions. Wink (1993) supports Frederickson and Mayer's (1977) suggestion by stating that when students face a clinical situation, questions asked by clinical teachers will facilitate recall of knowledge, then the translation

and interpretation of knowledge. Further questioning will enhance analysis of the data obtained about the specific clinical situation, followed by formulation of nursing diagnoses. The student then can be assisted to develop an appropriate plan of action, as well as evaluation of the action. Questions asked by clinical teachers at each step of the problem solving process, teach students to make decisions and clinical judgements. These elements of the problem solving process will improve the student's understanding of the relationship between 'knowing that' and 'knowing how'. This reinforces Benner and Wrubel's (1982) belief that 'knowing that' and 'knowing how' are equally important. Integration of 'knowing that' and 'knowing how', will assist the student to organise the information as well as process the information, and use it to make clinical decisions about patient care (Carroll, 1988).

Decision making and clinical judgement

Throughout the problem solving process, decisions and judgements are made. That is, cues and evidence are collected, inferences are then made and the best possible solution is selected and implemented. In America, according to Brooks and Shepherd (1990), controversy still exists over which nursing education programme should be adopted by all nursing schools which would adequately prepare registered nurses for making decisions and clinical judgements. These authors add that proponents of baccalaureate education have argued that decision making (and numerous other skills) which are part of professional practice, are only effectively taught at baccalaureate level.

Snyder (1993) on the other hand has stated that to provide consumer-oriented care, the nurse has to adopt a collaborative approach. She advocates that collaboration between patient and nurse must occur before mutual goals of care are developed. As the patient's clinical status can change quickly and be

dynamic, nurses must have technical skills, but must also be able to think critically and be capable of making clinical decisions (Snyder, 1993). This requires sound theoretical knowledge. Additionally, graduates of baccalaureate programmes are expected to work alongside other health-care workers which necessitates collaboration and decision making about patient care. In summary, Brooks and Shepherd (1990) and Snyder (1993) concur that decision making and clinical judgement are essential qualities of a registered nurse.

Itano's (1989) study compared the clinical judgement process used by registered nurses and senior nursing students of a baccalaureate programme. To study their clinical judgement process, she used 13 registered nurses identified as highly skilled judgement makers (HSJM) and 13 senior baccalaureate student nurses. The study consisted of two parts. The first part consisted of audio taping of the nurse-patient interview at commencement of a shift which included review of the patient's kardex, listening to the change of shift report as well as patient interview. On completion of the nurse-patient interview, the nurse was required to state her conclusions about the patient's state of health. The second part of the study included rating the clinical judgement process used by the 26 participants using a rating scale developed by Itano (1989). The results of the study, which were consistent with the results of Brooks and Shepherd (1990), indicated that registered nurses collected more cues appropriate for problem identification than student nurses. According to Itano (1989), this is because registered nurses have more knowledge about disease processes and past experiences with human responses to illness. Therefore, she believed that the experience that the student will obtain on becoming a registered nurse, will improve his/her ability In collecting many appropriate cues and making Inferences. However, Itano had not quantifled experience nor stated how experience will improve the

student's ability in collecting cues and making inferences. If the student is expected to continue developing these skills on becoming a registered nurse, the relationship between cues and inferences, and the process of collecting cues, must taught during the educational programme. This can be facilitated by suitable teaching strategies, such as questioning, during students clinical experience. As stated by Wink (1994) "questioning helps students to think critically when making clinical decisions" (p. 11).

Critical thinking

Critical thinking can be defined as a unique thought process (Dewey 1933 cited in Jones and Brown, 1993; Ennis, 1985). Others (Siegel, 1980; Ennis, 1962) have defined critical thinking as a problem solving technique which uses logical propositions. It also includes the ability to examine possible alternatives to a problem, and seek reasons for the chosen alternative (Reilly and Oermann, 1985; Norris, 1985). When solving patient problems, nurses have to consider the available alternatives and select the best option. To do so, as suggested by Malek (1986), Pond, Bradshaw, and Turner (1991) and Reilly and Oermann (1985), nurses must have critical thinking skills. Concern by nurse educators about the development of critical thinking skills in students has resulted in the inclusion of critical thinking skills as an evaluation criterion in baccalaureate and higher degree programmes (Tanner, 1993).

Several studies have been conducted to determine the impact of critical thinking as an evaluation criterion. Berger (1984) concluded that the quality of the nurse's critical thinking determines how well problem resolution is accomplished. Using the Watson Glaser Critical Thinking Appraisal (WGCTA), she studied the critical thinking ability of 137 students as sophomores and again as senior students in a baccalaureate nursing programme. Results

Indicated that critical thinking scores increased as students progressed through their nursing programme. Gross, Takazawa and Rose (1987) using the WGCTA, tested students' critical thinking ability on entry and exit of a 2-year associate degree programme as well as a baccalaureate programme. Results again indicated a significant gain in score by those who completed their respective course. The result of Gross, Takazawa and Rose was considered as a positive indicator of the effectiveness of the nursing curriculum and nursing education at the institution where the study was carried out. However, the process used to develop students critical thinking skills was not stated. This may have some implication(s) for the study reported in this thesis.

Using the WGCTA instrument, Brooks and Shepherd (1990) studied critical thinking ability by senior nursing students in four types of programmes (generic baccalaureate, associate, and diploma-RN programmes, and upper division baccalaureate). Highest scores were attained by generic baccalaureate and upper division senior students. Pardue's (1987) study indicated that nurses with a Masters degree scored higher mean scores in critical thinking ability than associate degree, diploma, or baccalaureate nurses. Frederickson and Mayer's (1977) study also found that baccalaureate students scored higher on critical thinking than associate degree students. Although Frederickson and Mayer's study was conducted over a decade ago, it is evident that nurses with university education perform better in critical thinking than nurses with a technical and skill oriented educational background.

Sullivan (1987) administered the WGCTA on entry and exit to 46 registered nurses who were undertaking baccalaureate studies. In contrast to the result of Gross, Takazawa and Rose's (1987) study, no significant difference in critical thinking was found between entry and exit. The finding was particularly surprising because the students were doing other units of

study such as, logic, statistics, mathematics, and research methodology, that would encourage the development of critical thinking skills. Because the study was conducted in one school that offers only a baccalaureate programme for RN's, Sullivan (1987) suggest that further research has to be done using similar programmes before any definite conclusions are made. However, her suggestion to examine the teaching strategies used to develop critical thinking skills must be noted.

The results of the reported studies related to critical thinking skills, suggest that increased knowledge and experience improved nurses critical thinking skills. What have not been stated are the strategies which were used during the nursing programme to integrate knowledge and experience to develop critical thinking skills. If critical thinking and decision making ability are essential skills of a nurse, then it is necessary to ensure that these skills are developed, especially during clinical practice. The results of the present study may provide answers as to how clinical teachers can develop students critical thinking skills and decision making ability during clinical practice.

Experience

Reilly and Oermann (1985) and Benner (1984) have stated that experience facilitates the progression of a nurse through the levels of skill acquisition, that is, from novice, to advanced beginner, competent practitioner, proficient practitioner and finally expert practitioner. As a novice, the nurse adheres to rules to solve problems. With additional experience, the nurse progresses to be an advanced practitioner. Recurrent meaningful situations are recognised. As a competent practitioner, deliberate, conscious, analytic plans are incorporated. The proficient nurse begins to perceive situations holistically and begins to use maxims to guide performance. Finally, the nurse

becomes an expert and begins to perceive the patient's situation as a whole, using both intuition and prioritising to solve patient problems (Benner, 1984; Dreyfus and Dreyfus, 1986; Reilly and Oermann, 1985; Urden, 1989).

According to Benner's (1984) model, a new graduate is expected to be at the stage of an advanced beginner. The clinical teacher has a dominant role in assisting the student to reach this stage. To do so, the clinical teacher needs to guide the student to develop the `knowing how'. That is, the teacher needs to assist the student to process knowledge, to solve patient problems and to make clinical decisions (Pesut and Harman, 1992) . The clinical teacher, as the manager of the ward learning environment, has to pay attention to the use of questioning strategies (Heims and Boyd, 1990;). To develop students' ability to process knowledge, Heims and Boyd (1990) and Wang and Blumberg (1983) suggest that clinical teachers must make an effort to employ high level questions. By asking high level questions, students will be motivated to develop analytical thinking, and make inferences, rather than merely stating what they had done for their patient.

Use of questioning as a teaching strategy

Questioning strategies are commonly used in clinical teaching (Alexander, 1982; DeYoung, 1990; Gott, 1982; Horsfall, 1990; Little & Carnevali, 1972; Mitchell & Kranovich, 1982; Wang & Blumberg, 1983). Chase (1983); Infante (1981), Klassens (1988), and McCue (1981) have identified questioning as a principal teaching strategy to develop critical thinking skills during clinical experience. Yet, research about its effective use in clinical teaching is limited. Research in clinical teaching has concentrated on the faculty's and students' perceptions of effective clinical teaching and clinical

teacher behaviours (Brown, 19B1; Kanitsakl & Sellick, 1989; Knox & Morgan, 1985; Stuebbe, 1980).

Scholdra and Quiring (1973) were probably the first to identify the effectiveness of questioning as a teaching strategy during clinical nursing experience. They carried out a study to determine if there was congruence between high level terminal objectives (analysis, synthesis, evaluation) for clinical nursing and the levels of questions asked by clinical teachers and students during clinical conferences. Additionally they hypothesised that there would be a significant relationship between the proportion of high-level objectives of the course and the proportion of high-level questions asked in post-clinical conferences. Sixteen clinical teachers participated in the study. An average of nine students were present at each conference. Scholdra and Quiring taped and analysed 22 post clinical conferences each lasting 63 minutes. The investigators extracted and tabulated questions asked by the clinical teachers and students. Three experienced nurses each with a Masters degree in nursing categorised 719 questions asked by the clinical teachers and students. Inter-rater reliability on question categorisation was reached on 617 questions or 85.5 %. Therefore, statistical analysis was based on 617 questions. Of the 617 questions, 38% was asked by students and the remaining 62 % was asked by clinical teachers. Results revealed that nursing students and clinical teachers asked 508 recall questions, 59 comprehension questions, and 44 application questions. Low level questions accounted for 98.4% of all questions. Although the stated objectives in three of the six courses surveyed indicated that high level thinking was the desired outcome, only six high level questions were asked. To develop critical thinking skills and decision making ability during clinical practice, clinical teachers have to ask questions that will promote application, analysis, synthesis, and evaluation of knowledge. The results of Scholdra and Qulring's (1973) study support

Frederickson and Mayer's (1977) conclusion that clinical teachers are more inclined to provide solutions to patient problems rather than facilitate students to think and develop accountability to solve the problems. A Chi square of .00025 with 1 degree of freedom resulted in the rejection of the hypothesis that there was a significant (p .05) correlation between the level of the stated objectives of the nursing courses and the level of questions asked at the post clinical conferences.

Scholdra and Quiring (1973) recommended further research to determine what type of high level questions asked by clinical teachers promote critical thinking in students when focusing on patient problems and planning related care. However, the development of critical thinking by students depends on the questioning skills of clinical teachers. A further suggestion was replication of their study to investigate other issues (not specified) related to use of questioning strategies. Yet, further research about issues related to use of questioning strategies have been limited. The present study has examined the relationship between teacher qualifications, teaching experience, clinical experience and types and level of questions raised in post-clinical conferences.

Craig and Page (1981) studied the effectiveness of a self-instructional module on how to use Bloom's (1956) cognitive taxonomy (knowledge, comprehension, application, analysis, evaluation, synthesis) to generate questions. A pre and post-test experimental design was used. Analysis of questions in the pre-test revealed that clinical teachers in the experimental group and control group asked only 19.7% high-level questions (application, analysis. evaluation, synthesis). However, the experimental group's ability to ask high level questions increased after using the self-instructional module. Four of the six participants in the experimental group had demonstrated improvement. The percentage of improvement varied between 11.6%-54.4%.

Only four of the eight participants in the control group demonstrated some improvement which ranged between 1.5%-6.9%. The difference in gain scores between the experimental group and control group was significant at the 0.05 level. Based on the results of their study, it is evident that clinical teachers have to be taught how to use questioning effectively.

Malcomson (1990) also carried out a study using a pre and post-test design, to determine the effect of a faculty development programme on the level of cognitive questions. Sixteen clinical teachers and their respective students in the clinical setting participated in the study. Again, post clinical conferences were audio taped and questions asked at the post clinical conferences were analysed using the Mason and Clegg (1970) classification system. The results of her study also revealed that clinical teachers who completed an instructional programme on the use of questioning, asked an increased number of high-level questions ($p < 0.01$). The results are similar to those from Craig and Page's (1981) study. (The results of the control group was not reported). Malcomson's (1990) study also revealed that high level cognitive questions asked by clinical teachers were positively correlated with students' high level first cognitive responses ($r > 0.9$ and $p < 0.001$) by all but one student.

Neither Craig and Page's (1981) nor Malcomson (1990) study stated the clinical teachers variables such as, academic qualifications, years of clinical experience, years of experience in classroom, or clinical teaching. Therefore, it cannot be determined whether an increase in asking high level questions was the direct result of the instructional module or was due to the clinical teacher variables.

Preparation of clinical teachers

As already stated in Chapter 1 and supported by Karuhije, (1986) Myrick (1991,1988), clinical teaching is carried out by clinical teachers with varying academic qualifications, teaching experience, and clinical experience, who may also be unfamiliar with the school curriculum. Three fourths of participants in Karuhije's (1986) study, male and female nurses with academic qualifications varying from Phd. in Nursing (11%), Masters degree (61%), and Educational degree (15%), agreed with the statement that ".... most graduate programmes do not provide individuals with basic information on clinical instruction" (p. 140). If they agreed with the statement, they were requested to state the course content that should be included in a graduate education programme on clinical instruction. Seventy percent of those who agreed with the statement, expressed the following, ranked in order of precedence, as the desired content: clinical teaching strategies, evaluation of clinical performance, developing/writing for a graduate education programme in clinical teaching clinical objectives, developing clinical evaluation tools, clinical teaching practicum with experienced teachers. Based on the findings of her study, Karuhije (1986) suggests that graduate programmes prepare effective teachers to teach in the classroom and clinically. It cannot be assumed that ability to teach in the classroom is sufficient preparation for clinical teaching.

Senior nursing students interviewed by Windsor (1987) stated the need for knowledgeable clinical teachers with clinical expertise. The clinical teacher's theoretical knowledge and clinical knowledge influences teacher effectiveness. However, Reilly and Oermann (1985) have stated that a clinical teacher with knowledge and expertise in clinical practice is not a clinical teacher. There are many attributes of a clinical teacher, which as stated by Reilly and Oermann (1992) include knowledge and clinical competence,

relationship with students, personal characteristics, and teaching skill. These attributes have to developed in the clinical teacher, especially teaching skill. The findings of Bergman and Gaitskill's (1990) study have suggested that an important dimension of clinical teaching is ability to relate underlying theory to clinical practice. Based on this finding, Bergman and Gaitskill recommended that special attention be given to preparing clinical teachers to teach. Craddock (1993) supports Bergman and Gaitskill's (1990) recommendation by stating that a student nurse requires a clinical teacher with adequate teaching preparation. Another result of Windsor's (1987) study indicated that students expected clinical teachers to have high expectations of them. The high expectations had to be demonstrated by asking difficult questions which required them to think and solve problems. Therefore, the clinical teacher needs to be competent in asking such questions. In conclusion, it is evident that clinical teachers have to be prepared for their role, which includes skilled teaching. One of the skills of teaching is the use of questioning.

Summary of literature review

Graduates of nursing programmes are expected to be able to solve patient problems and make clinical decisions. Knowledge is essential to comprehend patient problems and to determine the best solution. During clinical experience, students learn the practical skill of problem solving. This requires critical thinking skills and decision making ability. To develop these skills, clinical teachers have to ask low level and high level questions. The limited available research relating to the use of questioning strategy in clinical teaching indicates that proportionally, more low level questions are asked (Scholdra and Quiring, 1973). Other studies (Craig and Page, 1981; Malcomson, 1990) have indicated that clinical teachers have to be taught how to ask high level questions. Based on the findings of Karuhije's (1986) survey,

preparation of clinical teachers is far from satisfactory. None of the studies stated the clinical teachers' academic qualifications, years of clinical experience, experience in classroom teaching, or clinical teaching. These variables may influence their questioning skills. This study, therefore, examined whether and to what extent characteristics of the clinical teacher such as: teaching qualifications, academic qualifications, clinical teaching experience, and clinical experience, influenced their questioning skills.

CHAPTER 3 - CONCEPTUAL FRAMEWORK

Overview

This chapter discusses Craig and Page's (1981) conceptual framework th was used to guide the study. Craig and Page's framework is based on Bloom' s (1956) taxonomy of the cognitive domain. The taxonomy within this domain describes cognitive function in six areas: knowledge, comprehension, applicatior analysis, synthesis, and evaluation. For each category, Craig and Page (1981) h outlined the cognitive activity required, the key concepts, and sample question words. The information provided would enable categorisation of questions asked clinical teachers. For these reasons, Craig and Page's framework was selected f the study.

Classification of questions

There are multiple schema for classification of questions. House, Chassie, and Spohn (1990) have suggested several methods for classifying questions. One method suggested by them as well as by Wink (1993), is for questions to be classified as convergent questions or divergent questions. House, Chassie and Spohn (1990) have also suggested a three-tier hierarchy which includes knowledge questions, application questions, problem-solving questions, as well as probing questions. DeTomay and Thompson (1982) on the other hand have suggested the following classifications: factual or descriptive, clarifying, and higher order questions. The question classification systems have been based almost entirely on the types of cognitive process required to answer questions.

During a post-clinical conference, students and the clinical teacher reflect, analyse, evaluate patient care, as well as discuss emotive issues that the student may have experienced. This requires the clinical teacher, to begin with, to ask at least low level questions. The type of framework selected, therefore, had to facilitate categorisation of questions which could further be classified as low level or high level questions.

The review of the literature related to the types of questions asked by clinical teachers in Scholdra and Quiring (1973), Craig and Page (1981), and Malcomson's (1990) studies had indicated that the type of conceptual framework used to categorise questions was based on the cognitive activity evoked by the questions. The framework used by these authors was based on Bloom's (1956) taxonomy of the cognitive domain which will be briefly described in the following paragraphs.

Taxonomy of the cognitive domain

A taxonomy is a hierarchical classification system. The dimensions of an educational taxonomy facilitate communication of outcomes expected in students by educators. Bloom (1956) conceptualised his taxonomy as an educational-logical-psychological classification system. The first taxonomy that he developed was of the cognitive domain. It included categories which are described as being cumulative and sequential. That is, each category of thinking has unique elements as well as elements from the previous category. In other words, it is a hierarchical system. Definitions of each category within the cognitive domain are as follows:

Knowledge - ability to recall previously that which is learned which may range from specific facts to theories.

Comprehension - ability to grasp the meaning of information. Forms of comprehension include translation, interpretation, and extrapolation.

Application - ability to use learned information in new and concrete situations.

Analysis - ability to break down information into its component parts so that its organisational structure can be comprehended.

Synthesis - ability to put parts together to form a new whole.

Evaluation - ability to make conscious judgement of good or bad, right or wrong according to set standards (Bloom, 1956).

Achievement of all the categories within the cognitive domain requires application of knowledge at different levels. In doing so, there is progression of intellectual skills (Dillon, 1988; DeYoung, 1990; Reilly and Oermann, 1985). The intellectual skill development at the lower level of the taxonomy includes knowledge and comprehension. Intellectual skill development at the higher level of the taxonomy includes application, analysis, evaluation, and synthesis. Teaching strategies, such as questioning, used by clinical teachers during clinical experience, must facilitate intellectual skill development at both the lower end and the higher end of the taxonomy. Through questioning, students critical thinking skills, decision making ability, and clinical judgement skills are developed. This requires that clinical teachers ask both low level and high level questions.

Comparison of Scholdra and Quiring's (1973) and Craig and Page's (1981) theoretical base for categorisation of questions

Scholdra and Quiring (1973) used Manson and Clegg's (1970) framework to categorise questions. Manson and Clegg had operationalized Bloom's (1956) original categories by using alternative terms and phrases to categorise the questions (see Figure 3.1).

Bloom	Manson and Clegg
Knowledge	Remembering-Recalls or recognises ideas and principles learned
Comprehension	Understanding-Translates or interprets information based on prior learning
Application	Solving-Selects and uses data to complete a problem task
Analysis	Analysing-Distinguishes, classifies, and relates hypotheses and evidence with an awareness of the thought processes used
Synthesis	Creating-Originates and integrates ideas into a proposal that is new to the student
Evaluation	Judging-Appraises, assesses, or criticises on a basis of specific standards or criteria

(Scholdra and Quiring, 1973, p. 16)

Figure 3.1 - Comparison of Bloom's and Manson and Clegg's Framework for Categorisation of Questions

Category	Cognitive Activity Required	Key Concepts	Sample Question Words
1. KNOWLEDGE	RECALL The question, regardless of complexity can be answered by simple recall of previously learned material.	Memory Repetition Description Knowledge	What; When; Who; Which; Define; Describe; Identify; List; Name; Recall; Show; State; How, Indicate; Tell; Yes or No questions, e.g., Did? Was? Is?
2. COMPREHENSION	UNDERSTANDING Questions that can be answered by merely restating and reorganizing material in a rather literal manner to show that the student understands the essential meaning.	Explanation Comparison Illustration	Compare; Contrast; Conclude, Demonstrate; Differentiate; Predict; Reorder; Which; Why; Distinguish; Estimate; Explain; Extend; Extrapolate; Rearrange; Rephrase; Inform; What; Fill in; Give an example of; Illustrate; Relate; Tell in your own words.
3. APPLICATION	SOLVING Questions that involve problem solving in *new* situations with minimal identification of prompting of the appropriate rules, principles, or concepts.	Solution Application	Apply; Build; Construct; Solve; Test; Consider; Demonstrate(in a new situation); How would; Check out.
4. ANALYSIS	EXPLORATION OF REASONING Questions that require the student to break an idea into its component parts for logical analysis, facts opinions, logical conclusions, etc.	Induction Deduction Logical Order	Support your; What assumptions; What reasons; Does the evidence support the conclusion; What does the patient seem to believe about; What words indicate bias or emotion; What behaviors.
5. SYNTHESIS	CREATING Questions that require the student to combine her ideas into a statement, plan, product, etc. that is new for her.	Productive Thinking Novelty	Write; Think of a way; Create; Propose a plan; Put together; Suggest; Develop; Make up; Formulate a solution; Synthesize; Derive.
6. EVALUATION	JUDGING Questions that require the student to make a judgment about something using some criteria or standard for making her judgment.	Judgment Selection	Choose; Evaluate in terms of; Decide; Judge; Select on the basis of; Which would you consider; Defend; What is the most appropriate; For what reasons do you favor; Which policy.

(Craig and Page, 1981, p. 20)

Figure 3.2 - Craig and Page's Framework for Categorisation of Questions

To facilitate categorisation of questions by independent raters, Scholdra and Quiring (1973) have provided examples of the beginning phrase for each category. For example remembering questions were those starting as

"Define....." and "List.....". Understanding questions began "Explain....."or "What are the reasons for.....". Craig and Page's (1981) on the other hand, provided the expected cognitive activity, key concepts, and sample question words. Malcomson (1990) also used Manson and Clegg's framework (1970 cited in Scholdra and Quiring, 1973).

Both frameworks (Craig and Page, 1981; Scholdra and Quiring, 1973) indicate the key concepts required for each category as well as sample questions and words which facilitated categorisation of questions. Although there is a difference in the format of presentation, the expected cognitive activity is present in both the frameworks. The principal factor in determining the level of question asked is the type of cognitive activity evoked by the question. This attribute is presented in Craig and Page's (1981) framework. As illustrated in Figure 3.2, the supporting description for each category provided clarification for the expected cognitive activity. Key concepts and sample words for questions within each category have also been provided. The explicit information provided within the framework enabled categorisation of questions with relative ease. For these reasons, the researcher selected Craig and Page as the conceptual framework for this research.

Chapter summary

The conceptual framework selected for question categorisation must demonstrate the cognitive activity evoked by the question. Categories within Bloom's (1956) taxonomy of the cognitive domain provided the foundation for developing the conceptual framework used by Scholdra and Quiring (1973), Craig and Page (1981), and Malcomson (1990). Craig and Page's (1981) framework was selected for this study. because it illustrates the concept which In turn, determines the level of cognitive activity (thinking) that is required

before responding. This categorisation facilitated questions to be classified as low level questions or high level questions. The following chapter discusses the methods and procedures of the study.

CHAPTER 4 - METHOD

Introduction

This chapter discusses the research design, selection of subjects, description of the setting in which data were collected, instruments and materials, and the data collection method and ethical considerations.

Research design

A comparative-descriptive design was used to study clinical teachers' use of questioning strategies. As stated by Burns and Grove (1987, p. 244) the "comparative-descriptive design examines and describes differences in two or more groups that occur naturally in the setting." The independent variables in the study were the clinical teachers' academic qualifications, teaching qualifications, years of clinical teaching experience, years of clinical experience, and years of classroom teaching experience. The dependent variables for this study were the types and levels of questions asked at post-clinical conferences.

Subjects

The population for the study consisted of 57 clinical teachers (43 sessional and 14 full time) from a university that conducts a three year pre-registration nursing course consisting of six semesters. There are two semesters per year. In Semesters 1 and 2, there is no clinical experience.

Students have clinical experience in Semesters 3, 4, 5, and 6. In Semester 3, students have preceptors who fulfil the role of the clinical teacher

during clinical experience. These preceptors conduct individual discussion with students at irregular intervals making this semester unsuitable for the study. Clinical teachers are responsible for clinical teaching in Semesters 4, 5, and 6. Therefore, it was decided that clinical teachers in Semesters 4, 5, and 6 would be the focus of this study.

The professional qualifications of clinical teachers included: registered nurse (RN), registered midwife (RM), and post-basic qualifications (see Appendix B). The clinical teachers in each semester were involved in teaching in their area of clinical expertise and according to their professional qualifications. Their academic qualifications included: Bachelor of Nursing, Post-Graduate Diploma in Health Science (Nursing), and other tertiary qualifications (see Appendix B). Teaching qualifications of the clinical teachers included: Post-Graduate Diploma in Education, Diploma in Education, Diploma in Nursing Education, Masters in Education, Masters in Nursing/Masters in Health Science (Nursing), and Teaching Certificate (see Appendix B).

Clinical teachers' years of teaching experience were categorised according to: number of years of combined classroom and clinical teaching, and number of years of clinical teaching only (see Appendix B). Clinical teachers number of years of clinical experience was also taken into account (see Appendix B).

Setting

The settings for data collection were the conference or seminar rooms in hospitals where Semesters 4, 5, and 6 students were placed for clinical experience. Only the clinical teacher and his/her students were present in the room during post-clinical conference.

Clinical rotation

In Semesters 4 and 5, each student underwent four clinical rotations (Rotations 1, 2, 3, and 4). In Semester 6, each student underwent three clinical rotations (Rotations 1, 2, and 3). To be consistent with Semesters 4 and 5, the third rotation in Semester 6 has been classified as Rotation 4. At each rotation, the clinical teacher would have a new group of students.

Post-clinical conference data

Post-clinical conferences were conducted by the clinical teacher at the conclusion of an eight hour clinical experience. They were attended by students for whom the clinical teacher was responsible during the eight hour shift. According to the institution's policy, each clinical teacher was assigned up to a maximum of seven students per rotation. Regardless of the number of students assigned to the clinical teacher, or the number of students who attended the clinical experience for the day, every clinical teacher was expected to conduct a post-clinical conference at the conclusion of the clinical experience.

As stated by Carpenito and Duespohl (1985); Copeland (1990); DeYoung (1990); and DiRienzo (1983), the post-clinical conference provide an ideal time for students to analyse and evaluate patient care. This requires critical thinking and decision making. Integration of theory to practice is explained and emphasised. It can also be used as a forum to discuss students' feelings about nursing in general, about their clinical experience, or even about a patient's feeling towards their management (DeYoung, 1990; Flynn, Marcus, Schmadl, 1981; Mitchell and Krainovich, 1982). Such discussion facilitates

students' professional development as well as providing opportunities to discuss situations that may have been stressful. Sometimes it may be necessary to debrief, by first discussing emotional experiences, then pursue discussion with other aspects of the patient's care (Mitchell and Krainovich, 1982). This may involve the clinical teacher asking several clarifying questions among other types of questions. Clinical teachers do ask questions when the student is actively involved in providing direct patient care. The researcher decided that presence of a data collector recording the questions asked by the clinical teacher, could affect the student's responding behaviour or elicit doubt in the patient about the student's ability in providing nursing care. Therefore, it was decided that post-clinical conferences conducted by clinical teachers in Semesters 4, 5, and 6, during the Rotations 1 and 4 would be audio taped and the questions asked by the clinical teachers at the post-clinical conferences would be analysed.

Instruments and materials

The materials used to collect the data were audio tape recorders and audio tape cassettes. The instrument used to categorise the questions asked at the post-clinical conferences was Craig and Page's (1981) framework which was described in Chapter 3.

Procedure

A letter of introduction (see Appendix A) explaining the purpose of the study, method of data collection, and ethical considerations was given to each clinical teacher either during orientation week or during the in-service study day held at the commencement of the semester. The consent form and demographic information sheet (see Appendix B) accompanied the letter of

introduction. The clinical teachers were asked to sign the consent form and complete the demographic information sheet upon agreeing to participate in the study. A pre-paid self-addressed envelope was enclosed for returning the consent and demographic information sheets.

The researcher visited each clinical teacher in Week 2 of the first rotation for the semester. Each clinical teacher was provided with an audio tape recorder and a tape cassette. The researcher demonstrated the process of recording including optimal placement of the recorder for clarity of recording. A return demonstration was carried out to ensure that the clinical teacher was confident about the recording process. At this visit, the researcher arranged a time to return to collect the taped cassette.

All clinical teachers were instructed to audio tape one post-clinical conference conducted between Weeks 3 and 4 of the first rotation and a second recording between Weeks 3 and 4 of the last rotation for the semester. The purpose of obtaining two recordings was: (a) to ensure that sufficient questions were asked for data analysis and (b) to determine the extent of variability between the types and levels of questions asked at both conferences. Week 1 in both rotations was avoided because it was an orientation week and mainly involved giving information.

In Rotation 1, 31 clinical teachers recorded one post-clinical conference that they had conducted between Weeks 3 and 4. Twenty-five of these clinical teachers also recorded one post-clinical conference between Weeks 3 and 4 of Rotation 2. Of the remaining 6 clinical teachers, one clinical teacher left at the end of the first rotation and was replaced by a clinical teacher who agreed to record two post-clinical conferences between Weeks 3 and 4 in Rotations 2 and 4. Another clinical teacher left at the conclusion of the third rotation and

was replaced by a clinical teacher who did not make a second recording. Four other clinical teachers did not make a second recording. In two cases, the students did not consent to the recording. In one case, the ward was involved in a disaster practice leaving, no time for post-clinical conference, and in another case the clinical teacher had only one student and decided not to have a post-clinical conference. Twenty-five clinical teachers of the original 31 carried out a second recording in Rotation 4, and one of the replacements carried out two recordings in Weeks 1 and 4 of Rotation 4. Therefore, 26 clinical teachers' recordings of two post clinical conferences have been used for data analysis.

In order to determine that the recording was audible for transcription, the researcher listened to the used audio tapes immediately following collection. All recordings were clear. Following the collection of the audio tapes the researcher transcribed all questions. An independent rater, who was a registered nurse with a Masters in Education, was given transcripts of the questions. Used tapes were stored by the researcher.

Data analysis

Initially, questions were transcribed by the researcher. To ensure at least a minimum of 90% reliability of question categorisation by the researcher and the independent rater, three pilot exercises were undertaken before the final question categorisation was carried out. These are described in the following chapter. Non parametric statistics which included Wilcoxon Matched-Pairs Signed Ranks test, Kruskal-Wallis one way ANOVA, Mann-Whitney U test, and Spearman's rho, have been used to determine the level of significance.

Ethical considerations

Permission to carry out the study was obtained from the University's Committee for the Conduct of Ethical Research and the School of Nursing Ethics Committee (see Appendix C). Audio tapes and transcriptions of questions asked were kept in a locked cabinet by the researcher and were not accessible to anyone else. The audio tapes will be deleted and the transcriptions will be shredded on completion of the required 5-year period as required by the University's Committee for the Conduct of Ethical Research. The independent rater was given transcripts of questions without participant identification. Anonymity of subjects was maintained throughout data collection, analysis, and reporting.

CHAPTER 5 - RESULTS

Introduction

This study categorised the questions asked by clinical teachers during the post-clinical conference to demonstrate the level of cognitive activity expected. The researcher and an independent rater carried out the categorisation. Initially, Craig and Page's (1981) framework was used to categorise the questions. Questions were categorised according to type of cognitive activity (knowledge, comprehension, application, analysis, evaluation, synthesis), then classified as low level or high level questions according to Scholdra and Quiring's (1973) classification in which low level questions included knowledge, comprehension, and application, and high level questions included analysis, evaluation, and synthesis. Additional categories were created, the rationale for which is explained in the chapter. The study also examined if there were any differences in the types and levels of questions asked in Rotation 1 and Rotation 4, if there were any differences in the types of questions asked by clinical teachers in Semesters 4, 5, and 6, the relationship between the levels of questions asked by clinical teachers and their academic qualifications and professional experience. Non parametric statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS).

Study participants

Thirty-one clinical teachers from Semesters 4, 5, and 6 commenced the study, 26 completed two audio recordings of post-clinical conferences. The results presented here are based on the 26 participants. Table 5.1 shows their areas of teaching according to the semester of study.

Table 5.1

Number of clinical teachers who participated in the study

Clinical experience	*Semester*		
	4	*5*	*6*
Paediatric nursing	2	2	-
Adult nursing	3	3	-
Maternity nursing	2	3	-
Psychiatric nursing	1	2	-
Emergency nursing	-	-	2
Operation room nursing	-	-	3
Intensive care nursing	-	-	3
TOTAL	**8**	**10**	**8**

Categorisation of questions

The researcher and an independent rater were responsible for categorising the questions asked by the clinical teachers at the post-clinical conferences. The researcher and the independent rater, using Craig and Page's (1981) framework (see Figure 3.2), independently categorised the questions asked by the 26 clinical teachers at two post-clinical conferences. The researcher's categorisation was then compared to the independent rater's categorisation. Of a total of 1085 questions asked, 92 (8.5%) questions were deleted. This was because in a few cases, poor audibility resulted in incomplete question transcription and because lack of contextual information made it impossible to understand some of the questions. Examples of such questions were: "So what's next?" "More than you would have thought?" "Any questions?" Of the remaining 993 questions, the researcher and the independent rater achieved an 85.6% level of reliability in question categorisation for 850 of the questions. In Scholdra and Quiring's (1973) study, the three independent raters achieved an 85.8% level of reliability of question categorisation. Therefore, the level of reliability achieved in the present study

was considered as satisfactory. Discussion related to the remaining 143 questions follows.

Table 5.2

Categorisation of questions that did not fit Craig and Page's framework

Category	Number (%)
Information	101 (10.2)
Yes/No	4 (0.4)
Affective	24 (2.4)
Others	15 (1.5)
TOTAL	**143 (13.1)**

Table5.2 shows the 143 questions that did not fit Craig and Page's (1981) framework. There were some questions which the researcher and the independent rater did not categorise because they did not fit Craig and Page's (1981) description of knowledge questions. These questions were asked to set the scene in relation to particular patients the students had cared for during the shift. Alternatively, they were asked to enable the clinical teacher to focus on an appropriate topic for questioning. Based on the response the student(s) gave, the clinical teacher was able to ask appropriate follow on questions. An example of such a question was: "How many of you had patients on PCA monitoring?" The subsequent question was: "If you were going to be writing a nursing care plan for a patient who had PCA monitoring analgesia, how would you consider writing up that care plan?" Another example was: "What things would you like to improve on or experience next week?" The response to the question would have enabled the clinical teacher to select appropriate experience for the student in the following week. The independent rater and the researcher agreed that such questions were seeking information to set the

scene for further questions and, therefore, for convenience agreed to categorise them as information questions. There were 9.3% (101) information questions. This category was then added to the framework and included to the group of low level (knowledge, comprehension, application) questions.

Craig and Page (1981) have included questions with words such as those beginning with "Did?" "Was?" and "Is?" as knowledge questions. According to them, such questions "regardless of complexity can be answered by simple recall of previously learned material" (see Figure 3.2). But, some of the yes/no questions asked did not fit Craig and Page's (1981) conceptual description. An example of such a question is: "Anyone seen a midline incision?" To respond to the question, students have to understand what a midline incision is, recall what other types of incision are used, then, using the process of elimination, respond to the question. In another situation the question asked was: "With the client can you foresee any problems?" This question required the student to consider the patient's situation, analyse the situation, then determine what problems might occur, before responding. The process of cognitive activity required in the two examples goes beyond that required for knowledge questions as stated by Craig and Page. The researcher and independent rater agreed that such questions be categorised separately as yes/no questions. A yes/no category was created. There were four (0.3%) such questions.

There were some questions which invited students to reflect and discuss their affective experiences which facilitate the student's professional development. During post-clinical conferences, students must be provided with opportunities to discuss their affective learning experiences. It can be argued that clinical teachers may individually discuss student's affective experiences, but at times, group discussion is a worthwhile learning experience for all

students. It provides an opportunity for discussing issues which cannot be discussed by the patient's bedside or openly in the ward. Craig and Page (1981) and Scholdra and Quiring (1973) have categorised questions within the cognitive domain. The conceptual framework used in their respective studies did not provide for categorisation of affective questions. Examples of affective questions include: "For you, how has it been?" "What else has been good?" The researcher and the independent rater agreed that such questions were seeking feelings and opinions about various aspects of students clinical experience. Although few in number, it was felt that these questions could not be ignored. These questions were categorised as affective questions. There were 2.2% (24) such questions.

In addition, there were a few questions which the researcher and the independent rater identified as varying types of probing (eg. clarifying and leading) questions. Sometimes, to build a knowledge base at one level, and assist the student to respond to the next level, it may be necessary to ask varying types of probing questions. These are called extension probes, clarification probes, justification probes, prompting probes, and redirectional probes (Brown, 1981; House, Chassie, and Spohn, 1990; Hunkins, 1989). Such questions develop students' critical thinking skills (DeTornay and Thompson, 1982) and therefore, cannot be ignored during categorisation. There were also rhetorical questions. An example of such a question is: "What, have you not looked it up, nobody knows anything about it at all?"; double barrelled questions, an example of which is: "What are you going to look for, what are you going to do?", and multifaceted questions such as: "What happens when your brain lacks oxygen? What can happen? What kinds of symptoms can you see?" Craig and Page's (1981) framework did not provide guide-lines for categorising such questions. Again as the number involved was very small, the researcher and the independent rater agreed to group them in

one category as `Others'. There were 14 (1.3%) such questions. As illustrated in Table 5.3, all the additional categories were added to Craig and Page's (1981) framework.

Table 5.3

Framework developed and used in the study

Level	Type
Low level	**Information** Knowledge Comprehension Application
High level	Analysis Evaluation Synthesis
	Affective **Yes/No** **Others** **- rhetorical** **- multifaceted** **- probing** **- double barrelled**

Note: Added categories are in bold print

As categories were added to Craig and Page's (1981) framework, it was apparent that their framework did not permit for categorisation of all questions asked by clinical teachers. To ensure that all questions asked are categorised, it is necessary to state the domain of question categorisation that will be considered in a study. In the present study, the researcher did not state the domain of question categorisation that was to be considered. Neither of the previous studies (Craig and Page, 1981; Scholdra and Quiring, 1973) had stated the domain of questions categorisation that were being considered, nor had they stated if affective type questions were asked, and if so, were they considered for categorisation.

Craig and Page's (1981) conceptual framework was adapted from Bloom's(1956) taxonomy of the cognitive domain. The taxonomy of the cognitive domain is based on the principle of increasing complexity. Bloom developed the taxonomy to guide teachers to formulate curriculum objectives which, in turn, guided the construction of exam questions. Such an approach is more feasible to follow when developing planned, written examination questions than in the type of questions asked at post-clinical conferences investigated here because, the questions arising out of the context often cannot be planned. However, as suggested by Reilly and Oermann (1992) current nursing practice must encompass 'knowing that' and 'knowing how'. They further explain that 'knowing how' involves the cognitive process of concept learning, problem solving, decision making , critical thinking, and clinical judgement. Therefore, clinical teachers need to facilitate development of integrating the `knowing that' and `knowing how'. To do so, clinical teachers have to ask factual questions, high level questions, as well as clarifying questions. A method of classification by House, Chassie, and Spohn (1990) which includes knowledge questions, application questions and problem-solving questions is a possible alternative. Classification of questions suggested by DeTornay and Thompson (1982) which includes factual or descriptive questions, clarifying questions, and higher order questions is yet another alternative.

Following establishment of reliability of question categorisation, validation of the categorisation was attempted. The researcher individually approached 11 of the 26 clinical teachers to validate their categorisation of the questions. The researcher, using Craig and Page's (1981) framework, explained the process of categorisation. The clinical teacher was then requested to comment on the categorisation of the questions they had asked. They were advised to make any necessary changes to the categorisation.

Table 5.4

Validation of categorisation of questions by clinical teachers

Clinical teacher and semester		Number of questions asked	Number of question changes within categories
1.	4	103	nil
2.	4	59	nil
3.	4	23	nil
4.	4	32	nil
5.	4	65	nil
6.	5	34	1
7.	5	49	nil
8.	5	11	nil
9.	6	106	6
10.	6	46	3
11.	6	22	nil
TOTAL		550	10(1.8%)

As illustrated in Table 5.4, three clinical teachers made changes to low-level (knowledge to application) questions. As only 10 (1.8%) of the 550 questions asked by 11 clinical teachers were changed, the categorisation carried out by the researcher and independent rater were considered to be valid. Final analysis of questions was carried out using the categorisation agreed upon by the researcher and the independent rater.

For the purpose of this study, information, knowledge, comprehension, and application questions have been considered as low-level questions. Analysis, evaluation, and synthesis have been considered as high level questions.

Types and levels of questions that clinical teachers asked.

The first research question was : What are the types and levels of questions that clinical teachers ask? Table 5.5 illustrates the categories and levels of questions that clinical teachers asked at the two post-clinical

conferences. It also includes categories that were added to Craig and Page's (1981) framework. In the following paragraphs, examples of low level and high level questions asked will be presented. To begin with, examples of low level questions which include knowledge, comprehension, and application questions, are presented. Then examples of high level questions which include analysis, evaluation, and synthesis, are presented. Examples of information questions, which have been classified as low level questions, have been provided in the previous section and examples of questions categorised as 'others'.

Table 5.5

Total number of types and levels of questions that clinical teachers asked at two post-clinical conferences

Type of question	Number (%)
LOW LEVEL	
Information	101 (10.2)
Knowledge	508 (51.2)
Comprehension	137 (13.8)
Application	160 (16.1)
Total	**906 (91.2)**
HIGH LEVEL	
Analysis	19 (1.9)
Evaluation	16 (1.6)
Synthesis	9 (0.9)
Total	**44 (4.4)**
Affective	24 (2.4)
Yes/No	4 (0.4)
Others	15 (1.5)
Total	**43(4.3)**

As is evident from Table 5.5, the knowledge question was the most common type of questions asked. The following knowledge questions were asked during a post-clinical conferences conducted during maternity nursing rotations. One clinical teacher began the post-clinical conference by asking a student to state what she did for the day. The student responded by stating: "Today, I looked after a patient who had (patient situation stated)." The clinical teacher then proceeded to ask the following series of questions : "How much weight does an average person put on during pregnancy?", "Where does the weight go?", "What is normal pH?", "And the specific gravity?", "And what's the main thing we are looking for?", "What is the major complication in pregnancy, the most common complication?", "Do you know what the two signs are"?, "What was the other thing we are looking for in the urine, apart from protein, specific to pregnancy?" The clinical teacher had asked 12 questions of which nine were knowledge questions. Another clinical teacher's discussion, during a similar rotation, was focussed on client assessment using a specific form. Examples of questions asked were as follows: "First thing in the nursing process are?", "And then what do you do?", "The next bit?", "What's the next step?", "How do you evaluate nursing care?", "What's the other evaluation of your nursing action?", "What sort of things are you going to put for labour?", "What is an infarct?" The clinical teacher asked 26 questions of which 18 were knowledge questions

The following series of knowledge questions was asked at a post-clinical conference held during operation room nursing experience. The clinical teacher was discussing surgical incisions. The types of questions asked were: "And what is the organ underlying the stomach?", "What do you think this might be?", "What is the function of the gall bladder?", "What is the function of bile?", "Do we need to have a gall bladder?", "Is highly alkaline or acidic?" [sic], "What is normal pH?", "What are these called?", "What is operative cholangiogram?"

The clinical teacher asked 33 questions of which 29 were knowledge questions.

During a post-clinical conference held during an adult rotation, the focus of discussion was about the nursing care of a patient with osteoarthritis. The clinical teacher asked the following questions to the student who cared for the patient: "What is arthritis?" "Do you know which part of the joints are affected?" "When it is arthritic joint, which part of the joint?" [sic], "With destruction of cells, what happens?", "What did she have done?", "Have you had time to examine her, [sic] even from last week, which part of the joint is affected?", "What is prednisolone?", "Do you know some of the drugs used on the ward?" The opportunity to ask high level questions though present, was not grasped.

The cognitive activity in the examples of knowledge questions presented in the preceding paragraphs was recall of facts or of steps that the student had to take to complete a procedure or task. As stated by Craig and Page (1981) "such enumeration of data does little to foster the cognitive process required to nurse" (p. 21).

After knowledge, the application question was the next most commonly asked type of low level question. The following are examples of application questions asked during a maternity rotation. The clinical teacher had expected the students to read up about diabetes mellitis. An application question asked was: "What are you going to do for the baby with low blood sugar?" Discussion then centred on the effects of rhesus incompatibility between the mother and foetus during pregnancy. During this discussion the clinical teacher asked: "So what would you do if she had a miscarriage?" The response to this question ended the discussion about rhesus incompatibility. Discussion then focussed on care of a patient immediately following delivery.

A series of application questions asked were as follows: "Your lady has arrived on the ward and has been handed over to you. What are you going to do?", "What would you expect her temperature to be?", "What about her pulse?", "What are you going to do next?", "It is all over to one side. What are you going to do?", "This lady has been on the ward for 10 minutes and her bluey is all soaked. What are you going to do?", "What else are you going to do?", "This lady says 'I just passed a great big clot', what are you going to do?"

The cognitive activity in response to application questions is problem solving. In the examples provided, the students had to think and solve problem situations. The purpose of clinical experience is for students to learn to identify patient problems and solve these problems. The clinical teacher or the nurse with whom the student has been working during the shift may have assisted the student in solving the problems. During post-clinical conference, the student should be encouraged to reflect and identify the problems that she/he has determined in the patient, and how they were solved. This would necessitate the need to ask more application questions than those identified in the present study.

Comprehension was the third commonly asked low level question type. For example at a post-clinical conference during an adult rotation, a student had cared for a patient who had epidural anaesthesia. The clinical teacher directed the following comprehension question at the student: "Tell us about epidurals?", When discussing Constavac, a type of tissue drain, the clinical teacher asked: "Do you know why they take it out from the battery box to have a shower?", "Why do you think they removed it today?" At a post-clinical conference during a maternity rotation, the discussion concerned documentation of assessment data. The clinical teacher asked: "What is the difference between objective data and subjective data?", "Why is medication

significant?", "Anybody got any idea which is a better barrier, breast or placenta?" The following comprehension questions were asked at a post-clinical conference during paediatric rotation where the clinical teacher was discussing assessment of growth and development. "Why may the eardrum be retracted?", "Why do we need a fontanelle?", "Why do we feel for femoral pulses?" Explanation was the key concept illustrated in the comprehension questions. These types of questions promote understanding. The student needs to understand the problem before determining the action that should be taken to solve the problem. Therefore, it is appropriate to ask comprehension questions when the student is involved in planning the intervention.

The low level questions discussed above made up 91.2% of all questions recorded in this study. The high level questions discussed below, made up only 4.4%. Analysis questions were the highest number (1.9%) of high level questions asked. For example at a post-clinical conference during a maternity rotation, the clinical teacher, when discussing assessment of the newborn, asked the following analysis questions: "What if you can see the labia minora, what would you think?", "Why aren't you going to be worried at this stage?" During a discussion at a post-clinical conference in adult rotation, the clinical teacher was discussing pharmaceutical management of patients. An analysis question asked was: "Many of you say give analgesia. What is the rationale. Why do we give analgesia?" At a post-clinical conference during a paediatric rotations, the focus of discussion was about the nursing management of a patient with epilepsy. The clinical teacher asked: "Why do you reckon he is having the seizure?" These questions encourage students to analyse their reasons for their actions on the basis of scientific principles.

During post-clinical conferences, each student may present the patient that he or she had cared for during the shift, and discuss the related care that

was implemented for the patient. To facilitate exploration of scientific principles that had been used in different patient situations as well as encourage students to form logical conclusions, the clinical teacher needs to ask analysis questions. However, only 19 (1.9%) analysis questions were asked. Even when analysis questions were asked, their purpose was not always clear. For example, a clinical teacher, when discussing administering pre-medication during an adult rotation, asked the following questions: "What is the purpose? Why is it done? Why do we need to dry the oral, sort of the mucosal secretion? [sic]" The intention of the clinical teacher was to ask the student to explore the reasons for administering pre-medication to patients. As the question was reworded in many ways all at once, the students could not grasp the intention, resulting in the students not responding to the question.

The next type of high level questions is evaluation. Examples of evaluation questions asked at a post-clinical conference during maternity rotation included: "So if the baby isn't a diabetic and it has got high blood sugar, what's going [sic] to do to its insulin production?", "Contrary to all this, if you have a patient with advanced diabetes who has been a diabetic perhaps since as a child [sic], she may have vascular disease, they can have impaired circulation, what's that going to do to the baby?", "How do you think early discharge programme would affect, you know from delivery, optimum recovery. Do you think it is a good idea?" When discussing levels of spinal injury at a post-clinical conference during a paediatric rotation, the clinical teacher asked the following evaluation questions: "If say her level was say higher [sic], say the thoracic region, what sort of problems will she have?" "What else might she have if it was a higher level?" The aim of evaluation questions is to encourage students to make a judgement, on the basis of certain criteria. Again, clinical teachers did not make use of available opportunities to ask such questions.

The following synthesis questions were asked at a post-clinical conference during adult an rotation. The discussion was about the use of the nursing process. The clinical teacher asked: "How would you be, as a new graduate, how would you see your role in such a hospital?", "So in terms of the nursing process, these people do not have any knowledge of the nursing process. When do you think it will be appropriate for you to be involving yourself with the nursing process?" The cognitive activity in synthesis questions requires the student to combine ideas into a plan. Such questions could have been asked to facilitate application of concepts and principles learned from one clinical experience to new situations that the student is likely to experience in future rotations or as a registered nurse in the future.

Differences in the types and levels of questions asked by clinical teachers between two rotations

The second research question was: Are there any difference in the types and levels of questions asked by clinical teachers between two rotations in a four rotation course of clinical experience? The total number of questions asked by each clinical teacher at post-clinical conferences held during Rotation 1 and Rotation 4 was determined. The results are presented in Table 5.6. As is evident in Table 5.6, there was considerable variation in the total number of questions asked by each clinical teacher at both post-clinical conferences. The total number of questions asked by all clinical teachers at the post-clinical conference held during Rotation 4 (365 questions) was slightly more than half the total number of questions asked at the post-clinical conference held during Rotation 1 (628 questions).

Table 5.6

Comparison of number of questions asked by each clinical teacher during post clinical conferences held during Rotations 1 and 4

Clinical teacher	Rotation 1	Rotation 4
1	5	5
2	3	0
3	5	39
4	8	48
5	3	11
6	4	3
7	2	0
8	0	12
9	6	0
10	8	2
11	15	38
12	6	3
13	43	25
14	56	27
15	7	24
16	34	7
17	18	10
18	18	6
19	19	13
20	28	27
21	0	0
22	23	32
23	83	9
24	20	10
25	8	12
26	6	2
TOTAL	628	365

To determine whether clinical teachers asked significantly more questions, more low level, and more high level questions at one conference than the other, the types of questions asked by each clinical teacher in Rotation 1 and Rotation 4 was established. The total number of each type of question asked by all clinical teachers in Rotation 1 and Rotation 4 was then ascertained. These results are illustrated in Table 5.7. It is evident that although the total number of questions asked at Rotation 4 was slightly more than at Rotation 1, the percentage of low level questions at post-clinical conferences held during the two rotations was consistently high (over 90%).

Additionally, knowledge was consistently the most common type of low level question asked (over 50%).

Table 5.7

Comparison of types and levels of questions asked by clinical teachers at post-clinical conferences held in Rotations 1 & 4

Type of question	Rotation 1	Rotation 4	Total
LOW LEVEL			
Information	63 (10.0%)	38 (10.4%)	101 (10.2%)
Knowledge	324 (51.6%)	184 (50.4%)	508 (51.2%)
Comprehension	79 (12.6%)	58 (15.9%)	137 (13.8%)
Application	109 (17.4%)	51 (14.4%)	160 (16.1%)
Total	**575 (91.6%)**	**331 (91.1%)**	**906 (91.2%)**
HIGH LEVEL			
Analysis	11 (1.8%)	8 (2.2%)	19 (1.9%)
Evaluation	9 (1.4%)	7 (1.9%)	16 (1.6%)
Synthesis	1 (0.2%)	8 (2.2%)	9 (0.9%)
Total	**21 (3.4%)**	**23 (6.3%)**	**44 (4.4%)**
Affective	20 (3.2%)	4 (1.1%)	24 (2.4%)
Yes/No	2 (0.3%)	2 (1.1%)	4 (0.4%)
Others	10 (1.6%)	5 (1.4%)	15 (1.5%)
Total	**32 (5.1%)**	**11 (3.6%)**	43 (4.3%)
GRAND TOTAL	**628 (100.0%)**	**365 (100.0%)**	**993 (100.0%)**

As the results of the types of questions were strongly positive, non parametric statistical analyses were performed here and (in the remainder of the chapter). Statistical analyses were carried out on information, knowledge, comprehension, application, analysis, evaluation, and synthesis questions. Statistical analysis on the affective type questions, yes/no questions, and those categorised as 'others' was not carried out as only a very small number of these questions were asked. Wilcoxon Matched-Pairs Signed-Ranks test revealed that there were significantly more questions asked at the post-clinical conference held in Rotation 1 (Median = 16.00) than at the post-clinical conference held in Rotation 4 (Median = 10.00) $Z = 2.48$, $p < .05$. However, there was a significant difference in the number of low level questions asked at

the post-clinical conference held during Rotation 1 (Median = 14.50) and at the post-clinical conference held In Rotation 4 (Median = 10.00) $Z = 2.49$, $p = < .05$. There was no significant difference in the number of high level questions asked at the post-clinical conferences held during Rotation 1 (Median = .00) than at the post-clinical conference held during Rotation 4 (Median = .00) $Z = .44$, $p > .05$, possibly because so few questions were recorded at either conference.

Differences in the types and levels of questions asked by clinical teachers between three final semesters

The third research question was: Are there any differences in the types and levels of questions asked by clinical teachers between the three final Semesters (4, 5, and 6) in a six semester programme? As students progressed from Semester 4, through to Semesters 5 and 6, the type of patient care that they were learning to provide, progressively increased in complexity. Therefore, it was predicted that clinical teachers in Semester 5 would ask more high level questions than clinical teachers in Semester 4. Additionally, it was predicted that clinical teachers in Semester 6 would ask more high level questions than the clinical teachers in Semester 5. To test the predictions, the number of each type of questions asked by all clinical teachers in the individual semesters in Rotations 1 and 4 was established. These were summed to provide the total number of questions asked by each clinical teacher in both rotations. The total number of questions asked by clinical teachers in each semester are presented in Table 5.8. As illustrated in the table, the number of types of questions asked by the clinical teachers did not indicate any pattern across the three semesters. To determine whether there was a significant difference in the number of low level questions and high level questions asked by clinical teachers In Semesters 4, 5, and 6, a Kruskal-Wallis one-way ANOVA

was carried out. For low level questions, the results indicated that there was no significant difference between the three semesters: Semester 4 (Median = 41), Semester 5 (Median = 28), and Semester 6 (Median = 21.8), X^2 (2,N = 26) = 1.37, $p > .05$. For high level questions, the results also indicated that there was no significant difference between the three semesters: Semester 4, (Median = .5), Semester 5 (Median = 1.0), and Semester 6 (Median = 0), X^2(2,N = 26) = 2.19, $p > .05$. For the total number of questions, the results indicated that there was no significant difference between the three semesters: Semester 4 (Median = 43.5), Semester 5 (Median = 31.0), and Semester 6 (Median = 21.5), X^2 (2,N = 26) = 1.21, $p > .05$.

Table 5.8

Types and levels of questions asked by clinical teachers of Semesters 4, 5, and 6 students

Type of questions	Number of clinical teachers per semester		
	4 n=8	5 n=10	6 n=8
LOW LEVEL			
Information	35 (11.8%)	40 (11.0%)	26 (7.8%)
Knowledge	136 (45.9%)	171 (47.0%)	201 (60.4%)
Comprehension	36 (12.2%)	54 (14.8%)	47 (14.1%)
Application	58 (19.6%)	58 (15.9%)	44 (13.2%)
Total	**265 (89.5%)**	**323 (88.7%)**	**318 (95.5%)**
HIGH LEVEL			
Analysis	10 (3.4%)	8 (2.2%)	1 (0.3%)
Evaluation	3 (1.0%)	10 (2.7%)	3 (0.9%)
Synthesis	1 (0.3%)	5 (1.4%)	3 (0.9%)
Total	**14(4.7%)**	**23 (6.3%)**	**7 (2.1%)**
Affective	11 (3.7%)	12 (3.3%)	1 (0.3%)
Yes/No	2 (0.7%)	0	2 (0.6%)
Others	4 (1.4%)	6 (1.6%)	5 (1.5%)
Total	**17 (5.8%)**	**18 (4.9%)**	**8 (2.4%)**
GRAND TOTAL	**296 (100%)**	**364 (100%)**	**333 (100%)**

Relationship between clinical teachers' teaching qualifications and the types and levels of questions asked

The fourth research question was: Is there a relationship between clinical teacher's teaching qualifications and the types and levels of questions that they ask? Information about the clinical teachers' teaching qualifications was obtained from the demographic information sheet (see Appendix B). Table 5.9 shows the academic qualifications of the 26 clinical teachers in the study and the grouping of the clinical teachers. Group 1 consisted of clinical teachers with teaching qualifications (Masters in Nursing, Post-Graduate Diploma in Education, and Diploma in Nursing Education). Group 2 consisted of clinical teachers with professional qualifications and with or without baccalaureate degree.

Table 5.9

Academic qualifications of clinical teachers

Type of qualification	Number
Group 1	
1. Bachelors degree with Diploma in Education/ Diploma in Nursing Education	5 (19%)
2. Master's degree	3 (12%)
TOTAL	8
Group 2	
3. Professional qualifications only	5 (19%)
4. Completing Bachelor's degree	4 (15%)
5. Bachelor's degree	9 (35%)
TOTAL	**18**

Table 5.10 shows the types and levels of questions asked by the two groups of clinical teachers. A Mann-Whitney U test was performed to determine whether there was any significant difference in the number of low level questions and high level questions being asked by the clinical teachers in the two groups. There was no significant difference in asking low level questions between clinical teachers with teaching qualifications (Median = 41.00) and those without teaching qualifications (Median = 25.00) $Z = 1.14$, $p > .05$. There was also no significant difference in asking high level questions between those with teaching qualifications (Median = 5) and those without teaching qualifications (Median = 0) $Z = .18$, $p = > .05$. It can be concluded that clinical teachers' teaching qualifications did not make any difference to the level of questions asked.

Table 5.10

Type and level of questions asked by clinical teachers with and without teaching qualifications

Type and level of questions	With teaching qualifications Group 1 n=8	Without teaching qualifications Group 2 n=18
LOW-LEVEL	(%)	(%)
Information	16 (4.0)	85 (14.3)
Knowledge	256 (64.2)	252 (42.5)
Comprehension	55 (13.8)	82 (13.8)
Application	51 (12.8)	109 (18.4)
Total	**378 (94.8)**	528 **(89.0)**
HIGH-LEVEL		
Analysis	5 (1.3)	14 (2.4)
Evaluation	4 (1.0)	13 (2.0)
Synthesis	4 (1.0)	5 (0.8)
Total	**13 (4.3)**	**32 (5.2)**
Affective Domain	1 (0.3)	23 (3.9)
Yes/No	0	4 (0.7)
Others	7 (1.3)	7 (1.2)
GRAND TOTAL	**399 (100)**	**594 (100)**

Relationship between clinical teachers' years of clinical experience and types and levels of questions asked.

The fifth research questions was: Is there a relationship between clinical teachers' years of clinical experience and the types and levels of questions that they ask? The years of clinical experience varied from 5 to 23 years ($M = 11$). Spearman's rho indicated that there was a significant relationship between clinical teachers' years of clinical experience and low level questions asked, $r_s = .49$, $p < .05$. There was no significant relationship between clinical teachers' years of clinical experience and the number of high level questions, $r_s = .00$, $p > .05$. This was an unexpected result because it was anticipated that clinical teachers with more years of clinical experience would ask more high level questions.

Relationship between clinical teachers' years of clinical teaching experience and types and levels of questions asked.

The sixth research question was: Is there a relationship between clinical teachers' years of clinical teaching experience and types and level of questions asked? Information about clinical teachers' clinical teaching experience was obtained from the demographic data sheet (Appendix B). The number of years of clinical teaching experience varied from 0 to 18 years ($M = 3.7$). Spearman's rho was used to determine the relationship between years of clinical teaching experience and levels of questions asked. The results indicated that there was a significant but weak relationship between the number of years of clinical teaching experience and the number of low level questions asked, $r_s = .18$, $p < .05$. There was no significant relationship between years of clinical teaching experience and the number of high level questions asked, $r_s = .01$, $p > .05$.

Difference in asking high level questions between clinical teachers involved in classroom and clinical teaching, and clinical teaching only.

The seventh research question was: Do clinical teachers who are concurrently involved in classroom teaching and clinical teaching ask more high level questions than those involved in clinical teaching only? Information about clinical teachers' teaching commitments was obtained from the demographic sheet (see Appendix B). As illustrated in Table 5.11, there were nine clinical teachers involved in classroom and clinical teaching, and 17 clinical teachers involved in clinical teaching only. The number of questions asked by each clinical teacher in both conferences was totalled, after which statistical analysis was carried out. Results of a Mann-Whitney U test indicated that there was no significant difference in the number of high level questions being asked between clinical teachers involved in classroom and clinical teaching (Median = 0) and clinical teachers involved in clinical teaching only (Median = 1) $Z = .56$, $p > .05$. There was also no significant difference in the number of low level questions between clinical teachers involved in classroom teaching, clinical teaching (Median = 26) and clinical teachers involved in clinical teaching only (Median = 29) $Z = .73$, $p > .05$.

Table 5.11

Types and levels of questions asked by clinical teachers involved in classroom and clinical teaching, and clinical teaching only

Type and level of questions	Classroom & clinical teaching n = 9	Clinical teaching n = 17
LOW LEVEL		
Information	19 (4.7%)	82 (14.2%)
Knowledge	240 (60.7%)	262 (45.3%)
Comprehension	58 (14.3%)	79 (13.6%)
Application	52 (12.8%)	108 (18.7%)
Total	**369 (92.5%)**	**531 (91.8%)**
HIGH LEVEL		
Analysis	9 (2.2%)	10 (1.7%)
Evaluation	8 (2.0%)	8 (1.4%)
Synthesis	9 (2.2%)	0
Total	**26 (19.2%)**	**18 (21.8%)**
Affective Domain	0	24 (4.1%)
Yes/No	1 (0.2%)	3 (0.5%)
Others	8 (0.7%)	3 (0.5%)
Total	**9 (0.9%)**	**30 (5.1%)**
Grand Total	**404 (100%)**	**579 (100%)**

In the following chapter, a summary of the findings and related discussion are presented. Implications for nursing education and recommendations for further research are also presented.

CHAPTER 6 - DISCUSSION

Summary of study

The aim of this study was to examine the use of and variation in clinical teachers' use of questioning as a teaching strategy. A convenience sample of 26 clinical teachers participated in the study. The independent variables included clinical teachers' academic qualifications, teaching qualifications, years of classroom teaching, years of clinical teaching, and years of clinical experience. The dependent variable was the types and levels of questions asked at post-clinical conferences. A total of 1085 questions were asked at two post clinical conferences held during two rotations. Of these, 993 questions were analysed. All clinical teachers asked far more low level questions than high level questions. Clinical teachers asked more questions at the post-clinical conference held in Rotation 1 than that held in Rotation 4. There was a significant relationship between clinical teachers' years of clinical experience and the number of low level questions asked. There was also a significant but weak relationship between the number of years of clinical teaching experience and the number of low level questions asked.

Major findings and related discussion

Types of questions asked

In this study, clinical teachers in the last three semesters of a 3-year pre-registration degree course, asked more low level questions than high level questions. The most common type of low level question asked was knowledge questions. By asking predominantly knowledge questions, clinical teachers were facilitating recall of information rather than application of knowledge at a

higher level. Clinical teachers appeared to be assuming that ability to recall factual information will imply that the student will be able to apply the knowledge at a higher level. This was illustrated in many situations and two such situations are presented here.

At a post-clinical conference during a paediatric rotation, the clinical teacher was discussing normal developmental assessment of a child. The following series of questions were asked in relation to developmental assessment: "Can someone tell about growth when they think about growth of a child?" "What about development?" "So, what do we mean by skills?" "What is stepping reflex?" "What is fontanelle?" "Why do we need a fontanelle?" "When does a fontanelle close?" All of these questions demanded recall of factual information. Questions requiring the student to apply the factual information at a higher level was not asked.

Similarly, at a post-clinical conference during an adult rotation, the clinical teacher stated that the topic for discussion was pharmacology. The discussion began with the clinical teacher directing the following questions at one student: "What are things you have given? [sic] Give us two medications you have come across." The student was unable to recall two drugs she had administered but was able to state the medical diagnosis, treatment, and described the nursing care she had implemented for the patient. The clinical teacher then asked: "What medications did you put to dilate the pupils. And by dilating the pupil, you are constricting what muscles?" This is a complex question which informed the student that she had to recall what the drug was, as well as the muscles that were being constricted. The student was only able to state the name of the drug and that specific instructions to be followed related to the instillation. Following the student's response, the next question asked was: "What was the instruction?" This questions again demanded recall

of facts. The discussion ended with the clinical teacher directing further recall type questions to other students present at the clinical conference. Types of questions asked required each student to name at least two drugs they had given and the schedule they belonged to. Drugs can be referred to, according to their numerous trade names or their generic name. It was not was not made clear to the student which name was required. So, students responded by stating the trade name only. By merely asking students to recall the name the drug they had administered to a patient does not teach them about the purpose of the drug, its mechanism of action, or its effectiveness. For such learning to occur, it is necessary, and valuable to ask high level questions related to the use of a drug in varying patient situations, and how to evaluate the effectiveness of the drug.

Another reason for asking predominantly low level questions was, as stated by a clinical teacher in Paterson's (1994) study, that it is the only way to determine what they know, and therefore, prevent errors in patient care. However, it should be noted that to prevent errors in patient care, the clinical teacher needs to promote the relationship between 'knowing that' and 'knowing how'. After all, this is one of the main aim of clinical experience. Therefore, questions asked have to go beyond recall of facts. However, clinical teachers based their questions on the information given by each student about what they had done for their patient on that day. The clinical teacher assumed that by facilitating recall of facts or events related to the nursing care of the patient, the student would be able apply the knowledge to other patient situations. Reilly and Oermann (1992) have stated that post-clinical conferences provide opportunity for students to examine the data they have collected from a patient, the inferences made, and the actions taken to solve the problems. This type of reflection will facilitate development of clinical judgement skills as well as problem solving. One way of developing these is by asking high level

questions at post-clinical conferences. For example, at a post-clinical conference during a paediatric rotation, the clinical teacher began by stating: "(name of student) do you want to hand over your patient to me?" The student then provided a brief overview of her patient who had urinary tract infection (UTI), after which the clinical teacher asked: "Is she on medications?" "What investigations did they do to disapprove she had UTI?" "What else should we assume with UTI?" These questions facilitated recall of specific events in the management of the patient. The next question asked was: "When she came back from theatre, why could she have a drink so quickly?" This question, though valid on its own, does not form a link to the previous three questions. That is, why was the patient taken to theatre? The student who cared for the patient, but not the other students present at the post-clinical conference, may know the reason. Obviously, the student who cared for the patient was able to respond to the questions. The next question was: "Why was she able to have a drink so quickly?" "What does that stuff do?" "Why?" "What other reasons are there that you have full induction?" These questions as well as the three further questions asked were related to induction of anaesthesia. The student who cared for the patient was able to respond to three of the questions only. As the types of questions facilitated recall of events, only the student who cared for the patient was able to respond. The clinical teacher ended the discussion by providing the answers to some of the questions related to induction of anaesthesia, then went on to direct questions at the next student. The opportunity to ask high level questions was not taken.

Although low level questions were predominantly asked, in particular knowledge questions, they were also directed at one student who was responsible for the care of a patient. By doing this, the clinical teacher was focussing the attention at that student only, and obviously facilitating recall of events related to the management of the patient. Reilly and Oermann (1992)

have stated that group discussion at post-clinical conferences promotes cognitive development by exposure to multiple perspectives relative to nursing care and diverse points of view. For this to occur, the clinical teacher, following a student's presentation of his/her patient, could have asked questions that enlisted the group to identify the problems experienced by the patient, then determine why the interventions (as stated by the student) were taken. Questions related to the principles used in the management could have been asked. This would encourage diverse points of view, as well as group participation.

Although different types of questions were asked by some clinical teachers, the sequence of asking did not facilitate a chain of reasoning. To facilitate a chain of reasoning, it is important that questions are in a logical order such as: knowledge, comprehension, application, analysis, evaluation, and synthesis questions. The sequencing of questions can be in a deductive or inductive format. Bloom's (1956) taxonomy of the cognitive domain from which Craig and Page (1981) developed their conceptual framework, suggest a definite linearity of processing information, either deductively or inductively. Once started, there is no going back to the preceding level. However, as advocated by Hunkins (1989), when developing a student's thinking, it is useful to go down to the next level. For example, if a student is unable to answer a comprehension question, it is useful to go back and pose further knowledge questions to build a satisfactory knowledge base, the ask the comprehension question. But such a format was not was not followed. The order of questioning appeared to be ad hoc rather than follow a logical format. For example, at a post-clinical conference during a maternity rotation, the student gave a description of her patient's first and second stage of labour which was stated as two hours, and 15 minutes respectively. The clinical teacher then asked: "Is that reasonable, would you expect it to be short, say 15 minutes?"

This is an evaluation question which, based on the student's information, was appropriate to ask. Following the student's response, a short discussion about the client's labour was held after which the clinical teacher asked: "What sort of nursing problems did she have, nursing diagnoses would you say?" [sic] "What sort of nursing intervention would you advise her to have?" These are application questions. The subsequent question was: "And she's got an air-ring?" This is a knowledge question, which was followed by: "So anybody else volunteer any nursing diagnoses for this lady?" This is also a knowledge question which again, was responded to by the student who had cared for the patient, as she merely had to recall the nursing diagnoses that she had developed and documented in the care plan. The clinical teacher then asked: "What else has she got that you need to think about?" This is an application question. Again, the same student responded. The discussion ended here with the clinical teacher stating the main problems that were evident in the patient. Even though the questions were based on the responses (facts) provided by the student, the clinical teacher did not make use of the opportunity to follow a logical deductive or inductive format.

From the preceding paragraphs, it is apparent that more low level questions were predominantly asked at the post-clinical conferences. According to Carpenito and Duespohl (1985), Copeland (1990), DeYoung (1990) and Mitchell and Krainovich (1982) the purpose of a post-clinical conference is to analyse and evaluate patient care, as well as discuss students' feelings about their clinical experience, or nursing in general. One way of ensuring the achievement of the stated purposes is to provide the students with objectives either for weekly learning, or for the entire rotation. These objectives can then be used as a guide for discussion at the post-clinical conference, and therefore, guide the types of questions that can be asked. This assertion has been demonstrated by Bloom (1956), who developed a taxonomy of

educational objectives to guide teachers to develop a curriculum. The curriculum objectives guided the teachers to select the most appropriate strategy for teaching, as well as develop examination questions.

A type of question commonly asked at the conclusion of the post-clinical conference was: "Any questions?" or "Anybody got any questions?" Such questions did not evoke any response. Often, at the conclusion of a discussion, it is necessary to determine students' comprehension of subject matter taught or provide opportunity for students to ask clarifying questions related to any aspect of the discussion. One way of doing this is for the teacher to first summarise the discussion, then invite students to ask clarifying questions about any of the points summarised. This clarification is important. However, this format was not followed, resulting in the lack of students' response to the question.

Differences in the types and levels of questions asked between two rotations

In Rotations 1 and 4, each clinical teacher had a new group of students. However, the total number of questions asked at the post-clinical conferences held during Rotation 4 was considerably less than in Rotation 1. Additionally, low level questions were predominantly asked. It was predicted that at the post-clinical conferences held during Rotation 4, clinical teachers would have asked more high level questions. After all, by Rotation 4, which is the last rotation for the semester, students in Semesters 4 and 5 have had three previous clinical experiences, and students in Semester 6 would have had two clinical experiences. This would have given them the opportunity to validate the application of nursing principles to varying patient situations. Theoretical knowledge would have also increased because of attending lectures and tutorials. Therefore, they should be able to analyse and evaluate the nursing

care they had implemented, as well as synthesise knowledge. Clinical teachers need to see evidence of such developments, which they may have seen in some students during the clinical experience. The consolidation of such experience can be facilitated by clinical teachers asking high level questions during post-clinical conference.

One reason that more questions were asked at the post-clinical conferences held during Rotation 1 than in Rotation 4 may have been the duration of post-clinical conferences. Duration of the post-clinical conferences varied from 15 minutes to 70 minutes. Generally, the duration of the post-clinical conferences held in Rotation 1 was longer than in Rotation 4. As no previous studies have been carried out to determine the duration of post-clinical conference, comparison cannot be made. However, according to Carpenito and Duespohl (1985), DeYoung (1990), and Mitchell and Krainovich (1985), post-clinical conferences should be held for approximately half an hour. Clinical experience can be, and is physically exhausting. Therefore, it is unrealistic to expect students to concentrate for longer than 30 minutes. It is advisable for the clinical teacher to state the aim of the discussion at the commencement of the post-clinical conference. This would direct the focus of discussion and the types of questions that can be asked.

There was wide variation in the number of questions asked by individual clinical teachers. For example, one clinical teacher asked 83 questions in Rotation 1 and only nine in Rotation 4! One clinical teacher did not ask any questions at all at the post-clinical conferences held during both rotations. One student presented her patient's pathological process. The clinical teacher, other than clarifying a few points, did not ask any questions. Neither did any of the students present at the post-clinical conference. It was difficult to conclude how the clinical teacher evaluated other students' comprehension of the

presentation. Previous studies (Craig and Page, 1981; Malcomson, 1990) did not compare the total number of questions asked at more than one post-clinical conference. Although Scholdra and Quiring (1973) had analysed questions from more than one post-clinical conference, comparison of the total number asked at each conference was not made. Therefore, comparison of the findings of the present study cannot be made.

Differences in the types and levels of questions asked by clinical teachers between the final three semesters

As students progressed from Semester 4 through to Semesters 5 and 6, the complexity of patient care that they provided also increased. Therefore, it was predicted that clinical teachers in Semester 5 would ask more high level questions than clinical teachers in Semester 4, and clinical teachers in Semester 6 would ask more high level questions than clinical teachers in Semester 5. The findings of the study indicated that there was no significant difference between the three semesters in numbers of low level questions or high level questions. Sound knowledge of the curriculum would have assisted the clinical teachers in deciding the entry behaviour of students. As stated by Myrick (1991), "It is no secret that clinical teaching is deemed as low status and even punitive within the modus operandi of the university setting" (p. 44). Clinical teaching therefore becomes relegated to sessionaliy hired staff who are frequently inexperienced teachers, and are unfamiliar with the school's curriculum and clinical perspective. In this study 18 of the 26 clinical teachers who participated in the study were sessional clinical teachers. All but one of the 18 clinical teachers was involved in teaching only one semester. The clinical teachers' lack of knowledge of the curriculum could have contributed to lack of integration and application of the curriculum to the clinical setting, as

well as the lack of significant difference in the number of low level or high level questions asked.

There were two full time contract clinical teachers in Semesters 4 and three each in Semesters 5 and 6, who were involved in classroom teaching and clinical teaching. As they were involved in classroom teaching, it was presumed that they would have knowledge of the curriculum which should have enabled them to ask more high level questions, thereby integrating theory and practice., However, these eight clinical teachers asked predominantly low level questions indicating that, knowledge of the curriculum may be necessary, but is not sufficient to know how to ask high level questions. Clinical teachers as stated by Gall (1970), have to be taught how to use questioning strategies, and the skill of questioning.

Clinical teacher variables and types and levels of questions asked

The clinical teacher variables included teaching qualifications, concurrent clinical teaching and classroom teaching as opposed to clinical teaching only, years of teaching experience (clinical and classroom), and years of clinical experience. Firstly, it was predicted that clinical teachers with teaching qualifications such as Master of Nursing, Diploma in Nursing Education, Diploma in Education, or Post-Graduate Diploma in Education (n=8), will ask more high level questions than those without such qualifications. However, the findings of this study indicated that clinical teachers in both groups have asked predominantly low level questions. There was no significant difference in asking low level questions or high level questions by clinical teachers with or without teaching qualifications. There is, therefore, no evidence that clinical teachers with higher academic qualifications will ask more high level questions. This finding suggests that clinical teachers may

have to be taught specifically how to use questioning strategies as was reported by Craig and Page (1981) and Malcomson (1990). A Diploma in Education or similar qualification does not guarantee that the teacher will be able to ask high level questions. Therefore, it is inappropriate to assume that teachers with teaching qualifications such as Diploma in Education, or Post-Graduate Diploma in Education, would be skilful in using questioning strategies effectively. Academic qualifications or teaching qualifications of clinical teachers were not stated in Scholdra and Quiring's (1973), Craig and Page (1981), or Malcomson (1990) study. Craig and Page's and Malcomson's studies both indicated that clinical teachers asked more high level questions after receiving instruction in the use of questioning strategies.

Secondly, the findings of this study indicated that there was no significant difference in the number of high level questions asked between clinical teachers involved in classroom teaching and clinical teaching, and clinical teachers involved in clinical teaching only. There was also no significant difference in the number of low level questions asked between the two groups of clinical teachers. Wong (1979) has stated that a major weakness in students is their inability to transfer classroom theory to clinical experience. Clinical teachers involved in classroom teaching would presumably have not only knowledge of the curriculum, but also knowledge of the theory taught in the class. Therefore, they should be better prepared to facilitate transfer by asking more high level questions. Contrary to this assumption, the findings of this study have indicated that these teachers have only facilitated recall of facts. Recall of facts only does not facilitate problem solving, which is one of the primary aims of clinical experience. It requires clinical teachers to ask questions that extend beyond the recall of facts. Therefore, it cannot be assumed that a clinical teacher involved in classroom teaching and clinical teaching will know how to ask questions that facilitate transfer of classroom

theory to clinical practice. Questioning is a skill that has to be learned and one must know how to use questioning strategy effectively.

Thirdly, the findings indicated that there was no significant relationship between clinical teacher's clinical teaching experience and the number of high level questions asked. There was a significant, but weak relationship between number of years of clinical teaching experience and the number of low level questions asked. There is no formal preparation of clinical teachers. Therefore, the main preparation clinical teachers have is their own clinical teaching experience. However, it cannot be assumed that years of clinical teaching experience will inform the clinical teacher how to ask high level questions. Formal preparation would prepare the clinical teacher, as stated in Karuhije's (1984) study, how to use clinical teaching strategies such as post-clinical conference, as well as how to use questioning as a teaching strategy.

Fourthly, the findings of the study also indicated that there was no significant relationship between clinical teachers' years of clinical experience and the number of high level questions asked. Except for two of the clinical teachers, the rest underwent the traditional apprenticeship 3-year hospital based training. These programmes are service orientated and as stated by McMillan and Dwyer (1989), the emphasis was on curative medical rehabilitation, ability to carry out nursing procedures/tasks, and reliance on ritual/habit. Therefore, these clinical teachers would carry out the clinical teaching according to the instruction that they had been exposed to during their training. Nursing education today emphasises the nurse as a learner who learns to solve patient problems. The focus is on concepts and principles. It is possible that clinical teachers who were educated using this approach, may ask more high level questions. However, there were not enough clinical teachers in this category to determine if this assertion was true.

Implications for nursing education

Graduates of nursing programmes are expected to think critically and make decisions about patient care. Several studies (Berger, 1984; Gross, Takazawa, and Rose, 1987; Brooks and Shepherd, 1990; Pardue, 1987) have been carried out to determine the critical thinking of nurses. Clinical teachers play a dominant role in developing these skills in the student. To develop these skills in students, clinical teachers have to ask high level questions. The findings of Scholdra and Quiring's (1973) study indicated that more low level questions than high level questions were asked. The findings of Craig and Page's, (1981) and Malcomson's, (1990) studies indicated that clinical teachers' ability to ask high level questions improved significantly after receiving instruction about the use of questioning strategies. The results of the present study demonstrated that clinical teachers have asked more low level questions than high level questions. High level questions (analysis, evaluation, and synthesis) are congruent with the development of critical thinking skills. The limited use of high level questions by clinical teachers, may limit the extent to which development of critical thinking skills in students is facilitated. An implication derived from the present study is that more attention needs to be given to develop clinical teachers' skills in effective use of questioning strategies. Clinical teachers are engaged in a wide range of activities, and use different teaching strategies to facilitate learning during clinical experience of students. Use of questions is one such teaching strategy. This study has demonstrated that clinical teachers with teaching qualifications such as Diploma in Nursing Education/Teaching certificate, Masters degree surprisingly asked more low level questions than high level questions. There was a significant relationship between clinical teachers' years of clinical experience and low level questions asked, as well as a significant but weak relationship between clinical teaching experience and low level questions asked.

Universities offering higher degrees in nursing need to examine whether their course prepare nurses to be effective teachers in the classroom and clinically. Other activities which the clinical teacher engages in to facilitate learning may also need consideration.

Post-clinical conference was a common teaching strategy used by clinical teachers in this study. Questions asked at the post-clinical conferences were analysed. Based on the findings of the study, the clinical teachers have used the strategy to ask students to narrate what they did for the day or for the patient(s) they had cared for. As stated by Reilly and Oermann (1992), post-clinical conferences must promote problem solving learning, opportunity for peer review, questions aspects of patient management. Additionally, it is also a place where exploration of feelings, attitude, and values affecting clinical practice should be encouraged. Therefore, clinical teachers must know the purpose of post-clinical conference as a teaching strategy.

Recommendations

Based on the findings of the present study it is evident that clinical teachers have to learn the effective use of questioning strategies. Participants in Karuhije's (1986) study indicated the need to include clinical teaching strategies in graduate programmes. One of these could be the effective use of questioning. Craig and Page (1981) and Malcomson (1990) found that instructional modules in the form of learning packages with accompanying videos were useful. Rogers (1972) noticed marked improvement in teachers' ability to ask high level questions after the teachers had attended seminars which focussed on the purposes and use of questions at varying cognitive levels. Alternatively, Masters degree courses should offer a major in nursing education or clinical teaching. The results of Oermann and Jamisson's (1989)

survey results supports this recommendation.

The findings of the study also suggest that clinical teachers have to be taught how to use the post-clinical conference as a teaching strategy. For example, they have to be informed of the duration of the post-clinical conference. Following a clinical experience day, the students are physically and mentally exhausted. It is unreasonable to expect students to be attentive for longer than 45 minutes, which is the duration for classroom lectures. Clinical teachers also need to be educated of the purpose of post-clinical conference. This requires teaching clinical teachers to develop objectives for the clinical experience and/or for the post-clinical conference. Discussion at the post-Clinical conference can then focus on the achievement of the objectives. Alternatively, the clinical teacher can state the aim of the post-clinical conference at the commencement of the post-clinical conference.

Limitations of the study

The study was conducted using a convenience sample from one University School of Nursing and small sample size. Clinical teachers volunteered to participate in the study. Selection of the clinical teachers was not based on any sampling procedures. Therefore, findings from this study cannot be generalised.

As claimed by Myrick (1991), clinical teaching is delegated to least experienced and least prepared nurses. Myrick has not explained or defined the meaning of 'least experienced' and 'least prepared' nurses. This study did not quantify the number of years a clinical experience that a clinical teacher should, have, define the meaning of an 'experienced clinical teacher', or state the educational qualifications necessary for a clinical teacher. Therefore, the

extent to which Myrick's assertion is true for the clinical teachers who participated in this study cannot be considered.

Another limitation was lack of contextual detail. As the study only examined the questions asked by the clinical teachers, the placement of the tape recorder was important to ensure clarity of recording the clinical teacher's questions. Consequently, audibility of students responses was poor. At times, students' responses were necessary to comprehend the contextual detail of the clinical teacher's questions. This may have influenced question categorisation as well as decreased the number (92) of questions that were deleted. Future studies should use recording facilities that enable recording of teacher's and student's response.

As the clinical teachers were aware that the post-clinical conference was being audio taped, this may have influenced the number of questions that were asked. This may have been the case when audio taping the second post-clinical conference. As evident from Table 5.6, the total number of questions asked at the second post-clinical conference (365) was just slightly more than half the total number asked at the first post-clinical conference (628). Further qualitative studies may provide answers as to why clinical teachers ask less questions during the post-clinical conference held during the last rotation for the semester.

As evident from Table 5.9, there were very few teachers with teaching qualifications such Diploma/Certificate in Education. This necessitated grouping of clinical teachers with Master of Nursing, with those with Diploma/Certificate in Education as teachers with teaching qualifications. The course content of each clinical teacher's Masters programme was not examined. It was not known if the clinical teacher had completed either a maj

or minor unit of study in nursing education. Therefore, grouping of clinical teachers with teaching qualifications posed a limitation because course content of the individual Master of Nursing programme was not examined.

Recommendations for further research

1. Further study be conducted using a larger sample and from more than one institution.

2. A comparative study should be carried out to determine the relationship between objectives of the curriculum, objectives of the clinical experience units, and types of questions asked by clinical teachers.

3. A comparative study should be carried out to determine the types and levels of questions asked by clinical teachers during post clinical conferences held during each week of the rotation.

4. A qualitative study should be conducted to examine clinical teachers conceptual understanding of pre and post-clinical conferences.

5. A qualitative study should be conducted to determine clinical teachers comprehension of low level and high level questions.

6. A qualitative study should be done to determine how clinical teachers believe critical thinking can be promoted during clinical experience.

7. Clinical teachers who participated in the study taught in their area of clinical expertise. Yet, low level questions were predominantly asked. It would be valuable to carry out a qualitative study to determine why

clinical teachers did not ask high level questions at post-clinical conferences. Alternatively, it would be useful to determine if post-clinical conferences are the ideal time to ask high level questions.

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