

Faculty Awareness of Critical Thinking Research Within
Collaborative Baccalaureate Nursing Programs in Manitoba:
Teaching Experience is the Foundation of Critical Thinking

by

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fulfilment of the requirements for the degree of

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**FACULTY AWARENESS OF CRITICAL THINKING RESEARCH WITHIN
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Abstract

The purpose of this descriptive study was to identify which concepts and strategies faculty perceive as necessary for the development of critical thinking skills in a collaborative baccalaureate nursing program in Manitoba, Canada. With the advent of the collaborative baccalaureate nursing programs, the development of critical thinking abilities has become a major program goal. To reach this goal, faculty moving from traditional programs and those moving from generic programs to new ones, must first scrutinize their perceptions of critical thinking concepts and strategies.

The population of the faculty from the hospital-based and the university-based programs was surveyed. An investigator-designed questionnaire was used to collect data. Factor analysis and correlation coefficients were used to test the validity and reliability of the instrument. As well, descriptive statistics and nonparametric analyses of variances were used to summarize and analyze data.

Educators in the collaborative baccalaureate nursing programs in Manitoba suggested a rational-linear model for critical thinking balanced by a creative, process driven model. Teaching experience emerged as a significant factor in critical thinking. Previous clinical experience and education were not significant factors in faculty awareness of critical thinking research. Overall, results revealed an

inconsistency among educators in their awareness of critical thinking research, especially where contextual and procedural knowledge were concerned. Further, failure of faculty to clearly distinguish among types of learning has major teaching implications.

Although the source of faculty awareness cannot be ascertained from this study, the association between teaching experience and critical thinking bears closer scrutiny. Implications of this study, together with recommendations, are suggested for nursing administrators, faculty, board members of post-secondary institutions, and future researchers.

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INTRODUCTION

In 1985, The Association of American Colleges expressed criticism of the outcomes of higher education and suggested a greater emphasis on critical analysis (Curry, Wergin & Associates, 1993). At the same time, north of the border, the role and value of institutions of higher learning were being scrutinized (Donald, 1985; Forget, 1985; Neilson & Gaffield, 1986; Smith, 1991). By the late 1980s and the early 1990s some Canadians were concerned that their postsecondary educational institutions were unable to prepare young people adequately for the labour market (Association of Universities and Colleges of Canada, 1992; Canada, 1989; Canadian Chamber of Commerce, 1988; Economic Council of Canada, 1992; Janisse, 1992). Partly as a result of these consumer concerns, several studies were commissioned to assess the situation and to make recommendations for postsecondary education in Canada. The need for improved teaching strategies, especially in postsecondary institutions, surfaced following these inquiries (Commission on Excellence in Education, 1993; Gordon, Kavanagh, Richardson, & Roblin, 1993; Ontario Ministry of Colleges & Universities, 1990; Smith, 1991).

During this period, Canadian nursing leaders debated the issue of who was better qualified to meet present and future health care demands in a cost effective manner:

graduates from diploma (training) programs or from baccalaureate programs. By the early 1990s, several factors had convinced leaders in nursing that students needed to be educated in baccalaureate nursing programs instead of trained in diploma programs (Bevis & Krulik, 1991; Bramadat & Chalmers, 1989; Canadian Nurses Association, 1982, Kerr & MacPhail, 1988; Manitoba Association of Registered Nurses, 1984; 1994). The need for baccalaureate nursing programs intensified with (a) technological advances in the health care system, (b) people living longer with multiple, advanced medical and societal needs, (c) the alarming increase in acquired immune deficiency disease, (d) and the debate over euthanasia. These changes pose ethical and moral dilemmas requiring new decision-making skills (Bevis & Krulik, 1991). Miller and Malcolm (1990) contend that nurses are faced with a complex care environment in which new knowledge is constantly being developed and new clinical situations are constantly being presented. The nursing process alone, which is the current underpinning of nursing practice, has become too limiting to provide a conceptual framework for nursing education in the midst of complex care environments. The nursing process is a linear problem solving model, based on the scientific method. The process involves the gathering of data, assessment of data, nursing diagnosis or problem identification, an overall plan with behavioural objectives, initiation of the plan, and the

evaluation of the plan. Malek (1986) argues that nurses working in situations which change rapidly can no longer rely upon ritual, tradition, or procedure manuals as a framework for clinical judgement and decision-making. Instead, an emphasis on higher level thinking is required.

Another reason for an increased emphasis on university baccalaureate programs is the shift away from the manufacturing sector of society to the information and services sector. One result of this shift is society's decreasing dependence on physical labour and increasing dependence on the human intellect (Catterall, 1988; Jones & Idol, 1990). The kind of intellectual development needed for the information age takes place in university settings, "where questioning, probing, and seeking connections are a way of life" (Wisniewski, 1989, p. 40). Universities, in contrast to two year technical programs, are places where the truly educated are life long learners (Stark & Lowther, 1989), and where the major purpose of education is "learning to think" (Dewey, 1933, p. 78). Sheridan's (1992) premise that the "knowledge that students acquire as freshmen will be outdated by their second year on the job" underscores the imperative that nurses become thinkers and life long learners (p. 51). Thus, nursing educators emphasized the baccalaureate nursing degree as a way to meet increasing health care and professional development demands of the present and the twenty-first century.

Political support for baccalaureate nursing programs in Canada was evident as early as 1975. Marc LaLonde, then Canadian Minister of Health and Welfare, suggested that the current practice of placing the greatest emphasis on 'illness care' was too costly. He stressed the need for the prevention of illness using available health care personnel, including nurses. Nursing leaders agreed with the minister and proposed that nurses educated at the baccalaureate level could meet many more health needs than was then the case (LaLonde, 1975). Thus, the emphasis began to change from short diploma nursing programs to four or five year baccalaureate nursing programs.

A year later, in 1976, the Alberta Association of Registered Nurses (AARN) became the first association in Canada to adopt the requirement of a baccalaureate nursing degree to enter the nursing profession by the year 2000 (Kerr & MacPhail 1988). The position taken by the AARN was a giant step forward in Canadian nursing history.

The adoption of a baccalaureate degree as the basic professional credential was complemented by Canada's adoption of a "health for all" policy by the year 2000. This goal of health for all by the year 2000 was established in 1978 at an international conference at Alma Ata (Kerr & MacPhail, 1988) in what was then the United Soviet Socialist Republic. At this conference, sponsored by the World Health Organization (WHO) and the United Nations International

Childrens' Emergency Fund (UNICEF), the International Council of Nurses (ICN) pledged its full support to making primary health care a reality in all countries of the world. Primary health care is essential health care made accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost the community and country can afford (Jones & Craig, 1988). This goal of primary health care was accepted and strongly endorsed by the Minister of Health and Welfare, Canada.

The role of nurses in primary health care had also been endorsed in the Canadian Nurses Association's (CNA) brief, "Putting Health into Health Care," to the Hall Commission in 1980 (MacPhail, 1988). This brief was a proposal by Canadian nursing leaders to the Canadian government on how the nations' health care needs could be met more efficiently. The CNA called on provinces to make more effective use of nurses' skills and education. In its brief, the CNA also exhorted governments to revamp medical insurance plans to pay for the nursing services provided out of hospital in order to pave the way for nurses to be the first point of entry into the medical system. According to Rovers and Bajnok (1988), to successfully take on this expanded role and to successfully keep up with technology, nurses need a baccalaureate education. The majority of practising nurses are diploma (i.e. hospital and community college) trained.

Their education does not focus on community health. Due to the lack of in-depth primary care education, most nurses are ill-prepared for a future in which health care for all is the operating premise (Baumgart, 1981).

Encouraged by the primary care movement and societal changes, Canadian nurses decided that the era of training diploma nurses for entry to the profession was over. In 1982, the Canadian Nurses Association (CNA), unanimously supported a resolution that the baccalaureate nursing degree was necessary for entry to the practice of nursing by the year 2000 (CNA, 1982). In 1984, the Manitoba Association of Registered Nurses (MARN) endorsed a baccalaureate nursing degree program for entry to practice to be implemented by the year 2000 (Bramadat & Chalmers, 1989; MARN, 1984).

Because of the entry to practice position statement, nursing associations across Canada were concerned about access to professional education programs in order to graduate enough baccalaureate prepared nurses. Their concern was an impetus for diploma schools of nursing to join with university nursing programs in an effort to develop joint collaborative baccalaureate nursing programs. These joint ventures pose real challenges for the faculty involved in the change.

Bevis and Krulik (1991) contend that one challenge for these faculty is that they must learn the difference between training and educating nursing students. They believe that failure to make the distinction between training and

educating, will result in the proposed baccalaureate programs being little different from the current two year training programs. The greatest danger in the new joint ventures is promotion of the null curriculum where teachers believe they are developing critical thinking skills but in fact are merely perpetuating the old "training" model.

In an effort to continue to play a crucial role as major stakeholders in health care, The Manitoba Association of Registered Nurses (1994) presented the provincial government with its position statement Education Makes A Difference. Among other issues, the MARN, in line with Ketefian (1981), argued that baccalaureate prepared registered nurses used critical thinking, problem solving and decision making skills in their practice and that, traditional behaviourist curricula, which have been legitimized and legalized by accrediting nursing organizations over the past four decades, fail to prepare nurses with high level thinking skills (Bevis, 1989). Because of this failure, nursing teachers in diploma and baccalaureate programs must scrutinize their curricula in an effort to see how critical thinking is facilitated. It appears reasonable that nursing faculty adjust their curricula to prepare students for both the intellectual and technological demands of the twenty-first century. In order to achieve this adjustment, educators must be knowledgeable about current critical thinking research.

PROBLEM STATEMENT

Faculty involved in the transition from diploma nursing programs and generic baccalaureate nursing programs to collaborative baccalaureate nursing programs may encounter problems. According to Harris (1987; 1993) clear evidence exists in every field of education, including professional education, that continued recommendations for curricular reform have not been implemented because they have not been understood. This lack of understanding of repeated recommendations for curricular reform has various causes.

The findings of a study by Ford and Wertenberger (1993) in a survey of Master's Nursing programs in Canada indicated no fixed preparation requirements for the role of nurse teacher. Further to this finding, Master of Science in Nursing (MSN) programs in the United States focus very little attention on educator role development (Davis et al., 1992). They found that many novice nurse faculty are not educationally prepared for their roles. Gordon et al., (1993), Koch-Parrish (1992), and Smith, (1991) echo the theme of lack of educator preparation for teaching roles in universities.

Not only is a lack of preparation for the nurse-teacher role evident, but also there is a lack of knowledge of current research on developing critical thinking amongst educators in general (Beyer, 1988; Cromwell, 1992; Jones & Brown, 1991; Meins, 1991). Meins (1991) studied teacher

education programs in Arkansas and found that faculty were unfamiliar with critical thinking research. Variables such as faculty education and size of institution made little difference in faculty awareness of critical thinking research. The population consisted of instructors in teacher education programs in colleges and universities in Arkansas. A reasonable assumption is that teachers, be they nursing educators or teacher educators, must possess knowledge of critical thinking research before such information can be modelled or shared with students. Otherwise, lack of knowledge of current research on the subject amongst educators becomes an obstacle to the teaching of thinking skills (Beyer, 1988). This deficiency may explain negative reports on students' critical thinking abilities (Kintgen-Andrews, 1988; Sullivan, 1987).

On the whole, research on the level and development of students' critical thinking abilities while in their nursing programs is conflicting. These results agree with studies on critical thinking in college students within other faculties (McMillan, 1986). Kintgen-Andrews (1988) and Sullivan (1987) found no change in critical thinking ability for students in baccalaureate, associate degree (diploma) and practical nursing studies. Conversely, Gross, Takazawa, and Rose (1987) discovered that senior baccalaureate nursing students showed significant gains in critical thinking skills over the course of their program (Appendix A).

An inference which may be drawn from the poor showing in the Kintgen-Andrews (1988) and Sullivan (1987) studies is that students are not taught strategies of critical thinking and have no role models to follow. In order to teach and model critical thinking strategies, nursing educators must be clear about the concept and process of critical thinking. Bevis (1989) suggests that diploma (training) schools do not teach or model inquiry learning or critical thinking skills. Furthermore, a survey by Jones and Brown (1991) of deans and directors of baccalaureate and higher degree schools of nursing in the United States revealed that educators were unclear and confused about the mechanisms and operations of critical thinking. Thus, not only is articulation of critical thinking in diploma programs a concern, but also there is evidence of confusion about critical thinking in baccalaureate programs.

Clearly, any move from the diploma nursing programs to collaborative baccalaureate nursing programs involves a change not only in the curriculum, but also in faculty knowledge and behaviours with respect to critical thinking. According to Hersey and Blanchard (1988) four different levels must be passed through during change. These are knowledge, attitude, individual behaviour and organizational performance. Since the collaborative baccalaureate nursing programs are new to Canada, no research has been done to ascertain the faculty knowledge of what different elements

of critical thinking in curricula may be needed once educators move from diploma and generic baccalaureate to collaborative baccalaureate programs.

As a response to this need for research, collaborative baccalaureate nursing education programs will be assessed with a focus on obtaining information from nursing teachers about their knowledge of current research on critical thinking. Current interpretations of critical thinking by teachers in collaborative baccalaureate nursing programs will be determined. Nurse educators and administrators teaching in collaborative baccalaureate programs will be surveyed. The teachers' knowledge of critical thinking will be a major factor in educating nurses for present challenges and for the twenty-first century. Identification of those variables which influence nurse educators' knowledge of critical thinking will provide valuable information for students, nurse educators and administrators, accrediting bodies, licensure boards, professional schools, institutions of practice, educational policy committees, and course directors. From research data, plans can be made for faculty development in collaborative baccalaureate nursing programs and for curriculum development in emerging collaborative programs. Once teachers' knowledge level of critical

thinking research is ascertained further research may also be suggested.

Research Questions

The present study is designed to elicit an answer to the following question: How aware of current research into the nature of critical thinking are collaborative baccalaureate nurse educators in Manitoba? Specifically, for teachers in collaborative baccalaureate nursing programs:

- 1) Is there a difference in the knowledge of current research on critical thinking among faculty who taught only in diploma programs prior to collaboration, those who taught only in baccalaureate programs, and those who taught in both programs.
- 2) Is there a difference in awareness of current research on critical thinking among faculty with a small, moderate, or extensive amount of practice?
- 3) Is there a difference in the knowledge of critical thinking between undergraduate and graduate prepared faculty?
- 4) Is there a difference in the interpretation of critical thinking held by the hospital-based nursing faculty and the university-based nursing faculty?

DEFINITIONS

The following section will define several of the main concepts addressed in this proposal.

Critical Thinking: Appendix B.

Critical Thinking Concepts: Appendix C.

Critical Thinking Processes: Appendix D.

Cognition: Mental activity used to generate or find meaning (Bayer, 1988).

Metacognition: Awareness or knowledge of ones own cognitive activity and strategies used to monitor, direct and evaluate ones own thinking processes (Brown, 1978; Pressley & Associates, 1990).

Domain-specific knowledge: "The declarative, procedural, or conditional knowledge one possesses relative to a particular field of study" (Alexander & Judy, 1988, p. 376).

Conditional knowledge: "Knowledge of when and where knowledge (declarative or procedural) could, or should be, applied" (Alexander, Schallert, & Hare, 1991, p. 332; Alexander & Judy, 1988).

Declarative knowledge: "Factual information: what is sometimes described as 'knowing what' (Alexander, Schallert, & Hare, 1991, p. 332; Alexander & Judy, 1988).

Procedural knowledge: "Knowledge one has of certain processes or routines; can be described as 'knowing how'" (Alexander, Schallert, & Hare, 1991, p. 333; Alexander & Judy, 1988).

Strategies: They are goal-directed processes that are consciously activated before, during, or after the execution of a task (Alexander & Judy, 1988, p. 376). "Controllable processes that can facilitate particular performances"

(Symons, Snyder, Cariglia-Bull, & Pressley, 1989, p.3).

Generic baccalaureate nursing programs: University based programs, of four or five years duration, with practice in both a hospital and the community. A baccalaureate nursing degree is granted to students who graduate from a university. Baccalaureate students must not only meet the standards of the university but must achieve success on the same national exams as do diploma nurses.

Collaborative baccalaureate nursing programs: Nursing programs which result from articulation between hospital based diploma/community college nursing programs and university baccalaureate nursing programs. A baccalaureate nursing degree is granted to graduates from these university controlled programs. The designation of "Registered Nurse" is bestowed to graduates following success on the same national exams which are written by the diploma nurse.

Curriculum for professional education: "Curriculum is...those transactions and interactions that take place between students and teachers and among students with the intent that learning take place" (Bevis, 1989, p. 72).

Educating: Education is more than the achievement of tasks and scientific knowledge. It must include value judgements. Students' attitudes must be explored along with the exploration of knowledge. Students' views change as a result of knowledge acquisition and critical thought (Peters, 1967). Education is "a process of autonomously deciding what

is and what is not true and false" (Paul, 1987, p. 143).

Educative learning: A private journey by the student that seeks discovery, creativity, critical thought, and caring (Bevis, 1989).

Nurse educator: Teachers in diploma or university schools of nursing.

Training: Training encompasses the mastery of a task which has preset outcome criteria. Task mastery is achieved by practice, ongoing instruction, example, evaluation, and feedback of performance. Training involves "knack" and is highly specialized (Peters, 1972).

Summary

Any change from the diploma nursing programs to the collaborative baccalaureate nursing programs includes a change in curriculum. This change will effect the nurse educators involved because of the nature of the collaborative baccalaureate programs where teachers who formerly taught in the diploma nursing programs join with faculty in the baccalaureate nursing programs. Although educators in both the diploma and the baccalaureate nursing programs in Canada contend that critical thinking is an important curricular element, no studies on faculty awareness of current critical thinking research have been done with teachers in the new collaborative baccalaureate nursing programs. Assessment of this awareness will provide an insight as the faculty meet new challenges.

CHAPTER TWO

Review of the Literature

Diploma Nursing Programs

History.

Apprenticeship Era. The first Canadian diploma school of nursing, The Mack Training School of Nursing, was founded in 1874 in St. Catherine's, Ontario. Two graduates of the Nightingale School of Nursing in England were hired to teach in the new school. One major difference between the original Nightingale School and The Mack School of Nursing haunts nurse educators to this day. Whereas, the English school of nursing was independent of hospital control and had no conflict between service and education mandates, such was not the case in Canada. Once the school opened, Canadian officials saw a chance to staff their institutions with cheap labour under the guise of supplying a nursing education to young women. In this context, students learned by apprenticeship. "They worked in the hospital and, by doing more work than was necessary for their nursing education, paid for their room and board and part of their limited instruction" (Deloughery, 1977, p. 152). Thus, from the onset in nursing education in Canada, a conflict existed between the values of service and education (Canadian Nurses Association, 1968; Kerr & MacPhail, 1988; Mussallem, 1962).

In 1932, Dr. George Weir was appointed by the Canadian Medical Association and the Canadian Nurses Association (CNA), to conduct a national study of nursing education. Weir recommended that nursing education be removed from service based settings and placed within the general educational system of each province (Baumgart & Larsen, 1988; Weir, 1932). This suggestion was not followed because it was politically unwise to give up the many hours of free labour.

By 1960, nursing leaders were increasingly concerned about standards in schools of nursing in Canada. Mussallem (1962), in a study for the Canadian Nurses Association, found that only about sixteen percent of the schools of nursing met acceptable criteria of the day. She concluded that the poor showing resulted from conflict between the service and the education mandates of hospital controlled schools. It appears that education took a "back seat" to the service needs of hospitals.

Clinical Teacher Era. Mussallem (1962), in her doctoral thesis, reconfirmed the 1932 recommendation that nursing education programs in Canada be situated in postsecondary educational institutions. This move away from hospital-controlled education became a reality in the United States in the 1950s when Dr. Mildred Montag developed a pilot project to educate two year "technical nurses". Students in Montag's program were schooled in community colleges instead

of hospital-controlled institutions (Montag, 1951). This American trend was emulated in some areas of Canada in the late 1960s and early 1970s.

During this time, nursing leaders, deputy ministers of education, deputy ministers of health, and provincial hospital insurance commissioners believed that student nurses should be educated in educational settings. The era of the apprenticeship system was ending as the era of the clinical teacher was arriving. The teacher, instead of the head nurse and staff nurses, accepted responsibility for students (Mussallem, 1962; Paterson, 1991).

Canadian government officials and nurse educators concurred with recommendations stated in Mussallem's Report. The Ontario, Quebec, and Saskatchewan governments shifted diploma nursing education into the community colleges (Dennison & Gallagher, 1986). The Toronto, Ontario Ryerson Project in 1964, was the first diploma nursing program which was not under the control of a department of health and a hospital (Rovers & Bajnok, 1988). Manitoba and Alberta soon initiated diploma nursing programs in the community college sector. Nova Scotia, Manitoba, and Newfoundland continued with hospital based diploma programs.

Along with the transition of nursing students to community colleges came the move to shorten diploma nursing programs throughout Canada. As changes were made to shorten programs, leaders in nursing and in nursing education

suggested that more nurses be educated in the university setting (Mussallem, 1962; 1965). This move to the university setting was an attempt at decreasing the conflict between the service and education mandates as well as a promotion of the professionalization of nursing. Although a strong push began to situate an increased number of nursing programs within a university setting in the 1960s, especially at a time when governments were generous with student loans and bursaries, this was not the first such effort. Nurses already were being educated in university as early as 1919.

Baccalaureate Programs

History. In 1919, the University of British Columbia (UBC) created a department of nursing. The nursing degree program was referred to as a "sandwich program" because it included two years of arts at the University of British Columbia, two years of practical work at a hospital, and a final year at UBC. Close alliance with the Vancouver General Hospital was evident; Ethyl Jones was the Director of Nursing of the Vancouver General Hospital and also head of the Department of Nursing at the University of British Columbia with the Vancouver General Hospital paying her salary (Canadian Nurses Association, 1968; Kerr, 1988; Mussallem, 1962; Rovers & Bajnok, 1988; Stewart, 1990).

The first integrated generic baccalaureate nursing program in Canada was started in 1942 at the University of Toronto with E. Kathleen Russell as its first director

(Rovers & Bajnok, 1988). Over the next twenty years, several provinces developed generic university nursing programs (Mussallem, 1962; Paterson, 1991; Rovers & Bajnok, 1988) and today all provinces have at least one university nursing program. However, diploma nursing programs still exist based both in hospitals and in community colleges. The nursing profession must coordinate two major realities: The existence of these diploma nursing programs and the entry to practice position statement.

Because of the entry to practice position statement endorsing a baccalaureate degree for entry to practice by the year 2000, nursing associations across Canada were concerned about access to professional educational programs in order to turn out enough baccalaureate prepared nurses. Their concern was an impetus for diploma schools of nursing to join with university nursing programs in an effort to develop joint collaborative baccalaureate nursing programs.

Collaborative Baccalaureate Programs

Education in Transition. In the late 1980s, nurses across Canada investigated a different approach to nursing education through the development of collaborative nursing degree programs. The impetus for this change in focus from traditional diploma and baccalaureate nursing programs to collaborative nursing programs was the Canadian Nurses Association position statement of 1982: by the year 2000, nurses entering practice would need a baccalaureate nursing

degree (CNA, 1982). The need for more "student places" for baccalaureate study to meet the CNA mandate became a priority for nurses in all provinces. British Columbia, Alberta, and Manitoba nurses forged ahead with collaborative baccalaureate programs. Staff from hospital based and community college based diploma programs collaborated with university nursing staff to form joint baccalaureate nursing programs. The University of British Columbia collaborated with Vancouver General Hospital Diploma Program in British Columbia in 1989. The rest of the diploma programs in British Columbia are linked with a university. The University of Alberta collaborated with Red Deer Community College Diploma Program in Alberta in 1990. Four other diploma programs in Edmonton have linked with the University of Alberta. By 1993, the Calgary Conjoint Nursing Program opened on three sites. The University of Saskatchewan, Wascana Institute of Applied Science & Technology, Kelsey Institute of Applied Science & Technology have a target date for collaboration in 1996. The University of Manitoba collaborated with the Health Sciences Centre Diploma Program in Manitoba in 1991 and with St. Boniface General Hospital Diploma Program in 1992. The collaborative efforts between The University of Brandon, Brandon General Hospital, and The Salvation Army Grace General Hospital resulted in the admission of the first class of baccalaureate students in September, 1994. In 1996, The Brandon General Hospital and

The Grace General Hospital are allied with the University of Manitoba, as is Red River Community College and The Misericordia General Hospital. Ontario, New Brunswick, and Nova Scotia all have active collaborative baccalaureate nursing programs. Newfoundland expects to have its first collaborative baccalaureate nursing program in 1996 (CNA 1994; 1996). Quebec has a unique system whereby students enter nursing programs through the Colleges d'Enseignement General et Professionnel (CEGEP) and obtain a nursing diploma. These students can continue their studies at Quebec's universities to receive a baccalaureate degree in nursing (Dennison & Gallagher, 1986).

At the Manitoba Association of Registered Nurses (MARN) annual meeting in May, 1996, Health Minister Jim McCrae announced that a Bachelor of Nursing degree will become the basic preparation for entry into the profession with all new nursing students entering the baccalaureate program by September, 1997 (Earle, 1996). Other provinces have endorsed the CNA "Entry to Practice" mandate but several provinces still have a diploma exit in their collaborative programs. Because of a focus on "education" rather than "training" in the degree programs, significant differences between curricula in diploma and collaborative programs are expected to occur.

Differences between the diploma and baccalaureate programs have been and continue to be the subject of much

discussion in the nursing literature. The major focus of discussion centres around the abilities of the graduates of both of these programs since current national testing standards for the diploma and baccalaureate programs leading to "Registered Nurse" designation or the professional license are the same.

Standards

However, different educational standards apply to diploma and baccalaureate programs. Two ways of monitoring standards are approval and accreditation. Approval is a mandatory process which guarantees that minimal standards are met by the diploma granting institutions as well as the baccalaureate granting programs. The approval process, concerned primarily with the protection of public interests, is performed by a body empowered by provincial legislation (MacPhail, 1988; Thomas, 1995). The responsibility for approval of nursing programs rests with different groups in different provinces. In Ontario, the College of Nurses of Ontario approves nursing programs. In Alberta, the Universities' Coordinating Council approves nursing programs. In Manitoba, approval is granted by the Manitoba Association of Registered Nurses (MARN).

The Manitoba Association of Registered Nurses' Act of 1980 defines who develops, establishes, and maintains the standards for nursing education and nursing practice (MARN, 1980). The criteria for approval of schools of

nursing which emphasizes behavioural objectives, observable skills, relationships between theory and practice, and sequencing of content, corresponds with Bevis' (1989) training types of learning. Students' active participation in their own learning and their development of critical thinking skills is lacking in the MARN criteria used for the mandatory approval process.

Accreditation, on the other hand, is a voluntary process which is carried out by an external, non-governmental agency, the Canadian Association of University Schools of Nursing (CAUSN). Universities receive accreditation if preset criteria are met (MacPhail, 1988; Thomas, 1995). The CAUSN accreditation program promotes the active participation of students in the learning process. Evidence of the need for inquiry learning, problem-solving, hypotheses generation, and synthesizing is included in the CAUSN criteria. Integration of non-nursing courses also is judged by the accreditation team (CAUSN, 1987). Many of the indicators in the CAUSN accreditation program coincide with Bevis' (1989) "educating" type of learning.

Educating Versus Training

Educating. Education is a process for teaching students in a university setting (Kerr, 1988; O'Hear, 1989). According to education theorists (e.g. Baker, 1993; Bevis, 1988; 1989; Dewey, 1933; Peters, 1967; Raths, 1971; Stenhouse, 1983) the education process involves students as active learners.

Education is more than the achievement of tasks and scientific understanding; it encompasses value judgements and critical thinking (Bevis, 1988; 1989; Ennis, 1987; Paul, 1987; Peters, 1967). According to Stenhouse, "The art of education is at its highest when the learner is brought to reflect consciously on the message he [sic] receives" (1980, p. 106). Students become active learners when they speculate and search in a quest for truth (Stenhouse, 1983; 1985). Peters (1967) cautions that one not de-emphasize the acquisition of knowledge in favour of too much stress on critical thinking. Both knowledge and critical thinking are necessary for an education as are the mastery of some skills and an understanding of principles (Ennis, 1987; McPeck, 1981; Peters, 1967).

Bevis (1989), in her typology of learning (Appendix E), emphasizes an inquiry type of learning as a prerequisite to a professional education. This type of learning encompasses not only skills for rational thought, but also the creative and contextual characteristics so necessary for critical thinking. Bevis argues that critical thinking skills are neglected in diploma training programs, but that they increase by about ten percent in baccalaureate nursing programs. She contends that training programs alone are inadequate to meet the future health needs of society by the year 2000. Thus, nursing educators must strive for different ways to challenge students. Teachers must

encourage active learning where students think about their own thinking; where they plan and monitor thinking strategies, prior to, during, and following tasks (Pressley et al., 1990).

Training. The process of training is different than the process of educating (Bevis, 1988; 1989; Eisner, 1985; Peters, 1967; Stenhouse, 1980). Peters (1967) believed that the training process encompassed highly specialized activities which were confined to one area of practice or learning. The training for these highly specialized tasks could not readily be generalized to new situations. Students who are trained, master the tasks by repetition. In training, students appeal to the teacher as an authority. Behavioural outcomes of the student, however limited, are designed to be implemented in predictable situations. Preparation for every predictable situation is no longer possible. Thus, this approach appears too limiting to be successful for educating the next generation of nursing practitioners.

The processes of training and educating are different. Undoubtedly, well trained diploma nurses, until now, cared for the health needs of their patients in a highly skilled and competent manner. This perception of competency was probably a major factor involved in resistance to a mandatory baccalaureate nursing degree.

RN - BN Controversy

Much controversy has surrounded the position taken by the Canadian Nurses Association and the provinces on the entry to the practice of nursing by the year 2000. The majority of Registered Nurses are diploma graduates, many of whom believe that a diploma is adequate to meet future health care needs. Nursing literature is unclear about the performance of diploma and baccalaureate graduates. McMillan (1985) compared a group of associate (diploma) and baccalaureate degree nursing students at the end of their programs of study. Four areas were assumed to show professional/educational rather than technical/training behaviours. They were leadership, collaboration, research, and management of patient care. The baccalaureate group did not score higher on leadership, collaboration, and management skills; however, they did score significantly higher on research skills.

Ketefian (1981) found that baccalaureate nurses scored higher than associate degree and diploma nurses on critical thinking abilities. Brooks and Shepherd (1990) and Scoloveno (1981) confirmed those findings. A strong correlation also was evidenced between critical thinking abilities and moral judgement and reasoning abilities (Ketefian, 1981). Although baccalaureate educated nurses appear to be stronger in

research, critical thinking, and moral judgement and reasoning ability, Brooks and Shepherd (1990) and Pardue (1987) found that the generic baccalaureate prepared nurse was weaker in clinical decision-making skills. Conversely, studies by such authors as DeBack & Mentkowski (1986) and Jacobs (1981) found that baccalaureate nurses were "more likely" to show competent behaviours than diploma or associate degree nurses.

Raymond (1988) established that baccalaureate prepared nurses scored better than associate degree and diploma prepared nurses on national certifying examinations whereas baccalaureate candidates for Registered Nurse (RN) licensure scored lower than associate degree and diploma prepared candidates on the RN licensure examinations. Certification exams are usually administered following a period of nursing experience as a graduate nurse whereas RN licensure exams are administered immediately following graduation from the basic nursing program. Once baccalaureate prepared nurses practise their skills following graduation their knowledge and skills quickly surpass the diploma prepared nurse. This difference in outcomes indicates the merit of baccalaureate education.

Although equivocation exists in the nursing literature about the performance of graduates from various nursing programs, the type of curriculum used in diploma schools of nursing is clear. "Currently in nursing the legitimate

curriculum is behaviourist, ...training-oriented and technical..." (Bevis, 1989, p.77). She suggests that diploma (training) schools do not teach or model inquiry learning or critical thinking skills. Furthermore, a survey by Jones and Brown (1991) of deans and directors of schools of nursing in the United States revealed that educators were unclear and confused about the mechanisms and operations of critical thinking.

The situation in the education faculties in Arkansas is not unlike the Jones and Brown study. Meins (1991) found that many teacher preparation faculty members in Arkansas were unfamiliar with critical thinking research. Cromwell (1992) found that educators displayed only a vague idea of what is meant by the concept of critical thinking. A study by Koch-Parrish (1992) may suggest an explanation for the confusion related to critical thinking. Koch-Parrish (1992) found that baccalaureate nursing faculty were not prepared to teach critical thinking other than by self-instruction. Thus, the research of Jones and Brown (1991) and Meins (1991) is of concern to educators involved in the teaching of critical thinking and students involved in the learning of critical thinking. Students have the potential for logical thinking, critical analysis and inquiry but this potential can be realized only by explicit instruction of and actual experience in the performance of these skills (Association of American Colleges, 1985). Educators teaching

in collaborative baccalaureate nursing programs must rise to the challenge of developing this potential. Unfortunately, adherence to a purely Tylerian model of education may hinder student inquiry.

Behaviourist Curriculum

The theory of Ralph Tyler was adopted and adapted after the early 1960s to form the basis of nursing curricula (Bevis, 1989). Ralph Tyler in 1955 acted as an educational consultant to nursing associations in the United States. His ideas were soon adopted by nurse educators and accrediting groups. Behavioural objectives which precede activities planned in sequential steps to achieve known outcomes, are of the utmost importance for curricular planning in Tyler's rational model (Bevis, 1988, 1989; Eisner, 1985; Tyler, 1949).

The ideas advocated by Tyler for nursing initially were used to develop curricula for training nurses in diploma schools. Before long, the Tyler model was the only acceptable paradigm for all levels of nursing education. Nursing schools, diploma and baccalaureate, were evaluated positively if a rational, behaviourist model was evident in their schools. The practice of using prescribed Tyler-type curricula for the accreditation of nursing educational programs is currently evident in the both the United States and Canada (Bevis, 1989; Bevis & Watson 1989; Diekelmann, 1990). Adherence to the behavioural model, championed by

Tyler, has ensured that well trained competent nurses, up until now, gave reliable, safe nursing care (Bevis, 1989).

According to Madous and Stufflebeam (1989) little doubt exists that Ralph Tyler has been a leading figure in American education over the last four decades. Unfortunately, followers of Tyler, both in education and nursing, have turned his initial framework into a rigid, menu-like model. Prescriptive types of curricula were developed which ignored any part of education outside the realm of "behaviours and finite preconceived measurable outcomes" (Bevis & Watson, 1989). This narrow interpretation of education left little room for the development of critical thinking skills necessary for an educated, professional nurse. One weakness of an exclusively behavioural curriculum is that any attribute not measurable or any end result failing to coincide with a pre-stated goal, has no value. The narrow ends-means goals leave little room for student creativity, inquiry, reflection, independence, criticism, and caring which are integral qualities necessary for true modern education (Bevis, 1988).

With the anticipated complexities of the twenty-first century, higher level skills, and especially critical thinking skills, will be imperative. Nursing faculty must shift their emphasis away from the "banking concept of education", where the teacher is all knowing (Freire, 1970), toward approaches which empower active students to acquire

and analyse information on their own (Allen, 1990; Popkowitz, 1984, Rosser, 1986). Traditional nursing educators, especially those making the transition from teaching in diploma programs to teaching in the collaborative baccalaureate programs, must make a conscious effort to empower active students.

Bevis (1989) argues that the behaviourist curriculum is the antithesis of professionalism and is more aligned with training. She explores a theoretical model for professional education with a paradigm composed of four mini-models which include "the learner maturity continuum, the typology of learning, criteria for teacher-student interactions, and criteria for selecting and devising learning activities" (Bevis, 1989, p. 77; Appendixes E and F).

Undoubtedly, students entering post-secondary education need greater critical thinking skills (Bevis & Kurlex, 1991; Paul, 1990). Unfortunately, under the Tyler model, students are discouraged from analysing information and arriving at non-traditional solutions (Bevis & Watson, 1989; Eisner, 1979; 1985) which are imperative for critical thinking. New theories of cognitive and intellectual development must be added while retaining the strengths of previous models. These new components include critical thinking concepts,

metacognition, positions of intellectual development, expertise, and domain-specific knowledge.

Critical Thinking Concepts and Processes

Thinking is a universal operation supported by individuals' skills, strategies and knowledge. Concepts, such as decision making, problem solving, critical and creative thought, are cognitive operations often used interchangeably when referring to higher level thinking.

Theories referring to higher level thinking skills, which were used in Dewey's (1933) time are apparent today. For Dewey, an attitude of reflective thinking was an important characteristic of an educated person. By the late 1940's, however, a greater emphasis was placed on predictive behavioural approaches to learning. In addition, weight was placed on rational problem solving methods such as the scientific process. Such rational processes emphasized deductive reasoning rather than reflective and creative thinking.

Tyler (1949), Bloom (1956), Ennis, (1969) , and Bevis, (1973; 1978) suggested a rational approach to thinking whereas deBono (1970; 1976), McPeck (1981), and Ennis, (1987) proposed an added reflective dimension to thinking. However, as the 1980's progressed, Bevis (1989), Brookfield (1987), Paul (1987), and Schon (1983; 1987; 1991) added a contextual dimension to critical thinking.

Tyler (1949), a distinguished educator, presented a rational model for learning. Behavioural objectives were of the utmost importance for curriculum planning. These objectives precede activities which are planned in sequential steps to achieve known outcomes (Bevis, 1988; 1989; Eisner, 1985; Tyler, 1949). The curriculum, according to Tyler, is teacher centred with students playing no part in planning their learned experiences.

Bloom (1956) continued his work in the prescriptive mode with a set of objectives. He arranged thinking skills in an hierarchial order of complexity such as knowledge, comprehension, application, analysis, synthesis, and evaluation. The educational community quickly adopted the list, especially the latter three constructs, as examples of higher order thinking. Canadian nurses use Bloom's (1956) Taxonomy of Educational Objectives as the underpinning of the blueprint for national Registered Nurse testing (CNA, 1993). The upper levels of analysis, synthesis and evaluation have been accepted by nurse educators as crucial ingredients for the testing of critical thinking. The wide use of Bloom's Taxonomy by educators implies that nursing teachers are teaching and testing for critical thinking. Although Bloom (1956), in his synthesis level, stresses creative behaviours, uncertainty abounds as to whether student nurses actually learn to use this aspect of thinking.

Bevis (1973; 1978), a nurse educator, continued in the rational mode as she emphasized a curriculum based on behavioural objectives with predetermined outcomes. At this time, the nursing process was developing. The nursing process, a modification of the scientific method, was an attempt by nurses to separate nursing practice from the medical model. Although the process has been advanced as an example of how nurses apply critical thinking (Berger, 1984), the process actually is a linear model using logical-deductive reasoning (Field, 1987). Field (1983) disagrees with Berger's (1984) view on the use of the nursing process for critical thinking and argues instead that many nurses failed to examine relationships following the data collection step of the nursing process.

An exception to the narrowness of a strictly rational model was deBono's (1970) work on lateral thinking. He defined thinking as "the operating skill with which intelligence acts upon experience" (deBono, 1983, p.703). In order to be effective thinkers, deBono (1970) suggested the use of "lateral thinking" skills in addition to the conventional "vertical thinking" skills. Lateral thinking is concerned with the generation of new ideas, the creation of new patterns, and the use of insight. Conversely, vertical thinking is concerned with the practice of logic, the use of sequential steps (deBono, 1970; 1976; McPeck, 1981) and the employment of rational deductive reasoning. The suggestion

of a creative side to critical thinking marked a shift from strictly left brain use to include right brain use (Sheridan, 1992). Because of this shift, another dimension was added to the theory on higher level thinking.

McPeck (1981), a philosopher of education, stated that critical thinking is "the appropriate use of reflective scepticism that is ... linked with specific areas of expertise and knowledge" (McPeck, 1981, p.19). Because of this concept of domain-specific knowledge, he does not believe that critical thinking principles can be generalized to new arenas. He believes that one must possess the "propensity and skill" to take part in critical thinking. The propensity and skill for reflective scepticism implies active thought, risk taking, and the beginning of metacognitive awareness. McPeck (1981) believes "rationality" is compatible with "critical thinking". In addition, he argues that the two terms are not equivalent (p. 12). Instead, according to McPeck, critical thinking is included in rationality. He maintains that the use of logic, without a creative element, is insufficient for critical thinking.

Ennis, true to his philosophical background, initially proposed the use of logic for the study of critical thinking (Ennis, 1969). Although logic is important for thinking, it leaves no room for creative thought processes if used exclusively. As time advanced, Ennis (1987) characterized

critical thinking as "reasonable reflective thinking that is focused on deciding what to believe or do" (Ennis, 1987, p. 12). Following his newer definition of critical thinking, Ennis included creative thinking processes such as hypothesizing, alternative ways of viewing a problem, questioning, possible alternative solutions, and plans for investigation. Furthermore, in his earlier work, Ennis argued that certain dispositions and abilities along with criteria to assist in evaluating results could be taught in a separate generic course. He believed and still believes in the meaningfulness of general thinking ability as evidenced by his example of ordinary citizens, without legal training, serving on a jury (Ennis, 1987). Ennis argues that the vagueness of the term "domain" knowledge hinders a true evaluation of whether thinking skills are transferable. However, yielding to criticism from researchers such as McPeck (1981) by the late 1980s Ennis (1987) recommended the teaching of thinking throughout the curriculum with an emphasis on domain-specific background knowledge, at least some domain background knowledge, along with general critical thinking criteria and principles.

As the 1980s progressed, a contextual element was added to the creative and rational elements in critical thinking. This contextual emphasis was advocated by researchers such as Bevis (1989), Brookfield (1987), Paul (1987), and Schon (1983; 1987; 1991).

A major pedagogical shift from her earlier work was noted in Bevis's (1989) philosophy of learning. Where she once advocated a rational model, she now added contextual elements. Creativity appeared in her earlier writings but, as the 1980s evolved, this characteristic became more important for critical thought. As well, a greater weight was put on the importance of students becoming active participants and partners in their learning process.

Similarly, the adult educator, Brookfield (1987), defined critical thinking as "reflecting on the assumptions underlying our and others' ideas and actions, and contemplating alternative ways of thinking and living." (Brookfield, 1987, p. x). Brookfield emphasized the significance of context in creating meaning while dealing with problems requiring critical thinking. Such a contextual emphasis to critical thinking suggests that critical thinkers are bound by their culture. Critical thinkers then, from one culture to another, explore various alternatives while they challenge the "status quo" in an attempt to arrive at a new vision. Brookfield (1987) suggested that critical thinking is an active process by the student as opposed to a "banking" process where the student is merely a receptacle for knowledge.

Brookfield (1987) appears to differ from other authors because he included an emotional dimension to critical thinking. The inclusion of the characteristic of

emotionality to critical thinking, seems initially, to be at odds with rational reasoning which belongs in the cognitive domain. However, such an emotional emphasis is similar to Krathwohl's (1956) affective domain where conflicts between different values are resolved. At the highest level of the affective domain, students take responsibility for their own value system. Thus, it is possible that critical thinking involves the cognitive and the affective domain.

Paul (1987), true to his philosophical grounding, emphasizes the importance of dialogue in the development of critical thinking. He argues that "dialogical thinking about basic issues that genuinely matter to the individual provide the kind of practice and skill essential to strong-sense critical thinking" (p. 140) where, upon reflection, development of ones own beliefs is created. The strength of dialogue is the potential for the growth of new ideas not yet hinted at before dialogue began. With any dialogue, the assumption of reflection is implied, as it is when Paul emphasizes a move away from egocentric and ethnocentric attitudes in an attempt to understand other people's perspectives. In addition, Paul recognized the importance of a contextual element in solving a problem. Thus, according to Paul, the views of people outside one's own circle or the views from entirely different contexts or perspectives must be entertained during the critical thinking process. Later, Paul (1989) defined critical thinking as "disciplined, self-

directed thinking which exemplifies the perfection of thinking appropriate to a particular mode or domain of thinking" (p.214). His "passions" describe a positive attitude or disposition for critical thinking not unlike Krathwohl's (1956) valuing and positive problem-solving attitude. Also implied in his definition is that students are active learners using metacognitive strategies.

Schon's (1983; 1987; 1991) work is grounded on his own careful analysis of several professions and on Dewey's writings. Schon investigated many individuals' thinking during the practice of their profession. An emphasis on reflection in action, and reframing a situation are major themes. He follows the traditional research process for problem solving, using deductive logic to generate hypotheses to experiment and predict. The main difference with Schon's model of reflective practice from the traditional problem solving model is his use of problem solving in actual practice. Such usage in practice "sets the stage" for reflection in action. If, in using Schon's model, the hypothesis is proven, the goal is achieved. If it is not achieved, an important element of the reflective practice is the reframing of the situation so as to generate a new hypothesis. Schon (1983; 1987) suggests that novices and experts work together and reflect together on their practice. This working together and joint reflection are effective modelling strategies for thinking in professional

practice. Although Schon does not mention metacognition in his writings, his emphasis on the reflective practicum is closely aligned with the concept of metacognition. One might be so bold as to suggest that the monitoring and evaluation in practice and redirecting are the metacognition of professional practice.

Other authors, such as Nickerson, Perkins and Smith (1985) emphasized elements of the rational, creative, and contextual in their research on thinking. They suggested "two types of thinking, one characterized by such terms as analytic, deductive, rigorous, constrained, convergent, formal, and critical, and the other by synthetic, inductive, expansive, unconstrained, divergent, informal, diffuse, and creative" (p. 62). It is apparent that the first type of thinking covers hypothesis testing and the second covers hypothesis generation. However, upon closer examination, critical thinking is grouped with characteristics frequently applied to a rational ends-means process or an hypothesis testing process. These latter features are more closely aligned with earlier concepts of critical thinking. Nickerson et al. (1985) further identified characteristics of a creative thinker, such as the willingness to practice autonomy, and the ability to tolerate ambiguity. Because of these qualities the creative thinker demonstrated risk taking ability and self-motivation. Nickerson et al. (1985) also suggested the use of good role models, the study of

creative people, and the benefit of positive feedback as necessary conditions to reinforce the disposition for creative thinking. What is perhaps most important in their definition is the fact that current concepts of higher level thinking skills appear in the overall definition. According to Nickerson et al., teachers need to provide explicit guidance to students in an effort to facilitate thinking skills. However, Nickerson et al. suggest that thinking skills may have different applications in different contexts. Thus, a problem of transfer is that thinking skills developed in specific contexts may become "welded" to that context.

Presseisen (1987), with her educational psychology background, categorized problem solving, decision making, critical thinking, and creative thinking as complex level skills. She then added metacognitive skills as necessary components for effective thinking. These complex level skills are possible when a thinker concurrently monitors task performances and understands and selects appropriate strategies (Presseisen, 1987; French & Rhoder, 1992).

Conceptual similarities and differences by researchers, as to what is involved in critical thinking pose a challenge to teachers. Ennis (1987) agreed with McPeck (1981) in the assertion that background knowledge is crucial for critical thought but differs as to the generalization of

principles. Ennis (1987) suggested that critical thinking principles can be generalized whereas McPeck (1981) disagrees.

Bevis (1989) and McPeck (1981) agreed with deBono (1976) in their belief that logic alone is insufficient for effective thinking. Logic's use extends only to the context of justification and consequently is inadequate to deal with unforeseen circumstances. The engagement of such rules of logic do not allow for the introduction of new ideas or for the posing of alternatives. This deductive reasoning produces absolute certainty and leaves no room for inductive reasoning or probability (Overton, 1990).

A number of authors underline the importance of affect in critical thinking. Paul's (1989) "passions" which describe an attitude for critical thinking coincide with McPeck's (1981) propensity for reflective scepticism and Ennis' (1987) dispositions, especially the disposition to be open-minded.

McPeck (1981), and Brookfield (1987), agree that rational thought plays a part in critical thinking. Bandman and Bandman (1988) appear to use "rational" as a synonym for "critical". For Babbie (1979) "logic" and "rationality" are synonyms. However the term "rationality" was used by the aforementioned authors, there is no doubt that logic is closely allied with rationality.

In addition to researchers already mentioned, several others have contributed to critical thinking research. The importance of a contextual element to critical inquiry is emphasized by Jones and Brown (1991) and Sirotnik (1991). Other authors such as French and Rhoder (1992) Yinger (1980), and Beyer (1988) believe that problem solving and decision making include a creative element. Diekelmann (1990), Diekelmann and Rather (1993), and Thayer-Bacon (1993) emphasize the role of caring in the critical thinking process, thus expanding on Brookfield (1987) and Krathwohl's (1956) work in the affective domain.

From the 1940s to the 1970s, critical thinking researchers proposed a rational process of problem solving based upon the scientific method. By the 1980s, several researchers added contextual and creative elements to higher level thinking processes. As well, students became active learners instead of passive "receptacles" of facts. Views that espoused a rational approach, with time honoured concepts of logic as sufficient for students' education, clashed with arguments that declared the importance of context in creating meaning while dealing with rapidly shifting problems in a technologically volatile world. Tension still exists between the two factions. For instance, the rational nursing process is firmly entrenched in present nursing practice at the same time as evidence exists of multiple realities.

Not the least of these realities is the caring role practised by nurses. Caring has traditionally been identified with nursing. However, caring associated with critical thinking appears to be a new trend in the 1990s. Another strong reality, initiated in the 1980s and continued into the 1990s, is the premise that students are active learners. This trend was the forerunner to metacognition which as research shows, is imperative to the development of critical thinkers.

Metacognition and Strategy

Metacognition. Thinking consists of a type of mental activity which includes both cognitive and metacognitive operations (Beyer, 1988, p.68). Although a great many references to cognition are evident in the educational literature, not until recently has there been an additional emphasis on the term "metacognition" as an integral part of critical thinking. However, metacognitive knowledge and strategies are consistently applied throughout the critical thinking process (Bayer, 1988; Brown, Bransford, Ferrara, & Campione, 1983; French & Rhoder, 1992: Paris, Wasik, & Van der Westhuizen, 1988; Paris & Winograd, 1990; Pressley, Borkowski, & O'Sullivan, 1985).

Beyer (1988) referred to metacognition as "thinking about how one thinks" by planning, monitoring, and assessing one's learning experiences (p. 68). Flavell (1979) argues that metacognition is the "monitoring of...own memory,

comprehension, and other cognitive enterprises (p. 906). His metacognitive knowledge is further subdivided into a knowledge of self with respect to one's own cognitive processing, evaluation of cognitive tasks or potential planning and monitoring strategies used to complete cognitive tasks (Flavell, 1987). Metacognition has also been defined as awareness or knowledge of one's own cognitive activity and strategies used to regulate one's own thinking processes (Brown, 1978; Pressley & Associates 1990). Thus, the two main components of metacognition are the assessment of one's thinking style and the strategies used to direct one's own cognitive endeavours.

Pressley, Borkowski, and Schneider (1987) found that successful students were conscious of their own ways of thinking and learning, especially recognizing the need for personal effort to be focused on strategic activity. Zimmerman and Pons (1986) found that successful learners showed knowledge of and used several strategies in a consistent manner which was not the case for less skilled learners. Furthermore, Chi, Feltovich and Glaser (1981) and Schoenfeld (1985) demonstrated that expert problem solvers spent more time than novice problem solvers in analyzing mathematical problems and planning their attack, but spent relatively little time implementing their approach. Not only did novice problem solvers fail to plan their strategy or monitor their progress but also they had less content

knowledge to rely upon (Patel & Groen, 1986; Rohwer & Thomas, 1989). Moreover, students who reflected on the relationship between task performance and strategic behaviour were likely to select improved strategies in the future (Ghatala, Levin, Pressley, & Goodwin 1986). Furthermore, Pressley, Borkowski, and Schneider (1987) argue that strategy behaviour and exposure to strategy modelling without acquiring domain-specific knowledge and strategy knowledge (how, when, and where to use strategies) in that domain may hinder success.

Knowledge of and use of metacognitive strategies is not an innate gift for students. Instead, students need explicit instruction on how to plan, monitor, and evaluate their cognitive activities in an effort to become successful thinkers (Baker & Brown, 1984; Brown, Bransford, Ferrara, & Campione, 1983; Flavell, 1987; Paris & Winograd, 1990; Pressley, Goodchild, Fleet, Zajchowski, & Evans, 1987).

Nickerson (1989) and Schoenfeld and Herrmann (1982) suggest that students, when given explicit strategy training, use cognitive strategies more like the experts. Similarly, such strategies are evident when students are given actual opportunities to recognize the relevance of this process to their learning. Nickerson's view is that the success of teaching cognitive strategies depends upon gaining metacognitive knowledge and skills. In addition, several sources support the importance of modelling

cognitive and metacognitive strategies by faculty (Pressley, Borkowski, & Schneider, 1987; Short & Weissberg-Benchell, 1989; Whimbey & Lochhead, 1986). One method of modelling is when the teacher provides (1) "one or more examples of models that illustrate various features of the expected responses, (2) comments that identify exactly what is good about each response, (3) sample thinking processes used to arrive at the response, and (4) guided practice with ample opportunities for editing, revision, and correction of errors" (Jones, 1985, p. 110).

How these skills are taught is an area of concern. The challenge for educators is transfer of thinking skills. Perkins and Solomon (1989) argue that good thinking depends upon a synthesis of domain-specific knowledge, general thinking heuristics, and positive conditions such as self-monitoring, practising and cueing. French and Rhoder (1992) believe in the importance of teaching thinking skills throughout content area as well as initiating thinking skills with separate instruction. Be it separate instruction or integrated course content, educators must introduce multiple viewpoints, ambiguity, and disagreement among authorities in an effort to facilitate students' critical thinking abilities (Chaffee, 1992).

Metacognitive Strategies. Several strategies for teaching critical thinking were deemed to be successful. Palincsar and Brown (1985), in their Reciprocal Training Program,

included teaching strategies such as question generating, summarizing, predicting, and clarifying. These authors found that students independently used such strategies once their teachers modelled the techniques. Furthermore, trained students continued to use the modelled strategies. An important aspect of this approach is that students are actively involved in questioning and explaining processes they and others use. Reading gains were then generalized to other classroom content. This notion of generalizability is a crucial aspect for new educational situations.

Paris and Winograd (1990) recommend both cognitive coaching and cooperative learning as strategies to improve metacognition. Cognitive coaching, which includes mutual dialogues, direct explanation, modelling, and encouragement, was shown by Paris (1986) to improve metacognition in school children. A most important outcome of this study was that coaching, through its encouragement of reciprocal interactions, transferred control from the teacher alone to the student and teacher. Although the Paris study population involved school children, the idea of student ownership of learning is equally important for all student populations. Further, cooperative learning as well as cognitive coaching, empower students to actively participant in their learning while monitoring, directing and evaluating their thinking processes.

Cooperative learning promotes self-regulatory processes such as self-appraisal and self-management. In cooperative learning, students work together to complete tasks. This active participation by students improves their metacognition because they are required to explain their thinking to others (O'Donnell et al. 1988; Table 2). Conversely, students' high anxiety during cooperative learning interfered with their performance resulting in decreased metacognition (Hall et al. 1988). However, the provision of standardized scripts for interaction reduced college students' stress during cooperative learning (O'Donnell, Dansereau, Hall, & Rocklin, 1987). In scripted cooperation, the participants read the text, then the predesignated participant(s) recall the text and verbally summarize what was read, the remaining participant(s) identify and verbally correct any errors noted in the summary, and finally, in the elaboration stage, all the students work together to develop analogies and examples in an effort to understand the material (Hall et al. 1988).

In using any of the teaching strategies described, the teachers must be willing to practise these techniques. Creating opportunities where students explicitly apply and discuss the application of critical thinking strategies is essential to the development of critical thinking ability. Unfortunately, researchers show that many teachers believe they have achieved their goal of teaching "how to think" by

merely encouraging students to think about content or respond to simple questioning (Beyer, 1988).

The use of cognitively high level questioning raises the level of thinking in students (French & Rhoder, 1992; Harrison, 1988; Hoelzel, 1987; House, Chassie & Spohn, 1990; Samiroden, 1983). Educators and students are encouraged to ask high level questions. Student generated questioning reinforces active learning which is necessary to empower students and to improve their analytical thinking and communication skills (Sadler, 1987). How the questions are asked, the environment, and wait time will have an effect on the level of cognitive response received. Not surprisingly, wait time of less than three seconds, following questioning, is not effective in facilitating the development of students' thinking skills (Rowe, 1987; Tobin, 1987; & Wink, 1993).

The aforementioned strategies which encourage active learning or metacognition are necessary components in a student's quest to become a critical thinker. In addition, domain-specific knowledge prior to metacognitive strategy learning underpins the movement to expert status where critical thinking is assumed.

Domain-Specific Knowledge

Alexander and Judy (1988) argue that domain-specific knowledge includes the declarative, procedural, or conditional knowledge one possesses in a specific area. As

well, the suggestion that critical thinking demands a grounding in domain-specific knowledge for the skillful organization and application of knowledge which is employed within its proper context is a common theme in the cognitive literature (Alexander & Judy, 1988; Alexander, Kulikowich, & Jetton, 1994; Rohwer & Thomas, 1989). The aforementioned authors agree with Perkins and Solomon (1989) who argue that experts rely on a rich data base where domain knowledge is organized and accessed at a much higher level than do novices, and where patterns are recognized and used in novel situations. One area of discussion and disagreement in the critical thinking literature pertains to the necessity, or lack, of domain-specific knowledge. Part of the perception surrounding the necessity for a rich domain of knowledge is that one is unlikely to think about nothing. As well, a second consideration is that there may be a specific application of critical thinking within specific disciplines. Where McPeck (1981) stresses the importance of content knowledge for critical thinking within disciplines, he disagrees that this same knowledge can be accessed to use in different contexts. Other researchers (Alexander & Judy, 1988; Perkins & Salomon, 1989) argue that the transfer of reasoning skills is possible if certain conditions are met. Not only is domain-specific knowledge important but also, a healthy amount of general world knowledge aids successful transfer. In addition, a positive environment and the use of

strategies such as reciprocal teaching, summarizing and predicting, aid knowledge transfer to new situations (Alexander, Kulikowich & Jetton, 1994; Palinscar & Brown, 1985; Schoenfeld, 1985). The concept of domain-specific knowledge, which McPeck (1981) refers to as specific subject content, has been enlarged to encompass all aspects of knowledge, i.e., declarative, procedural, conditional (Alexander & Judy, 1988). Overall, more weight appears to be given to the importance of domain-specific knowledge as a prerequisite for greater thinking ability. Part of the perception of the need for specific knowledge is that one cannot think about nothing. To encourage the generalization of critical thinking skills educators might be wise to teach general critical thinking skills, integrate these skills and strategies throughout the curriculum while emphasizing domain-specific and strategic knowledge (Perkins & Salomon, 1989). And when doing so, create explicit links to new areas of old skills. Although generic critical thinking skills are of value across the professions, the nursing profession must attend to the research which emphasizes the importance of domain-specific knowledge. Thus, faculty development in critical thinking for nurses must be facilitated by experts in the nursing profession.

As students develop intellectually from novice to expert thinkers, evidence of increased use of domain-specific knowledge emerges. Thus, an awareness by students

and teachers of the intellectual developmental levels is important to the learning and teaching of critical thinking.

Intellectual Development and Strategies

Several researchers (Belenky, Clinchy, Goldberger, & Tarule, 1986; Bevis, 1989; Perry, 1970) have addressed this issue of intellectual development. Each has given labels to the stages which suggest, but which do not define, metacognitive development.

Belenky et al. (1986) interviewed women from different races, classes, family backgrounds, and educational levels. The researchers focused on what women had to say about their experience as learners.

Belenky et al. (1986) argued that women's intellectual development consisted of five categories:

silence, a position in which women experience themselves as mindless and voiceless and subject to the whims of external authority; *received knowledge*, a perspective from which women conceive of themselves as capable of receiving, even reproducing, knowledge from the all-knowing external authorities but not capable of creating knowledge on their own; *subjective knowledge*, a perspective from which truth and knowledge are conceived as personal, private, and subjectively known or intuited; *procedural knowledge*, a position in which women are invested in learning and applying objective procedures for obtaining and communicating knowledge;

and constructed knowledge, a position in which women view all knowledge as contextual, experience themselves as creators of knowledge, and value both subjective and objective strategies for knowing (p. 15).

Similarly, Bevis (1989) suggested five basic positions of intellectual development or "learner maturity continuum" which she labelled "charming, anticipatory -compliant, resonating, reciprocating and generating" (p.83). Her model is a theoretical position which has been field tested but not researched. It is mentioned here because the field test population was mostly female student nurses.

In the *charming* category students aim to please the teacher instead of meeting learning goals. Students in the *anticipatory-compliant* level expend energy in outsmarting the teacher; *resonating*, students respond to charismatic teachers by being highly motivated. Unfortunately, the teacher usually controls learning. *Reciprocating* requires students to be active learners, to look for patterns, to question, and to express insights. Collegial relationships are apparent among students and between student and teacher. The most mature position is *generating* where students are in control of their learning as they move in new directions while exploring ideas relevant to their goals. Teachers are consultants, facilitators, and expert learners. Trust is imperative between student and teacher.

Perry's (1970) study is seminal in the literature of intellectual development. His population consisted of mostly male students at Harvard University. Belenky et al. (1986) chose a population which was more heterogenous than Perry's (1970). Consequently, Perry's developmental levels have a more defined linear pattern than that shown by Belenky et al. (1986). The four positions that Perry (1970) presents are: *basic dualism* where knowledge is absolute, right or wrong; *multiplicity*, a position where all knowledge is relative, where students reassess what it is that teachers want; *relativism subordinate*, where analytical thinking is developed more as a special procedure which teachers expect. Once *full relativism or commitment to relativism* is reached students understand that truth is relative and contextual in all facets of life. At this stage, more demands are made of the student as he searches for the truth. With this new found individuality students have confidence that their educational community will support exploration.

Several of the learning positions will be compared. According to Bevis (1989), who worked in the behaviourist paradigm, students are discouraged from judging their own nursing care or evaluating their own reasoning. Such students remain in the anticipatory-compliant position on the learner maturity scale where students try to anticipate educators' wishes (Bevis, 1989). In the anticipatory-compliant position students fail to question, take risks or

think about their own thinking processes. Often, argues Bevis, in the anticipatory-compliant stage students attempt to outsmart the instructor. Perry (1970) refers to this "outsmarting the instructor" stage as multiplicity while Belenky, Clinchy, Goldberger, & Tarule (1986) refer to a comparable stage as subjective knowledge. Although students in Belenky et al.'s subjective knowledge stage begin to develop their own beliefs and perceptions, these same students keep their beliefs private, continue to anticipate what the teacher wants and respond accordingly. The majority of college students operate at the multiplicity/subjective knowledge position of intellectual development (Belenky et al., 1986; King, Kitchen & Wood, 1985; Kurfiss, 1988). A study by Brabeck (1983) supports the premise that students unfamiliar with basic critical thinking skills reached the position of multiplicity.

Relativism is not unlike Belenky et al.'s (1986) procedural knowledge where disciplined attempts are made to understand what underlies an opponent's point of view. At the highest level, Perry (1970) implies that a risk free, trusting environmental climate between student and teacher and among students characterizes mature intellectual functioning.

Perry (1970) and Belenky et al. (1986) infer that at the lower positions of intellectual development, college students are no further ahead in their metacognitive

development than elementary or secondary students who have not been exposed to strategies for thinking. Belenky et al.'s (1986) level of procedural knowledge showed women becoming aware of their thinking and their need for active participation in learning. Apparently, metacognition begins with procedural knowledge and continues to develop in constructed knowledge. Perry's (1970) students became self-motivated active learners when they reached the final position of full relativism.

The intellectual development perspective can provide guidance for educators as they assess students' progress. Once assessments are completed pertinent strategies can be used to challenge students as they strive to become critical thinkers. Explicit strategies are necessary to facilitate students' movement along the continuum of intellectual development (Perry, 1970). Certain methods, such as writing to learn, encourage higher level thinking skills (Sheridan, 1992). Writing instruction forces students to be less rigid in their thinking and encourages them to engage in dialectical thinking so necessary for critical thought (Kurfiss, 1988; Paul, 1987; Sirotnik, 1991). Bowers and McCarthy (1993), using Perry's (1970) model of the positions of cognitive development in a required prenursing health issues course, moved students along the continuum of cognitive development. The strategy used was writing to learn (WTL) based upon theories of adult cognitive

development (Kinneavy, McCleary & Nakadate, 1985; Kohlberg, 1981; Perry, 1970). Several students realized the importance of the assignments and became more cognitively aware. Students became active learners, moved to a higher cognitive level, and became involved in more dialogue with their teachers. During the study, teachers modelled analytical thinking and gave students ample opportunities to practise skills necessary for the development of higher level cognition.

One cannot assume that all students in similar classes have achieved comparable positions of cognitive development. For high school and college students, Hays, Brandt and Chantry (1988) found that developmental level played a more significant role than students' educational level in the quality of students' writing. Such a finding underscores the importance of teachers' knowledge of developmental research when attempting to facilitate critical thinking.

Cognitive and metacognitive theory along with levels of intellectual development provided a framework for this work. The cognitive component addressed is that which is at a higher level than simple recall of knowledge. Different theorists and researchers used different constructs as synonyms for upper levels of thinking. Literature on thinking shows that no one definition could be applied universally to the cognitive processes of critical thinking. However, several common components of critical thinking

arise throughout many theorists' work including contextual, creative, reflective and rational elements; a propensity and passion for thinking while using domain-specific knowledge. In addition, critical thinkers possess a highly developed cognitive and metacognitive awareness which becomes evident at upper levels of intellectual development.

SUMMARY

The majority of Canadian nurses prepared for professional practice were trained in the hospital based schools of nursing until the late 1960s and early 1970s. By 1970, many nursing education programs were removed from hospital controlled schools of nursing and placed in community colleges and universities. This change in direction by nursing and government leaders closely followed trends in nursing education in the United States.

The strongest influence on nursing education occurred following the adoption of the Tyler model. Performance criteria based curricula developed according to this model, still predominate in schools of nursing. Although all nursing programs contain some elements of training, current researchers suggest that nurses develop new curricular paradigms to enable the education of nurses instead of training of nurses. A major focus for the education of nurses is the facilitation of critical thinking. The nurse of the future must be ... "one who can act and reflect and who has the nature of compassionate scholar with a mind

that never ceases to inquire, quest, and expand" (Bevis & Watson, 1989).

A wealth of literature and research exists on the subject of critical thinking. Because of such extensive research, one would expect that educators experience little difficulty in teaching and facilitating critical awareness in their students. However, research does not support this contention.

Several definitions of critical thinking have been described. Each employs similar constructs but may have different meanings. A problem arises when different terms are used interchangeably or in different ways to define critical thought. Problem solving frequently is equated with decision making or reflective thinking. Inquiry learning has been used as a synonym for questioning, hypothesis generation, logic, discerning of underlying assumptions, and the scientific method. All of these terms have been equated with critical thinking. In addition, several researchers have narrowly defined critical thinking as a rational, objective, linear problem solving process with logico-deductive reasoning. Other researchers suggest broader terms, such as reflection, scepticism, creativity, the posing of alternatives and underlying assumptions, and inference to define critical thinking.

Although equivocation exists with regard to the definition of critical thinking, agreement allows that one

must possess a propensity or disposition to question the "status quo". This propensity to challenge presumes that the critical thinker is a risk taker and is willing to accept ambiguity.

Metacognition cannot be separated from critical thinking and, indeed, is an integral part of it. Thinking about how one thinks, with an emphasis on planning and monitoring one's own thinking strategies, are characteristics of the expert problem solver. Students must move to these upper positions on the learner maturity continuum (Bevis, 1989) or stages of intellectual development (Belenky et al., 1986) and become active learners in an effort to become expert problem solvers. In order to facilitate critical thought, both cognitive and metacognitive strategies must be made explicit to students and must be practised by students.

Although a "blurring" occurs over what one author or group refers to as problem solving and another group refers to as critical thinking or reasoning, undoubtedly, all of these skills are necessary components of higher order thinking. In an effort to prepare students for the present and the twenty-first century cognitive processes of critical thinking with an emphasis on domain-specific knowledge, allied with metacognitive processes must be modelled by educators, explicitly taught to students and practised by students.

CHAPTER THREE

RESEARCH DESIGN

Method. The purpose of this study was to identify nursing faculty awareness of current research into the nature of critical thinking. This was accomplished by sending a questionnaire to 56 nursing faculty in a collaborative baccalaureate nursing program in Manitoba. A descriptive design was selected for this study because the independent variables had already occurred and were not open to manipulation (Moore, 1983; Schumacher & McMillan, 1993). Furthermore, information acquired from descriptive research can be used to provide leads for future investigation and changes (Phillips, 1986). Another strength of descriptive research is the provision of detailed information about the variables under study (Brink & Wood, 1988). This type of research helped determine what existed with respect to the current situation (Moore, 1983), in this case, the state of teacher knowledge of critical thinking research in collaborative baccalaureate nursing programs in Manitoba. According to Moore (1983), descriptive research accurately portrays events and also describes interrelationships between important variables.

Although several types of descriptive designs exist, the survey method was used in this study to collect data. Because it was a self report assessment, the survey was an

excellent method to attain data on existing phenomena, quickly and efficiently (Nieswiadomy, 1993). Surveys allow indepth focus on specific problems (Moore, 1983).

Furthermore, survey design use facilitates replication of the study by forcing the researcher to formalize the sample plan, the instrument, and the analysis plan (Hessler, 1992). Thus, this design will prove useful to the researcher if, in the future, a larger sample is surveyed.

Subjects. The subjects surveyed were the nursing educators who were teaching in a collaborative baccalaureate nursing program in Manitoba. Following requests for access and site access approval, all the names and addresses of the faculty teaching in the collaborative baccalaureate nursing program were requested from the program directors of the three sites; The University of Manitoba Fort Garry site, The University of Manitoba Health Sciences Centre site and The St. Boniface General Hospital site (Appendixes G, H, I,). Names from two sites were obtained with their work addresses. The Director of the third site instead requested twenty-five surveys which she introduced to her faculty. According to the requested lists, a total of 56 faculty members taught in the collaborative baccalaureate nursing program in Manitoba. One individual, who received a survey, informed the researcher that she did not teach in the program. She was told to discard the survey. Thus the population was 55. Because the entire population in Manitoba

was surveyed, it was representative of the nursing teachers in the collaborative baccalaureate nursing program in Manitoba. This factor decreased bias and increased the generalizability of results to teachers working at all sites in the collaborative baccalaureate nursing program in Manitoba (Moore, 1983).

Procedure. The independent variables included the education, work history, and current employment site. Because there was no manipulative control over these variables, the measurement type of operational definitions was called for (Moore, 1983). The levels of the concept "education" included (a) undergraduate and (b) graduate education. The levels of the concept "work history" included (a) teaching experience in diploma nursing programs (b) teaching experience in baccalaureate nursing programs (c) teaching experience in both programs and (d) nursing practice exclusive of teaching experience. The two levels of faculty site included (a) hospital based collaborative baccalaureate nursing faculty and (b) university based collaborative nursing faculty.

Instrumentation. The dependent variables were the educators' current knowledge of critical thinking concepts and knowledge of critical thinking research. These variables were operationalized by a questionnaire. The survey instrument contained open ended questions, Likert type critical thinking questions, and a demographic section

(Appendix J). The Likert type questionnaire had questions which represented five subscales including declarative, procedural, contextual, and strategic knowledge as well as the value given to strategic teaching. The following questions represented various types of knowledge: Declarative (8,14,16,19); Procedural (17,18,20,22); Contextual (15,23,24,25); Strategic (5,6,7,10,11,12,21) and Value given to strategy teaching (3,13,26,27,28,29). The construct validity of the original questionnaire was ascertained by a factor analysis of the original declarative, procedural, and contextual questions. A second factor analysis was done on all the Likert type questions. Further, reliability coefficients were calculated on significant common factor loadings in an effort to test for the internal consistency of the instrument, which was broken into subscales. The questionnaire was designed to be answered in about 30 minutes. The instrument was developed by the researcher after careful literature review and consultation with education and nursing professionals who had expertise in critical thinking. A pilot study to test the content and face validity of the questionnaire was conducted. The names of experts in the nursing teaching community on critical thinking were requested from the then Acting Director of Nursing at the University of Manitoba and from the researcher's nursing colleagues. From this list, three experts were chosen to complete the test instrument.

The questionnaire was revised incorporating suggestions given by the individuals in the pilot study.

Data Collection. The questionnaires were mailed to all names put forward at the two sites and hand delivered, without names, to the Director of the third site. The Director of the third site saw that the surveys were addressed and mailed to specific instructors from this location. A cover letter accompanied each survey (Appendix K). As well, a self addressed stamped envelope was included. Three weeks later, a follow-up letter was mailed to all available names of the educator population with the remaining letters hand delivered to the Director of the third site for individual dispersal (Appendix L). The first mailing consisted of 56 instruments. A total of 18 surveys were returned following the first mailing yielding a 32% return rate. After the follow-up letter, 13 more questionnaires were received making a total of 31. All returned surveys were used bringing the return rate to 56%. A response rate of seventy percent is very good but 50% is an adequate response rate (Babbie, 1989; Nachmias & Nachmias, 1987).

Analysis. Following data collection, data were recoded and entered into a file on a Unix based system. The computer program SPSS for Unix, release 5.0 was used for statistical analyses. As well, Microsoft Excel version 5.0, MS-Dos was used for tables and figures. Factor analysis of the Likert type questions was done in an effort to discover patterns

among the variations in the values of several variables. Factor analysis of the Likert type questions was employed as a method of construct validation and to suggest something about the properties of the scale. (Kerlinger, 1973). An initial factor analysis was done on the 12 items originally developed to measure declarative (8,14,16,19); procedural (17,18,20,22); and contextual (15,23,24,25) knowledge. Further, a factor analysis was done on all the 27 items in the Lykert type questionnaire. The original factor analysis with the 12 elements is more stable compared to the factor analysis with the 27 elements (Child, 1970). According to Child (1970), it is desirable to have at least three tests in order to represent a dimension. Thus, a much larger sample for the twenty-seven item factor analysis is suggested for future analyses. The variables developed from the factor analysis were compared with the independent variables once significant correlations among questions supporting each factor were achieved.

Cronbach's alpha was used to measure the correlation coefficients of a set of factors obtained from the factor analyses (SPSS Inc., 1988). These correlation coefficients tested the internal consistency of the questionnaire (Moore, 1983). Once the reliabilities were ascertained and the variables were formed, nonparametric and descriptive statistics were used to analyze the differences among variables and to summarize the data. The Kruskal-Wallis one-

way analysis of variance and the Mann-Whitney U test were used to analyze the data. These tests were chosen due to the small sample size and the lack of equal subjects in each comparison group (Moore, 1983; Siegel, 1956). Descriptive statistics included medians, frequencies, ranges, quartiles, and percentages to report data. A significance level of .08 was selected prior to analysis. The significance level of .08 was prechosen due to the use of the more conservative nonparametric tests which were more in line with the small sample size and the unequal number of subjects in each comparison group (Moore, 1983; Siegel, 1956). As well, due to the theoretical nature of this research and the difficulty in defining critical thinking, a significance level of .08 was deemed acceptable (Siegel, 1956).

The faculty awareness of critical thinking research was measured using the median scores from the Likert type questions. Specifically, faculty awareness was evident when the median of the individual subscales was equal to or greater than the product of the number of questions in the subscale and number six on the Likert type scale.

A content analysis was performed on the open-ended questions to ascertain patterns. The findings from the open-ended questions were summarized and are provided. The characteristics of the respondents are reported in tables.

Assumptions

Assumptions which underlie this study are:

1. Information regarding the critical thinking knowledge base of the collaborative baccalaureate nurse educators will assist educators and directors to plan faculty development programs and develop a curriculum which empowers students.
2. Knowledge of what constitutes critical thinking is necessary to teach it.
3. Students must be actively involved in their curriculum and learning if they are to become critical thinkers.
4. A commitment to only a rational-technical model of education will no longer work for educating nurses to think in a critical manner.
5. Students can be taught to recognize and apply clearly identifiable thinking skills.
6. High level thinking skills must be modelled to be taught to students.
7. Experts in their chosen field are considered critical thinkers in that field.

Limitations

The limitations of the study were the following:

1. Due to the small population of educators in one collaborative baccalaureate program and due to the

- same sex of the respondents, generalizability to other populations is a concern (Cohen & Manion, 1994; Moore, 1983).
2. Critical thinking is extremely difficult to define posing a threat to the validity of the instrument (Cohen & Manion, 1994).
 3. The potential for the entire questionnaire factor analysis to be less stable than the twelve question factor analysis or less stable than with a larger sample is a concern and poses a threat to the validity of the instrument (Child, 1970).
 4. With reliabilities of - .42 - .61 for the subscales, one may not be as confident as with the subscale reliabilities of .80 - .84.
 5. Survey research depends upon voluntary participants thus increasing the possibility of volunteer bias (Cohen & Manion, 1994). Different findings may have resulted from data of the remaining population.
 6. Open-ended questions where respondents were not probed as to what was meant by particular responses is a concern (Cohen & Manion, 1994).
 7. Reliability may be a concern with a survey return rate of 56%.
 8. Self-report responses may effect reliability due to a tendency of the respondents to provide socially acceptable responses (Hessler, 1992; Neswiadomy, 1993).

9. The possibility of a Type 1 and a Type 11 error is a concern due to the small sample size (Siegel, 1956).

CHAPTER FOUR

Results

The purpose of this study was to gain information about collaborative baccalaureate nursing faculty awareness of current research into the nature of critical thinking. The dependent variable was the educators' current knowledge of critical thinking research. The independent variables included education, work history, and current employment site. The levels of the concept "education" included (a) undergraduate and, (b) graduate education. The levels of "work history" included (a) teaching experience in diploma nursing programs prior to teaching in a collaborative baccalaureate nursing program, (b) teaching experience in baccalaureate nursing programs prior to teaching in a collaborative baccalaureate nursing program (c) teaching experience in both programs prior to teaching in a collaborative baccalaureate nursing program and (d) nursing practice exclusive of teaching experience. The two levels of "faculty sites" included (a) the hospital based collaborative baccalaureate nursing faculty and, (b) the university based collaborative nursing faculty.

Research Questions

- 1) Is there a difference in the knowledge of current research on critical thinking among the faculty who taught only in diploma nursing programs prior to collaboration, those who taught only in baccalaureate

- nursing programs prior to collaboration, and those who taught in both programs prior to collaboration?
- 2) Is there a difference in awareness of current research on critical thinking among faculty with a small, moderate or large amount of nursing practice?
 - 3) Is there a difference in knowledge of critical thinking between the undergraduate and graduate prepared faculty?
 - 4) Is there a difference in the interpretation of critical thinking held by the hospital based nursing faculty and the university based nursing faculty?

The Likert type questions (Appendix J) attempted to elicit information to answer the first three research questions. The critical thinking questionnaire (CTQ) consisted of 27 Likert type questions three to twenty-nine where the respondents choosing "one" indicated "strongly disagree" and the faculty choosing "seven" indicated "strongly agree". Questions four, eight, fourteen, nineteen, twenty-two, twenty-four, and twenty-six were recoded for analysis so that one equalled seven, two equalled six, three equalled five, four equalled four, five equalled three, six equalled two and seven equalled one. For analysis, the median score on the Likert type questions, the dependent variable, measured critical thinking awareness. These questions were subdivided, following factor analysis and moderate to strong correlation coefficients, into subgroups

where the median, range, lower and upper quartile scores of each were calculated. These subscales measured aspects of knowledge which support critical thinking. A factor analysis was done of the 12 original questions measuring declarative, procedural and, contextual knowledge. As well, a factor analysis was done of all the Likert type questions in an effort to develop additional subscales. Cronbach's reliability coefficients were calculated, following each factor analysis, to further develop reliable subscales. The individual subscales, following factor analysis of the twelve original questions, included questions measuring declarative (14,16,24), procedural (17,18,20,22), and contextual (15,23,25). Following the factor analysis of all the Likert type questions the two subscales specific teaching strategies (6,7,10,11,21), and the value afforded these strategies (27,28,29) were developed.

Following the development of the individual subscales, the Kruskal-Wallis and the Mann-Whitney U tests were calculated for the purpose of measuring differences among the population groups for each of the subscales of the test. Given alpha at a .08 level and the small sample, the probability of making a Type I error is a concern (Moore, 1983; Segal, 1956). In an effort to ascertain faculty awareness of critical thinking research, the Likert type questions have the research based answer which includes the upper range on each of these questions of greater than or

equal to six on the Likert scale. Faculty awareness was evident when the median of the individual subscales was equal to or above the product of the number of questions in the subscale and six on the Likert scale.

Respondents to this research study were nursing educators in the University of Manitoba Collaborative Baccalaureate Nursing Program in Manitoba. These nursing educators were from three sites within this program. A total of 55 educators, represented the population of collaborative baccalaureate educators in the province of Manitoba. Thirty-one (56%) of the nursing educators voluntarily responded to the survey. These nursing educators had various teaching experiences, clinical experience, education, and age. All were female. Because of the small population, and because all were female, these results may not be truly representative of nurse educators across Canada and cannot be readily generalized to other populations (Babbie, 1989; Leavitt, 1991).

Characteristics of Nurse Educators

Age. The age for the nursing educators ranged from 31 to 60. Each group comprised of close to one-third of the total of nurse educators with the 51-60 age group showing a slightly higher representation (Table 1).

Previous Clinical Experience. Clinical experience, exclusive of teaching experience, ranged from a small amount to a large amount with 0-4 years representing small, 5-10 years representing moderate and >11 years representing a large amount of clinical nursing experience. Approximately one-quarter of the population possessed a moderate amount of clinical nursing experience with the groups small and large composing close to one-third each (Table 1).

Previous Teaching Experience. In Manitoba and across Canada, at the time of the first collaborative baccalaureate nursing program in Manitoba, there were both diploma and baccalaureate nursing programs in existence which prepared Registered Nurses for entry level positions. As diploma schools were phased out, several educators moved from the diploma programs and the generic baccalaureate nursing programs to teach in the collaborative baccalaureate nursing program. In this study, of those with previous teaching experience, prior to employment in a collaborative baccalaureate nursing program, close to 40% taught only in the diploma nursing programs as compared to 16% who taught only in the baccalaureate nursing programs. Further, the teachers with more varied experience in both programs made up 25% of the teachers in the new program. The new teachers comprised the final 19% of the sample (Table 1).

Table 1

Characteristics of nursing educators

Characteristic	n	%
Age		
31 years to 40 years	9	29.0
41 years to 50 years	10	32.3
51 years to 60 years	12	38.7
Gender		
Female	31	100
Years of Clinical Experience		
0 - 4	11	35.5
5 - 10	8	25.8
≥ 11	12	38.7
Previous Teaching Experience		
Diploma	12	38.7
Baccalaureate	5	16.1
Diploma and Baccalaureate	8	25.8
New Teacher	6	19.4
Education		
Undergraduate Baccalaureate	7	22.6
Graduate-Masters & Doctorate	24	77.4

Education. The nursing educators were asked to identify the highest educational degree they had obtained. Seven respondents possessed a baccalaureate degree, twenty a masters and four a doctorate. As well, five respondents were enrolled in a doctoral program and four were enrolled in a masters program. For statistical purposes, respondents were grouped into two categories. The baccalaureate degree was considered in the undergraduate category and the masters and doctorate degrees were considered in the graduate category. Prior to answering the first three research questions, subscales were developed and the construct validity and the reliability of the instrument was ascertained. This was done by factor analyses and Cronbach's reliability coefficients.

Characteristics of Questionnaire

Factor Analysis of Three Concepts in Rating Scale

In order to examine the properties of the rating scale, a factor analysis was completed. The Likert type questions testing declarative, procedural, and contextual knowledge were developed by the researcher using theoretical constructs set forth by Alexander and Judy (1988), Alexander, Schallert, and Hare (1991), and Ryle (1962). The factor structure was analyzed to see what concepts emerged from the original twelve Likert type questions representing declarative (8,14,16,19), procedural (17,18,20,22), and contextual (15,23,24,25) knowledge. The results of a

varimax-rotated principle component analysis showed faculty awareness of procedural and declarative knowledge. As well, a strong pattern of contextual awareness appeared with an underlying procedural structure contamination (Table 2).

Following Kaiser's criterion, (cited in Child, 1970), the analysis produced four factors with eigenvalues equal to or greater than one (Table 2). By examining the factor loadings in Table 2 which have a value of 0.39 or greater (underlined), at the five percent level of significance (Fisher, 1965), one notes the emergence of the following knowledge constructs: factor one (eigenvalue=3.54) compares to procedural knowledge; factor three (eigenvalue=1.26), declarative knowledge; factor four (eigenvalue=1.16); declarative knowledge. Note that factor three and four each indicate an underlying structure load onto two different and two of the same items. Factor three, representing declarative knowledge includes a component with a strong theory base (theory versus memorizing procedures, nursing process limits knowledge discovery) and a component of theory organization (organize theory for skills). The fourth factor representing declarative knowledge as well, included a theory based component (theory versus memorizing procedures) and a theory organization component (organize theory for skills, nursing process limits knowledge discovery). The second factor (eigenvalue 2.03) had three

significant loadings for contextual knowledge. As well, two significant procedural items were evident in factor two.

Factor one is associated with 29.5% of the factor variance compared with a total of 20.2% of the factor variance for factors three and four combined. Factor two, where contextual knowledge may account for most of the 17% of the factor variance, is not as clear due to the emergence of significant procedural loadings. However, factors one, three, and four account for a total of 49.7% of the factor structure variance.

Analysis of the factor loadings fits Thurstone's (1947) criteria for simple structure: (1) each row contains at least one numerical value which is not statistically significant; (2) there are at least four near zero loadings (six to nine) in each factor; (3) for every pair of factors several (three to five) have zero loadings in one factor and significant loadings in the paired factor; (4) several (four to seven) of the paired factors contain zero values in both factors; (5) a small proportion (two to three) of significant value loadings for paired factors is present.

Factor Analysis of all Likert Type Questions

The twenty-seven Likert type questions which tested faculty awareness of critical thinking research were developed using cognitive literature from many noted authorities such as Dewey (1933), Tyler (1949), Bloom (1956), Flavell (1979; 1987), Ennis (1969; 1987),

Table 2

First Four Factors of the Critical Thinking Structure Matrix

		Factor1	Factor2	Factor3	Factor4
Q8	(d)	-.03	<u>.63</u>	.09	.09
Q14	(d)	-.28	-.07	<u>.75</u>	.03
Q15	(c)	.61	.45	.04	.00
Q16	(d)	-.17	-.06	<u>-.65</u>	.39
Q17	(p)	.70	.12	-.26	.35
Q18	(p)	.68	.46	.04	-.17
Q19	(d)	.06	.19	.01	<u>.89</u>
Q20	(p)	<u>.43</u>	<u>.58</u>	-.17	.20
Q22	(p)	<u>.73</u>	-.19	.34	-.00
Q23	(c)	.09	.76	-.19	.09
Q24	(c,d)	.35	-.02	<u>.70</u>	<u>.42</u>
Q25	(c)	.33	<u>.67</u>	<u>.52</u>	-.08
Eigen values		3.54	2.03	1.26	1.16
(% Variance)		(29.5)	(17.0)	(10.5)	(9.7)

c = contextual

d = declarative

p = procedural

Bevis (1973; 1989,), de Bono (1976; 1983), McPeck(1981), Brookfield (1987), Paul (1987), Schon (1987; 1991), Presseisen (1987), Pressley, Borkowski, and O'Sullivan (1985), and Alexander, Schallert, and Hare (1991).

Principal components analysis with varimax rotation showed the emergence of limited concepts. Kaiser's criterion (cited in Child, 1970), the number of factors extracted is the number of eigenvalues greater than one, was adopted and is considered reliable when the number of variables are between 20 and 50 (Child, 1970). Nine factors were extracted with eigenvalues greater than one. The criterion used for choosing the significant loadings in each factor was 0.41 at the five percent level (Fisher, 1965). By examining factor loadings in Table 3 which have a value of 0.41 or greater (underlined), at the five percent level of significance one notes the emergence of the following theoretical constructs: factor one (eigenvalue=6.21) compares to specific teaching strategy awareness; factor two (eigenvalue=3.25) compares to value faculty gave to teaching strategies; factor seven (eigenvalue=1.36) compares to declarative knowledge. Note that factor one, besides having five significant factor loadings representing specific critical thinking strategies, has two significant procedural

Table 3

First Seven Factors of the All Likert Structure Matrix

		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Q3	(v)	.09	-.02	.05	.08	.01	-.05	.05
Q4	(d)	<u>-.39</u>	.07	-.18	.02	.17	<u>.38</u>	<u>.54</u>
Q5	(v)	.25	.26	.27	<u>-.40</u>	-.16	<u>.58</u>	-.07
Q6	(s)	<u>.55</u>	<u>.63</u>	.08	.11	.19	0.00	-.09
Q7	(s)	<u>.63</u>	-.01	-.13	<u>-.37</u>	.01	.12	.10
Q8	(d)	.27	.22	.12	.11	<u>.73</u>	-.01	.16
Q9	(d)	.30	-.07	<u>-.45</u>	-.06	.34	.21	<u>-.58</u>
Q10	(s)	<u>.74</u>	.30	-.13	-.05	.03	.32	.16
Q11	(s)	<u>.41</u>	.21	-.08	<u>.38</u>	.02	<u>.65</u>	-.03
Q12	(s)	.01	-.09	.05	.02	<u>.80</u>	.23	-.17
Q13	(v)	.13	.27	<u>.48</u>	-.18	.08	.15	-.18
Q14	(d)	-.25	-.06	-.23	<u>-.58</u>	.10	-.11	.21
Q15	(c)	.01	-.01	<u>.86</u>	.15	.12	.10	.10
Q16	(d)	.07	.09	-.08	<u>.81</u>	.14	.04	.14
Q17	(p)	.18	.30	<u>.61</u>	-.24	-.13	.09	.21
Q18	(p)	<u>.54</u>	-.07	<u>.62</u>	.19	.09	-.03	-.11
Q19	(d)	.33	.01	.09	-.06	-.12	.04	<u>.85</u>
Q20	(p)	<u>.71</u>	.28	<u>.40</u>	.05	.06	.18	-.04
Q21	(s)	<u>.84</u>	-.01	.23	-.07	.16	.08	.06
Q22	(p)	.08	-.03	.23	.13	-.02	.01	-.01
Q23	(c)	.23	.05	<u>.40</u>	.01	.06	<u>.67</u>	.11
Q24	(c,d)	.04	.13	.02	-.51	.05	.01	<u>.43</u>
Q25	(c)	.17	-.05	<u>.44</u>	<u>-.60</u>	.32	.36	.04
Q26	(v)	-.02	.19	-.02	-.15	<u>.65</u>	-.26	-.16
Q27	(v)	.11	<u>.92</u>	-.12	-.07	-.04	-.04	.15

Table 3 (Cont)

		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Q28	(v)	.02	<u>.87</u>	.05	.05	.09	.16	-.06
Q29	(v)	.08	<u>.81</u>	.29	-.19	.17	.11	.05
Eigen values		6.21	3.25	2.57	2.25	1.79	1.52	1.36
% (var)		(23.0)	(12.0)	(9.5)	(8.3)	(6.6)	(5.6)	(5.0)

c = contextual
 d = declarative
 p = procedural
 s = strategies
 v = value

loadings. In factor three, four, five, and six, several theoretical concepts with significant factor loadings emerged. Faculty, in factor three (eigenvalue=2.57), do not distinguish between procedural and contextual knowledge. Yet, this factor accounts for 9.5% of the factor variance. Factors one, two, and seven account for 23%, 12%, and 5% respectively of the factor structure variance for a total of 40% of the factor structure variance.

Analysis of the factor loadings fits Thurstone's (1947) criteria for simple structure: (1) Each row contains at least one numerical value which is not statistically significant (2) there are several near zero loadings in each factor (3) for every pair of factors several have zero loadings in one factor and significant loadings in the paired factor (4) several of the paired factors contain zero values in both factors (5) a small proportion of significant value loadings for paired factors is present.

The potential for factor analysis to be not as stable as with a larger sample population, especially when considering the twenty-seven Likert type questions, is a concern (Child, 1970). This limitation can be overcome by replicating the analysis with a much larger sample.

Following the factor analysis of the original twelve question subset, questions 17,18,20, and 22 showed significant loadings for procedural knowledge. Questions 15,23, and 25 showed significant loadings for contextual knowledge. Questions 14,16, and 24 and questions 16,19, and

24 for factors three and four (with overlap) had significant loadings for declarative knowledge (Table 2). Reliability coefficients, using Cronbach's Alpha, were calculated for the set of items forming a single variable. The reliability coefficients associated with procedural, contextual, declarative (factor three), and declarative (factor four) knowledge are Alpha .61;.73;-.71;.15 respectively.

Consequently, subscale questions 16,19, and 24 will not be analyzed due to the weak correlation coefficient of .15. However, the remaining three subscales were used because according to Cohen and Manion (1994) reliability coefficients of .60 -.80 are acceptable. The remaining scores from the variables for procedural, contextual, and declarative subscales were compared to faculty history and analyzed using the Kruskal-Wallis and the Mann-Whitney U Tests.

The second factor analysis was completed on all the 27 Likert type questions in an effort to identify the various subscales. Due to the large number of questions and the small sample, this analysis was not as stable as the analysis of the original 12 questions (Child, 1970). Significant loadings were noted for questions 6,7,10,11, and 21 in factor one representing strategic knowledge. As well, significant loadings were apparent for questions 27,28, and 29 in factor two representing the value respondents gave to the teaching of specific strategies. Further, significant loadings were found for questions 4,9,19, and 24 in factor

seven corresponding to declarative knowledge. Reliability coefficients for strategic knowledge, value given to strategic knowledge, and declarative knowledge were Alpha .80; .84; -.42 respectively. Those questions with correlations of .80, strategic knowledge and .84, value given to strategic knowledge were compared to faculty history using the Kruskal-Wallis and the Mann-Whitney U tests. As well, tables representing frequencies, percentages, medians, ranges, and quartiles were utilized to ascertain where the differences appeared among the groups of respondents.

In the limited twelve question factor analysis of declarative, procedural, and contextual theory, educators differentiated between procedural and declarative knowledge to a greater extent than they isolated contextual knowledge. Further, results from the factor analysis of the twenty-seven Likert type questionnaire showed that three patterns emerged; teaching strategies, value given to teaching strategies, and declarative knowledge. As well, limited significant procedural and contextual loadings were interspersed throughout the factors indicating that respondents were not always differentiating among types of learning. Not as much confidence in the internal consistency of the subscales with reliability coefficients of $r = -.41 - .61$ was shown as with subscale reliabilities of $r = -.71 - .84$.

Table 4

Subscale comparison of awareness of critical thinking among nurse educators with previous teaching experience

Subscale	Median	Range	Q ₁	Q ₃	df	χ^2	p
Procedural							
Diploma	26	21-28	23	27	3	8.00	.05
Baccalaureate	25	22-26	23.5	26			
Baccalaureate & Diploma	23.5	17-27	22.5	25.5			
New teachers	19.5	17-27	18	22			
Contextual							
Diploma	20.5	13-21	18.5	21	3	4.18	.24
Baccalaureate	19	16-21	17	20.5			
Baccalaureate & Diploma	19	18-21	18	20			
New teachers	17.5	15-20	15	20			
Declarative							
Diploma	16	15-20	15	18	3	3.85	.28
Baccalaureate	16	15-17	15	17			
Baccalaureate & Diploma	17	13-19	14	19			
New teachers	15	12-17	14	16			

Population sample. Diploma (n=12) Baccalaureate (n=5)
Baccalaureate & Diploma (n=8) New teachers (n=6)

Results of Differences Among Groups

Question 1. Is there a difference in the knowledge of current research on critical thinking among the faculty who taught only in the diploma programs prior to collaboration, those who taught only in the baccalaureate programs, those who taught in both programs, and the new teachers? Using the variables developed from the original factor analysis, significant differences were found among the diploma, baccalaureate, baccalaureate and diploma, and the new teachers on the subscale procedural ($df=3$; $\chi^2=.8.00$; $p=.05$). However, no significant differences were evident in the subscales contextual knowledge ($df=3$; $\chi^2=.4.18$; $p=.24$), and declarative knowledge ($df=3$; $\chi^2=.28$; $p=.28$), Table 4. The median scores of the teachers with diploma only teaching experience were higher than those teachers with baccalaureate, baccalaureate and diploma teaching experience, and new teachers. The potential range of scores for the four procedural questions was four to twenty-eight with diploma (21-28), baccalaureate (22-26), baccalaureate and diploma (17-27), and new teachers (17-27). Although, according to Table 4, the baccalaureate and diploma group scored in the same range as the new teachers, these new teachers scored lower than the baccalaureate and diploma respondents in the lower and upper quartiles. Thus, the experienced teachers, especially the diploma only and the

baccalaureate only, showed a greater awareness of procedural knowledge than did the new teachers.

The median scores on the three questions for the contextual subscale were diploma (20.5), baccalaureate (19), baccalaureate and diploma (19), and the new teachers (17.5), Table 4. The potential range was three to twenty-one where the actual ranges were diploma (13-21), baccalaureate (16-21), baccalaureate and diploma (18-21), and the new teachers (15-20). Since the differences among the groups were not significant and the overall median was in the upper aspect of the scale at 19, all respondents showed an awareness of contextual knowledge.

In Table 4, the median scores on the three questions of the declarative subscale were diploma (16), baccalaureate (16), baccalaureate and diploma (17), and the new teachers (15). The overall median was sixteen and indicates a lack of faculty awareness of the importance of domain-specific knowledge and the organization of knowledge (declarative). Differences were evident among nurse educators with various teaching experiences. Because the procedural knowledge subscale was statistically significant, the null hypothesis was rejected.

Question2. Is there a difference in awareness of current research on critical thinking among faculty with a small, moderate, or large amount of practice? Scores representing

Table 5

Subscale comparison of awareness of critical thinking among nurse educators with various clinical practice experiences

Subscale	Median	Range	Q ₁	Q ₃	df	x ²	p
Procedural							
0 - 4 Yrs (Small)	23	17-28	22	26	2	0.86	.65
5 -10 Yrs (Moderate)	25	18-27	22	27			
≥ 11 Yrs (Large)	26	17-28	21	26			
Contextual							
0 - 4 Yrs (Small)	18	15-21	18	19	2	4.53	0.10
5 -10 Yrs (Moderate)	20	15-21	18	21			
≥ 11 Yrs (Large)	20	13-21	19	21			
Declarative							
0 - 4 Yrs (Small)	16	14-19	15	18	2	0.62	0.73
5 -10 Yrs (Moderate)	16	13-20	14	17			
≥ 11 Yrs (Large)	16	12-20	15	17.5			
<u>Population sample.</u> Small (n=11) Moderate (n=8) Large (n=12)							

the individuals' responses on the dependent variable subscales procedural, contextual, and declarative, measuring awareness of current research on critical thinking, were used to calculate the range of responses, the upper and the lower quartiles and the median for the Likert type questions. The Kruskal-Wallis one-way analysis of variance by ranks was used to ascertain whether the differences among years of clinical practice represented genuine population differences at $p=.08$.

In terms of the scores on the critical thinking questionnaire subscales compared with clinical practice, no significant differences were found in the subscales of procedural ($\chi^2=.86$; $df=2$; $p=.65$), contextual ($\chi^2=.4.53$; $df=2$; $p=.10$), and declarative ($\chi^2=.62$; $df=2$; $p=.73$), Table 5. Faculty with a great deal of clinical experience had a median score on procedural knowledge of 26, those with a moderate amount of clinical practice had a median score of 25 and respondents with a small amount of clinical practice scored lowest with a score of 23. The potential range of scores for the four questions in the procedural subscale was four to 28 with the actual ranges of 17-28 (small), 18-27 (moderate), and 17 to 28 (large). The respondents with five years of clinical experience and greater were more aware of procedural knowledge than those respondents with up to four years of nursing practice. However, the differences were not significant.

The median scores, noted in Table 5, for the three questions comprising the contextual subscale were 18 for a small practice experience, 20 for a moderate practice experience, and 20 for a large practice experience. The potential range was three to 21 with the actual range of 15-twenty-one (small), 15 to 21 (moderate), and 13-21 (large). The dispersion of the scores measured by the upper and lower quartiles is at the upper end of the scale, indicating an awareness of contextual knowledge by the majority of the respondents. As well, the medians were in the high range of the scale which supported faculty awareness of contextual knowledge. Note, in Table 5 that contextual awareness approached significance.

In table 5, the median score on the declarative subscale was 16 for small, moderate, and large amounts of clinical practice respectively. This median was below the upper end of the Likert scale and indicated a lack of awareness of declarative knowledge. The potential range for the declarative subscale was three to 21 with the actual ranges of 14-19 (small), 13-20 (moderate), and 12-20 (large). The quartiles indicated that the scores failed to disperse towards the upper regions of the scale. Although differences existed, as evidenced in Table 5, among faculty with varying amounts of clinical experience, these differences were not significant. Since the differences among faculty with a small, moderate, or large amount of

clinical practice were not significant, the null hypothesis was not rejected.

Question 3. Is there a difference in knowledge of critical thinking between undergraduate and graduate prepared faculty? Undergraduate education consisted of teachers prepared at the generic baccalaureate level or the post RN baccalaureate level. Graduate education included all nursing faculty prepared at the masters and doctoral level. The nonparametric Mann-Whitney U test was used to determine if the undergraduate and graduate faculty came from the same population or if the responses were independent of education (Table 6). The predetermined level of significance was .08. No significant differences were found between graduate and undergraduate prepared faculty for the subsale procedural awareness ($Z=-.53$; $p=.60$), contextual awareness ($Z=-.96$; $p=.34$), and declarative awareness ($Z=-.62$; $p=.53$), Table 6. The graduate and undergraduate prepared faculty each had the same median score (25) on the procedural awareness subscale. The lower and upper quartile scores indicated that the undergraduate prepared faculty scores were dispersed more in the upper ranges than were the graduate respondents' scores. The potential range for the four procedural questions was four to twenty-eight. Thus, the high median scores indicated faculty awareness of procedural knowledge.

Table 6

Subscale comparison of awareness of critical thinking among nurse educators with various educational preparation

Subscale	Median	Range	Q _L	Q _U	z	2-tailed P
Procedural						
Undergraduate	25	22-28	23	26	-0.53	0.60
Graduate	25	17-28	21.5	26		
Contextual						
Undergraduate	18	17-21	18	20	-0.96	0.34
Graduate	20	13-21	15	17.5		
Declarative						
Undergraduate	16	13-18	15	16	-0.62	0.53
Graduate	16.5	12-20	15	17.5		

Population sample. Undergraduate (n=7) Graduate (n=24)

The median scores for the three questions in the contextual subscale were graduate, 20, and undergraduate, eighteen, Table 6. The potential range for the three contextual questions was three to 21. Although the graduate median was higher than the undergraduate median, the overall median was 19 indicating faculty awareness of contextual knowledge.

Further, the median scores for declarative knowledge were undergraduate, 16, and graduate, 16.5. The potential range of scores for the three declarative questions was three to 21 with an actual range of 13-18 for the undergraduate responders and 12-20 for the graduate responders. In Table 6, the lower quartile was 15 and the upper quartile was 16 for the undergraduate faculty and 15 and 17.5 respectively for the graduate responders. The medians and the upper and lower quartiles were not in a high enough region of the Likert type scale to indicate an awareness of declarative knowledge.

No significant differences were found on the subscales procedural, contextual, and declarative knowledge between graduate and undergraduate faculty. Thus, the null hypothesis was not rejected as the level of significance was not achieved.

Frequency Tables seven to nine for procedural, contextual, and declarative knowledge were compared to

Tables four to six. Comparisons between Tables four and seven showed that one new teacher and one teacher who taught in both diploma and baccalaureate programs scored the lowest on procedural knowledge. As well, study of Tables four and eight showed that no new teachers scored at the highest level on the Likert questions. Further, study of these Tables indicated that one diploma only respondent scored the lowest on the three contextual questions. Comparison of Tables nine and four indicated that, once again, a new teacher scored the lowest on the three declarative questions whereas two diploma only respondents scored the highest.

Differences Among Groups Post Second Factor Analysis

Following the twenty-seven Likert type question factor analysis and Cronbach's reliability coefficients, two subscales were developed and analyzed. The two subscales were teaching strategies and the value respondents gave to the teaching strategies. The teaching strategies subscale included questions six, seven, ten, eleven, and twenty-one. The value given to the teaching strategies subscale was comprised of questions twenty-seven, twenty-eight, and twenty-nine.

The first question these Likert type questions attempted to answer was: Is there a difference in the knowledge of current research on critical thinking among faculty who taught only in diploma nursing programs prior to

Table 7

Survey questions 17, 18, 20, 22 testing procedural knowledge

Response value	frequency	%
17	2	6.5
18	1	3.2
19	1	3.2
20	1	3.2
21	1	3.2
22	3	9.7
23	4	12.9
24	1	3.2
25	4	12.9
26	8	25.8
27	3	9.7
28	2	6.5
Total	N=31	100.0

Note. Median score is 25.

Table 8

Survey questions 15, 23, 25 testing contextual knowledge

Response value	frequency	%
13	1	3.2
15	2	6.5
16	1	3.2
17	1	3.2
18	6	19.4
19	5	16.1
20	7	22.6
21	8	25.8
Total	N=31	100.0

Note. Median score is 19.

Table 9

Survey questions 14, 16, 24 testing awareness of declarative knowledge

Response value	frequency	%
12	1	3.2
13	1	3.2
14	3	9.7
15	7	22.6
16	6	19.4
17	6	19.4
18	3	9.7
19	2	6.5
20	2	6.5
Total	N=31	100.0

Note. Median score is 16.

Table 10

Subscale comparison of awareness of critical thinking among nurse educators with previous teaching experience

Subscale	Median	Range	Q ₁	Q ₃	df	χ^2	p
Strategies							
Diploma	30.5	22-34	27.5	32	3	3.10	0.38
Baccalaureate	28	22-35	24.5	32			
Baccalaureate & Diploma	28.5	20-31	23	30.5			
New teachers	28.5	21-31	23	29			
Valuing of strategies							
		1					
Diploma	20	13-21	18	21	3	1.68	0.64
Baccalaureate	20	16-21	18	20.5			
Baccalaureate & Diploma	19.5	12-21	17	20.5			
New teachers	18.5	12-21	15	20			

Population sample. Diploma (n=12) Baccalaureate (n=5)
Baccalaureate & Diploma (n=8) New teachers (n=6)

collaboration, those who taught only in baccalaureate, those who taught in both, and new teachers? As seen in Table 10, no significant differences were found on the subscales of teaching strategies ($\chi^2=3.10$; $df=3$; $p=.38$) and the value given to these strategies ($\chi^2=1.68$; $df=3$; $p=.64$). The median scores for the strategies subscale were diploma (30.5), baccalaureate (28.0), baccalaureate and diploma (28.5), and new teacher (28.5). The diploma only respondents scored higher than the expected median of 30 as well as higher than the other three groups. However, since the differences among the groups were not significant and the group median is below thirty, overall faculty awareness of specific strategies was considered lacking.

The median scores for the three questions in the value subscale were diploma (20), baccalaureate (20), baccalaureate and diploma (19.5), and new teachers (18.5). Because all the median scores were above 18, respondents demonstrated that they valued the teaching of specific teaching strategies in the nursing curricula. Although differences among faculty existed, these differences were not significant. Since the differences among faculty with dissimilar teaching histories were not significant, the null hypothesis was not rejected.

The second question which the Likert type questions attempted to answer was: Is there a difference in the

Table 11

Subscale comparison of awareness of critical thinking among nurse educators with various clinical practice experiences

Subscale	Median	Range	Q _L	Q _U	df	x ²	p
Strategies							
0 - 4 Yrs (Small)	29	20-34	22	31	2	1.55	0.46
5 -10 Yrs (Moderate)	30	26-34	28	31.5			
≥ 11 Yrs (Large)	28.5	21-35	25	30.5			
Valuing of strategies							
0 - 4 Yrs (Small)	20	12-21	18	21	2	0.34	0.84
5 -10 Yrs (Moderate)	20	16-21	18	21			
≥ 11 Yrs (Large)	20	13-21	15	20			

Population sample. Small (n=11) Moderate (n=8) Large (n=12)

awareness of current research on critical thinking among the faculty with a small, moderate, and large amount of nursing practice? As seen in Table 11, no significant differences were found in the subscales strategies ($\chi^2=1.55$; $df=2$; $p=.46$), and value given to the strategies ($\chi^2=.34$; $df=2$; $p=.84$). The median scores for the five questions in the strategy subscale were small (29), moderate (30), and large (28.5). The respondents who represented a moderate amount of clinical practice showed an awareness of strategies because they scored the necessary median of 30. However, because the group median was below 30, and the differences among the groups were not significant, faculty awareness of specific strategies was lacking. One concern is the chance of a Type II error.

The median score for the three questions in the value subscale was 20 for each of the subgroups (Table 11). Because the median scores were higher than 18, faculty showed they valued specific teaching strategies in the nursing curriculum.

Although differences existed among the groups on the subscale scores, the differences were not significant. The null hypothesis was not rejected.

The third question which the researcher attempted to answer with the Likert type questions was: Is there a difference in knowledge of critical thinking between

Table 12

Subscale comparison of awareness of critical thinking among nurse educators with various educational preparation

Subscale	Median	Range	Q ₁	Q ₃	z	2-tailed p
Strategies						
Undergraduate	28	22-31	22	31	-0.66	0.51
Graduate	29	20-28	26	31		
Valuing of strategies						
Undergraduate	20	16-20	18	20	-0.63	0.53
Graduate	20	12-21	18	21		
<u>Population sample.</u> Undergraduate (n=7) Graduate (n=24)						

undergraduate and graduate prepared faculty? As noted in Table 12, no significant differences were apparent in the subscales strategic knowledge ($Z=-.66$; $p=.51$), and the value given to strategic knowledge ($Z=-.63$; $p=.53$). The median scores for the five questions in the strategies subscale were undergraduate (28), and graduate (29). Since both medians are lower than the necessary 30, faculty showed a lack of awareness of good teaching strategies.

The median score for the three questions in the value subscale was 20 for each of the undergraduate and graduate groups. This median, placed at the upper region of the subscale, indicated that faculty valued good teaching strategies throughout the curriculum.

Differences existed between the medians and the dispersions of scores. However, these differences were not significant. Thus, the null hypothesis was not rejected.

Experienced teachers, especially those who taught only in diploma and only in baccalaureate programs prior to collaboration, exhibited a consistent awareness of procedural theory contributing to critical thinking. New teachers showed a lack of awareness of critical thinking research in several areas.

Characteristics and Processes

Question4. Is there a difference in interpretation of critical thinking held by hospital based nursing faculty and university based nursing faculty? A content analysis was

done on responses to open-ended questions one and two of the survey instrument (Appendix J). Out of the content analysis, patterns were found from which twenty-five characteristics and sixteen processes emerged. Frequencies and percentages were calculated while comparing characteristics and processes of critical thinking by site (Tables 13 & 14; Figures one & two). Respondents were asked to present characteristics which represent critical thinking. Many characteristics of critical thinking noted in the current literature were suggested by the collaborative baccalaureate nursing faculty. As well, concepts reported such as good communicator and observant no doubt support critical thought and are closely allied with critical thinking yet these characteristics may stand separate and no critical thinking may emerge. Similarly, good communication, intelligence, observant, and collector of appropriate data were presented as critical thinking characteristics by a few respondents as well as anticipatory and priorizer (Table 15).

Other characteristics, some of which are apparent in the literature were contradictory or mutually exclusive. For example, 16% believed critical thinking was a goal directed behaviour whereas 12% believed it was an intuitive behaviour. As well, 32% thought critical thinking involved the use of logic, while 42% cited a flexible attitude and being creative as necessary values for critical thinkers to possess.

Table 13

Critical thinking characteristics - responses by nursing educators

	Characteristics	University n=13		Site Hospital n=18		Total n=31	
			%		%		%
1	Risk taking	7	54	10	56	17	55
2	Flexible	6	46	7	39	13	42
3	Creative	7	54	6	33	13	42
4	Knowledgeable in field	3	23	8	44	11	35
5	Questioning	3	23	7	39	10	32
6	Logical	6	46	4	22	10	32
7	Self-regulating	3	23	5	28	8	26
8	Contextual appraisal	5	38	3	17	8	26
9	Exploring alternatives	2	15	6	33	8	26
10	Pattern recognition	1	8	6	33	7	23
11	Reflective	3	23	3	17	6	19
12	Reflective scepticism	1	8	5	28	6	19
13	Problem solver	3	23	3	17	6	19
14	Caring	2	15	3	17	5	16
15	Goal directed	3	23	2	11	5	16
16	Good communicator	3	23	1	6	4	12
17	Intelligent	4	31	0	0	4	12
18	Intuitive	3	23	1	6	4	12
19	Observant	0	0	3	17	3	10

Table 13 (Continued)

		University n=13		Site Hospital n=18		Total n=31	
Characteristics			%		%		%
20	Challenges assumptions	0	0	3	17	3	10
21	Moral	2	15	1	6	3	10
22	Collection of appropriate data	0	0	3	17	3	10
23	Anticipatory	2	15	0	0	2	6
24	Priorizer	0	0	2	11	2	6
25	Non-judgemental	0	0	2	11	2	6

Table 14

Critical Thinking Process Responses by Nursing Educators

Site	University n=13	Hospital n=18	Total N=31			
Process	%	%	%			
1 Synthesis	10	77	11	61	21	68
2 Evaluation	9	69	13	72	21	68
3 Analysis	9	69	9	50	18	58
4 Imaginative speculation	6	46	8	44	14	45
5 Problem solving	8	62	4	22	12	39
6 Data gathering	5	38	4	22	9	29
7 Alternative exploration	3	23	6	33	9	29
8 Hypothesis testing	1	8	5	28	6	19
9 Deduction	2	15	3	17	5	16
10 Hypothesis generation	1	8	4	22	5	16
11 Contextual appraisal	1	8	4	22	5	16
12 Challenging assumptions	2	15	3	17	5	16
13 Questioning	3	23	2	11	5	16
14 Implementing plan	2	15	3	17	5	16
15 Intuitive	2	15	1	5	3	10
16 Application	3	23	0	0	3	10

Further, this research revealed that a moral stance competed with a nonjudgemental attitude.

Generally, the findings indicated that the challenging of assumptions, intuition, suggesting a moral stance, appropriate data collector, anticipator, intelligence, and priority setter were not often perceived as necessary characteristics for critical thought. No more than 12% suggested the aforementioned concepts even though each quality is important for thinking nurses to possess.

Risktaking, flexibility, and creativity were the most frequent separate critical thinking concepts suggested by the faculty in the collaborative baccalaureate nursing program. Note in Table 13, 55% of the faculty suggested risktaking, 42% flexibility, and 42% creativity. The responders teaching at both sites, university and hospital, showed little difference in the frequency of these first three characteristics with the exception of creativity. Fifty-four percent of the university site faculty compared with 33% of the hospital site faculty cited creativity as a necessary trait for the critical thinker to possess. Knowledgeability in ones field, a questioning attitude, and logical at 35%, 32%, and 32% respectfully were the next three characteristics mentioned by the responders. Forty-four percent of the faculty situated at the hospitals compared to 23% of the faculty situated at a university site

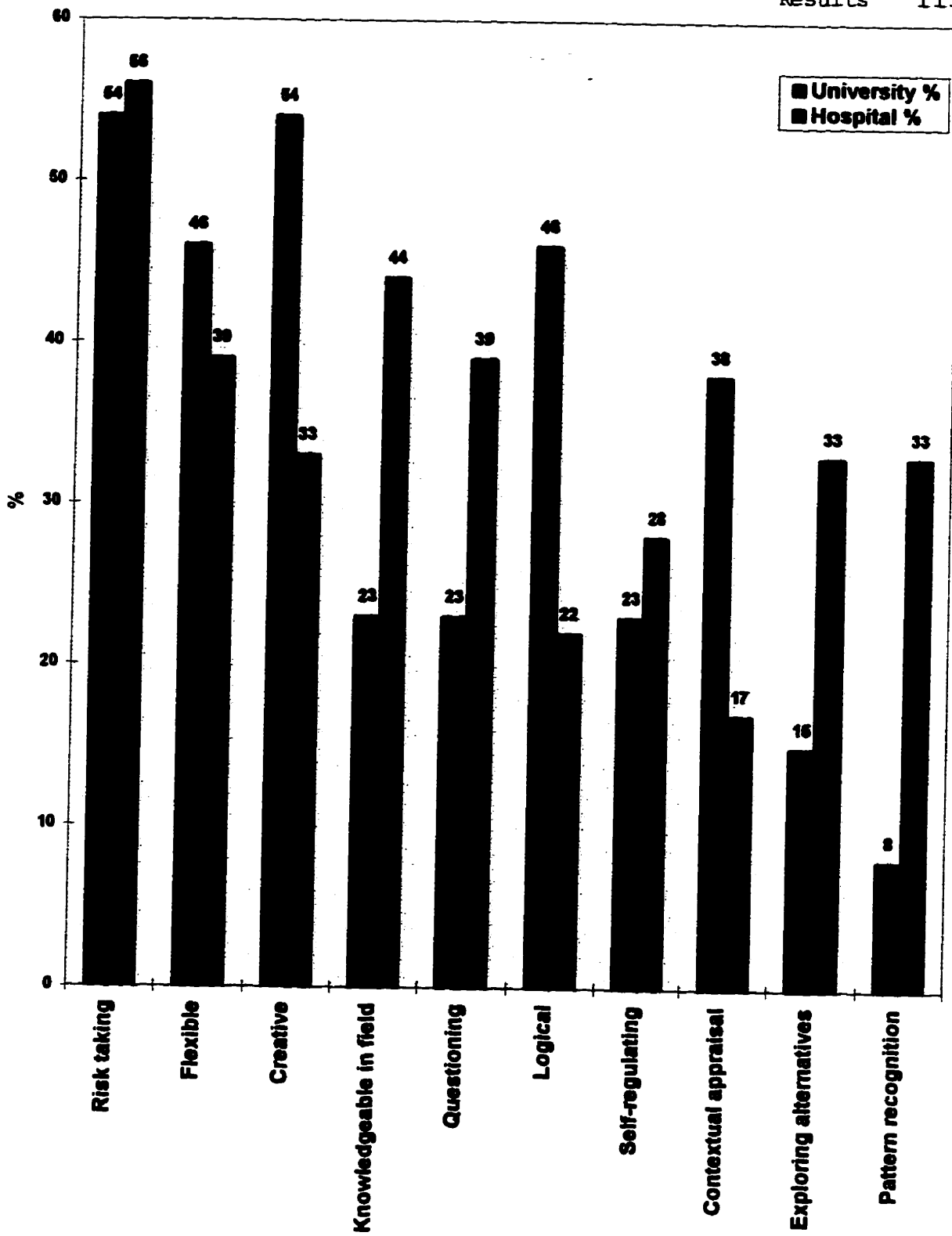


Figure 1. Critical thinking characteristics

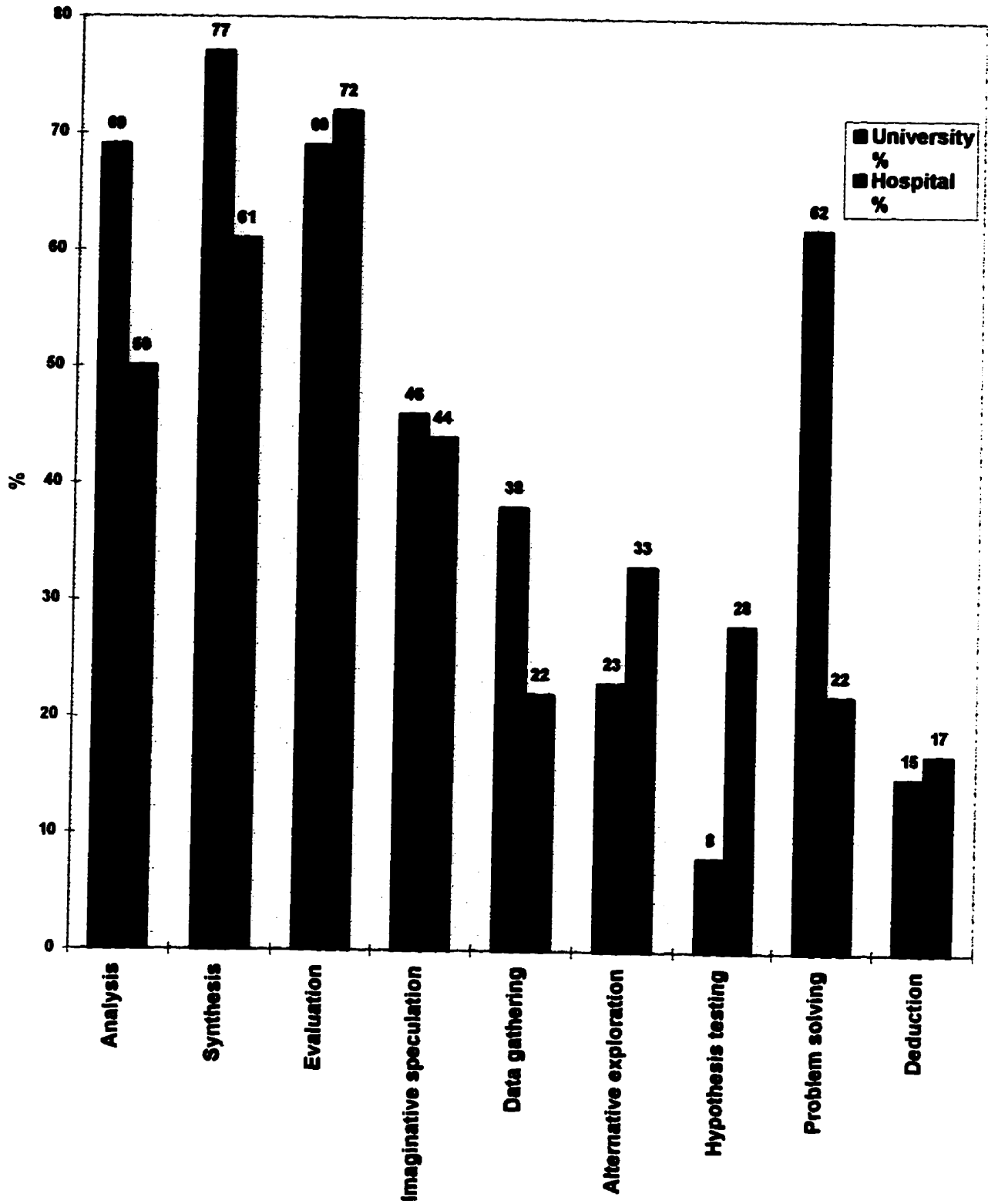


Figure 2. Critical thinking processes.

mentioned knowledgability in ones field as a necessary characteristic of a critical thinker. Thirty-nine percent of the hospital site responders as compared to 23% of the university site responders put forth questioning as a critical thinking characteristic. On the other hand, 46% of the university site responders compared with 22% of the hospital site responders believed the use of logic was a necessary critical thinking characteristic. The responders who included characteristics such as contextual appraisal, exploration of alternatives, pattern recognition, reflective scepticism, and goal directed behaviour showed appreciable site differences (Table 13). Supporting qualities such as self-regulating (metacognitive), caring, and a moral stance, underpin the will and the ability to actively become involved in dialogue with the health care team in pursuit of high level decision making. Three (23%) university and 5 (28%) hospital site respondents considered a self-regulating quality important to critical thought. As well, caring was important for 2 (15%) university site participants and for 3 (17%) hospital site participants. Only 2 (15%) responders from the university and 1 (6%) responder from the hospital site considered moral choices when making critical decisions.

The majority of the university site respondents suggested characteristics of critical thinking such as

logical, goal directed, and problem solver which affirm vertical thinking behaviours whereas, the hospital site faculty were more inclined to define critical thinking with characteristics such as a questioning stance, exploration of alternatives, assumption challenges, and reflective scepticism. Although greater than 50% of the respondents from both sites mentioned risk taking as a valuable critical thinking characteristic, fewer university site participants mentioned additional characteristics to support risk taking behaviour. Instead, a total of twelve (92%) university site respondents supported rational characteristics, such as logical, goal directed and problem solver, for critical thought yet, simultaneously seven (53%) believed in taking risks, 6 (46%) believed in flexibility, and 7 (53%) believed in creativity. Following these results, a greater emphasis on contextual appraisal was expected especially as the results suggest, both lateral and vertical thinking were emphasized by the nursing faculty. One suspects that context plays a part in the decision to employ lateral or vertical thinking processes. Instead, only 5 (38%) of the university site participants and 3 (17%) of the hospital site participants believed that context was an important aspect of critical thinking for the nursing profession.

In question two of the survey, the respondents were asked to present concepts which represented critical thinking processes. The three most frequently mentioned

critical thinking processes were synthesis, evaluation, and analysis (Table 14; Figure 2). Site differences were evident with nine (69%) of the university and 9 (50%) of the hospital respondents citing the analytic process necessary to critical thought. As well, 10 (77%) university site respondents and eleven (61%) hospital site respondents suggested synthesis as a critical thinking process. The evaluation process was important to 9 (69%) of university site teachers and thirteen (72%) of the hospital site teachers. Not only were appreciable site response differences noted in synthesis and analysis but also in the processes of problem solving, data gathering, alternative exploration, hypothesis testing, hypothesis generation, contextual appraisal, and questioning (Table 14).

Once similar processes were grouped together, critical thinking emerged as both product and process driven. Eleven (85%) university site and 12 (67%) hospital site respondents suggested rational-linear processes such as hypothesis testing, deduction, and problem solving. Similarly, 7 (54%) university and fifteen (83%) hospital site respondents suggested a process oriented procedure encompassing alternative exploration, hypothesis generation, contextual appraisal, and intuition. As well, 6 (46%) university and eight (44%) hospital site respondents included imaginative speculation while 10 (77%) university and 11 (61%) hospital site educators cited synthesis as non-linear processes. With

such findings of two dissimilar orientations, product and process, in line with characteristic results, a greater awareness of contextual appraisal was expected should coexistence between linear and non-linear processes be entertained. Such was not apparent with 4 (22%) hospital and one (8%) university site participants aware of the vital part context plays in decision making in nursing. However, once processes with supporting characteristics were combined, minimal site differences occurred in respect to the importance given to context. Still, the majority from each site failed to suggest contextual appraisal. Only ten percent of the respondents cited the intuitive and the application process (procedural).

Many critical thinking characteristics were suggested which supported similar critical thinking processes. Both rational and process oriented models of thinking emerged. Risk taking behaviours along with the actual characteristic of risk taking were more common among hospital site respondents whereas, rational thinking processes such as logical and goal directed were more apparent with university site respondents. Further, along with the rational processes, the university site teachers responded with many creative processes as well as a good knowledge of analysis and synthesis. Although a wide range of characteristics and processes were suggested by both site respondents, a small

percentage of characteristics and processes were identified by more than fifty percent of the teachers.

Several differences existed between both university and hospital site respondents. Risktaking, with its supporting characteristics, was acknowledged more often by hospital site respondents. Rational characteristics were more common with the university site respondents. However, along with rationality, the university site respondents were more aware of creativity, flexibility, analysis, and synthesis than the hospital site respondents. In contrast, the hospital site respondents acknowledged the evaluation process more readily than the university site respondents.

Summary of Findings

Results from the factor analysis, on the Likert type questions, suggested that the educators distinguished between procedural and declarative knowledge but failed to separate contextual knowledge. Further, thinking strategies were identified as well as the value given to the teaching strategies. These findings, resulting from data gathered from the Likert type questions, will be examined in an effort to answer research questions one, two, and three.

The first question "Is there a difference in the knowledge of current research on critical thinking among faculty who taught only in diploma programs prior to collaboration, those who taught only in baccalaureate programs, and those who taught in both programs?" showed a

significant Kruskal-Wallis test. Thus, the null hypothesis was rejected because differences identified signify genuine population differences among the groups with varying teaching experiences.

The second question "Is there a difference in awareness of current research on critical thinking among faculty with a small, moderate, or large amount of practice?" showed no significance in the Kruskal-Wallis test used. Thus, the null hypothesis was not rejected. In other words, the differences noted among the sample groups could well be due to chance variations instead of genuine population differences.

The third question "Is there a difference in knowledge of critical thinking between undergraduate and graduate prepared faculty?" showed no significance in the Mann-Whitney U test. Thus, the null hypothesis was not rejected. Further, any differences found between the graduate and undergraduate prepared faculty cannot be attributed to genuine population differences. Instead, the differences may be due to chance variations.

The fourth question "Is there a difference in interpretation of critical thinking held by the hospital based nursing faculty and university based nursing faculty?" showed several differences. These differences will be explored.

Faculty with teaching experience, in contrast to new teachers, showed a greater awareness of current critical

thinking research according to the Likert type questionnaire. Clinical experience and education were not significant factors in faculty awareness of critical thinking. Specifically, the experienced educators, in contrast to the new teachers, showed procedural awareness. As well, the majority of educators in all categories were contextually aware when responding to the prompted questions. However, although the respondents valued thinking strategies, confusion existed as to whether these strategies increased critical decision making. Further, lack of awareness of specific teaching strategies to facilitate thinking practices existed on the prompted Likert type questions.

On the interpretation of critical thinking, on the open-ended questions one and two of the survey, the majority of respondents from both the university and hospital sites suggested the importance of risk taking as a characteristic for critical thinking. However, the hospital based faculty suggested more characteristics which supported risk taking. Differences occurred in relation to creative as a characteristic. The majority of university site educators proposed a creative aspect to critical thinking. As well, differences between the groups occurred in relation to domain specific knowledge where more hospital based educators cited this characteristic. Agreement existed between the two sites regarding self-regulation as an

important aspect of critical thinking behaviour. As well, general agreement between the groups about the importance of a caring attitude was present. However, this characteristic was offered by a small percentage of respondents.

University site respondents indicated a greater preference for rational thinking characteristics such as logical and goal directed. However, similarity existed between the groups regarding rationality as a process for critical thinking. Interestingly, while both groups supported rational thinking processes, respondents from each site entertained the idea that critical thinking involved an intuitive process. More university site educators proposed an intuitive process when making critical decisions. Thus, a rational critical thinking orientation coexisted with creative processes for critical thinking.

Contextual appraisal was evenly represented by both groups once characteristics and processes were combined. Still, less than a majority from each group, in contrast to respondents on the Likert type questionnaire, cited the importance of context in decision making.

Differences occurred between groups in relation to procedural knowledge represented by the application process. This process was suggested by a few university site faculty in contrast to none of the hospital site group. These findings differed greatly from findings on the prompted Likert type questionnaire where expertise in procedural

knowledge was apparent by the majority of experienced educators.

The results from the first two open-ended questions of the survey provided a range of characteristics and processes necessary for critical thinking. These data will be examined in an attempt to answer research question four as well as the overall question of faculty awareness of current critical thinking research.

The age distribution for nurse educators indicated that the majority were middle aged or older. As well, the majority of respondents had five or more years of clinical practice. The majority of educators possessed master's degrees with very few prepared at a doctoral level. Close to one-fifth of the sample population achieved the baccalaureate level as their highest educational preparation.

The findings of this last portion of the survey provided an overview of collaborative baccalaureate nurse educators in Manitoba. These data will be examined in an effort to answer the research questions.

CHAPTER FIVE

Discussion

This study was designed to ascertain faculty awareness of current research into the nature of critical thinking. Critical thinking is a vital aspect of professional nursing education especially in a society engulfed in rapid technological change. Major changes give rise to many contentious issues. Subjects such as euthanasia, in vitro fertilization, and acquired immune deficiency disease pose ethical and moral dilemmas. The resolution of these dilemmas requires professionals who are capable of critical thinking skills. Nursing educators are charged with the task of teaching critical thinking skills to student nurses, our future health care professionals. Thus, educator awareness of critical thinking research is imperative. Identifying nursing educators' awareness of current research on critical thinking is a preliminary step for administrators and curricular developers in the development of the new collaborative baccalaureate nursing programs.

An extensive literature review, yielded no studies pertaining to faculty awareness of critical thinking research specifically for the collaborative baccalaureate nursing programs. However, literature published by authorities in the field of critical thinking and cognitive development was reviewed. As well, research by Baker (1993), Jones and Brown (1991), and Meins (1991) stimulated the

researcher's interest in faculty awareness of critical thinking.

A survey of deans and directors of baccalaureate and higher degree schools of nursing in the United States indicated that critical thinking was deemed to be the more traditional rational-linear activity using the nursing process as a problem-solving tool (Jones & Brown, 1991). Further, according to Jones and Brown (1991), a lack of awareness by deans and directors existed regarding more current characteristics of critical thinking. Meins' (1991) research on teacher education programs in Arkansas found that faculty were unfamiliar with critical thinking research and as such were unable to prepare future teachers in the process of critical thinking. Baker's (1993) research on nursing faculty demonstrated a relationship between critical thinking awareness and levels of education. Further, Baker's (1993) research revealed that nursing faculty perceptions of what promotes critical thinking skills had no relationship to clinical practice.

An awareness of current critical thinking research began to emerge from the results of the Likert type questions, in this study, where teacher experience was the determining factor. Experienced teachers were aware of the types of learning congruent with critical thinking whereas the new teachers did not share this knowledge. Clinical practice and the educational level of the educators failed

to influence educators' awareness of current research on critical thinking. The model of critical thinking which emerged was rational-linear balanced by a creative, process driven, orientation. As well, an overall lack of awareness by the majority of the educators of current critical thinking characteristics and processes emerged. This lack of awareness of critical thinking characteristics and processes on the open ended questions was especially evident for domain specific knowledge, contextual appraisal, application, and self-regulation. All of these characteristics also were tested by the Likert type questions. Inconsistency between responses to the open ended questions and the prompted questionnaire revealed that the educators in the collaborative baccalaureate nursing program recognized expert thinking practice but many of these educators were unable to spontaneously state these same thinking practices and the characteristics which support them. Arguments related to the prompted questions will be discussed first.

Factor Analysis Discussion

Factor analysis of the original twelve Likert type questions representing declarative (8,14,16,19), procedural (17,18,20,22), and contextual (15,23,24,25) knowledge will be discussed separately from metacognitive strategies. Although theoretically, researchers distinguish among these types of learning or factors when presenting material to

students, the nurse educators in this research only distinguished among two of these three kinds of knowledge when teaching. The collaborate baccalaureate instructors emphasized underlying procedural theory. As well, the nurse educators in this research identified the two aspects of declarative knowledge, organization of theory and a strong theoretical data base. Further, the surfacing of significant contextual and procedural variables in factor two, with contextual appearing stronger than procedural suggests that educators are aware of the importance of context to learning but in practice, fail to distinguish between the two concepts. Factor two contributes 17% of variability and cannot be ignored. This finding of a pattern of contextual with procedural implies that, perhaps, since nursing is a practice profession, practitioners find it difficult to isolate contextual knowledge from procedural knowledge.

A significant contextual element is present in factor one and factor three. Perhaps the nursing educators have gone beyond distinguishing among types of learning. Instead, for these nursing educators, teaching may be informed by actual nursing practice as argued by Diekelmann (1990). The finding, where blurring exists among different types of knowledge, supports Ryle (1962) and Benner's (1984) contention that the experts who "know how" have forgotten the "knowing that". An implication of these findings, in line with Ryle (1962) and Benner (1984) may be that the

educators must revisit the research on expertise to guarantee that this theory is made explicit to the students. As well, perhaps, in an attempt to translate expertise to their nursing students, the nursing educators in line with Alexander, Schallert, and Hare (1991) may have developed a theory of education where procedural and declarative knowledge are individually identified, but also, where contextual implications are integrated throughout all learning areas (Brookfield, 1987; Paul, 1987; Schon, 1991). Because the procedural variable contributed 29.5% of the variability in types of learning, this finding provides support that procedural knowledge is of vital importance to the collaborative baccalaureate nursing teachers in educating their nursing students. The challenge for the nursing educators in these new collaborate baccalaureate nursing programs will be to ensure a curriculum where procedural knowledge is emphasized in a collaborative baccalaureate nursing university setting. Further, in an effort to accommodate expertise in the procedural type of learning, the four year nursing baccalaureate programs may need to expand, as suggested by this research, in order to make room for enough expert procedural knowledge practice.

Discussion of all Likert Type Questions

Factor analysis of all the Likert type questions, three to twenty-nine, revealed that although theoretical researchers such as Alexander, Schallert, and Hare (1991),

distinguish among declarative, procedural, and contextual concepts, as well as strategies which promote the expertise necessary for critical thinking. These findings indicate that the nurse educators failed to distinguish among procedural and contextual factors. Clear identification of declarative knowledge as well as identification of strategic knowledge, in contrast to a blurring of procedural and contextual knowledge, suggest that the nurse educators failed to distinguish among some types of learning. As suggested for the previous factor analysis, educators must make a conscious effort to emphasize underlying theory especially in the practice arena where procedural and contextual awareness are imperative.

A factor analysis with twenty-seven questions and a population sample of thirty-one is potentially not as stable as it could be with a larger sample. According to Child (1970), it is desirable to have at least three tests in order to represent a dimension. Further, the original factor analysis is more stable as twelve elements were analyzed compared to twenty-seven items in the latter analysis. A much larger sample is suggested for further analysis.

In summary, the respondents in this research distinguish among procedural, declarative, and strategic knowledge and indeed separate these concepts in their teaching. The contextual emphasis for critical thinking is of interest even though the concept of context was not as

clearly identified as a separate factor. Instead, contextual loadings permeated throughout the procedural and declarative factors. One may speculate that perhaps the concept of context may be the "glue" which joins together the important critical thinking concepts.

Knowledge of Critical Thinking on Likert Questions

Findings of the prompted Likert type questions showed that the majority of the faculty with prior teaching experience, in contrast to the new teachers, showed an awareness of critical thinking, especially of procedural knowledge. As well, the majority of the respondents were aware of contextual knowledge. One may speculate that the experienced teachers' greater awareness of critical thinking research may be due to their access to professional development sessions in an attempt to increase their teaching skills. An important question worthy of pursuit is at what stage do the new teachers become experienced teachers and what can be done to speed the advance of critical thinking awareness in the new teachers?

Alexander, Schallert, and Hare's (1991) argument, that awareness of knowledge in one form does not necessarily guarantee knowledge in all forms, supports the findings of this study. This research showed that the participants with prior teaching experience, especially in the diploma only and baccalaureate only schools of nursing, showed an awareness of procedural and contextual knowledge but showed

much less expertise where declarative, metacognitive, and strategic knowledge were concerned. As well, the majority of the collaborative baccalaureate nursing teachers were aware of contextual knowledge. A closer look will be taken at the individual types of knowledge.

Declarative Knowledge

Schoenfeld (1985) and Schoenfeld & Herrmann (1982) indicate that the novice problem solvers, in contrast to the expert problem solvers, spent less time analysing a situation while advancing quickly to attempt a solution. The novice participants (new teachers) in this study preferred quick, rote interventions and showed a greater lack of awareness of the importance of the reorganization of knowledge necessary to synthesize new insights. In contrast, many participants who had several years of teaching experience, demonstrated declarative knowledge more akin to the experts who possess a rich domain-specific data base more in line with previous research. Chi, Feltovich, and Glaser (1981) and Patel and Groen (1986) argue that the experts extract domain-specific principles retrieved from a strong underlying knowledge base in an effort to solve problems. Unfortunately, even though the experienced teachers in this research, scored higher on declarative knowledge than the new teachers, the difference was not significant enough to say that experienced teachers have become experts in this important knowledge domain.

Further, in accordance with the critical thinking theorists Bandman and Bandman (1988), Ennis (1987), and McPeck (1981), the respondents from both the university and hospital sites espoused the importance of domain-specific knowledge as an important characteristic for the critical thinkers to possess. However, the hospital site respondents supported domain-specific knowledge to a greater extent than did the university site respondents. A possible explanation for this finding is that the diploma students, formerly taught by many of the hospital site respondents, were accustomed to a heavier clinical workload while studying. One may speculate that the diploma educators learned earlier, the necessity of a strong organized knowledge base and stressed this quality to the students. Otherwise, one may theorize that the students with limited knowledge would fail to complete their learning assignments on time and potentially harm their patients. Thus, continued emphasis on expert declarative knowledge to support critical thinking is as important as the use of expert procedural knowledge.

Procedural Knowledge

Baker's (1993) research on the faculties' perceptions in respect to critical thinking is significant where the nursing faculties agreed that the application of theory and principles to clinical practice promoted critical thinking. Results from this survey, in agreement with Baker's findings, show that the majority of the respondents to the

Likert type questions, with teaching experience, were aware of the importance of procedural knowledge. The experienced teachers, in support of Bevis (1989), Belenky, Clinchy, Goldberger, & Tarule (1986) and Perry's (1970) upper levels of intellectual development, encouraged their students to be active problem solvers who revised procedures and generated alternatives. In contrast, the new teachers in this study, were more inclined to expect the students to complete assigned tasks in a routine fashion more in line with Belenky, Clinchy, Goldberger & Tarule's (1986) "received knowledge" or Perry's (1970) "multiplicity". One suspects that role transition may be a major hurdle for these novice teachers where they still have one "foot" in the clinical nurse role or the student role and the other foot attempting to step timidly into the teacher's role.

Contextual Knowledge

Research on expert versus novice learners emphasizes the imperative that all truth is relative and must be viewed within its proper context (Belenky, Clinchy, Goldberger, & Tarule, 1986; Perry, 1970). In agreement with the arguments by the aforementioned researchers, an awareness of contextual knowledge was evident from the majority of respondents, not only experienced teachers, who answered the Likert type questions but the new teachers as well. These findings are in disagreement with Jones and Brown's (1991) study where the deans and directors of nursing espoused a

rational-linear thinking model, and where a means end form of thinking predominated nursing education. The linear model of thinking left little room for contextual appraisal.

The findings in this research, where the respondents considered the contextual implications of problem solving, are extremely encouraging for a profession which cares for individuals of all cultures involved in a variety of situations. As well, survey results where the teachers encouraged their students to interact with the nursing staff are in agreement with Paul's (1987) theory citing the importance of dialogue to critical thinking. The majority of the respondents encouraged the students to develop their own knowledge and meaning to situations in a quest for truth while reflecting upon the staff members' experiences. These findings are consistent with Bevis' (1989) contention that context embodies the essence of nursing where autonomous decision making is an important element of a profession. Curiously, in the open ended questions, in contrast to these prompted Likert type questions, few respondents suggested that "contextual appraisal" represented a process or characteristic of critical thinking. Benner (1984) and Ryle (1962) indicate that expert practice is possible without conscious awareness of underlying theory. Thus, a possible explanation for the discrepancy between responses to the Likert type questionnaire and the first two open ended questions may be an inability to recall theoretical

constructs long hidden in memory, yet often practised by the expert. Thus, in line with what Benner (1984) and Ryle (1962) have established, a challenge for the collaborative baccalaureate teachers is to reflect upon the "knowing that" of critical thinking practice. Once done, the educators must make implicit theory explicit for the students while simultaneously facilitating the students' introspection of the actual behaviours. Otherwise, expert practice by the educators or staff in the clinical arenas will appear to be done by rote without revealing what underlies the behaviours. In an effort to facilitate introspection and critical thinking, educators will need to employ good teaching strategies.

Teaching Strategies

Successful thinkers require explicit instruction on how to plan, monitor, and evaluate their cognitive activities (Baker & Brown, 1984; Brown, Bransford, Ferrera & Campione, 1983; Flavell, 1987; Paris & Winograd, 1990; Pressley, Goodchild, Fleet, Zajchowski, & Evans, 1987). The underlying assumption arising out of the concept of explicit metacognitive instruction is that the educators must first of all be aware of current teaching strategies before these processes can be taught. Yet, results from the Likert type questions depicting strategies indicate a lack of respondent awareness of several current research-based strategies which encouraged the students to take an active and interactive

role in their learning. These findings, indicating a more passive stance, are in contrast to Paris' (1986) support of peer group interaction which increases student ownership of learning. Exceptions where these educators supported a more interactive learning style included the respondents acknowledgement of questioning and writing as excellent teaching strategies. These two areas of interactive learning are in agreement with House, Chassie and Spohn, (1990) and Sadler, (1987), who argue that a climate where students are encouraged to question the policies and procedures increases analytical ability and the development of new insights. As well, the educators' awareness of writing as a teaching strategy is in agreement with Kurfiss (1988) and Sirotnik (1991). Kurfiss (1988) and Sirotnik (1991) argue that writing to learn (WTL) improves dialectical thinking, assists students to be creative, and forces the use of analysis and synthesis.

Despite a lack of support for several valuable teaching strategies, the respondents nevertheless indicated a need for good teaching processes throughout the curriculum. The latter finding is consistent with French and Rhoder's (1992) argument that thinking strategies should permeate all learning. Although a majority of the respondents, in agreement with French and Rhoder (1992), indicated that thinking strategies should be included in all areas of teaching, the educators, at the same time, were unsure if

specific strategies actually promoted active problem solving. As well, few of the respondents accepted current research acknowledging the importance of modelling of, or exposure to, actual thinking strategies (Pressley, Borkowski, & Schneider, 1987; Short & Weissberg-Benchell, 1989; Whimbey & Lochhead, 1986). Perhaps an explanation for these educators' lack of support for more good thinking strategies is that most teachers usually teach how they were taught. Unfortunately, it may be, as Bevis (1989) contends, that most nursing teachers were exposed to patriarchal thinking and a system of oppression and control in their education. Thus, nothing less than active teacher involvement with excellent critical thinking role models and explicit strategy learning is required if our current collaborative teachers are to develop the skills to teach critical thinking. A giant step towards this goal has already occurred as this research showed that these educators value integrating thinking strategies throughout the curriculum.

Findings which indicated that the majority of the educators surveyed, including the new teachers, agreed upon integrating thinking strategies into the curriculum, contrasted with the educators' ambivalence regarding the value of specific strategies in the facilitating of problem solving. One explanation for the educators' confusion over the value given to the merit of several thinking strategies

may be the lack of actual preparation of nurse teachers for the role of teacher. This explanation is supported by Ford and Wertenberger's (1993) findings that in Canada no preparation requirements were evident for the nurse teacher role. As well, this ambiguity by the respondents lends some support to Bevis' (1989) theory that the null curriculum and the illegitimate curriculum are present in nursing education. The challenge for educators will be to identify the null and illegitimate curricula while simultaneously learning and teaching strategies for critical thinking supported by the current research.

The majority of the educators with teaching experience were aware of the types of learning necessary for critical thinking. In contrast, the new or novice teachers were not aware of the current critical thinking research. Thus, a significant difference was evident in the sample population surveyed to answer question one.

The second research question was designed for the purpose of identifying differences among the educators' prior clinical practice and critical thinking awareness. The educators' prior clinical practice was not a significant factor involved in faculty awareness of current critical thinking research. This finding lends support to Baker's (1993) research which showed that nursing faculty perceptions of what promotes critical thinking skills have no relationship to clinical practice. One possible

explanation for this finding is suggested by Benner (1984) and Ryle's (1962) argument, that expert practitioners often are unaware of underlying theory. One can surmise, that more emphasis on reflective practice by the educators with a wealth of clinical experience, in line with Schon (1987) could bring expert practice knowledge into teacher consciousness. Schon (1987) argues for ongoing reflection and the reframing of practice situations so as to generate new hypotheses.

One expected that, because of the large practice component in nursing, the participants with several years of clinical practice, in contrast to novice practitioners, would show significant differences in procedural knowledge. However, the research showed that, although differences existed among the groups, they were not significant. Some other element, outside of critical thinking, may be at work for clinical practitioners which assists them in achieving success in the clinical arena. One may theorize that perhaps the highly charged, fast paced reality of much of the nursing practice may necessitate mechanical routine where obedience to policy and procedure is the only way to survive. The "why" of expert clinical practice may be too stressful to reflect upon during practice. Whatever the reason, the finding of no significant differences between the experienced and novice practitioners in this research, suggests further study of the actual behaviours of

practitioners especially with an eye, in accordance with Schon (1987), to the frequency of reflective practice in the population who share a wealth of clinical experience. Schon (1987) argues that reflective practice is necessary for expert decision making. It will be a challenge for educators to assure their students enough time to properly reflect at the end of practice experiences.

The third research question was designed for the purpose of identifying differences between teachers' education and their awareness of critical thinking research. The teachers' awareness of current critical thinking research showed no relationship to educational level achieved. These findings are consistent with Meins' (1991) argument that the teacher education faculties in universities were unaware of relevant research about critical thinking. In spite of Meins' (1991) argument, that educational level achieved does not prepare critical thinkers, Baker (1993) argues that the degree held by educators does indeed influence critical thinking awareness. Findings in this research which showed a lack of significant differences in education as well as conflicting results by Baker (1993) and Meins (1991) suggest that further research with a much larger sample is in order where educational preparation and critical thinking are concerned. Until this issue is clarified, a major challenge for university nursing faculties will be to scrutinize their baccalaureate programs

for ways to enhance critical thinking as well as to evaluate their graduate nursing programs for possible deficiencies in the teaching and modelling of critical thinking.

Processes and Characteristics

The fourth research question was designed for the purpose of identifying differences in awareness of critical thinking processes and characteristics between educators at the university and hospital sites. Results of this study indicated site differences in several areas. This research, in contrast with the research of Jones and Brown (1991), and Cromwell (1992) indicated a robust array of critical thinking characteristics. However, although a wide range of characteristics and processes was suggested by the respondents on the non-prompted questions, only a few educators offered a large number of the current concepts. As well, contrary to the research of Jones and Brown (1991), where rational-linear thinking predominated, a beginning grounding of a creative process orientation along with, but more apparent than, the more narrow product orientation for critical thought was evident. A shift from the traditional rational-linear thinking to a more balanced model which integrated the former with a creative non-linear approach to thinking emerged. These findings are in line with deBono (1976) and McPeck's (1981) contention that the creative non-linear approach is an extension of the rational approach. In contrast, Bevis and Watson (1989) and Eisner (1979; 1985)

argue that rational thinking discourages analysis and synthesis of creative solutions. Bevis and Watson (1989) argue that a rational and process model cannot coexist due to the tension between these orientations to thinking. However, one would be foolhardy to discard a time-honoured process with a completely new model especially in a practice profession where traditional decision making has been successful. Further, in line with Jones and Brown's (1991) arguments, educator ignorance of a more creative, process driven model would limit the acceptance of ambiguities associated with human beings from a vast array of cultures. Perhaps, as suggested by the results in the factor analysis, the important element bridging the rational and the non-linear processes is the contextual assessment as one reflects, explores alternatives, yet continually questions time honoured assumptions. Thus, in line with deBono (1976) and McPeck (1981) a balance between the rational and the creative models is a step forward for the nursing profession.

Problem solving activities which reject the status quo increasingly challenge the professional nurse to risk critical thought. Although the respondents from both sites mentioned risk-taking as an important critical thinking characteristic, the hospital based respondents offered a greater number of processes and allied characteristics, like questioning, challenging of assumptions, and reflective

scepticism to support risk-taking behaviour. These research findings create contrasting evidence to Bevis's (1989) assumption that the diploma schools of nursing and the diploma teachers, were less inclined than the baccalaureate schools of nursing and the university teachers, to teach inquiry learning and critical thinking. In this research, although one is unsure if all the educators who taught only in the diploma programs prior to collaboration stayed at the hospital sites once collaboration was initiated, such was usually the case. Thus, the hospital site educators may be equated with Bevis's (1989) diploma school teachers.

The apparent inconsistency in risk taking behaviours between the hospital and university site respondents may be due to the university educators' guest status in new clinical areas. The reluctance by the university site educators to suggest more risk taking characteristics corresponds with Stanko's (1981) argument that risk taking can be inhibited due to the guest status often afforded to the nursing teachers in service settings. Teachers hired by and practising at a hospital site often have less of a guest status than the visiting university site faculty. Perhaps the hospital site teachers feel more a part of the institution and as such they are more comfortable in their environment. As well, because the hospital site teachers generally remain in their own institution, these educators may experience a greater ease while actively questioning

underlying assumptions, exploring alternatives, and creating new patterns of care. Such reflective scepticism and willingness to generate new ideas are seminal to critical thinking and are in line with the beliefs held by Bloom (1956), Dewey (1933), deBono (1970; 1976), Ennis (1987), and McPeck (1981). Because of the importance of risk taking behaviours, efforts must be made to decrease the guest status of the university site faculty. One possibility may be to limit the movement of teachers to a minimum in the clinical areas.

The educators often are shuffled from site to site within acute care settings as an ever changing menagerie of new students "tag along". Continued rotation of the instructors ensures that they retain guest instructor status instead of becoming a part of any clinical group or setting. In settings where patients' lives depend upon informed decisions and where time-honoured procedures dominate, one is not too surprised at the research findings which reveal a dearth of awareness of characteristics which possess an element of risk. Perhaps more time is spent on trying to figure out the ward culture than is spent on modelling critical thinking or assisting students to risk critical thinking. A major challenge for the educators and their employers will be to gain the confidence of the ward staff in an effort to decrease guest status. Once educators become

confident members of the ward team, greater risk taking may become a reality.

An unexpected finding in this research was that there was a difference between the groups who suggested analysis, synthesis, and evaluation as important processes for critical thought. This finding was unexpected not only because these processes are used for testing critical thinking ability in the national Registered Nurse/licensure exams but also because evidence of these elements is sought during accreditation of the Canadian baccalaureate nursing programs (Canadian Association of University Schools of Nursing, 1987; Canadian Nurses Association, 1993; Thomas, 1995).

The University site respondents greater awareness of analysis and synthesis may be due to their recent university accreditation process by the Canadian Association of University Schools of Nursing (CAUSN) where an emphasis is on active student participation and synthesis (CAUSN, 1987). Perhaps an explanation for the hospital site respondents greater emphasis on evaluation is the traditional emphasis placed upon the behaviourist paradigm in diploma schools of nursing. According to Bevis (1989) "...evaluations are the essence of reinforcement (a behaviourist concept) in learning..." p.30. However, perhaps evaluations need not be based on strict guides, such as suggested with behavioural objectives, but instead can

encompass many value systems. Thus, a challenge for these educators is to ensure the evaluation process is broadened to encompass various value systems.

While the respondents, to the open ended questions, embraced analysis, synthesis, and evaluation as necessary processes for critical thinking, surprisingly little importance was given to the contextual implications considered so necessary by Bevis (1989), Brookfield (1987), Paul (1987), and Schon (1983; 1987; 1991). The development of new plans and the evaluation of these new insights must involve contextual contingencies. A lack of emphasis on context in the open ended questions coincides with the findings of Jones and Brown (1991) where only thirty-five percent of deans and directors of baccalaureate schools of nursing supported contextual appraisal. Poor spontaneous support for contextual judgements by the collaborative baccalaureate nursing educators might have been expected within a nursing culture traditionally controlled by physicians and administrators. In such a culture, the decisions were made at the top of the hierarchy. Little room was allowed for contextual contingencies which arose at the bedside. This philosophical dependence on hierarchal decision makers was inherited from schools of thought where spiritual salvation, service to God, country, and physician predicated most nursing decisions (Bevis, 1982). The value system often adopted was that of the most powerful within

the institution without emphasis upon context. Although the hospital site respondents in the non-prompted questions were more aware of the "process" of contextual appraisal, the university site respondents emphasized the "characteristic" where thinking skills have different applications in different contexts. These findings lend limited support to Jones and Brown's (1991) argument that nurses practise in situations where contextually defined value judgements are paramount. As well, several other theorists support these findings which defy unambiguous linear decision making instead acknowledging issue complexities where context is increasingly important (Bevis, 1989; Brookfield, 1987; Paul, 1987; Schon, 1983; 1987; 1991; Sirotnik, 1991). However, in line with Jones and Brown (1991), Bevis (1989), Brookfield (1987), Paul (1987), Schon (1991) and Sirotnik (1991) a greater spontaneous awareness than was revealed in this research, of the importance of situational contingencies, must become evident before more of the collaborative baccalaureate nursing educators possess the requisite conscious knowledge to teach contextual concepts to students.

The flexibility of the critical thinker allows for contextual contingencies and the questioning of universal truths. As well, awareness of our own and other's value systems, our own underlying assumptions as well as those of other's, and a search for alternative plans of action

presupposes the possession of flexibility on the part of a critical thinker. In this research, more of the university site than the hospital site educators were cognisant of flexibility in relation to critical thinking. One may speculate that perhaps the university site respondents' more flexible attitude is due to a traditional university administration which espouses democratic leadership versus the traditional hospital site culture of top down decision making. In a mostly hierarchal culture, participants find it difficult to make judgements based on critical thought, instead, accepting authoritative decisions without much reflection. Although too much organizational structure is the antithesis of flexibility, too little structure may lead to nonjudgemental anarchy.

The suggestion, by a couple of educators from the hospital site, that a nonjudgemental attitude, "multiplicity" in Perry's (1970) scheme, supports critical thinking is akin to treating one's brain as an empty vessel. As well, in a profession driven by a code of ethics and nursing standards and where conflict exists among different value systems, one must certainly care enough to consider moral choices and make thoughtful judgements. Otherwise, the propensity to care enough to use moral reasoning in making critical judgements can be suspended in abeyance to a commitment to authority as evidenced at the inquest into the baby deaths at the Health Sciences Centre in Manitoba (Paul,

1996). Further, a lack of moral reasoning is a definite possibility in our present social and economic climate of "downsizing" where the "bottom line" concerns dollar amounts over people concerns. Thus, the dearth of respondents in this research who offered moral values and caring as characteristics of critical thinking, especially in a profession where life and death decisions are frequent, is disconcerting. These findings, unfortunately are in agreement with the now infamous Milgram (1963) research. Milgram's (1963) findings clearly indicated that participants obeyed authority instead of using critical thought based upon basic human principles. A major challenge for educators is the acknowledgement of the position of morality and caring in critical thinking and the acceptance of its association to risk taking behaviours.

Suggestions in this research that caring is valuable to critical thinking implies risk taking and active involvement, both of which are supported by Bevis (1989) and Belenky, Clinchy, Goldberger, and Tarule (1986). As well, unless one takes the responsibility to reflect upon ones own thinking processes and values before becoming actively involved in the resolution of conflict among value systems, a fertile environment for critical thinking may remain an illusion. According to Thayer-Bacon's (1993) argument, which

is in contrast to these results citing a nonjudgemental attitude, "... it is impossible to get rid of ones voice and be 'objective'" (p.335).

Caring and nursing fit together like a hand and glove. However, only a small proportion of the educators saw fit to suggest this characteristic when discussing critical thinking. These findings, with such a lack of emphasis on caring, contrast with Thayer-Bacon's (1993) constructive thinking theory. Thayer-Bacon (1993) encouraged the development of one's personal voice to be used in a receptive and caring manner. Further, Thayer-Bacon (1993) argued that caring is required to ensure fair appraisal of ideas, issues, and data. Perhaps, one may speculate that the reason few respondents linked caring to critical thinking was a reluctance by some of the respondents to move away from a rational only model of thinking. As well, traditionally nursing sat at the bottom of an hierarchial structure where nurses possessed little power. This culture of master-servant mentality may have contributed to an uncaring environment. Further, perhaps another reason caring was mentioned by so few respondents is that caring suggests feelings which, until recently, according to Benner (1984) and Diekelmann (1990) were ignored in the critical thinking literature. According to Benner's (1984) research, feelings or intuition were the mainstay for expert practitioners. Benner (1984) argued, in research on intensive care nurses,

that intuition informed expert nursing practice. In this research, the faculty from both sites were aware of intuition in the critical thinking process, in agreement with Benner (1984). However, although intuition was identified, only a minority of the respondents did so. A possible explanation for this finding in agreement with arguments by Ryle (1962) may be that practice which appears to be intuition driven, instead, is based upon theory already learned but not always called into consciousness. This finding of subconscious theory, in line with Ryle (1962), suggests that the educators, along with their students, perhaps need to actively explore the role that intuition plays in critical thinking as well as actively seek underlying theory such as pattern recognition research in expert/novice studies.

Several other characteristics such as good communicator, intelligent, observant, collection of appropriate data, anticipator, and priority setter were advocated by a very small percentage of the respondents. Of these characteristics, priority setting bears closer scrutiny.

Priority setting presupposes that processes of analysis and evaluation are antecedent to the act. Thus, an expert priority setter must first analyse and evaluate while ordering plans already synthesized. Probably due to the emergent nature of much of clinical nursing practice and the

processes necessary before ordering occurs, priority setting may well be one of the most important characteristics possessed by critical thinkers. Indeed, The Canadian Nurses Association (1993) advocates priority setting as a necessary characteristic for critical thinking. Thus, observational research into the practices of identified nursing experts and novices may be in order in an effort to identify priority setting behaviours. Further research is especially important in view of an inconsistency between the apparent importance of priority setting to critical thinking and the poor showing afforded priority setting by respondents in this research.

The rational and creative process model for critical thinking was supported by many characteristics cited in the current research literature. Although differences existed between the respondents from the university site and the hospital site, once both processes and characteristics were combined, the differences did not appear to be many.

Following results of these findings, a conceptual definition emerged. Critical thinking involves rational thinking processes balanced by creative processes. Contextual appraisal is employed to balance the rational and the creative processes. The critical thinker not only is a goal directed problem solver who analyses situations using logical deductive reasoning, hypothesis testing and evaluation but also is a person employing risk taking

behaviours such as questioning, challenging underlying assumptions, exploring alternatives, using reflective scepticism, and self regulation in an effort to synthesize many different kinds of information to form a coherent conclusion. The critical thinker is flexible and creative while using imaginative speculation. As well, the critical thinker possesses sufficient domain specific knowledge.

Summary

Based on responses from the population sample, the majority of nurse educators with teaching experience, recognized current research on critical thinking when responding to prompted questions. In contrast to experienced teachers, new teachers were less than knowledgeable where current critical thinking research was concerned. Further, many educators found it difficult to spontaneously offer current critical thinking processes and characteristics. This lack of ready knowledge will hinder educators' ability to facilitate critical thinking in their students.

Although the majority of educators agreed on the value of integrating metacognitive strategies throughout the curriculum, confusion was evident in respect to good teaching practices. Most of the educators focused on teacher initiated strategies of how to teach critical thinking. Along with the teacher initiated writing assignments, the teachers must explicitly discuss, emphasize and model strategies, such as peer learning and role playing, which

allow the students to be active learners who plan, monitor, and evaluate their own thinking activities. Thus, improved strategic knowledge, by all the educators, not only the new teachers, is an initial step which must be achieved before the educators can model critical thinking.

Clinical practice and education failed to have an influence on faculty awareness of critical thinking. The general finding of no differences between graduate and undergraduate prepared educators has implications not only for the baccalaureate education program but also for the graduate nursing program.

Teachers from both the university and hospital sites proposed a model of rational thinking balanced with a creative process approach. This product-process model will be confusing to the students if contextual contingencies are ignored. Findings in this study indicated a need for educators to increase their spontaneous knowledge on contextual learning. Only then, with renewed consciousness of context, can explicit teaching and modelling of acceptable thinking processes be achieved.

Although, theoretically, researchers distinguish among types of learning, the educators in the collaborative baccalaureate nursing program failed to consistently do so. Factor analyses revealed a strong contextual presence throughout other types of learning suggesting that, the nurse educators, once prompted, were aware of the importance

of context to critical thinking but at the same time, these same educators failed to make contextual theory explicit. Thus, a challenge for the nurse educators is to explicitly discuss, emphasize and model underlying contextual theory.

The transition from diploma schools of nursing to collaborative baccalaureate nursing programs is in its completion stage in Manitoba. Critical thinking has been identified as a major thrust in the collaborative baccalaureate nursing curricula. The educators who are unaware of many aspects of critical thinking are unable to teach or model thinking skills to their students. Thus, in an effort to attract and retain the brightest and the most independent students to the nursing profession, educators must immediately develop their own critical thinking knowledge and teaching strategies. Once such knowledge and strategies are achieved, educators and students can move with confidence into the twenty-first century.

CHAPTER SIX

Conclusions and Recommendations

The move in nursing education from diploma to collaborative baccalaureate programs involves a major change for nursing educators. An important aspect of such a shift is the assurance that university nursing students will graduate as critical thinkers. To achieve this end, nursing educators have a major responsibility to teach critical thinking. To accomplish this task, nursing faculty require a greater awareness of current research on critical thinking and more expertise in the modelling and teaching of current thinking strategies than was shown in this research. Without up to date skills, educators will be unable to facilitate the students' learning. Although a sector of educators, those with teaching experience, were aware of several types of learning necessary to the development of critical thinking, educators in general were not as well informed about characteristics and processes for critical thinking.

The nursing profession's contention that critical thinking is taught to students will remain an illusion unless educators explicitly distinguish among types of learning in their teaching. Further, strategies which encourage student empowerment must become a part of all educators' arsenal to facilitate the development of professional practitioners.

A positive finding which emerged from this research was a balanced approach to critical thinking, encompassing creative and objective approaches. This is in disagreement with Jones and Brown's (1991) argument that a product model predominated baccalaureate nursing education. This balance demonstrates a step forward by Manitoba nurse educators to a more enlightened stance to critical thinking. Educators' emphasis on context (in the prompted questions and factor analysis) indicates that context must be afforded a strong presence in any attempt to use the elements of product and process models for critical thinking. A step away from an exclusively linear approach to decision making demonstrates that nursing educators in Manitoba's collaborative baccalaureate programs have a beginning awareness of new processes for critical thinking.

Other findings of this research agreed with Jones and Brown's (1991) and Meins' (1991) arguments that, contrary to educators' opinion, graduate education does not automatically prepare faculty members to teach critical thinking. Therefore, attention should be directed not only to baccalaureate nursing curricula but also to graduate studies as well.

Surprisingly, in this practice profession, clinical experience was not a factor in educators' awareness of critical thinking research. Perhaps, one may theorize that because of the continued emphasis on necessary speedy

interventions, not enough reflection occurs throughout the practice of nursing. The skills used during nursing practice may be dramatically opposed to the skills needed for critical thinking. Thus, unless nursing educators explicitly discuss, emphasize and model critical thinking strategies students may graduate into their practice with a lack of knowledge of critical thinking research.

New teachers' poor knowledge of critical thinking research may have an impact, especially in a climate where experienced teachers are encouraged to move out of the workforce at an earlier age. New teachers do, however, value thinking strategies and such an attitude is an important factor for speedy learning of the teaching skills necessary to develop critical thinking.

Implications for Nursing Education

Results of this research provided valuable information which has implications for curriculum developers, employers of educators, accrediting bodies, educational policy directors, and educators in collaborative baccalaureate nursing programs. The recommendations may assist deans and directors of nursing baccalaureate programs as well as nursing educators in appraising curricula in the new collaborative baccalaureate nursing programs. Further, the recommendations can assist all faculty members during the assessment of their own teaching practices.

Teachers' failure to distinguish among types of learning, in a practice profession where students are exposed to many expert practitioners in the clinical areas, may confuse the students. The great importance of contextual appraisal to critical thinking must be explicitly identified for students in an effort to decrease any possibility of mixed messages.

New teachers, entering a profession with a history of training nurses to nurse but not teaching teachers to teach, can be at a disadvantage. Not only do new teachers encounter the stress of a new job but they also take on a different role. Previously, these teachers practised in a clinical area or were students. New teachers' limited awareness of critical thinking research along with the stresses of a new job and new expectations, may deprive both educators and students of valuable learning experiences.

Employers must assist these teachers in attaining awareness of current critical thinking research. Since experienced teachers have a greater awareness of several aspects of current research, these educators are the obvious choice to be mentors for the new teachers. A planned professional development series stressing the current research on teaching strategies to develop critical thinking must be implemented as soon as possible to meet the needs of the rest of the educators. Active teaching practice by the learners must be employed in these sessions so educators

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learn to model current techniques. Faculty must be willing to risk the novice status during the process of acting out the new critical thinking teaching strategies.

Risk taking is a necessary characteristic for critical thinkers to possess. The guest status afforded to visiting teachers in the clinical area is a threat to educators' willingness to question underlying assumptions and challenge the status quo. Initiation of a formal mentorship program between educators and experts in specific clinical areas would diminish some of the barriers encountered due to the educators' guest status. A clearly outlined program where new teachers or experienced teachers in new clinical areas, practise alongside mentors, will not only help teachers learn the culture of the clinical setting but will also decrease the distance between the two settings. Although these measures are employed already on a limited basis, an extension of the program, especially in the practice realm, is recommended. Once this program is in place every effort should be made to keep the educator in the clinical area where credibility has been established.

In the midst of a climate of "downsizing" in Canada with incentives for the experienced members of the workforce to retire early and coupled with the fact that 39% of the collaborative baccalaureate teachers are over 50 years of age, new teachers' lack of critical thinking awareness may pose a significant problem. The experienced teachers

demonstrated greater awareness of the types of learning associated with expertise and a plan should be devised to access this knowledge base following their retirement. Perhaps, these experienced retirees can be encouraged to volunteer time to assist faculty in the development of computer programs and packages with current thinking concepts and strategies. These items would be used for educators, especially the new teachers, in the baccalaureate nursing programs.

New teachers' limited awareness of the current research in critical thinking must be addressed. This population is relied upon to bring fresh ideas and new perspectives to nursing schools. Every effort must be made to ease them into their new role while simultaneously facilitating their expertise in teaching critical thinking. As well, educators must explicitly teach important thinking concepts and processes as well as model thinking strategies.

Recommendations

The following recommendations are made to assist deans and directors in integrating new staff into collaborative baccalaureate nursing programs.

1. Initiate ongoing faculty development programs on teaching strategies and current critical thinking research.

2. Review baccalaureate and graduate nursing curricula paying particular attention for evidence of "consistent" use of teaching strategies which empower students.
3. Encourage recently retired nursing educators to assist in the development of computer programs for new teachers based upon current critical thinking research and facilitate other faculty development activities.
4. Given the differences observed between experienced teachers and new teachers, an ongoing "formal" mentorship programs should be developed between the experienced teachers and new teachers in order to facilitate critical thinking awareness of new faculty.
5. Given the expertise of many clinical nurses, a formal mentorship program with an extended practice component should be initiated between expert clinical practitioners and educators to help increase teacher credibility and limit "guest" status.
6. Replicate this study with a larger random sample of collaborative baccalaureate nurse educators in Western Canada to ascertain whether the findings are representative of more than educators in Manitoba.
7. Replicate the factor analysis of all the Likert type questions using a much larger sample.

These recommendations also can assist all educators to focus on the important elements in baccalaureate and graduate nursing programs.

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Appendix A
Critical Thinking Research

Studies Investigating Critical Thinking

Author	Problem	Design	Subjects	Instrument	Results
Brooks(1990)	To investigate the relationship between clinical decision making skills and critical thinking ability of nursing students.	Pre-test & post-test.	50 senior students from each, generic baccalaureate, associate, diploma & RN Baccalaureate completion programs.	Watson-Glaser Critical Thinking Appraisal	Improvement in C.T. over course of program. No difference among group.
Gross, Takazawa & Rose (1987)	To evaluate impact of nursing curriculum on students' ability to think critically	Pre-test & post-test	60 Articulated Science (AS) & 60 Bachelor of Science (BS) nursing students at U. of Hawaii	Watson - Glaser Critical Thinking Appraisal	Improvement in critical thinking over course of program but no difference between groups
Jones & Brown (1991)	To characterize C.T. as it was interpreted in nursing education programs	Descriptive design	Deans and directors of 50 schools of nursing in U.S., 470 mailed to each National League for Nursing(NLN) baccalaureate & higher degree program in U.S.	Survey designed by authors & submitted to institutional review press. Descriptive.	Those surveyed were unclear regarding operations and mechanisms of C.T.
Ketefian (1981)	Is there a relationship among critical thinking, educational preparation, and level of moral judgement?	Descriptive	79 practicing Associate Degree (AD) & baccalaureate nurses	Watson-Glaser Critical Thinking Appraisal & Rests Defining Issues Test	Baccalaureate nurses scored higher than AD nurses on critical thinking, moral judgement scores for baccalaureate significantly higher than AD
Kintgen-Andrews (1988)	To compare career ladder practical nursing (PN) & associate degree (AD) nursing students with university counterparts with regard to critical thinking over academic year.	Pre-test & post-test	55 PN, 55 AD, 38 pre-health science freshmen, & 29 generic baccalaureate sophomore nursing students	WGCTA & GPA	None of groups made significant gains in critical thinking over the academic year.

Meins(1991)	To study teacher preparation faculties in Arkansas to see if they understand C.T. research.	Descriptive research with survey instrument	140 instructors in teacher education programs in colleges and universities in Arkansas' 20 institutions.	Survey designed by autho	Found teachers unfamiliar with C.T. research.
Pardue (1987)	To determine differences in critical thinking ability and decision making skills among associate degree, hospital diploma, baccalaureate, & master prepared nurses	Descriptive	121 associate degree, diploma, baccalaureate, and MN	WGCTA & self-report measure of decision making	MN and baccalaureate nurses scored higher on critical thinking ability. No significant difference found among four groups re decision making skills
Scoloveno (1981)	To investigate nursing problem solving ability among baccalaureate, associate degree, and hospital based diploma nursing students		90 senior baccalaureate, 93 senior associate degree, 97 hospital based diploma nursing students	WGCTA	Baccalaureate scored significantly higher than associate degree or diploma students on WGCTA
Sullivan (1987)	To determine if critical thinking, creativity, and clinical performance improved during nursing program enrollment and if any significant relationship among the three abilities and academic performance at entry & exit of BSN program	Pre and post test first four weeks of first semester & last four weeks of final semester	51 RN's enrolled in BSc.N degree completion program, grads of either a diploma or an associate degree program & licensed to practise nursing in the state	WGCTA & Torrence Test of Creative Thinking (TTCT)	No change in critical thinking ability for students between entry and exit levels

Studies Investigating Learning Strategies

Author	Problem	Design	Subjects	Instrument	Results
O'Donnell, Dansereau, Hall, Rocklin(1987)	What effect do dyadic scripling manipulations have on cognitive, metacognitive, social/affective outcomes emerging from the performance on both an initial & a learning transfer task (i.e. an unscripted co-Operative learning task)	Quasi experimental scripted dyads & treatment= instructions or unscripted dyads , no treatment or worked alone.	93 introductory psychology students	The Delta Reading Vocabulary Test, The Private & Public Self-Consciousness Scales Subjective graphs.	Students who cooperated on an initial and transfer learning task recalled more than students who studied the first task individually.
O'Donnell, Dansereau, Hythecker, Hal i, Skaggs& Lambiotte, Young(1988)	What effect does cooperative learning strategy manipulation have on the ability to enact a medical procedure. (set up & initiate intravenous infusion.)	Expirmental groups. 1) 18 - no strategy, 2,3 or 4 cooperative dyads, 2) 26 were a prompting group only, 27 were a distributed-planning -with-prompting group who planned in sections & practised, 27 were a preplanning-with each section-prompting group who planned entire procedure prior to actual practice	98 psychology undergraduate students	Written recall test, test performance videotaped (Precoded)	Distributed planning combining the previously identified benefits of prompting and planning resulted in significantly better performance than preplanning, prompted-only performance, or individual self-guided practice.
Palincsar & Brown (1985)	What effect does question generating, summarizing, predicting, clarifying have on seventh grade students?	Teacher modelling	Seventh grade students	Reciprocol Training Program	Students independently used strategies. Reading gains generalized to other classrooms content.
Paris (1986)	What effect does 'cognitive coaching have on school children?	Teacher modelling mutual dialogues, direct explanation & encouragement	School children.	Mutual dialogues, direct explanation, modelling, encouragement.	Improved metacognition

Samiroden (1983)	Is there a relationship between higher cognitive level questions, wait time and student achievement?	Quasi experimental	34 classes of 11th graders, Science.	Teachers using extended wait time, 4-7 seconds & teachers using wait time of 1-4 seconds.	Classes receiving extended wait time treatment achieved at a significantly higher level than those receiving short wait time treatment.
Tobin (1986)	What is the effect of increased wait time on student formal reasoning ability, summative achievement & retention		20 classes from grade 6 to 7 Math & Language Arts.	Used class mean achievement scores as unit of analysis. Used wait time \geq 3-5 seconds vs $<$ 3 seconds.	Fewer lower level reactions & increased higher cognitive level concepts associated with probabilistic reasoning for classes receiving extended wait time.
Wink (1993)	Will nursing faculty who participate in a program designed to increase cognitive level of questions ask a higher percentage of cognitively high level questions in clinical conference when compared to faculty who did not attend such a program? Students of nursing faculty who participate in a program designed to increase the cognitive level of their questions ask a greater percentage of cognitively high-level questions during post	(1) 7 hr in-service on questioning, (2) audiotape feedback of post conference, (3) 1 hr seminar led by instructor for treatment group faculty.	10 faculty = treatment group, 8 faculty= control group.	Teacher Pupil Questioning Inventory (TPQI)	Faculty treatment group increase in percentage of cognitively high level questions but their students high level cognitive questions decreased. Evaluation type questions scarce overall.

Appendix B
Critical Thinking Definitions

CRITICAL THINKING DEFINITIONS

Critical thinking is the propensity to engage in "the appropriate use of reflective scepticism that is...linked with specific areas of expertise and knowledge (McPeck, 1981, p.19).

Critical thinking is a "disciplined, self-directed" search for truth using dialogue and reasoned judgement that is exercised within a contextual framework "appropriate to a particular domain of thinking" (Paul, 1989, p.214; Paul, 1987).

Critical thinking is the process of "reflecting on the assumptions underlying our and others' ideas and actions, and contemplating alternative ways of thinking and living". The importance of context in creating meaning as well as the development of reflective scepticism are necessary for critical thought (Brookfield, 1987, p. X ; Brookfield, 1987).

Critical thinking is "reasonable reflective thinking that is focused on deciding what to believe or do" (Ennis, 1987, p. 12). Ennis believes that his definition includes creative thinking which involves hypothesis generation, questioning, alternative ways of seeing a problem along with plans for investigating it. Ennis further itemizes several skills and dispositions involved in critical thinking (Ennis, 1987).

Critical thinking is "using basic thinking processes to analyze arguments and generate insights into particular meanings and interpretations; develop cohesive, logical reasoning patterns and understand assumptions..." (Presseisen, 1986, p. 11). Another vital component for critical thinking is metacognition (Presseisen, 1987).

The above theorists all have contributed extensively to critical thinking theory by developing concepts, arguments, and assumptions to support their definitions. Several other theorists are covered under the critical thinking section. The following is a definition of critical thinking developed by researcher from critical thinking theory.

Critical thinking is a mental process where disciplined, self-monitoring, self-directed, reflective scepticism and reasoned judgement are exercised within a contextual framework. The mental processes are used to analyse arguments, generate insights, search for assumptions, and make value judgements. An openminded disposition along with domain-specific knowledge are essential characteristics.

Appendix C
Critical Thinking Concepts

CRITICAL THINKING CONCEPTS

No standard model

Multidimensional concept

Abstract cognitive activity

Culturally-based

Reflective judgement

Dialectical thinking

Creating and testing meaning

Culturally and historically specific

Risk taking

Reflective scepticism

Imaginative speculation

Emotional

Search for objective truth

Tolerance for ambiguity

Self-monitoring

Jones and Brown (1991)

Appendix D
Critical Thinking Processes

CRITICAL THINKING PROCESSES

Logical reasoning processes
Deductive reasoning processes
Standardized reasoning processes
Inductive reasoning processes
Contextual appraisal
Creating and testing meaning
Challenging assumptions
Making value judgements
Decision-making process
Acknowledging diversity
Objectivity
Imaginative speculation
Distinction between facts and values
Application of rules of logic
Rational-linear process
Self-regulating process

Jones and Brown (1991)

Appendix E
Learning Typology (Bevis, 1989)

Learning Typology

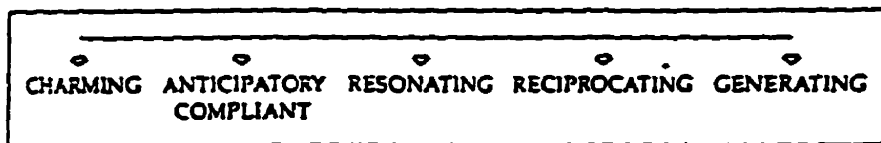
Item	Directive	Rationale	Contextual	Syntactical	Inquiry
Pieces of information	Rules	Underlying theory	Caring and concern	Grounded in practice	Creativity
Individual factors	Injunctions	Sequencing items and directives	Nursing culture, mores, and folkways	Wholes	Investigating
Lists	Do's and don'ts	Why's	Language-jargon	Broad relationships	Theorizing
Procedures	Expectations	Use of formal properties	Perceive world as a nurse	Setting aside rules generating personal rules and guides	Strategizing
Using tools and materials	Instructions	Relationship of skills and interventions to items and directions	Politics	Individualized care	Researching
Simple relationships between items	Directions	Applying research to practice	Power	Using personal guides	Idea generating
Task centered			Ethics	Acknowledging personal paradigm experiences	Visualizing
Mechanical			Work-role relationships	Consequential reasoning	Determining assumptions and implications
Descriptions			Esthetics	Insights	Scholarly feelings, standards, activities
			Philosophy (nursing)	Meanings	Questioning
			Professional activities	Interpretations	Intuitive leaps
			Professional identification	Significance	Analyzing
				Comparisons	Synthesizing
				Patterns	Criticism
				Using informal properties	
				Deeper structures of the field	
				Praxis	

Appendix F

Learning Maturity Continuum (Bevis, 1989)

Nursing Curriculum as Professional Education

Figure 3
Five Basic Positions on the Learner Maturity Continuum



LEARNER MATURITY CONTINUUM

Appendix G
Letters for Access

April 25, 1995

Dr. L. Oppenheimer
Director of Research
Health Sciences Centre
820 Sherbrook Street
Winnipeg, Manitoba

Dr. L. Oppenheimer:

I am a graduate student in a master of education program at the University of Manitoba. For my thesis, I intend a descriptive study of facultys' perceptions of thinking strategies being taught in collaborative baccalaureate nursing education programs in Manitoba. For data collection, I must gain access to the Health Sciences Centre faculty/instructors teaching in the collaborative baccalaureate nursing program so the questionnaire can be mailed to them. Enclosed find my application for such access.

The University of Manitoba, Faculty of Education Research and Ethics Committee, has approved the process of data collection.

Thank you for your cooperation in this venture.

Sincerely,

Joan Pawlikewich, RN, BScN
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7

May 29, 1995

Dr. Cynthia Cameron
Acting Dean
Faculty of Nursing
University of Manitoba
Winnipeg, Manitoba
R3T 2N2

Dear Cynthia:

I am a graduate student in a master of education program at the University of Manitoba. For my thesis, I intend a descriptive study of faculty's perceptions of thinking strategies being taught in collaborative baccalaureate nursing education programs in Manitoba. For data collection, I am formally requesting access to the University of Manitoba Nursing Faculty, Fort Garry Site, teaching in the collaborative baccalaureate nursing program so the questionnaire can be mailed to them.

Access to St. Boniface General Hospital Faculty has been approved and names received. Application for access to Health Sciences Centre Faculty is currently being reviewed. The University of Manitoba, Faculty of Education Research and Ethics Committee, has approved the process of data collection.

Thank you once again for your cooperation in this venture.

Sincerely,

Joan C. Pawlikewich, RN, BScN
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7
895 - 0776

May 12, 1995

Kaaren Neufeld
Director Nursing Education and Research
Nursing Education Building
431 Tache Avenue
Winnipeg, Manitoba
R2H 2A7

Dear Ms. Neufeld;

I am a graduate student in a master of education program at the University of Manitoba. For my thesis I intend a descriptive study of faculty's perceptions of thinking strategies being taught in collaborative baccalaureate nursing programs in Manitoba. For data collection, I must gain access to the St. Boniface nursing faculty involved in the collaborative baccalaureate nursing program so the questionnaire can be mailed to them. I would appreciate obtaining the names and addresses of nursing faculty members involved in the collaborative baccalaureate nursing program at the St. Boniface site.

The University of Manitoba, Faculty of Education Research and Ethics Committee, has approved the process of data collection. Application for access to St. Boniface General Hospital Faculty is currently being reviewed.

Thank you for your cooperation in this venture.

Sincerely,

Joan Pawlikewich, RN, BScN
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7
895 - 0776
e-mail umpawlik@CC.UManitoba.CA

Appendix H
Letters of Approval



620 SHERBROOK STREET
WINNIPEG, MANITOBA R3A 1R9
DIAL DIRECT (204) 787-4587
FAX (204) 787-4547

OFFICE OF THE DIRECTOR OF RESEARCH

June 15, 1995

Ms Joan Pawlikewich
9 Lipsett Crescent
Winnipeg, Manitoba R3R 2C7

Dear Ms Pawlikewich:

**RE: FACULTY AWARENESS OF CRITICAL THINKING RESEARCH WITHIN
COLLABORATIVE BACCALAUREATE NURSING PROGRAMS IN
MANITOBA.**

ETHICS #: U OF M FACULTY OF EDUCATION, APRIL 20, 1995

The above-named protocol, has been evaluated and approved by the H.S.C. Research Impact Committee.

If your study is receiving funds, please contact the H.S.C. Finance Department for an application for a Specific Purpose Account. It is imperative that you submit a copy of this letter along with your application to: Supervisor, Ancillary Services, Finance Division, so she is aware this has been approved by the H.S.C. Research Department.

**PLEASE NOTE: THIS SPECIFIC RESEARCH ACCOUNT NUMBER CAN ONLY BE
USED FOR THIS PARTICULAR STUDY.**

My sincere best wishes for much success in your study.

Sincerely,

A handwritten signature in black ink, appearing to read "Luis Oppenheimer".

Luis Oppenheimer, MD, FRCSC
Director of Research
Health Sciences Centre

cc: Ms G. Dutchuk, Finance
Department Head

LO/ks



**REQUEST FOR ACCESS TO STUDENTS/FACULTY IN THE FACULTY OF NURSING
FOR STUDENT PROJECTS**

- 1) Name: Jean C. Paulkovich
- 2) Address: 9 Lupatt Crescent Year in Program: 5th - part-time
Winnipeg, Mb Phone Number: 895-0776
R3K2C7
- 3) Review is requested to fulfil the following course requirements: Thesis for completion
of MEd.
- 4) Academic Program: Masters in Education
- 5) Faculty Advisor: Dr. Jamie-Lynn Magnusson
 Department: Faculty of Education
- 6) Title of Proposed Project: Faculty Awareness of Critical Thinking Research
Within Collaborative Baccalaureate Nursing Programs in Manitoba
- 7) Purpose of Proposed Project: To identify which concepts and strategies
collaborative baccalaureate faculty perceive are necessary
in their curricula for the development of critical thinking skills.
- 8) Anticipated Starting Date: Dep to survey by end of June, 1995. As soon as access allow
 Anticipated Date of Completion: May, 1996
- 9) Signature of Faculty Sponsor: Cynthia X. Cairns Date: June 16, 1995
Acting Dean
- I understand if the data from the project are employed beyond the purpose of fulfilling a class requirement, permission must be obtained from the participants.
- 10) Signature of Student: J. Paulkovich Date: June 13, 1995
- 11) Faculty Approval Faculty of Education Date: April 20, 1995
Ethics Approval. Copy on file

ATTACH A COPY OF THE OUTLINE OF THE PROJECT.



Hôpital général **St-Boniface** General Hospital

May 16, 1995

Joan C. Pawlikewich
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7

**Re: Access to SBGH for Study Entitled:
A DESCRIPTIVE STUDY OF FACULTY AWARENESS OF CRITICAL THINKING
RESEARCH WITHIN COLLABORATIVE BACCALAUREATE NURSING
PROGRAMS IN MANITOBA**

Dear Joan Pawlikewich:

I am pleased to inform you that your research access request has been approved. You may proceed with your study on the understanding that:

- 1) any significant changes in your proposal will be submitted to Dr. Diana Clarke, Program Development and Evaluation Specialist in the Nursing Research Office;
- 2) you inform us when your data collection is complete. This information helps us coordinate research access requests and minimize competing demands of research study protocols on patients and nursing staff time.

Below is a list of the Faculty from St. Boniface General Hospital currently teaching in the University of Manitoba, Faculty of Nursing, Four-Year Undergraduate Program:

Vicki Holmes	Noelie Lavergne	Rosalie Mazur
Pat McCormack-Speak	Pat McMullan	Liz Sokoloski
Sally Thomas	Jeanette van der Vis	Gale Hume

Upon completion of your study, we request that you provide us with a brief summary of your final report.

Thank you for selecting St. Boniface as the site for recruiting participants for your study. Please feel free to contact me with your questions or concerns. Should you encounter any site-related difficulties during the course of your study, I would appreciate being notified of these.

All the best with the completion of your study.

Sincerely,

Kaaren Neufeld, R.N., M.N.
Director of Nursing Education and Research
Tel. (204)237-2736

KN/mj
7\Access\Letters\Pawlikewich.m95

Appendix I

**Letters to Coordinators of Collaborative Baccalaureate
Nursing Program**

May 29, 1995

Dr. Sheila Dresen
Program Director
University of Manitoba, Health Sciences Centre School of
Nursing
700 McDermot Avenue
Winnipeg, Manitoba
R3E 0T2

Dear Dr. Dresen:

I am a graduate student in a master of education program at the University of Manitoba. For my thesis, I intend a descriptive study of faculty's perceptions of thinking strategies being taught in collaborative baccalaureate nursing education programs in Manitoba. In anticipation of access to the Health Sciences Centre, I would appreciate obtaining a list of names and addresses of nursing faculty members involved in the collaborative baccalaureate nursing program at the Health Sciences Centre site.

Application for access to the Health Sciences Centre is currently being reviewed. The University of Manitoba, Faculty of Education Research and Ethics Committee has approved the process of data collection.

Thank you for your cooperation in this venture.

Sincerely,

Joan C. Pawlikewich, RN, BScN
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7

March 20, 1995

Ina Bramadat
Coordinator, Collaborative Baccalaureate Nursing Program
Faculty of Nursing
University of Manitoba
Winnipeg, Manitoba
R3T 2N2

Dear Ms. Bramadat;

I am a graduate student in a master of education program at the University of Manitoba. For my thesis, I intend a descriptive study of facultys' perceptions of critical thinking strategies being taught in collaborative baccalaureate nursing education programs in Manitoba. For data collection, the names of faculty/instructors teaching in the collaborative baccalaureate nursing program are necessary so the questionnaire can be mailed to them. I would appreciate obtaining a list of the instructors involved in collaborative baccalaureate nursing programs.

The survey questions have been approved by the University of Manitoba Faculty of Education Ethics Review Committee.

Thank you for your cooperation in this venture.

Sincerely,

Joan Pawlikewich, RN, BScN
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7

Appendix J
Survey Questionnaire

QUESTIONNAIRE

The purpose of this questionnaire is to survey faculty's perceptions of students' learning in collaborative baccalaureate nursing programs. Instructor, or teacher refer to any faculty member teaching in the collaborative baccalaureate nursing programs regardless of their position. Thank you for taking the time to contribute to this research.

1. List as many characteristics of an expert critical thinker as you can (e.g., open - minded).

2. List as many processes as you can that you believe represent expert critical thinking (e.g., analysis).

The following are statements about nursing education. Please indicate, by circling a number, on the 7-point scale the degree to which you endorse each statement (1= strongly disagree, 7= strongly agree). There are no right or wrong answers but variations of each theme.

3. Nursing students who consistently are exposed to various thinking strategies will adapt those cognitive strategies to their practice.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. Increased emphasis on psychomotor skill training in nursing educational programs is necessary to meet nursing needs of the twenty - first century.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

5. The practice of writing as a thinking strategy is important for student nurse education.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

6. Cooperative learning strategies (where students work together to complete tasks, explain their thinking to others and evaluate each other) should be used more often as a learning activity in nursing education.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please indicate, by circling a number, on the 7-point scale the degree to which you endorse each statement (1= strongly disagree, 7= strongly agree). There are no right or wrong answers but variations of each theme.

7. Role playing should be used more often as a learning activity in nursing education.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

8. An emphasis on theory in nursing education hinders the development of technical skills.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

9. Expert and novice problem solvers differ in that experts spend more time than novices analyzing the problem and planning their attack.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

10. Student nurses should be taught to plan, monitor, and evaluate their own thinking activities.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please indicate , by circling a number, on the 7-point scale the degree to which you endorse each statement (1= strongly disagree, 7= strongly agree). There are no right or wrong answers but variations of each theme.

11. Student nurses should be encouraged to use peer groups to teach each other thinking processes.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

12. Techniques like journalling should be used by students to enrich reflective thinking of clinical experiences.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

13. Teachers can promote active problem solving by giving students specific strategies to use.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

14. Memorizing procedures should take precedence over theoretical knowledge in the clinical setting.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

15. Students should be encouraged to engage daily in dialogue with staff concerning patient care.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please indicate, by circling a number, on the 7-point scale the degree to which you endorse each statement (1= strongly disagree, 7= strongly agree). There are no right or wrong answers but variations on each theme.

16. The nursing process model limits a student's ability to discover knowledge embedded in clinical practice.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

17. Students should be encouraged to suggest revisions to nursing procedures.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

18. Students, in clinical postconferences, should be encouraged to generate alternatives to each days nursing interventions.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

19. Nursing instructors should impress upon students the importance of following sequential procedural steps when carrying out psychomotor skills.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please indicate, by circling a number, on the 7-point scale the degree to which you endorse each statement (1= strongly disagree, 7= strongly agree). There are no right or wrong answers but variations on each theme.

20. Nursing instructors should encourage students to analyze nursing procedures prior to application.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

21. Students should be encouraged to question policies and procedures.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

22. The most important step of the Nursing Process for students in the clinical area is implementation of nursing care.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

23. Students should be encouraged to develop their own meaningful ways of knowing and thinking.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

24. Students, during their clinical practice, should be encouraged to follow the standard nursing care plan exactly as noted on each patient's chart or kardex.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please indicate, by circling a number, on the 7-point scale the degree to which you endorse each statement (1= strongly disagree, 7= strongly agree). There are no right or wrong answers but variations on each theme.

25. Nursing instructors should impress upon students the importance of listening to and reflecting upon staff nurses' professional experiences.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

26. Critical thinking is an innate skill.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

27. Thinking strategies should be included in all areas of teaching.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

28. An emphasis on thinking skills is as important as an emphasis on subject matter.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

29. Teaching strategies are equally as important as content delivery.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

For the following THIRTEEN questions select the response that best describes you. Place an X on the line in front of that response.

30. WHAT IS YOUR MAIN PROFESSIONAL ROLE?

- Full time educator
 Permanent part time educator
 Educator in full time term position
 Educator in part time term position
 Administrator in nursing education program
 Other (Please Specify) _____

31. WHAT IS YOUR BASIC EDUCATIONAL BACKGROUND?

- Diploma in nursing
 Baccalaureate in nursing
 Other (Please specify) _____

32. WHAT IS YOUR POSTBASIC NURSING EDUCATION?

- Postbasic certificate/diploma
 Postbasic baccalaureate
 Masters degree
 Doctorate degree
 None
 Other (Please specify) _____

33. DO YOU HAVE POSTBASIC EDUCATION OTHER THAN NURSING?

- Certificate/diploma
 Baccalaureate
 Masters degree
 Doctorate degree
 None

34. ARE YOU CURRENTLY ENROLLED IN AN EDUCATIONAL PROGRAM?

- Enrolled in a nursing program
 Enroled in a non - nursing program
 None

35. FROM WHAT TYPE OF PROGRAM WILL YOU GRADUATE?

- Certificate\diploma
 Baccalaureate
 Masters
 Doctorate
 Not applicable

For the following questions select the response that best describes you. Place an X on the line in front of that response.

36. WHAT TOTAL NUMBER OF YEARS TEACHING IN BACCALAUREATE NURSING EDUCATION DO YOU HAVE?

- 0-1
- 2-4
- 5-10
- 11-15
- >15

37. WHAT TOTAL NUMBER OF YEARS TEACHING IN DIPLOMA NURSING EDUCATION DO YOU HAVE?

- 0-1
- 2-4
- 5-10
- 11-15
- >15

38. WHAT TOTAL NUMBER OF YEARS TEACHING IN BACCALAUREATE NURSING EDUCATION DID YOU HAVE BEFORE TEACHING IN THE COLLABORATIVE BACCALAUREATE PROGRAM?

- 0-1
- 2-4
- 5-10
- 11-15
- >15

39. WHAT TOTAL NUMBER OF YEARS TEACHING IN DIPLOMA NURSING EDUCATION DID YOU HAVE BEFORE TEACHING IN THE COLLABORATIVE BACCALAUREATE PROGRAM?

- 0-1
- 2-4
- 5-10
- 11-15
- >15

40. WHAT TOTAL NUMBER OF YEARS PRACTISING NURSING, EXCLUSIVE OF TEACHING, DO YOU HAVE?

- 0-1
- 2-4
- 5-10
- 11-15
- > 15

For the following questions select the response that best describes you. Place an X on the line in front of that response.

41. AGE

- 20-30
- 31-40
- 41-50
- 51-60
- > 60

42. SEX

- Male
- Female

Please answer the following questions by marking an X on the line(s) in front of the appropriate response(s).

43. How did you receive your preparation to teach students high level thinking skills?

- Workshops/conferences
- Self-taught
- Independent Course in thinking skills
- Thinking skills incorporated into subject matter of all university courses

44 Is your salary while teaching in a collaborative baccalaureate nursing program paid by:

- a university
- a hospital

Appendix K
Letter to Each Participant

August 7, 1995

Dear Nurse Educator:

I am a student in a Masters Degree in Education program at the University of Manitoba, Winnipeg, Manitoba. As a part of the requirements for my Masters Degree I am conducting a survey of instructors in collaborative baccalaureate nursing programs. The purpose of this study is to survey facultys' perceptions of students' learning in collaborative baccalaureate nursing programs. The data gathered will be important for curriculum developers of new and current collaborative nursing programs. Thus, your expertise is essential to this study.

The questionnaire will take about thirty minutes of your time. Please return this questionnaire within one week in the stamped self-addressed envelope provided. The University of Manitoba, Faculty of Education Research and Ethics Committee, has approved the process of data collection.

Please be assured that personal information will be kept confidential. The results will be reported as an aggregate of collected data. You have the right to withdraw from this study at any time. Once data is compiled, if it is your wish, you may obtain a summary of the results of the study by writing to the address below. As well, a summary of the results will be given to the involved faculties. If you have any questions before, during, or following data collection, call me at 895 -0776.

Thank you for your cooperation.

Sincerely,

Joan C. Pawlikewich, RN, BScN
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7

Dr. Jamie-Lynn Magnusson
Thesis Advisor
Faculty of Education
University of Manitoba
474 - 9235

Appendix L
Follow-up Letter to Participants

August 28, 1995

Dear Nurse Educator;

This letter is a follow-up to the letter and questionnaire of August 7, 1995. Since your response is very important for research on my thesis, I would appreciate it if you would take about thirty minutes to fill it out and return it.

If you have recently mailed the survey, please disregard this correspondence. Thank you for the consideration you have given my request.

Sincerely,

Joan Pawlikewich, RN, BScN
9 Lipsett Crescent
Winnipeg, Manitoba
R3R 2C7
895 - 0776

Appendix M

Ethics Approval - University of Manitoba



Faculty of Education ETHICS APPROVAL FORM

To be completed by the applicant:

Title of Study:

Faculty Awareness of Critical Thinking Research Within

Collaborative Baccalaureate Nursing Programs in Manitoba


Name of Principal Investigator(s) (please print):

JOAN C. PAWLKEWICH


Name of Thesis/Dissertation Advisor or Course Instructor (if Principal Investigator is a student) (please print):

Dr. TAMIE-LYNN MAGNUSSON

I/We, the undersigned, agree to abide by the University of Manitoba's ethical standards and guidelines for research involving human subjects, and agree to carry out the study named above as described in the Ethics Review Application.



Signature(s) of Principal Investigator(s)




Signature of Thesis/Dissertation Advisor or Course Instructor
(if required)

To be completed by the Research and Ethics Committee:

This is to certify that the Faculty of Education Research and Ethics Committee has reviewed the proposed study named above and has concluded that it conforms with the University of Manitoba's ethical standards and guidelines for research involving human subjects:

Name of Research and Ethics Committee Chairperson

Date



Signature of Research and Ethics Committee Chairperson