



Learning strategies utilized by Montana nursing students
by Suzanne Frank Lockwood

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:

An emphasis from accreditation agencies on the critical thinking skills of nurses has resulted in a curricular shift to include critical thinking in nursing education.

Therefore, the purpose of this study was to describe the learning strategies used by Montana registered nursing students. Data were collected from 192 participants using (a) the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS), (b) a demographic survey questionnaire, and (c) follow-up cluster focus groups. Learning strategies included metacognition, metamotivation, memory, critical thinking, and resource management. Quantitative analysis techniques included descriptive statistics, univariate procedures of t-test and analysis of variance, and multivariate procedures of discriminant and cluster analyses. Qualitative data were collected from focus group interviews of learners identified in the quantitative data analysis.

The learning strategy profile of the nursing students indicated that they primarily use the areas of metacognition and memory learning strategies. Nursing students use different learning strategies in their personal life versus nursing situations. Other findings revealed that identifying learning strategies was not useful in discriminating between the different types of nursing programs or the different programs located at diverse campus settings in Montana.

Conclusions included that there are four distinct groups of learners in the registered nursing students without regard to program type, campus location, or demographic variables. Groups of nursing students learn in similar ways. While one group utilizes critical thinking skills, most are not using critical thinking learning strategies to any appreciable extent in their educational programs. There are specific teaching strategies useful for each of the learner groups. Nursing faculty's sharing of their vision of nursing and actual patient experiences are important aspects of Montana nursing students' learning.

Recommendations included that an adult learning strategies course be offered for registered nursing students and that information regarding learning strategies be made available to Montana nursing faculty. The SKILLS instrument may be useful in future studies of critical thinking skills of nursing students. If a specific learner group is investigated, the SKILLS instrument should be modified for that group. Furthermore, focus group interviews should be well planned and included in learning strategies studies which use cluster analysis.

LEARNING STRATEGIES UTILIZED BY
MONTANA NURSING STUDENTS

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APPROVAL

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This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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Date April 1, 1997

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ABSTRACT

An emphasis from accreditation agencies on the critical thinking skills of nurses has resulted in a curricular shift to include critical thinking in nursing education. Therefore, the purpose of this study was to describe the learning strategies used by Montana registered nursing students. Data were collected from 192 participants using (a) the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS), (b) a demographic survey questionnaire, and (c) follow-up cluster focus groups. Learning strategies included metacognition, metamotivation, memory, critical thinking, and resource management. Quantitative analysis techniques included descriptive statistics, univariate procedures of t-test and analysis of variance, and multivariate procedures of discriminant and cluster analyses. Qualitative data were collected from focus group interviews of learners identified in the quantitative data analysis.

The learning strategy profile of the nursing students indicated that they primarily use the areas of metacognition and memory learning strategies. Nursing students use different learning strategies in their personal life versus nursing situations. Other findings revealed that identifying learning strategies was not useful in discriminating between the different types of nursing programs or the different programs located at diverse campus settings in Montana.

Conclusions included that there are four distinct groups of learners in the registered nursing students without regard to program type, campus location, or demographic variables. Groups of nursing students learn in similar ways. While one group utilizes critical thinking skills, most are not using critical thinking learning strategies to any appreciable extent in their educational programs. There are specific teaching strategies useful for each of the learner groups. Nursing faculty's sharing of their vision of nursing and actual patient experiences are important aspects of Montana nursing students' learning.

Recommendations included that an adult learning strategies course be offered for registered nursing students and that information regarding learning strategies be made available to Montana nursing faculty. The SKILLS instrument may be useful in future studies of critical thinking skills of nursing students. If a specific learner group is investigated, the SKILLS instrument should be modified for that group. Furthermore, focus group interviews should be well planned and included in learning strategies studies which use cluster analysis.

CHAPTER 1

INTRODUCTION

Nursing

Nursing education in the United States has its roots in the outbreak of the Civil War in 1861. Just as the Crimean War spotlighted the activities of Florence Nightingale and the importance of nursing in Europe, the Civil War was an impetus for the development of training programs for nursing in the United States. Responding to the nursing needs created by the war, women volunteered to help, and after a brief training course, they performed nursing duties. In 1861, Dorthea Dix was appointed by the Secretary of War to supervise these new "nurses."

In fact, these women who numbered in the thousands were untrained volunteers. The nursing role of these unsophisticated women brought to the attention of the American public not only the need for nurses but also the desirability of some organized programs of training. The New England Hospital for Women and Children began in 1872 what was considered to be the first graded course in scientific nursing. Within the next year three more schools of nursing were established in the United States

based on the Nightingale model (Kelly, 1992, p. 27). Several major nursing training schools like Bellevue in New York and The Boston Training School endured into the next century. Their success resulted in a massive proliferation of nursing training schools. "In 1880, there were 15; by 1900, 432; by 1909, 1,105, which resulted in hundreds and even thousands of applicants a year" (p. 27) to the more famous hospital schools.

Initially this nursing education was largely an apprenticeship that resulted in students providing much of the work force for the hospitals. Although some formal theory classes were conducted, learning was achieved primarily by "doing." There was no standardization of curriculum or accreditation. The nursing programs were developed to meet the service needs of the hospital rather than the educational needs of the students. Programs varied widely from hospital to hospital. The diploma or hospital nursing programs persisted until the middle of the 1960s when there was a significant decline in enrollments (Kalish & Kalish, 1995, p. 131). This decline was due to a number of factors including the push to have nursing education moved into institutions of higher learning and public reaction to a number of reports that were published around this same time. Elimination of hospital-based nursing programs is particularly true in the western part of the United States (Ellis & Hartley, 1995, p. 58; Kalish

& Kalish, 1995). There are no diploma or hospital-based schools of nursing in Montana, and only one or two remain in the other western states.

Nursing Education

In American society, education has been a key factor for opening doors to power, prestige, and economic security. Early nursing students were all women who in some cases saw nursing as a means out of servitude. In the 1950s and 1960s, there were a number of government studies that scrutinized nursing education. The Brown Report recommended that nursing move away from apprenticeship and into a planned program of education similar to that of other professions. It further recommended that the nursing programs be routinely reviewed for consistency (Brown, 1948). Along with this push for the improvement in nursing education, licensing authorities pressured for a uniform licensing examination for all nurses. By 1951, all licensing jurisdictions adopted a standard passing score throughout the country. The establishment of the State Boards of Nursing grew out of this development (Ellis & Hartley, 1995, p. 87). This same pattern was happening in the Canadian provinces. The State Boards of Nursing today supervise uniform licensing of nurses in their respective states. By 1952, the National League for Nursing (NLN) had a temporary accreditation program in place and was helping

schools of nursing find ways to improve their programs of instruction. "Designated by the United States Department of Education as the accrediting body for all nursing programs, the NLN currently accredits more than 1500 educational programs" of nursing (Ellis & Hartley, 1995, p. 461). Many nursing graduate schools will not admit a nurse who graduated from a non-accredited undergraduate nursing program.

Unlike many other professions that provide a single route of educational preparation, the development of nursing in the United States has resulted in three major educational routes that prepare graduates to write the National Council Licensure Examination for registered nursing. This has resulted in various alternatives and opportunities for a prospective student, but it also has resulted in much confusion. These three avenues continue to be the three-year hospital-based diploma programs, the four-year baccalaureate programs, and the two-year associate degree programs. This diversity presents a real challenge to the educator teaching in a nursing program who is charged with providing a "safe" nursing practitioner. There may not be clear direction to the educator as to how the professional preparation is provided given the differences in purpose, structure, and outcomes that these three different educational programs may follow.

Nursing education suffers from the same economic cutbacks being experienced in all of higher education. Additionally, the changes in health care at large have placed tremendous demands on faculty in nursing programs to provide for quality clinical/patient experiences. The advent of declining in-hospital patient numbers has meant far fewer actual clinical/patient experiences for today's nursing student. "There were 55 million fewer inpatient days in the U.S. hospitals in 1994 than there were just a decade ago" (Aiken, 1995, p. 201). Faculty have had to use alternative means to provide for simulated patient experiences like computer or laser disk simulations to extend the clinical/patient experiences for students. Reduced clinical hours has also had an impact on the amount of time a current nursing student has in actual patient care. This decreases substantially the real-life experiences a nursing student may experience while in the basic educational preparation for nursing clinical practice. Given the rapidly changing technological health care environment, texts and procedures are often outdated within five years of publication. "It is commonly accepted that the half life of knowledge today is about five years, and less in the sciences" (Kelly & Joel, 1996, p. 218). Thus, the use of the same teaching strategies used in the past may not prepare a student for the changing health care arena that the newly graduated nurse will face.

The typical nursing student of today has also changed dramatically. No longer is this an 18-year-old, white female. Now 4% are men, all minorities are represented, and most could be classified as the non-traditional student (Kelly & Joel, 1996, p. 179). Today's typical nursing student is in his/her late 20s in an associate degree program and in his/her mid 20s in a baccalaureate program, is an individual in the midst of changing careers, has children, and is often returning to college after a long absence from a structured learning environment (McCloskey & Grace, 1994, p. 165). The student may not have the best of study skills and often reports high levels of "stress" at being in the nursing program (Brubaker, 1990; Kelly & Joel, 1996; Manderino, Ganong, & Darnell, 1988). Nursing students fit closely the characteristics of adult learners as described by Smith (1982). Adult learners have multiple social roles and responsibilities, have accumulated many experiences, are undergoing various stages of development related to stable and unstable periods, and face educational challenges with anxiety and ambivalence (McCloskey & Grace, 1994, pp. 38-45).

Estimates of retention of nursing students show that nationally the average attrition rate of all nursing students is 15%, and the attrition rate of minority students can be as high as 85% (Courage & Godbey, 1992, p. 36). Additionally, nursing educators must be aware not

only of attrition rates but also of the fact that the nation still faces a nursing shortage that is predicted to extend into the 21st century (Aiken, 1995; Moccia, 1990a; Rimmer, 1990). This shortage in the "mix of nurses by educational background" is not sufficient to meet present and future nursing health care challenges (Aiken, 1995, p. 210).

Nursing is one of the few disciplines experiencing an increase in enrollment. Nursing education has seen a 10% increase in enrollments between 1988-1990, which surpasses the national college increase of 3-4% during this same time frame (McCloskey & Grace, 1994, p. 158). Unfortunately, the vast increase has been in associate degree programs. In 1992, 30% of registered nurses in the U.S. had a baccalaureate degree, 28% had an associate degree, and 38% had a diploma degree in nursing (Moses, 1994, p. 7). This is in spite of growing data that supports a need for a baccalaureate degree in nursing as the minimum preparation for professional nursing practice. Aiken (1995) believes that the future shortage of registered nurses will be at the baccalaureate and higher degree educational levels (p. 202).

Since the publication of the American Nurses Association's Position Paper on Educational Preparation for nurses in 1965, which even then took the stand that the minimum level of education for professional nursing

practice be the baccalaureate degree, little progress has been made toward that goal (Ellis & Hartley, 1995). Sparse research has been focused on the differing length and foci of educational programs in terms of critical-thinking ability and decision-making characteristics of student nurses. To function effectively in today's complex health care system, nurses need both a broad knowledge base and mastery of intervention skills in order to be able to deliver high quality, fiscally-responsible patient care.

The key component of nursing practice, regardless of practice site, is the nurse's ability to process information and to make decisions (Pardue, 1987, p. 354). The thrust of most educational programs for nurses is to enhance students' cognitive abilities and clinical decision-making skills. A study by Pardue (1987) sought to identify the differences in decision-making skills and critical-thinking abilities among associate degree, diploma, baccalaureate degree, and master's degree prepared nurses. Overall, she found that baccalaureate and master's degree prepared nurses used critical thinking more than the associate degree or diploma prepared nurses. However, because the study's design was limited by a newly developed instrument, these results are not generalizable and may be related to other factors.

In exploring a literature review of nursing education's impact on students' ability to problem solve,

think critically, and make decisions, Kintgen-Andrews (1991) found five longitudinal and two cross-sectional nursing education studies. Three of the five longitudinal studies found no significant gains in critical thinking over the periods of their studies. The remaining two seemed to support the impact of nursing education upon critical thinking, but these findings may well be due to the selectivity of the students included. The cross-sectional studies failed to give support to the impact of nursing education on the critical thinking skills of nursing students (pp. 152-154).

Adult Education

Nursing education is one specific type of teaching and learning that falls into the category of adult education. The focus of how adults learn has shifted from teaching to adult learning (Fellenz & Conti, 1989; Kidd, 1976). Leaders in this field such as Knowles (1975) postulate the concept of andragogy which is the "educational mode in which the teacher is viewed as a facilitator of learning, students are perceived as self-directed, and the climate for learning is informal and collaborative" (pp. 5-6). A major part of the definition of andragogy stresses the growth of self-direction in learning and the use of experiences of the learner in the educational process (Davenport, 1987; Knowles, 1975). The similarity between

concepts of andragogy and the struggle to teach nursing clinical decision making and critical thinking which include patterns of knowing lends credence to the notion that nursing programs are adult education programs (Jenks, 1993).

Given that the technological changes are so rapid in the health care arena, it behooves nursing educators to explore new ways to promote lifelong learning. "Nurses are required to synthesize and integrate multiple forms of knowledge to make health-affirming decisions that embody changing values" (Kramer, 1993, p. 406). Paralleling the renewed interest in critical thinking skills within general education, critical thinking has received widespread attention in nursing. It is now also one of the National League for Nursing's (1991a) agreed upon mandatory criteria for baccalaureate nursing program accreditation. Students need to learn how to learn because "it is no longer realistic to define the purpose of education as transmitting what is known. In a world in which the half-life of many facts may be ten years or less, half of what a person has acquired at the age of twenty may be obsolete by the time that person is thirty" (Knowles, 1975, p. 15). Students may well need to be equipped with skills which they can use to direct their own learning.

Nursing students may use a variety of learning strategies in order to acquire the skills necessary to be

successful in the discipline of nursing. Specifically, those skills are primarily the nurse's ability to process information and to make decisions (Pardue, 1987, p. 354). Nursing tasks are performed in real-life situations. Many adult learning tasks are performed with the intent of solving problems in real-life situations. "Such learning usually involves problem solving, reflection on experience, or planning for one of the numerous tasks or challenges of adult life" (Fellenz & Conti, 1993, pp. 1-2). Learning strategies are the techniques or specialized skills that a learner has developed to use in both formal and informal learning situations (McKeachie, 1988a). Learning strategies are the strategies used to solve real-life problems (Conti & Fellenz, 1992). Real-life problems and challenges are what face a practicing nurse every day.

Learning Strategies

The Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS) instrument was developed to measure adult learning strategies in real-life situations (Conti & Fellenz, 1992). "SKILLS is based upon five aspects of learning which are essential to the learning process and that have the potential for improvement through the refinement of learning strategies. These are the constructs of metacognition, metamotivation, memory, critical thinking, and resource management" (p. 65). These

five constructs each contain three associated learning strategies. Metacognition is composed of the strategies of planning, monitoring, and adjusting; metamotivation is composed of the strategies of attention, reward/enjoyment, and confidence; memory is composed of the strategies of organization, using external aids, and memory application; critical thinking is composed of the strategies of testing assumptions, generating alternatives, and conditional acceptance; and resource management is composed of the strategies of identification of resources, critical use of resources, and using human resources.

While the National League for Nursing is now requiring nursing educational programs to demonstrate that critical thinking is a mandatory outcome of baccalaureate nursing programs, there have been no investigations that examine how nursing students learn. The learning strategies identified in SKILLS are ones that nursing students must use, but which ones do they use the most? Are there differences between the associate degree students versus the baccalaureate students? For example, do student nurses use critical thinking more as a learning strategy than memory?

Statement of the Problem

In the United States today there are three distinct higher educational programs for students in the discipline of nursing that qualify an individual to sit for the national licensure exam of which the successful passage provides for a license as a registered nurse. The three programs are the three-year hospital-based diploma program, the two-year associate degree program, and the four-year baccalaureate degree program. In the state of Montana, there are no remaining diploma/hospital based programs, but there are five institutions of higher learning that offer an associate degree or baccalaureate degree in nursing.

The literature sheds little insight into the learning strategies that nursing students use in their learning. Nursing students today are non-traditional adult learners. An emphasis on and questions from the accreditation agencies on the critical thinking skills of nurses has resulted in a lip service shift of curricular focus in nursing programs to include "critical thinking" even during the first year of nursing study in both associate and baccalaureate degree programs.

While there are no studies on learning styles or learning strategies of nursing students, Kintgen-Andrews (1991) summarized the somewhat perplexing literature on critical thinking and clinical judgment. Her review

outlined that nursing education apparently has little impact on the development of critical thinking skills but does improve skill in clinical judgment of nurses. Additionally, she points out that there is no relationship between measures of critical thinking and clinical judgment. This same conclusion was reached in a very recent longitudinal study by Maynard (1996) who reported that there was no change in critical thinking scores of nursing students over their three-year course of nursing study. This study utilized the Watson-Glaser Critical Thinking Appraisal as the instrument to measure critical thinking in nursing students. An inherent problem with this instrument is that its definition of critical thinking does not include the concept of reflection which is a concept included in many other definitions of critical thinking (Brookfield, 1987; Conti & Fellenz, 1993; Ennis, 1985). This consistent finding of no relationship between critical thinking and nursing education may suggest some conceptual problems in the long-standing assumption by nursing educators that critical thinking can be operationalized as clinical judgment or that the concept of reflection is more important than previously thought. It further suggests that the nursing discipline needs to examine how students learn in order to further delineate the processes of critical thinking and clinical judgment.

Nursing curricula have long utilized the behavioral approach with numerous objectives that students are supposed to meet in every single topic. This behavioral approach has been questioned by Em Bevis, a noted authority on the behavioral model who now has become an outspoken advocate of more emancipatory models of nursing education (Tanner, 1993). This change in focus is similar to tenets of adult education especially those advocated by Malcolm Knowles (1975). There may be several learning strategies that students use in combination that allows this transition. Benner (1983) and Tanner, Padrick, Westfall, and Putzier (1987) have studied decisions made by practicing nurses since the mid-'70s but have not examined student nurses' decision making. It is in this academic climate that learning in the discipline of nursing must take place. Given the reduced clinical hours, use of technology to supplement decreased availability of actual patient experiences, heavy course loads, and an emphasis on critical thinking, what learning strategies do student nurses use to learn? Many unanswered questions exist related to the learning patterns for nursing students. For example, if nursing students learn best by real-life experiences, then by cutting clinical experiences are faculty contributing to a decline in better cognitive abilities, i.e., critical thinking and problem solving skills? Which learning strategies do nursing students use

the most? Are there differences in the learning strategies used by associate degree students as compared to baccalaureate students?

Purpose of the Study

The purpose of this study was to describe the learning strategies used by Montana nursing students. This was done by three means. First, a profile of their learning strategies was identified. Second, it investigated if individual learning strategies and selected demographic, educational, and cultural factors can discriminate between various achievement or academic levels of nursing students in the six nursing programs in five institutions of higher learning of Montana. Relationships between the grade point average of students at a college in Montana, their nursing program, and their learning strategies as measured by the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) were examined. The demographic and educational factors included age, gender, cultural orientation, years of education completed, college class, nursing class, and type of nursing program. Third, cluster analysis was used to determine groups of learners from whom focus groups were formed. Follow-up focus group interviews were utilized to further describe these learners.

Research Questions

This study provided a profile of learning strategies used by Montana nursing students, investigated the relationship between learning strategies used in both personal and nursing professional situations by adult nursing students in the six nursing educational programs in the state of Montana, and uncovered groups of learners in the nursing programs. Four research questions were addressed in the study:

1. Using a modified version of SKILLS, what is the learning strategies profile of Montana nursing students?

2. Using a modified version of SKILLS, is it possible to determine if nursing students use different learning strategies when confronted with a personal-life versus a nursing learning situation?

3. Using a modified version of SKILLS, is it possible to discriminate between groups of associate and/or baccalaureate degree nursing students which are organized by:

- a. Personal life and nursing situations;
- b. Academic achievement as measured by GPA;
- c. Demographics such as age, gender, and nationally;
- d. Educational level in college; or
- e. Associate versus baccalaureate program.

4. Is it possible to identify and describe if distinct clusters or learning groups exist among students in the six nursing programs in Montana based on SKILLS scores of learning strategies used in personal life and nursing situations?

Significance of the Study

The discovery of information that provides insight into which learning strategies are associated with effective learning has great importance for nursing education. This information can be used to develop curricula that maximize the strengths of the student. It can provide validation and/or direction in terms of strategies for teaching critical thinking skills. It may even shed some light on the appropriateness of the current emphasis on critical thinking in the different levels of nursing education. It may provide direction for change in the nursing program which could take the form of a metacurriculum as suggested by Smith (1982). This information may well provide an impetus for the design and development of workshops for nursing faculty around the state which would provide them with information on learning strategies and on the specific learning strategies that nursing students use. Sharing this information with the learners can empower them and lead to improved lifelong learning. Thus, "to encourage lifelong learning and

lifelong self-directed learning we must assist people who want to break their ties with formal education and develop their own strategies for learning" (Apps, 1981, p. 246).

Definition of Terms

Adult education: The "educational mode in which the teacher is viewed as a facilitator of learning, students are perceived as self-directed, and the climate for learning is informal and collaborative" (Knowles, 1975, pp. 5-6).

Critical thinking: A reasonable, reflective thinking focused on deciding what to believe or do. It includes identifying and challenging assumptions, challenging the importance of context, imagining and exploring alternatives, and reflective skepticism (Brookfield, 1987, p. 12).

Learning strategies: The techniques and skills that an individual elects to use in order to accomplish a specific learning task. Such strategies vary by individual and by learning objective. Often they are so customary to learners that they are given little thought; at other times much deliberation occurs before a learning strategy is selected for a specific learning task. (Fellenz & Conti, 1989, p. 1)

Memory: The storage, retention, and retrieval of knowledge. Memory strategies associated with adult

real-life learning are rehearsal, organization, external aids, and memory application (Fellenz & Conti, 1993, p. 18).

Metacognition: Thinking about the process of learning and emphasizing self-regulatory tactics to insure success in the learning endeavor (Fellenz & Conti, 1989, p. 2).

Metamotivation: Tactics and techniques used by the learner to provide internal impetus in accomplishing learning tasks, not necessarily in an established educational program (Fellenz & Conti, 1993, p. 10).

Nursing: In 1980, the American Nurses Association defined nursing as "the diagnosis and treatment of human responses to actual and potential health problems" (Varcarolis, 1994, p. 99). For the purposes of this study, nursing, nursing discipline, and nursing practice are used interchangeably.

Nursing education: The three educational programs of higher learning "that prepare a graduate to be eligible to take the licensure exam for registered nurses" (McCloskey & Grace, 1994, p. 153). For the purposes of this study, only the associate and baccalaureate programs are represented.

Resource management: Identification of appropriate resources, the critical manner in which they are used, and/or the use of human resources in learning

situations or activities (Fellenz & Conti, 1993, p. 2).

SKILLS: Acronym for the Self-Knowledge Inventory of Lifelong Learning Strategies. A learning strategies inventory with established validity and reliability which usually asks respondents to rate 15 learning strategies in 4 scenarios commonly found in everyday life and which call for a learning effort on the part of the respondent (Fellenz & Conti, 1993, p. 2).

Student participants: Full-time students who volunteered for the study and were in good academic standing in their respective nursing educational program.

Assumptions and Delimitations

Assumptions

Two methods were employed in the study in data collection. In the first phase an instrument was used. It was assumed that the most accurate and reliable responses to the instrument used in the study could be best obtained under controlled conditions. Therefore, instruments were distributed and completed by the participants and were collected by the researcher or a colleague of the researcher all within the same session. It was assumed that the participants answered the instrument and biographical questionnaires truthfully and in an unbiased manner.

During the second phase of the study, the selected participants attended and shared their views and strategies in eight separate focus group interview sessions. It was assumed that the focus group participants were truthful in the group discussions. All participants in this study volunteered to respond to the instrument and voluntarily attended the focus groups.

Delimitations

The study was delimited to full-time nursing students enrolled in the six higher education programs of nursing in the state of Montana during the spring semester 1996. Focus groups were delimited by the need for small numbers and representativeness of the population.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

Trends in health care suggest major changes in nursing practice and, therefore, implications for nursing education. The Health Professions Commission, comprised of 20 members (four of whom were nurses), has restated that the education of health professionals is not in step with the health needs of the American people (Pew Health Professions Commission, 1995). Factors which are shaping the health care delivery system of the future include changing demographics, emphasis on health promotion, escalating health care costs, the movement toward community-based care, and expanding technology (Blancett et al., 1995).

Many of the recent trends in health care reform have continued the need for an increase in registered nurses. While nursing leaders like deTornyay (1996) suggest a temporary supply of nurses as more hospitals close and health care is delivered in the community (p. 147), others continue to predict the shortage of nurses to continue into the 21st century (Moccia, 1990a; Rimmer, 1990). Trends are

for nursing to be delivered in the community and home settings much like at the beginning of the current century. However, community health nursing has gone from "no tech" to high tech in the past 30 years. These trends require that nursing education prepare nurses who can provide care very independently. "Faculty are faced with preparing students for future practice that will be more complex and specialized than it is now" (Oermann, 1994, p. 153).

An increase in non-traditional and second career students entering schools of nursing is a trend that started in the 1980s and is expected to continue. Moccia (1989), the Vice President of Education and Accreditation Services for the National League for Nursing, predicts that nontraditional students will become the norm as the college-age population decreases.

There is every indication that the country's health care system will change significantly within the next decade. Nursing's Agenda for Health Care Reform (National League for Nursing, 1991b) suggests an expanded role for nurses particularly in community based care. The nurse will assume an even greater role in health education and providing information to patients and families for making decisions regarding both their care and the services individuals need to be healthy. The tremendous changes in the health care system are not occurring in isolation, but are taking place within a society that is also changing.

"The skills most needed for the future will be those of problem identification, problem solving, and strategic brokering, that is, connecting those who can identify problems with those who can solve them" (Reich, 1991, p. 134). The most important thing is to prepare thinkers who are curious, skeptical, and courageous. This description surely describes the current and future professional nurse. More often than not a nurse will be faced with identifying several alternatives for an individual or family when faced with decisions in health care. The nurse will have to become courageous if he/she is to practice within the best interest of a family in accordance with legal and ethical standards of practice. Given that there are major changes in the delivery of nursing care and the complexion of nursing students, nursing educators need to explore new ways to promote lifelong learning.

Trends in Nursing Education

Historical Perspective

Some type of nursing care has always existed. Early on, care of the sick was provided typically by women in a person's family. No particular education or experience was needed to provide care. Throughout the history of nursing, an assumption was that nurses could substitute for family members in the provision of care, thereby transferring the

role of care-giver from the family to the nurse (Lynaugh & Fagin, 1988, p. 184). Initially, nurses cared for patients who did not have family members or were poor. However, by the end of the 19th century, it was more common for families to delegate care to nurses.

As nurses became recognized as care-givers for the ill, training programs for nurses were developing. The first such program was initiated in 1860 by Florence Nightingale at St. Thomas's Hospital in London (Oermann, 1991). An apprenticeship model of education was used in which students worked under the tutelage of ward sisters. In the United States, nurses were first prepared for this professional role in the 1870s (Oermann, 1991). Many hospital-based schools opened, and by using students as providers of service, hospitals were able to reduce the real costs of nursing care. Service, rather than education, was the primary purpose of these early schools of nursing. By 1910, only half of the schools of nursing employed nursing faculty members as much instruction was provided by fellow students or physicians (Reilly & Oermann, 1992).

Accompanying the growth of colleges and universities after World War II was an increase in collegiate programs of nursing. In 1951, Mildred Montag proposed an additional level of nursing education. She proposed preparing nurses at the associate degree level in community colleges

(Oermann, 1991). There are still three educational programs which prepare students to sit for the Registered Nurse licensure exam. These include the two-year associate degree program, the three-year hospital based diploma program, and the four-year baccalaureate degree program.

However, diploma programs are rapidly disappearing. "The number of diploma programs has declined from 875 in 1961 to 145 today" (Aiken, 1995, p. 203). The National League for Nursing (1994) indicates that the education of new nurses is currently 68% associate degree, 7% diploma, and 25% baccalaureate degrees. There are no diploma programs of nursing in Montana. Nursing leaders continue to be divided and continue an ongoing debate over entry into practice, but some suggest that there should be more nurses at the baccalaureate degree level (Aiken, 1995). North Dakota now requires the Baccalaureate Degree for entry into registered nursing practice. The Seventh Report to Congress on the Status of Health Personnel in the United States estimates that by the year 2000 the country will have an excess of 156,000 associate degree nurses and a shortage of 428,000 nurses educated at the baccalaureate level (U.S. Department of Health and Human Services, 1990).

Recent Trends in Nursing Education

Since the evidence suggests that nurses will hold greater responsibilities for patient care in the future,

the quality of a nurse's education is very important. It requires that nursing educators examine not only how adult students learn but also the teaching strategies being utilized. Since 1986, there has been a contemporary movement in nursing education proclaimed the "curriculum revolution" (Allen, 1990; Bevis & Murray, 1990; detornyay, 1990; Middlemiss & Van Neste-Kenny, 1994; Moccia, 1990a; Tanner, 1990). This revolution has followed along the suggestions of Goldman (1989) who outlined alternative conceptions of the educational process that would be reflective of major societal changes. In nursing, the health care crisis is directing nursing education toward new ends. This changing focus of education has resulted in a change from nursing curricular content to nursing curricular outcomes, with a major emphasis on helping students learn to think critically (Rane-Szostak & Robertson, 1996, p. 5). The literature has suggested the need for nursing educators to be open to questioning assumptions of past practices and to try new educational methods (Allen, 1990; Bevis & Murray, 1990; deTornyay, 1990; Diekelmann, 1990; Ford & Profetto-McGrath, 1994; Knollmueller, 1994; Moccia, 1990b; Oermann, 1994; Rane-Szostak & Robertson, 1996; Waters, 1990). This curriculum revolution represents a paradigm shift that focuses on the humanistic perspective in nursing education. This focus toward humanism and away from behaviorism

demands changes in teaching and learning approaches and in student-teacher relationships. While this paradigm shift is occurring in nursing, it articulates with a much larger national movement occurring in general education.

The Tyler behavioral model has made considerable contributions to nursing. The Tyler model has helped to lift nursing education "to a highly organized, evaluation-oriented, and regulated group that provides services of reliable quality . . . a quality seen in few other disciplines" (Bevis, 1988, p. 32). As nursing moves from training to education, the limitations of this behavioral approach become evident. Behavioral objectives are not useful for promoting an educative environment, one that fosters seeing patterns and finding meanings to solve problems (Bevis, 1988). A behavioral model makes instruction teacher-centered as opposed to student-centered (Diekelmann, 1988). This promotes passivity in the nursing student and encourages students to process content that will satisfy the teacher's expectations. In 1,000 classroom observations over an 8-year period under a behavioral model "teachers appear to teach within a very limited repertoire of pedagogical alternatives, emphasizing their own talk. This customary pedagogy places the teacher in control. Few activities call for or even permit active student planning . . . [students] rarely plan or initiate anything" (Schor, 1986, p. 187).

On the contrary, active learner participation promotes more holistic teaching and learning. Learners have to become more conscious of their own thinking (Sadler & Whimbey, 1985). Many authors (Bevis, 1988; Brose, 1988; Novak & Gowin, 1984; Poppenhagen, Schuttenberg, & Gallagher, 1982; Van Neste-Kenny, 1992) note the important transformations that occur in the learner as a result of an active teaching-learning approach. These authors note the increased feelings of self-esteem and confidence, the feelings of increased competence, the sense of increased motivation, and the feelings of control and empowerment.

The movement from behavioral education to a focus on learning that is educative where the teacher and the learner are allies in the discovery of knowledge represents a marked change in the meaning of nursing education. Historically, the education of nurses has been strictly pedagogical (I tell; you learn). However, nursing is not alone in its quest to place behaviorism into perspective. The general education literature is refocusing attention on learning theory, humanism, and a more holistic educative process.

Adult Learners

Malcolm Knowles is thought by many to be the grandfather of contemporary adult education. Knowles (1973, 1975, 1980) compares the assumptions about learners

in the pedagogical (traditional) model with the andragogical (adult) model of education. This comparison can be used as a basis for examining student nurses as adult learners.

In the traditional model the learner is a dependent personality while in the adult model the learner is self-directed. The learner's past experience is seen as having little value in the traditional view, but in the adult model the learner's past experience is valued and accepted. Readiness to learn in the traditional model is seen as having the learners told what they have to learn in order to advance to the next level. In the adult model readiness to learn happens when the learner experiences a need to know or to do something in order to perform more effectively in some aspect of their lives. The learner's orientation to learn in the traditional model is the process of acquiring prescribed subject matter content, but in the adult model the learner learns in order to be able to perform a task, solve a problem, or live in a more satisfying way. Lastly, the motivation to learn is viewed in the traditional mode as coming from external pressures, but in the adult model motivation comes from internal sources in the learner such as self-esteem or an enhanced way of life (Knowles, 1980).

While Knowles (1975, 1980) certainly discussed the notion of the adult as a self-directed learner, it was

Stephen Brookfield who explored this concept in depth. He identified several central themes in self-directed learning (Brookfield, 1988). Several of these are particularly applicable if one considers student nurses as adult learners. The use of learning contracts, the value of establishing opportunities for peer learning groups, and the identification of appropriate resources can all be used in the new, self-directed learning model. Brookfield's (1987, 1988) work has extended to the point where he has identified the development of "critical thinking" as the primary goal of adult education. Critical thinking is related to various aspects of nursing education and to the concept of learning strategies in adult education.

Harri-Augstein and Thomas (1991) have looked at self-directed learning and view it as organized learning and learning concentrations. Thomas and Harri-Augstein (1985) point out that individuals do not necessarily learn from their life experiences. Indeed, learning only occurs when those individuals utilize awareness, reflection, and intentional review to analyze and integrate their experiences (Houle, 1985; Long, 1989). Such learning is a deliberate, insightful, and highly skilled activity, which they termed self-organized learning (SOL). Self-organization consists of the ability to converse with oneself about one's own learning processes and to observe, search, analyze, formulate, review, decide, and act on the

basis of such creative encounters. There is a prime emphasis on the affective component along with the cognitive elements. The seven characteristics of self-organized learners are as follows:

1. To be able to accept responsibility for managing one's own learning, rather than to be dependent on other's initiatives and directions.
2. To be aware of, and to control how one learns, specifically:
 - a) to recognize one's needs and to translate them into clearly defined purposes for learning;
 - b) to recruit appropriate resources and to initiate flexible strategies for achieving the purposes;
 - c) to recognize the quality of achieved outcomes;
 - d) to critically review this cycle of activity; and
 - e) to plan and implement more effective cycles of learning.
3. To appreciate the dynamic nature of the personal learning process, and to strive for greater self-organization.
4. To be able to challenge one's partially developed skills, so that such skills evolve into higher standards of personal competence.
5. To see the value of SOL and to practice it as a way of life.
6. To digest, challenge and redefine SOL in one's own terms.
7. To strive constantly for a "quantum leap" improvement in one's personal capacity for learning. (Thomas & Harri-Augstein, 1985, pp. 72-78)

While some of these characteristics may only be developed within individuals and over time, it seems reasonable and sensible that learning experiences for student nurses, and even practicing nurses, should be planned and conducted in such a way that learners are given

the opportunity to practice as many as possible. These authors emphasize that the process of self-organized learning is conversational, and they promote the use of deliberate learning conversations as the most beneficial process for promoting SOL. A learning conversation is a process of sustaining a conversation with oneself about learning which may be initiatory, innovative, insightful, remedial, rejective, physical, open, committing, spiraling, and/or creative (Harri-Augstein & Thomas, 1991, p. 90). The use of a "learning coach," who temporarily externalizes the learning conversation to make it explicit to the learner, is the role of the teacher.

The literature on adult learning suggests applications to nursing and nursing education, especially in view of the need for nurses to be able to "keep up" with the information explosion and rapid technological changes occurring today. Nurses will need to be able to continue their lifelong learning if they are to stay current in their chosen discipline. Thus, nursing education programs are just the beginning of nursing lifelong learning for those in the discipline.

Critical Thinking in Nursing

Many skills are required for an individual to provide nursing care to both well and sick people in both institutional settings and in the community. One of the

skills that has received much attention both in the adult learning arena and in the nursing literature is critical thinking. The development of this skill is of particular importance to nursing education for it is considered essential for practice (Toliver, 1988; Valiga, 1983); as well as a measure of the quality of baccalaureate nursing programs (National League for Nursing, 1991a).

An issue of current concern for higher education is the measurement of expected educational outcomes of critical thinking (Association of American Colleges of Nursing, 1987; Brookfield, 1987; Ewell, 1988; Lynton & Elman, 1987; Meyers, 1987; Paul, 1990; Young, 1980). While there is consensus on its importance, questions remain regarding how critical thinking is defined and measured. There has been limited study focusing on the development of critical thinking during nursing education and its relationship to nursing practice. What does exist provides little information on the development of the teaching and learning of critical thinking in nursing students.

In Benner's (1984) model of nursing competence, the assumption is that the skill of critical thinking is inherent within nursing practice. Benner has described nursing competence as stages of skill acquisition. These stages are as follows:

Stage 1: Novice. Beginners have had no experience of the situations in which they are expected to perform. They are taught

about situations in terms of objective attributes; rule governed behavior is limited and inflexible; and rules must be given to guide performance. A new nursing graduate of a program of nursing is seen as a novice.

Stage 2: Advanced Beginner. The individual can demonstrate marginally acceptable performance and has coped with enough real situations to note the recurring meaningful situational components that are termed "aspects of the situation." Aspects require prior experience in actual situations for recognition. The advanced beginner still relies on rules; takes in little of the situation; needs support in the clinical setting for setting priorities in the care of patients.

Stage 3: Competent. The nurse has been in the same position or similar situations two or three years and is able to see own actions in terms of long-range goals or plans. A plan establishes a perspective, and the plan is based on considerable conscious, abstract, analytic contemplation of the problem. At this stage the individual lacks the speed and flexibility of the proficient nurse, but does have a feeling of mastery and the ability to cope with the many contingencies of clinical nursing.

Stage 4: Proficient. The proficient nurse perceives situations as wholes rather than in terms of aspects, and performance is guided by maxims. Perception is a key; it is not thought out, but presents itself based upon experience and recent events. The nurse understands a situation as a whole; perceives its meaning in terms of long term goals; learns from experience what typical events to expect in response to those events; has improved decision-making which becomes a less labored process; considers fewer options and hones in on an accurate region of the problem; uses maxims as guides, but a deep understanding of the situation is required before a maxim is used; and is able to recognize early warning signals. This level is usually found in nurses who have worked with similar patient populations for about 3 to 5 years.

Stage 5: Expert. This individual no longer relies on an analytic principle to correct understanding of the situation to an appropriate action. Relying on an enormous background of experience, the nurse has an "intuitive grasp" of each situation and zeros in on the accurate region of the problem without wasteful consideration of a large range of unfruitful alternative diagnoses and solutions. There is a deep understanding of the total situation, perceptual acuity, and recognitional ability. The nurse does not rely on analytical tools except when in situations having had no nursing experience. (Benner, 1984, pp. 20-34)

There have been a variety of meanings attributed to critical thinking in the nursing literature. According to Beyer (1987), "the term critical thinking is one of the most abused terms in our thinking skills vocabulary. Generally it means whatever its user stipulates it to mean" (p. 32). Watson and Glaser (1980) described critical thinking as a composite of knowledge and attitudes including (a) attitudes of inquiry that involve an ability to recognize the existence of problems and an acceptance of the general need for evidence in support of what is asserted to be true; (b) knowledge of the nature of valid inferences, abstractions, and generalizations in which the weight or accuracy of different kinds of evidence are logically determined; and (c) skills in employing and applying these attitudes and knowledge (p. 1). This definition forms the basis for the Watson-Glaser Critical Thinking Appraisal, an instrument used by researchers across disciplines (Berger, 1985; Helmstadter, 1985).

Finding that critical thinking was an educational ideal not in widespread practice, one researcher described it as a complex of many considerations, highly sensitive to context and requiring a "critical spirit" for implementation (Norris, 1985). Dialectical reasoning is viewed as an important element of critical thinking (Paul, 1985). An additional description of this concept is that it is an attitude of inquiry involving the use of facts, principles, theories, abstractions, deductions, interpretation, and the evaluation of arguments (Kemp, 1985). "Systematic goal-directed thinking that includes evaluation of the assumptions, processes, and outcomes in making a decision, solving a problem, or formulating inferences from information given" is yet another definition of critical thinking (Halpern, 1987, p. 75). In contrast, critical thinking skills have been categorized into four distinct components: problem solving, decision making, creative thinking, and critical thinking (Smith, 1987). Critical thinking is then defined as the use of the basic thinking processes to analyze arguments and to generate insight into particular meanings and interpretations. Additionally, critical thinking has been viewed as consisting of specific intellectual skills not synonymous with nor encompassing decision making or problem solving. These are identified as separate thinking skills with specific characteristics (Beyer, 1987).

Reflecting a divergent interpretation, Brookfield (1987) described critical thinking as a process which is highly sensitive to context with emotional and rational dimensions. He conceptualizes critical thinking as an active process rather than an outcome. This process has specific components: (a) identifying and challenging assumptions, (b) challenging the importance of context, and (c) imagining and exploring alternatives. Central to this process is the concept of perspective-taking by the individual. When specifically addressing the field of nursing, "it becomes clear that critical thinking is a strongly emotional as well as cognitive process" (Brookfield, 1993, p.197).

Paul (1995) has written extensively on critical thinking. He defines critical thinking as having the three components of (a) disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking; (b) thinking that displays mastery of intellectual skills and abilities; and (c) the art of thinking about your thinking while you are thinking in order to make your thinking better: more clear, more accurate, or more defensible (p. 526). In this definition, which is consistent with Brookfield's (1993), critical thinking has both a cognitive and an affective component. The attitudinal domain provides the motivation for the use of the cognitive domain in a responsible

manner. The following attitudes are essential to "higher order thinking in real settings":

1. Intellectual Humility--awareness of ones own limitations
2. Intellectual Courage--willingness to examine alternative ideas
3. Intellectual Empathy--ability to imagine self in place of others
4. Intellectual Integrity--uniform application of standards
5. Intellectual Perseverance--willingness to struggle for truth
6. Faith in Reason--belief in the abilities of mankind
7. Intellectual Sense of Justice--sense of impartial judgment. (pp. 129-130)

Not only are there certain attitudes necessary for critical thinking, but there are also universal intellectual standards. Blais and Wilkinson (1993) modified Paul's lengthy intellectual standards into micro-skills and macro-skills for the discipline of nursing. Micro-skills are the most basic, are self-contained, or are skills an individual can practice in isolation. These include:

1. Comparing and contrasting ideals and actual practice
 2. Noting significant similarities and differences
 3. Distinguishing between irrelevant and relevant facts
 4. Recognizing and examining assumptions
 5. Evaluating evidence and alleged facts
 6. Making plausible inferences, predictions, or interpretations
 7. Recognizing contradictions
 8. Exploring implications and consequences.
- (p. 2)

The micro-skills are combined with more complex, higher-level abilities called the macro-skills. Such abilities include evaluating arguments and generating problem solutions. These macro-abilities include:

1. Refining generalizations, and avoiding oversimplifications
2. Comparing analogous situations and transferring ideas to new concepts
3. Developing one's perspective
4. Clarifying issues, conclusions, beliefs, and claims
5. Developing criteria for evaluation; clarifying values and standards
6. Evaluating the credibility of sources of information
7. Raising and pursuing root questions; questioning deeply
8. Analyzing and evaluating arguments, beliefs, theories, actions, policies
9. Generating and assessing solutions
10. Reading critically, clarifying or critiquing texts
11. Listening critically, the art of silent dialogue
12. Making interdisciplinary connections
13. Comparing perspectives, interpretation, theories, and points of view
14. Evaluating perspectives, interpretations, or theories. (pp. 2-3)

Even more recently, Kataoka-Yahiro and Saylor (1994) at the School of Nursing at San Jose State University saw the need for a definition of critical thinking as a basis for nursing judgment. These authors outline the confusing picture of critical thinking in nursing. Since there is no clear definition nor conceptualization of critical thinking in nursing, they proposed a model for critical thinking in nursing that includes five components:

1. Specific knowledge base in nursing
2. Experience in nursing
3. Critical thinking competencies
4. Attitudes for critical thinking
5. Standards for critical thinking.
(pp. 353-355)

As early as 1964, Watson and Glaser saw critical thinking as a composite of attitudes, knowledge, and skills. In 1985, Ennis defined critical thinking as "reflective and reasonable thinking that is focused on deciding what to believe or do" (p. 45). The common themes and common components of critical thinking reveal the need for standards (Blais & Wilkinson, 1993; Conti & Fellenz, 1992; Kataoka-Yahiro & Saylor, 1994; Paul, 1995).

Thus, numerous authors with the exception of Watson and Glaser in 1964 share the view that critical thinking is a reflective process. Jarvis (1987) and Brookfield (1987) introduced the idea of a specific domain or place where critical thinking takes place, and Conti and Fellenz (1992) view this domain as adult learning in real-life situations. Nursing is definitely a real-life situation where decisions are made that can mean life or death, emotional support, education, or the meeting of one or more basic human needs.

Although there are commonalities and overlapping concepts in defining critical thinking, the nursing scholars in this field clearly fail to achieve consensus. Among the various definitions presented, the one used by Watson and Glaser (1964) is the most prevalent in the

critical thinking and nursing research literature despite its failure to include reflection as a component.

Several studies of critical thinking have focused on nursing. These studies have used the Watson-Glaser Critical Thinking Appraisal (WGCTA) as a measurement, thereby subscribing to its definition of critical thinking. There has only been one nursing study to date that did not use the WGCTA. Facione, Facione, and Sanchez (1994) developed the California Critical Thinking Disposition Inventory and in so doing defined critical thinking as "the process of purposeful, self-regulatory judgment; an interactive, reflective, reasoning process" (p. 345). It is too soon to know if this new inventory will adequately measure critical thinking in nursing students or in clinical practice. In nursing it is common to equate critical thinking with problem-solving, analysis of data, clinical decision-making, analysis of data, clinical decision-making or judgment, or the use of the nursing process (Bevis, 1993; Kintgen-Andrew, 1991).

Studies that examined the cognitive development of nursing students report conflicting findings. In one longitudinal investigation, the cognitive development of nursing students to determine changes over the span of an academic year found that students increase in cognitive development from year to year, but this is very minimal. Upon graduation, nursing students are still very dependent.

upon others for decision making and problem solving (Valiga, 1983). Three studies that investigated nursing student critical thinking skills report conflicting findings. One found significant improvement in critical thinking from the time students entered a nursing program to the time they graduated (Gross, Takazawa, & Rose, 1987). In the second, WGCTA scores of nursing students between the first and last semesters of the program of study were compared, finding no significant change in critical thinking (Bauwens & Gerhard, 1987). These authors suggested that the WGCTA was not a valid instrument to measure nursing critical thinking. The third investigated the relationship between critical thinking and the ability to formulate nursing diagnoses (make nursing decisions) and found no overall relationship (Matthews & Gaul, 1979).

Nursing competence has been described both as a minimum level of competency (Gove, 1965; McCloskey, 1983; Watson, 1983), and as a higher level of functioning and thinking (Green, 1988; Lynton & Elman, 1987). In studies focusing on the concept of professional competence and its relationship to effective work performance, the development of professional competence was found to require a trio of abilities including cognitive, psychomotor, and affective competencies initiated during the educational process (Stark, Lowther & Hagerty, 1986; Klemp, 1977). Skills developed during the educational experience did not

guarantee competence on the job (Klemp, 1977). Acquisition of competence is initiated by the educational process and developed through professional experiences (Benner, 1984; Booth, 1985; Stark, Lowther, & Hagerty, 1986).

A review of the literature in nursing education with regard to critical thinking reveals that:

Studies presenting longitudinal and cross-sectional data relevant to the impact of nursing education on generic critical thinking have produced mixed results. Strong support for the impact of nursing education is lacking; the cross-sectional data presented by studies of clinical judgment, for the most part, support the impact of nursing education; the studies that tested both critical thinking and clinical judgment provide practically no evidence of congruence between the two; the relatively few studies that present correlations between critical thinking ability and measures achievement in nursing education produced mixed findings. Strong support for the relationship between critical thinking and success in nursing education is lacking (Kintgen-Andrews, 1991, p. 154).

There are distinct gaps in the nursing literature of critical thinking and its relationship to nursing education or to professional nursing competence. To date, the relationships between critical thinking ability in relation to education or professional experience have not been explored in the literature. To what extent a nursing student develops critical thinking skills during the educational process has not been established. A very recent longitudinal study by Maynard (1996) investigated critical thinking of student nurses from their sophomore to

their senior year in nursing school. The critical thinking ability did not change significantly during the educational experience. Only when several more years passed was there a significant increase found in practicing nurses. Once again, the WGCTA was used as the measurement instrument. While critical thinking was not supported as an educational outcome, probably due to the limitations of the instrument, Benner's (1984) work on professional competency was supported. The study supports the experiential component of competence development. The nursing educational program may only begin this process of competence development and produces the novice nurse. Perhaps critical thinking ability is a process as proposed by Brookfield (1987) and not an educational outcome. If so, a need exists for a different instrument to measure critical thinking as part of lifelong learning in nursing.

Learning Strategies and the SKILLS Instrument

Adults enrolled in higher education nursing programs have a variety of learning needs and challenges related to their chosen career and to their personal lives. The discipline of nursing involves situations in which "real-life learning" is involved. "Real-life learning usually involves problem solving, reflection on experience, or planning for one of the numerous tasks or challenges of adult life" (Fellenz & Conti, 1993, pp. 1-2). Real-life

learning tasks encompass a myriad of possibilities which includes such things as studying for a test, talking to a dying patient's family or the dying patient, or arranging babysitters while participating in clinical experiences. Much of the time involved in real-life learning situations for nursing students can easily become "complicated, involved, and long-enduring" (p. 2).

How can individuals solve problems and overcome challenges related to both nursing and personal learning situations? One way may be through the use of learning strategies. "Learning strategies are the techniques or skills that an individual elects to use in order to accomplish a learning task" (Fellenz & Conti, 1993, p. 1). Several researchers have investigated and contributed to the use of learning strategies (Mayer, 1988; McKeachie, 1988a; Weinstein, 1988). Weinstein (1988) and McKeachie (1988a) have focused mainly on learning strategies used in traditional higher educational settings. However, "what is new with the current interest in learning strategies is that it can be based on an emerging cognitive theory of human learning and memory" (Mayer, 1988, p. 21).

Learning strategies are related to the concept of learning to learn in various ways. The idea that adult learners take charge of their own learning was explored in the field of adult education by Houle (1961) and Tough (1971). Soon Apps (1978) and Smith (1982) offered ways a

self-directed learner could develop study skills in learning how to learn. Fellenz and Conti (1993) furthered these efforts in the development of SKILLS and the study of learning strategies in real-life learning situations.

Learning strategy selection is very complex. Weinstein (1990) names four general areas of learning strategies. These include (a) comprehension monitoring-- knowing when you know, knowing when you don't know; (b) knowledge acquisition--building connections between what you already know and new knowledge; (c) active study skills--targeting specifically what the learner does to help acquire information; and (d) support strategies-- building and maintaining suitable internal and external environments for learning.

Often learning strategies are linked in a mechanical fashion like in the increase in note taking, better time management, or acquiring information through the memorization of facts. While some educators focus on these lower level skills, others advocate going beyond the mechanical rote process to more critical thinking skills and the application of knowledge. Learning strategies represent higher-order skills which control and regulate the task-specific or practical skills. While they are general in nature, they are the sort of activity needed time and time again in different learning situations. A

