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A Study to Determine Whether Differences Exist in Cognitive Levels of Instruction between Nursing Faculty Engaged in Clinical Practice and Those Not Engaged in Clinical Practice

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A STUDY TO DETERMINE WHETHER DIFFERENCES EXIST IN COGNITIVE LEVELS OF INSTRUCTION BETWEEN NURSING FACULTY ENGAGED IN CLINICAL PRACTICE AND THOSE NOT ENGAGED IN CLINICAL PRACTICE

by

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This research study was designed to determine whether differences exist in cognitive levels of instruction between nursing faculty engaged in clinical practice and those not engaged in clinical practice. Benjamin S. Bloom's Taxonomy of Educational Objectives (1956) within the cognitive domain provided the organizing framework for the study.

A review of the literature for the study focused on three major areas: a) research on faculty clinical practice which includes faculty and administrator perceptions and case studies of faculty practice models; b) the relationship of cognitive behavior to the use of teaching tools; and, c) research focused on higher education using Bloom's (1956) conceptual framework of educational objectives in the cognitive domain. No studies were identified which seek to determine if differences exist in cognitive levels of instruction between the two groups of nursing faculty.

For this study, a sample of nurse educators who held appointments in Illinois, NLN-accredited institutions of higher learning was used. Sampled faculty had a minimum of one year of teaching experience, minimally held a Master of Science Degree with a major in Nursing, were actively or in

the previous year had been engaged in clinical instruction, were tenured or in a tenure-track position, and were teaching an upper division, theory-based course, or unit within a course, for which they prepared their own educational objectives. Faculty in nursing practice were, at the time of the study, either in practice or had clinical practice in the previous year of employment.

A total of 362 nursing faculty at 20 schools of nursing in Illinois was contacted for participation. The response rate, including a follow-up letter, yielded a final total of 123 surveys (35.4%) and 80 sets (23%) of curricular materials.

The research data were compiled from the surveys and sets of curricular materials consisting of course or unit objectives, assignment instructions and examination questions which were received from respondents. Of these, 56 nursing faculty were in clinical practice and 67 were not in practice.

The Friedman two-way analysis of variance (ANOVA) test followed by the Wilcoxon Signed-Ranks test revealed that for both nursing faculty groups combined, significant differences do exist among the six levels of Bloom's Taxonomy for course objectives, for assignment instructions and for examination questions. Next, the Mann-Whitney U test for two independent samples was used to determine if significant differences exist between each of the categories for objectives, assignment instructions and examination questions. Only one

probability demonstrated a significant difference in the population distribution. Significance was found between the two faculty groups in the inclusion of Analysis for examination questions. Group One, practicing faculty, revealed significantly less use of Analysis for examination questions than Group Two, the non-practicing faculty.

Faculty perceptions of administrator views regarding rewards for combining practice with teaching, research and service were reported by descriptive data. Both faculty groups perceived that the greatest rewards were for teaching and research and that minimal or no rewards exist for clinical practice.

A two-sample T-Test revealed that a significant difference exists between the faculty groups regarding their perceptions about their own clinical competence. Nursing faculty in clinical practice viewed themselves as extremely competent whereas non-practicing faculty viewed themselves as very competent. The Chi-Square test revealed a significant difference between the two nursing groups' perceptions of the major mechanism for maintaining their level of clinical competence. The majority of practicing faculty provided direct client care in order to maintain their level of clinical competence. The majority of non-practicing faculty, however, indirectly gave nursing care during clinical instruction in order to maintain their clinical competence.

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confidence in this older adult who yearned to continue her own love of learning by completing this exemplary doctoral program.

VITA

The investigator was born Alma Lila Joel to the now deceased parents, Batishva Lazar Joel and John Joel in Chicago, Illinois. Upon completion of high school at North Park Academy, she majored in Spanish and Music at St. Olaf College, Northfield, MN, continued at West Suburban Hospital School of Nursing in Oak Park, IL for her nursing diploma, and obtained a Bachelor of Science degree with a major in Nursing at Wheaton College, Wheaton, IL in 1957. Concomitant with her philosophy of lifelong learning, Ms. Labunski maintained continuing education with studies centered about nursing practice, nursing education, instructional media for nursing and adult education. Her Master of Science degree with a major in Nursing and Curriculum Instruction and a minor in instructional media was awarded at Northern Illinois University, DeKalb, IL in 1975. She also completed 30 semester hours of doctoral study in adult education prior to transferring to Loyola University of Chicago in 1982.

In addition to numerous nursing staff positions in a variety of health care settings, Ms. Labunski is also a long-term nurse educator of over 30 years. Her teaching experiences have been in hospital-based programs, community colleges and baccalaureate and higher degree colleges and universities as Instructor, Assistant Professor, Associate

Professor and Chairperson, Division of Nursing and Natural Sciences and currently, Associate Professor of Nursing at St. Xavier College, Chicago, IL.

Furthermore, Ms. Labunski has remained committed to professional service. Her 35 years of membership and office positions in numerous professional organizations, frequent presentations to professional groups and regular professional services to the community reflects her long-standing commitment to service. In fact through the years, five national awards have been granted to Ms. Labunski in order to commemorate her professional service.

Finally, Ms. Labunski is committed to scholarship. She is the senior author of three editions of Textbook and Study Guide for Medical-Surgical Nursing (published by Mosby Co.), numerous written publications (including chapters in books), software instructional programs for nursing and three previous research studies related to health care.

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CHAPTER I

INTRODUCTION

Background

Since its inception, the profession of nursing has attempted to bridge the functions of nursing service and nursing education. The first hospital training programs of nursing were established in the United States in the 1880's (Christy, 1980). In the majority of programs, instructors did not exist; students were thrust into the hospital wards to learn "catch-as-catch can" by observing and imitating other students. At the turn of the twentieth century, nurses known as Training School Superintendents provided minimal classroom instruction in nursing, and physicians presented lectures on medical care (Christy, 1980). Since most hospital training programs were opened for the sole purpose of providing care to hospitalized patients, educating nurses was not an objective.

Nonetheless, a rapid growth in schools of nursing paralleled the increased establishment of hospitals. According to Ashley (1976), hospital schools of nursing multiplied from three in the 1880's to over 2000 by 1926. Most hospitals were operated by physicians who had "schools" for women (p. 21). Since free labor by student nurses provided nursing service at the least possible cost, hospital

incomes increased the financial remuneration for physicians.

The first baccalaureate program in nursing was established in 1909 at the University of Minnesota (Mauksch, 1980). As one of the newer disciplines in the academic community, this event was considered a milestone for nursing. Nonetheless, it was only the beginning of a long struggle to have nursing recognized and accepted as a legitimate scholarly discipline deserving of equality and autonomy within the higher education system.

The Minnesota program and others like it demonstrated inconsistent growth. The lack of qualified nursing faculty who could meet the usual requirement for university faculty rank was the most glaring problem (Mauksch, 1980). To alleviate the problem, graduate degree programs in nursing increased during the 1930's and 1940's. The preparation of nurse educators included an expanded curriculum and skill development designed to enhance their future role as educators. Initially, enhancement of clinical skills was not part of the graduate curriculum. The program provided the nurse educator with an opportunity for decision making, autonomy and authority not available in the bureaucratic restraints of the hospital setting.

Throughout the 1930's and 1940's, few nursing graduates were employed in hospitals as nursing service was still primarily provided by students. Furthermore, as these students progressed through the program, they assumed ward

management roles and instructor-type roles for less advanced students. Thus, students were functioning as head nurses and were teaching other students. Clinical practice was a function of nursing education; however, qualified faculty to supervise this practice were nonexistent (Wakefield-Fisher, 1983).

By the late 1940's and early 1950's, nursing graduates assumed head nurse positions and functioned as instructors for students. Observations made at that time indicated that the head nurses were both clinical practitioners and nurse educators. Nonetheless, when the nursing load was heavy, staffing inadequate, and pressures to produce mounted, quality nursing suffered. Shortcuts assumed priority as did devoted, self-sacrificing nursing service (Wakefield-Fisher, 1983).

Inadequacies in the rapid growth of schools of nursing paralleling the growth of hospitals became evident during the 1940's when the quality of nursing education in hospital schools suffered extensive criticism. Poor levels of instruction, inadequate preparation of faculty and a major dependence on students for nursing service were major issues. Gradually, as a result, a movement to upgrade the quality of nursing education began (Wakefield-Fisher, 1983).

One major change occurred during World War II when federal financial support through the United States Cadet Nurses' Corps went directly to schools rather than to pay

nurses in hospitals whose major function was service (Christy, 1980). This trend became more firmly established with the development of associate degree programs piloted in the 1950's and increased growth of baccalaureate programs in the 1960's and 1970's. These programs employed full-time faculty who were not required to staff hospital wards.

Concurrently, the National League for Nursing Education (retitled, National League for Nursing [NLN] in 1952), a private, non-profit accrediting agency for nursing, published a list of approved schools. Moreover, when the NLN listed the ratio for minimal numbers of faculty to students in the clinical area, separation of service and education became more evident. The educational process was gradually moving from the hospital to the academic setting.

In the 1950's as nursing educators slowly continued to gain acceptance within academe by meeting the same expectations of scholarly productivity as faculty in other disciplines, nursing faculty became less skilled in the clinical area (Millonig, 1986). For most, it was not an issue; their involvement clinically in supervising students appeared to be adequate. As nursing faculty became entrenched in professorial demands, nursing service professionals became apprehensive about the clinical competence of their academic colleagues.

Selected nursing leaders attempted to resolve these concerns. Rauen (1974) suggested that nurse educators become

more involved in the care provided by their students through role modeling and by assisting them in that care. Others reported by Rauen suggested faculty have their own patient assignments while supervising students with patients. At issue was whether faculty should give priority to their students and their students' patients or to their own patients.

Some early developments for faculty practice were initiated by the educational community. In 1918 Isabel Stewart, an educator-researcher at Teachers College, believed that focusing on scientific organization and structure would regularize nursing and ensure quality nursing care in hospitals (Fagin, 1986). Meanwhile,in the 1940's, Virginia Henderson, another educator, sought to legitimize nursing by asking questions about clinical practice, that is, focusing on nursing problems and the best approach to their resolution.

An additional educator who supported the concept of faculty practice in 1956 was Dorothy Smith. Recruited to be the Dean of the College of Nursing at the University of Florida, she agreed to accept the position only if she could also control nursing service. This revolutionary step of establishing a unification model represents the first move to close the education/practice gap. Her goals were clear: to introduce an intellectual and clinical nursing role that influences people about the nature of nursing; to guarantee

faculty clinical practice; to develop nursing systems and a data base; to develop an educational hierarchy in nursing service; and to obtain power for nursing deans (Fagin, 1986).

While Smith aimed at instituting an intellectual role focusing on problem-solving at the University of Florida, another program promoted academic nursing leadership at Case Western Reserve University (Ohio) in 1961 (Fagin, 1986). Two additional innovations followed using the same organizational structure at Rush-Presbyterian-St. Luke's Medical Center with Rush University (Chicago, IL) and at the University of Rochester (New York). These latter two programs, also labelled unification model programs, enabled nursing faculty to assume authority and accountability in three areas: education, practice and research. Both have been well described in the nursing literature; however, neither has been duly replicated. Rush University is a health science university in a free-standing medical center. Thus, while the unification model may be successful in this setting, it has been deemed inappropriate for traditional university organizations. The University of Rochester model has also evidenced multiple problems in meeting its goals (Fagin, 1986).

Dean Smith lost control at the University of Florida and by 1972, resigned from her position at the mercy of changed professional relationships and professional vulnerability. The unification model was terminated and the educational

hierarchy in nursing service was severed.

Each of the above examples indicates the desire for increasing clinical competence among some nursing faculty. Concomitantly, increasing numbers of nurse educators are establishing themselves as full university professors. The nursing community is just beginning to see theory development, research productivity, and research-based teaching. Once again, as nursing faculty continue to gain acceptance in academe by meeting the same expectations for scholarly productivity as faculty of other disciplines, they are becoming less skilled in the clinical arena. Moreover, some clinical professionals are apprehensive about the clinical competence of their academic colleagues (Wakefield-Fisher, 1983).

Considerable progress has been made in closing the education and service gap. The majority of university programs has some faculty in shared positions with hospitals and health care agencies. However, from the perspective of institutionalizing practice, multiple missions of institutions and agencies must be addressed before additional models or prototypes are established. Furthermore, educational programs preparing practitioners demand much communication, mutual planning and long meeting hours in order to meet objectives. Moreover, since nursing is a practice-based discipline, practicum courses are essential. Faculty and student contact hours generally triple those of

other disciplines (Fagin, 1986). Most faculty have accepted this requirement as sufficient evidence for maintaining clinical skills.

Few faculty would deny the need to remain current in their clinical field. Many clinical faculty are well prepared academically in their specialty area and retain credibility with their service colleagues. However, some faculty preparing students for practice in the clinical setting have little insight into the realities of these settings, since their only contact with patients is while conducting research (Fagin, 1986). With the rapid and complex changes in health care that have occurred in the last 20 years and which are continuing, isolated faculty are losing credibility in the classroom and among their professional colleagues in service. Faculty clinical practice is one approach that can alter this image.

Millonig (1986) identifies several benefits associated with faculty practice: a) maintenance of clinical skills; b) increased credibility with students; c) improved teaching; d) greater opportunities for research; e) application and testing of nursing theories; f) identification of clinical problems which form the basis for research; g) monetary benefits; h) professional development and personal satisfaction; and i) involvement in providing quality-based nursing care (pp. 168-169).

Kent (1980) claims that as nursing's responsibility for

quality health care is more clearly evidenced, its credibility in society will be enhanced and, subsequently, its image should be improved. As a provider of care, the nurse educator has enhanced the credibility of nursing in the eyes of the consumer. No longer could it be stated that the educator is "not really a nurse" (Ford & Kitzman, 1983, p. 23).

Numerous educators (Millonig, 1986) raise concerns regarding current faculty practice. At a time when the educator is slowly gaining credibility as a full-fledged faculty member, she is being forced to apologize for her lack of recent "hands-on" activity and to squeeze time into an already demanding academic workload for regular clinical practice. The greatest issue pertains to time. Faculty in practice must balance their time for teaching, research, writing, university service, course development, curriculum revision, and clinical practice. The value of their activities associated with promotion and tenure dramatically affects the time left for individual practice. Furthermore, adding the dimension of clinical practice to an already over extended faculty promotes additional role strain, increased on-the-job tension, decreased job satisfaction and decreased confidence in the organization (Harrington, 1980).

Commitment to both the practice setting and educational institution poses additional problems. Kent (1980) claims

that serving in both roles creates "cognitive dissonance" (p. 21). Others reported by Millonig (1986) maintain that establishing and maintaining a practice role consume time and energy with a resulting dichotomy of commitment and responsibility. Building trust and identity in the practice setting may affect the sense of commitment to the academic setting. Conversely, establishing trust, identity and commitment to students, faculty colleagues and the institution may affect one's sense of impact upon the practice setting. Clearly, serving two masters at the same time is not easy.

Another issue related to faculty practice pertains to recognition of practice in promotion and tenure. Opportunities for clinical research may be used by faculty to satisfy both clinical practice and increased chances for promotion and/or tenure. Clinical administrators, however, expect productivity and often view research and other scholarly activities as too time-consuming and cost ineffective (Millonig, 1986).

Faculty practice, as viewed by the academic setting, may not be considered a viable activity along with teaching and research. Many institutions of higher learning do not include faculty practice as a criterion warranting merit and promotion. In their view, it lacks equitable status for objective faculty evaluation.

Concerns about part-time clinical practice present

another legitimate issue raised by health care settings (Wakefield-Fisher, 1983). Faculty, who practice on an irregular, part-time basis and who are unfamiliar with policies and procedures and everyday staff problems, cause disharmony and increased stress on staff and the setting.

These practice sites also present problems for faculty. Many agencies refuse to hire faculty on a limited, part-time basis. Problems such as workman's compensation, benefits, malpractice insurance, responsibility and authority are but a few that are identified (Wakefield-Fisher, 1983). Most agencies prefer time commitments that are greater than the time allotted for faculty practice.

Finally, faculty reimbursement for practice may pose another issue for the academic setting. Some settings restrict supplemental faculty income. Dinsmore and Pollow (1981) argue that faculty should not receive reimbursement for services. They contend that when the focus of practice is on finances rather than on the experience of practice, benefits of practice suffer. That is, when faculty focus on income, they lose site of the purpose for clinical practice. Other faculty disagree. They maintain that faculty need direct compensation for practice; faculty practicing without compensation will soon discover that the rewards are minimally proportionate to the benefits (Holm, 1981).

In summary, faculty clinical practice has evolved, in part, as an attempt to bridge the gap that exists between

nursing service and nursing education. The milestones achieved in the establishment of nursing education in academic settings have resulted in a loss of responsibility and accountability of nursing faculty in practice settings. Although the role of faculty in academic settings has expanded to include research, publication and university and community service, direct faculty practice remains minimal. Consequently, in losing touch with the patient and staff, nursing educators have suffered a loss of credibility and authority in promoting quality-based nursing care.

Early developments for faculty practice were initiated by the educational community. The first institution, the University of Florida, and subsequent innovators, including Case Western Reserve University, Rush University and the University of Rochester, have provided models for bridging that gap.

Although numerous benefits associated with faculty practice have been identified, overriding concerns remain. At a time when the nurse-educator is finally gaining credibility as a university-based faculty member, she is being forced to apologize for her lack of recent "hands-on" client care or a "case load" of clients. The nurse-educator may be doing the profession a disservice when faculty assume two major roles, each of which is legitimate, that provide an essential service, require continual study and skill refinement and deserve total professional immersion

(Harrington, 1980). Hence, the trend toward formalizing practice into the faculty role continues to progress very slowly.

Purpose

Some nurse educators reported by Smith (1983) contend that mobilizing faculty toward integration of practice and education affects the profession's body of knowledge. This integration creates a new intellectual pattern of behavior in faculty (Smith, 1983), alters and strengthens the educator's instructional skills, and reveals differing instructional quality. As a result, levels of cognitive instruction may vary among faculty in practice versus faculty who are not in practice. Practicing faculty may use higher levels of cognitive instruction to enhance their teaching. A common assumption held by some nursing leaders is that by using higher levels of cognitive instruction, faculty in clinical practice promote critical thinking skills which, in turn, affect the level of cognitive learning for nursing students (Anderson, 1981). The persistence of this contention suggests the need to search for substantive differences in educational processes and outcomes between faculty in clinical practice and those not in clinical practice. Specifically, it is important to determine if faculty who engage in clinical practice are more likely to use higher levels of cognitive instruction designed to promote critical thinking than faculty not engaged in clinical practice.

The purpose of this study is to explore whether differences exist in the levels of cognitive instruction between nursing faculty engaged in clinical practice and those not engaged in clinical practice. More specifically, it is designed to examine whether faculty in practice use higher levels of cognitive instruction which promote critical thinking as opposed to faculty not in practice.

Conceptual Framework

Benjamin S. Bloom's Taxonomy of Educational Objectives within the cognitive domain provides the organizing framework for the study. The Taxonomy is organized into six major classes: a) knowledge; b) comprehension; c) application; d) analysis; e) synthesis; and f) evaluation (Bloom, 1956). The arrangement of the classes is hierarchical with cognitive behaviors arranged from simple to complex.

Knowledge is the first level of Bloom's classification. It is defined as "the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting" (p. 201). This category has a subclassification ranging from simple to more complex knowledge behaviors. Knowledge of specifics refers to concrete, tangible phenomena. The more complex categories deal with abstract phenomena, such as the knowledge of theories.

Bloom (1956) describes the second class, comprehension, as a term representing the lowest level of understanding. It

refers to a type of understanding in which an individual can translate material from original communication, can reorder and rearrange it, and can make immediate inference and determine implications and consequences.

The third category is application which refers to the use of abstractions in particular and concrete situations. These may be in the form of general ideas, rules of procedures or generalized methods (Bloom, 1956, p. 205). They also may be technical principles, ideas and theories which can be applied. Additionally, application includes the ability to predict the probable effect of a change in a factor on a biological situation which was previously stable (p. 205).

Analysis is the fourth classification. Bloom defines it as "the breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between the ideas expressed are made explicit" (p. 205). The elements are intended to indicate how communication is organized, how it manages to convey its effects, its basis and its arrangement.

In the synthesis class, elements and parts are brought together to form a whole. It involves the process of working with, arranging and combining pieces, parts, elements, and the like, to construct a new structure or pattern. Although comprehension, application and analysis also involve putting elements together, one major difference exists between these

categories and synthesis. The upper categories require a given set of materials or elements which comprise a whole. The student studies the whole in order to understand it. In contrast, synthesis requires the student to draw from many sources to construct a whole structure which was previously non-existent (Bloom 1956, p. 163).

The final category of evaluation includes quantitative and qualitative judgments about the value of material and methods which satisfy criteria. For purposes of classification, only the evaluation prepared with distinct criteria is considered in this category. Criteria may be those determined by the student or evaluator. The standard appraisal may evaluate internal and/or external criteria. Evaluation is listed as the last class in the Taxonomy because it is regarded as a late stage in a complex process that involves some combination of all the remaining behaviors (p. 185).

Instructional components in the cognitive domain include activities pertaining to the six categories in Bloom's taxonomy. This study is specifically designed to determine whether a variety of instructional tools used by faculty in their nursing courses incorporate Bloom's six categories. Since the Taxonomy is hierarchical, the study is intended to determine whether higher levels of cognitive behavior (i.e., critical thinking) are used in the faculty's instructional tools.

Research Objectives

Objectives which guide this research study include the following:

1. Using Bloom's Taxonomy of Educational Objectives, to determine the cognitive level of educational objectives, assignment instructions, and examination questions for courses or units prepared by faculty engaged in clinical practice versus faculty not engaged in clinical practice.

2. To determine the differences in cognitive levels of instruction used by faculty engaged in clinical practice and those faculty not engaged in clinical practice.

3. To determine faculty perceptions regarding the rewards given by nursing and institutional administrators for combining clinical practice with teaching, research and service.

4. To determine faculty perceptions of the level of clinical competence of faculty engaged in clinical practice versus those not engaged in clinical practice.

Significance

This exploratory study is timely, relevant, and important to the profession of nursing. Never before in the history of nursing and nursing education has this specific issue been examined. Although nursing leaders have emphasized the necessity for bridging the functions of nursing service and nursing education, the profession remains poorly informed about the outcome of those combined efforts.

The premise that faculty practice increases the image of faculty as professionals to students, staff and colleagues has been minimally documented in previous research studies (Wakefield-Fisher, 1983). Furthermore, increased faculty self-esteem regarding their own competence and improved teaching skills as enhanced by faculty practice have only been anecdotally reported. Additional studies pertaining to this issue remain nonexistent.

This study addresses the possible impact of faculty practice on clinical research. If practice increases the faculty generation of research questions, it could lead to higher levels of cognitive thinking and in turn, increased critical thinking skills for faculty. Course objectives, assignment instructions and test questions will hopefully reflect these higher levels of thinking and reasoning. The use of questioning as a method of instruction to enhance critical thinking, for example, could be promoted. The use of critical thinking skills for, among, and by students will alter their behavioral learning outcomes.

This study identifies the practicing faculty's use of intellectual skills in their courses. Educational objectives which promote critical thinking will be reflected in the course objectives, assignment instructions and examination questions faculty select to implement their course objectives. Faculty will use various instructional components which exercise all six levels of the cognitive

domain. And, if the study determines that a significant difference in practicing faculty exists, most nursing education curricula will require major alterations to promote the programs' primary mission. Total curriculum revision will probably include course syllabi, course requirements, and administration components.

Outcomes of the study may also emphasize the need for further research on the impact of faculty clinical practice upon students' educational performance. If selected instructional components using higher level thinking skills are facilitated rather than inhibited by faculty in clinical practice, major changes in department organizational structure and governance will be required. Additional research on appropriate curricular models will be needed. Furthermore, if teaching is strengthened by faculty in practice, results will stimulate new ideas for nursing scholarship.

Moreover, if faculty clinical practice increases the cognitive level of instruction, it could become mandatory as one criterion for promotion and tenure within employing institutions. This mandate will allow more time for faculty to remain off campus and be engaged in practice.

Concomitant faculty practice also may provide current, relevant content and health care data for classroom and clinical teaching. Because of faculty expertise, the quality of health care may improve. Faculty in practice may learn

better administrative skills and increased delegating responsibilities. The role strain they may encounter is healthy; it may help meet faculty expectations and understanding of staff requirements to improve health care.

Additionally, this study identifies the non-practicing faculty's use of intellectual skills in their institution. Outcomes may also indicate that educational objectives which promote critical thinking are reflected in the assignment instructions and examination questions faculty select to implement course or unit objectives.

Moreover, the study may raise issues that faculty and administrators perceive as real concerns in fulfilling the roles of nursing educators. Although faculty practice is not a new concept, the expectation of maintaining a nursing practice base is fairly recent. These issues pertain to the realities of combining practice with teaching, scholarship and university service. For many faculty, practice demands unrealistic expectations. It places increasing accountability and responsibility upon faculty who currently experience existing faculty overload. Hours spent in research, service, teaching, academic advising, college committee participation and in some cases concomitant doctoral studies result in the existing faculty overload. Saylor, as reported by Wakefield-Fisher (1983), indicates that faculty currently spend well over 50 hours per week in activities related to research, service and teaching. This

role overload causes strain which increases pressure or tension while fulfilling the role expectations. According to Wakefield-Fisher, a lack of clear-cut expectations and frequent changes in faculty roles have resulted in a state of flux and subsequent ambiguity. Wakefield-Fisher contends this ambiguity regarding faculty practice has been evidenced since 1975. Outcomes of this study are intended to reveal the percentage of time devoted to teaching, research, service and clinical practice. The study may demonstrate that few educational programs incorporate clinical practice into faculty contracts.

Hence, due to the above potential problems, faculty in clinical practice may have less time for planning their nursing education programs, developing their curricula and creating cognitive instruction skills which promote critical thinking within their students.

This study may also reveal that most non-practicing faculty perceive themselves to be clinically competent. Faculty may, in their view, maintain relevancy by clinical instruction of the students from two to three times per week.

As part of their graduate education, most current faculty have advanced preparation in clinical practice. It is plausible this preparation indicates adequate clinical competence. As faculty work with students in practicum (clinical-oriented) courses, they assist students to operate within a conceptual framework where the nursing process (a

problem-solving tool) is used to identify and meet patients' needs and establish productive relationships. Faculty's intellectual skills are consistently being tested and refined.

Of particular concern is the place of clinical practice in promotion and tenure, the logistics of its implementation and its economic implications. Outcomes of this study may reveal that faculty practice provides minimal, if any, rewards from their institution's administration. Promotion and tenure capabilities which include faculty practice, if any, are selected.

Nonetheless, results of this study may serve to stimulate faculty to resolve their differences and direct their energies toward strengthening the profession as a whole. No longer, perhaps, will faculty be viewed as "second class" and have to apologize for their lack of "hands-on" experience. To the practitioner, faculty credibility may depend on what faculty do with students as well as without them.

Finally, this study is important to the growth, development and accountability of the profession. Results of this study may enhance quality-based nursing care for clients and increase the profession's credibility in society.

Limitations

The current study had several limitations. One is that it was limited by the small sample that was used to collect

data. Although it was a preliminary study, respondent participation remained minimal. Numerous factors to explain the response are noteworthy. Some faculty indicated that the course materials were the property of the university. Others indicated reluctance since they were planning for an accreditation visit from the National League for Nursing (NLN). Faculty protective of their printed materials expressed refusal to participate for fear of the investigator's exploitation of the submitted materials for personal use. Items such as part-time status, providing only clinical instruction vis-a-vis classroom theory, unavailable materials for distribution, and faculty teaching at the graduate level were all posed as reasons for lack of response.

Logistical factors presented still another reason for lack of participation. In five out of twenty institutions, the investigator was required to send faculty requests for participation directly to the Dean/Director/Chair of the Department/Division/School of Nursing. Hence, potential follow-up for specific non-respondents was more difficult.

Another limitation is the difference in types of institutional programs which were asked to participate. Although limiting variables comprised traditional, National League for Nursing - accredited baccalaureate generic and/or completion nursing programs, differences in curricular approaches may exist among those within the state.

An additional limitation of the study is that it uses the survey method to elicit information. The major disadvantage of the survey method is the use of ex post facto research (Polit & Hungler, 1985). Hence, the research lacks first-hand observations of faculty in functions of their classroom setting, in discussions with students, and in their clinical instruction roles. Since the investigator has no control over the independent variables, the research relies on faculty statements and course materials they submitted and indicated they used. Furthermore, submitted course materials may vary widely in content, credit hour requirement, and placement in the educational program. Major differences may also be noted between courses that are solely theory-based and those that combine theory and clinical instruction. As a result, course materials, such as ethics and research course materials may differ from maternal-child and medical-surgical materials. Theory-based course materials may reveal higher level objectives than those which include clinical instruction and require development of affective and psychomotor skills. And since the study did not review materials on a course-by-course basis, this represents another limitation.

Moreover, the submitted unit/course materials may not have been prepared by the faculty member submitting them. In spite of investigator screening, they may have been prepared by a team which required coordinator's approval and/or have

been prepared by faculty but used by successors in the position.

Additionally, the survey method is limited by submission of selective information. Hence, the data for this study are restricted to the extent of course materials that are submitted by faculty respondents.

Finally, the study is limited to faculty participation in one midwestern state where the investigator resides. Since she is a long-term educator in that state, the investigator anticipated a high response rate for the study. Also, it is possible that responses may differ according to geographic region, such as faculty attitudes toward collegial sharing and preparation of materials, the stability of their positions, and faculty's view of clinical practice. Based upon leading nursing proponents' geographic appointments, regional variations may evidence much support for faculty clinical practice.

Definition of Terms

In this dissertation several key terms are used. Their definitions are provided below.

Cognition. A process of explaining behavior and learning in terms of human intellectual thinking and ways in which individuals deal with complex problems (Hill, 1977). Two distinct approaches to defining adult cognitive growth are identified by Frisch (1987). One approach documents individuals' experience and understanding of their world

view. The alternative approach focuses on individuals' ability to use abstract reasoning (p. 25).

Collaboration/joint practice model. An organizational structure which is designed to require education and service interaction. It enables opportunities for both education and service to share and expand human and material resources and to conduct nursing research. The progress and activities occurring are monitored by an advisory board comprised of key education and service personnel. The nursing service administrator holds a bona fide faculty position; the nursing education administrator, similarly, holds a high ranking position in nursing service (Munroe, 1987, p. 297). Mutual respect, trust and understanding is fostered by the formal and informally created social system.

Critical thinking. An attitude of inquiry which involves the use of facts, principles, theories, abstractions, deductions, interpretations and evaluation of arguments (Matthews, 1979, p. 19). As an educational ideal, Siegal (1980) contends that critical thinking embodies a rationality that is crucial to generality, to ethics, and to a political emphasis.

Curriculum. An educational program designed to accomplish certain educational goals and to use specific means to accomplish these goals. It consists of the broader environment within which interactive teaching takes place and includes overall content and approaches to it (Joyce & Weil,

1972, 319).

Faculty practice. The provision of direct, accountable health care to clients without the presence of students. It does not include care provided indirectly through students during the course of clinical instruction.

Faculty practice plan. A plan for faculty practice which refers to individual and/or institutional process and provides a merging of the academic nursing program with nursing service.

Instructional tools. Devices and/or planned purposeful experiences which provide a structure to facilitate students' learning. Examples include: a) course objectives; b) study questions accompanying reading assignments; c) instructions which guide individual projects and written term papers; and d) essay examination questions.

Integration model. A model in which nursing faculty, as part of their contract, provide direct practice along with students during school hours during the week. It is an approach which creates a nursing practice site as an integral component of the nursing academic unit and develops practice in this site as another element of the faculty role.

Moonlighting. Engaging in faculty practice on faculty's own time such as on weekends, evenings and/or during summer periods. In these situations, the academic site often has no real knowledge of the practice activity and takes no responsibility for it. Faculty may use that as evidence of

clinical expertise and/or community service. Oftentimes, faculty engaged in moonlighting have a private practice for which they earn additional income to supplement their salaries.

Primary affiliation. This term is used in an academic setting to distinguish formal collaborative agreements between nursing education and nursing service. Restated, it defines a partnership between education and service (Munroe, etal, 1987).

Practitioner/teacher. As defined by Christman (1979), this title is given to faculty members who actively effect high-quality patient care in the clinical and classroom setting through an integrated role as clinician, educator, consultant, and researcher.

Taxonomy. A classification scheme that has specified structural rules which have no arbitrary elements, but is constructed so that the order of the terms corresponds to order of phenomena which are represented by the terms. It is validated by demonstrating its consistency with theoretical views within research findings it attempts to order (Bloom, 1956, 17).

Unification model. A method of faculty practice in which faculty fulfill clinical practice and faculty roles simultaneously. It serves as part of the faculty contract. Practice is clearly an expectation of individuals appointed to a faculty position. Where institutions have this model in

place, faculty practice is one of the criteria for promotion and tenure.

CHAPTER II

REVIEW OF THE LITERATURE

Rapid changes in technology including biomedical advances and the delivery of health care services demand the integration of nursing education, research and practice. Clinical practice for nursing faculty should be reflected in the teaching of students, the research of faculty and the generation and sharing of knowledge. The premise that faculty clinical practice disseminates innovation efficiently and effectively leaves many nursing leaders pondering how clinical practice for faculty can best be accomplished (Millonig, 1986). Their concern is how to most effectively mobilize faculty expertise into the health care system. Several examples or models of the restructuring of faculty roles demonstrate both success and failure. These models are based on individual and institutional commitment to faculty practice. The various models which incorporate nursing faculty into clinical practice have been well described in the literature and at national symposia.

Major research focusing on faculty clinical practice involves the evaluation of its impact upon nursing education programs, faculty and students and changes in the health care systems which are critical to its continued viability. Although numerous studies pertaining to the use of faculty

instructional tools and evaluation instruments in classroom and clinical settings are available, at this writing no studies have been conducted which seek to determine if a difference exists in the use of instructional tools to promote higher cognitive levels of instruction between faculty in practice and those who are not. Moreover, a dearth of research pertaining to faculty practice currently exists. Hence, the review of the literature for this study focuses on three major areas: a) research on faculty clinical practice which includes faculty and administrator perceptions and case studies of faculty practice models; b) relationship of cognitive behavior to the use of teaching tools; and, c) research focused on higher education using Bloom's (1956) conceptual framework of educational objectives in the cognitive domain.

Faculty Clinical Practice

The collaboration of nursing education and nursing service has historically been supported by nursing education's accrediting agency, the National League for Nursing (NLN). This organization has identified the need to legitimize faculty practice as an essential element of academic excellence. Since various reasons have been posed to explain the role that practice, or the lack of it, serves in academic nursing, Bellinger, Reid and Sanders (1985) conducted a study of faculty practice. Surveying all NLN-accredited nursing education programs in the United States,

the authors sought information about faculty practice and institutional policy governing that practice. Of 287 programs surveyed, responses were obtained from 118 (41%). In 82 (70%) schools, policies were non-existent. And of those 82 respondents, 49 (60%) admitted that no faculty practice plan was being developed. The majority of nurse educators either practice without an institutional policy or do not practice. In several schools where no provision was made, promotion and tenure guidelines included faculty clinical practice in the evaluation process. Faculty who practiced during unscheduled time (i.e., weekends, holidays, and spring and summer breaks) and as needed were subjected to role conflict and time constraints because they had to coordinate two schedules. No support in the form of release time or lighter teaching loads was given.

Some form of policy was in place at 35 (30%) schools. However, the faculty clinical practice policies varied widely. Some required practice be limited to the institution's affiliated agency; several (11) indicated that faculty must obtain specific approval from the administrator to engage in clinical practice. Three schools' respondents reported that their policy prevented faculty practice during the academic contract period (p. 215).

Faculty perceptions of their own accountability to maintain clinical skills for direct patient care, i.e., through faculty practice, are the focus of two comprehensive

studies. Anderson and Pierson (1983) explored problems of practice which faculty perceive as facilitating or inhibiting maintenance of their clinical skills. The authors conducted a survey of all National League for Nursing (NLN) accredited baccalaureate programs to determine which programs had faculty members in practice. In response, 127 NLN programs returned lists of faculty and 972 faculty were sent questionnaires. Of the total group, 573 faculty (59%) completed the survey. For the majority of respondents who were 40 years of age or under, had no dependents at home and had limited teaching experience, faculty practice was seen as meeting the needs of newer educators. Three principal reasons were cited for involvement in clinical practice: a) enrichment of teaching skills, b) maintenance of clinical skills and, c) personal satisfaction (p. 137).

Anderson and Pierson's findings also indicate that the greatest facilitator of faculty practice is perceived as administrative support. The implications are that faculty who strongly endorse practice roles seek employment where faculty have administrative support for participation in clinical practice. Almost unanimously, faculty also reported that students and agency staff thought favorably about their practice. Heavy workload was ranked as the greatest inhibitor to faculty practice. Half of the sample perceived faculty peers as having ambiguous/negative reactions to their practice which indicated continuing potential stress.

O'Shea's (1982) study of faculty workload policies and practices addressed factors which impact nursing faculty in higher education. A 40-item questionnaire was mailed to 333 nursing school deans who hold membership in the American Association of Colleges of Nursing (AACN). The major purpose was to examine factors administrators consider in determining faculty workload assignment. Deans at 72% of the schools responded; 55% were at public institutions and 45% were at private (p. 21). Results indicate that faculty workload is largely determined by quantifiable factors which directly relate to teaching scheduled courses. By contrast, less quantifiable factors such as student advisement, research, writing for publication, and involvement in direct client care for nursing practice were rated as having "minimal" or "no importance" (p. 24) by approximately 48% of the deans.

In the latest review of research on faculty practice Lambert and Lambert (1988) address role conflict and its impact on faculty involved in clinical practice. The authors review the theory of role conflict, its development and how it is likely to arise for the nurse who has been socialized into the role of care giver and then attempts to transit into the role of being a faculty member. Studies pertaining to role conflict in nursing faculty have related to how faculty spend their time (Solomons, Jordison, & Powell, 1980) and how they are viewed as faculty (Brown, 1981; Stuebbe, 1980). Davis and Williams' (1985) study indicated that nursing

faculty have greater difficulty than faculty from other disciplines in establishing and succeeding in an academic career in institutions of higher learning due to role conflict. Charron (1985) similarly identified that the expectations of nursing faculty for teaching, research, service, publishing, practice and study toward an advanced degree have given rise to role conflict for the nurse educator.

Descriptive studies of faculty in baccalaureate nursing programs have shown that they are continually involved in conflict due to work overload such as described by O'Shea (1982); and that they most often resolve conflict by direct verbal confrontation (O'Shea, 1982). Stressors faculty members experience and the consequences of unmet needs have also been studied by Bauder (1982) as reported in Lambert and Lambert (1988).

As indicated by these authors, numerous anecdotal reports and presentations at faculty practice symposia about various practice programs have been identified in the literature. Minimal research regarding faculty practice, however, has been done. In the authors' view, unless implications of practice on other components of faculty roles (eg. time allotted for faculty practice) are determined, the strains of role conflict will persist.

Rosswurm's (1981) study is similarly designed to reflect faculty perceptions of practice. Her study, focusing on

group clinical practice, found faculty spending a minimum of 12 hours per week in clinical practice. Faculty in group practice are more likely to be those who hold masters degrees and nurse practitioner certificates than those who hold masters degrees without practitioner certificates. Very few doctorally prepared nurses were found to be in group practice. A majority of faculty has full-time appointments with only 26% in joint appointments.

Another survey regarding faculty perception of clinical practice was sent to 545 faculty who were randomly selected by Parascenzo (1985). Based upon a response of 332 surveys (61.8%), the faculty revealed that they consider practice to be important for various reasons: a) to maintain competence, b) to supplement income, and c) to maintain confidence in practice ability. Faculty roles performed most frequently are those of teaching and service, with the most prevalent role combination including research, service and teaching. Faculty also perceive disparity in the importance of the roles and in the rewards associated with them. Specifically, practice provides minimal or no reward toward academic advancement.

McCarthy's (1975) descriptive study determined functions and responsibilities of faculty with joint appointments in baccalaureate nursing programs in university medical centers. Of 61 NLN-accredited baccalaureate programs located in academic health centers, 29 programs offered joint

appointments, but only 126 of the 244 faculty appointees in these schools actually taught and had clinical practice. Her assessment of functions and responsibilities of faculty in practice led McCarthy to three conclusions: a) nursing education is enhanced by having faculty role models who apply theory to practice; b) confusion results due to a variety of models available (medical, academic, service); and c) clarity is lacking as to which model is most appropriate for nursing practice.

An examination of administrative support for practice as reported by nursing education administrators was conducted by Dickens (1983). Of 113 questionnaires mailed in the southeastern region of the nation, 74 (65.4%) were returned. Of those who responded, 32% of full-time faculty and 42% of part-time faculty were involved in clinical practice activities. Among the full-time faculty, the majority practiced during the summer, on weekends or during academic recess. Joint academic appointments and private practice accounted for 80% of the clinical practice activities of part-time faculty. Only 11.4% of the administrators reported a formal structure or agreement in the school of nursing for faculty practice. Fourteen percent reported the presence of formal compensation policies. While 100% of the administrators indicated they approved of faculty practice, 68% did not require it for maintenance of a faculty appointment. Of the administrators who reported a mechanism

in place for faculty clinical practice, 23% said it was in the university promotion policy; 47% indicated it was part of the annual faculty evaluation. In summary, minimal administrative support for faculty practice in baccalaureate nursing schools of the southeastern region of the nation was evidenced in this study.

Models of faculty practice. Numerous case studies describing successful faculty practice models exist in the literature. Both institutional models and individual efforts have been reported. One, the "unification" model is designed to unite service and education. It is a method of faculty practice in which faculty fulfill clinical practice and faculty roles simultaneously as part of their faculty contract. The school of nursing and acute care agency are under one administration, one budget and one governing board. Pioneered by the University of Florida and continued at Rush University (Chicago) and the University of Rochester, the model has been described by Smith (1964, 1965), Christman and Kirkman (1972), Jezek (1980), Ford (1981), Nayer (1980), and Powers (1976).

The "collaborative" or "joint appointment" model differs from the the unification model in that faculty hold appointments in both service agencies and academe (Millonig, 1986). Separate administrative stuctures work together interdependently. Implemented by Case Western Reserve University School of Nursing (Ohio), it has been described by

Schlotfeldt (1969, 1981) and MacPhail (1981). A modified collaborative or joint appointment model implemented at Millikin University (Illinois) was reported by Westcot (1983) and another at the University of Pennsylvania was described by Fagin (1985). Other specific reports of modified models have been made by Pierik (1973), Nagai-Jacobson (1986), Chickadonz et al. (1981), and Sherwen and Salvio (1983). Individuals such as Campbell (1970), Basteyns (1980), Dadich (1985), Morrison (1985), Mahoney (1985), Llwellyn (1985), Cox (1985), and Donovan (1985) have provided reviews of both successful and failed joint practice experiences.

Authors who support both the unification and collaboration models contend that these models promote collaboration between nursing education and nursing service (Christman & Kirkman, 1972). Faculty have opportunities to conduct research, influence the quality of patient care and influence student learning (Ford, 1981). According to Millonig (1986), however, major problems pertain to equitable allocation of faculty within both educational and service settings and with division of responsibilities. Complaints of "burnout" (p. 168) and resentment about unrealistic time and energy demands are frequently heard among nursing faculty.

A nationwide survey of deans by Redman, Cassells and Jackson (1985) indicates collaborative arrangements between nursing programs and clinical agencies. Of 246 respondent

schools, 125 (51%) had formal reciprocity arrangements with clinical agencies. Another 16 (10%) were planning to make agreements in the near future. Among these schools, 54% were universities, 24% were academic health centers, and 22% were four-year colleges. Examples of collaborative arrangements were as follows: 47% provided faculty in-service programs for agency staff, 45% provided faculty consultative services to agency staff, 39% arranged for reciprocal representation on committees in clinical agencies and schools of nursing, and 33% shared audio-visual materials and computer hardware. The majority of nursing school deans perceived the greatest benefits from collaborative efforts to be enhanced communication with clinical agencies, maintenance of student clinical placements with agencies, and increased service staff and faculty satisfaction with clinical experiences. Of the schools in this study, 68 (28%) reported faculty in their programs hold joint appointments.

Creighton University (Nebraska) serves as an example of an "integrated" model which exists in a health care setting. As described by Ryan and Burger-Lux (1985), this institution's school of nursing created a professional services division in which faculty and students provide direct patient care. It has resulted in increased revenue generation, appropriate, quality-based patient care, and increased school of nursing and faculty visibility. Problems identified with this model related to accessibility of

practice settings and administrative support from both institutions and health care agencies.

Mills and Free (1984) describe their private practice model as one in which nursing faculty provide direct patient care. Faculty practice usually occurs during school hours in either an acute or ambulatory setting. If students are assigned to them during those hours, reimbursement for faculty time is usually made directly to the school of nursing. Faculty who practice as care giver using this model state that it provides students with a positive role model. Difficulties identified range from division of responsibility to both patient and student priorities.

Diers (1980) reports the results of four models of faculty practice at Yale University Graduate School of Nursing (i.e., joint, dual, school-owned services, moonlighting). In the joint appointment model, Yale has affiliation agreements and representation on policy-making boards with two large agencies. Both, however, are separate and independent corporations. Yale thus deals with another company which has no defined commitment to cooperate (p. 9). In the clinical arena, jointly appointed faculty carry their own clinical practice load and may participate in service education, staff development, and serve on agency committees and councils. At the school, joint appointees have teaching responsibilities in the clinical setting and in the classroom. With the creation of joint appointments, time and

salary are negotiated since there is wide variation among faculty appointees.

In the dual-appointment positions, individuals essentially have two part-time jobs, one in the clinical agency and one in the university.

In the third Yale model for faculty practice, the school staffed by the faculty runs its own services. Currently, as Diers reports, the model has been restricted to the nurse-midwifery program where faculty manage several services such as private practice with 24-hour service and a neighborhood health center (p.11).

The fourth model at Yale is moonlighting. It is used by some faculty who choose to maintain a private practice of their own without school acknowledgement and/or arrangement.

Following 15 years of experimention with faculty practice models in the graduate school, Diers (1980) reports that the most critical issue to its success is institutional support. She contends that when and where faculty practice is an integral part of the system, structure, administration, budget, recruitment and retention policies have been positivly effected. Academic "busywork" (p.12) is kept to a minimum; the teaching load for faculty is low; and a spirit of cooperation and inter- and intra-departmental sharing is encouraged.

Problems that faculty incur relate to conflict between Yale's views of quality-based patient care versus that of the

clinical agency. Faculty also complain periodically about their workload being greater than faculty in other disciplines. Students similarly complain that their interests and concerns are in third place, after patient needs and faculty research requirements. And, finally, attempts at establishing collegial relationships with physicians in the medical center setting, who are unaccustomed to faculty equivalent appointments, occasionally result in friction (p. 14).

At Pennsylvania State University an alternate collaborative approach was chosen by opening a nursing practice site which occupied one floor of the academic building. Additional alternate approaches are described by Nettles-Carlson, et al. (1985) for group practice and Hauf (1977), Barger (1986) and Jones (1985) for academic health centers. In the former, Nettles-Carlson, et al. reports that the authors are nursing faculty who also are nurse practitioners in group practice at a health maintenance clinic. Curently, the practice offers patient services five days a week. Five nurse practitioner faculty share clinic sessions, each taking a half- or a full-day depending on their teaching commitments. An internist sees patients for the remaining portion of the week. One of the faculty acts as the clinic coordinator which includes clinic coverage 40 hours a week (p. 9). Although the service has provided a clinical site for students and research, it has not been

problem-free. The authors report several effects such as isolation from the traditional mainstream of faculty life, concerns regarding their primary mission vis-a-vis patient service, viewing the delivery of service from a management rather than a humanitarian perspective, and dealing with the differences in values and measurements of productivity in the academic and service worlds. Productivity in academics is generally measured by research and publication; in service it is measured by the number of patients seen and revenues generated (p. 11).

To address the gap between education and service, Kruger (1985) describes a collaborative/joint faculty-practice position at Wichita State University. A collaborative relationship had already been developed between a private midwestern medical center and the university. Objectives for the joint position included increased communication between the two institutions, combining nursing roles of practice, education and research, bringing education and research to the practice setting, and facilitating the nurse educator's role as practitioner. During the initial period, the author was asked to develop a parent education program and begin a research study on the pediatric unit. She was also asked to establish a parent support group for parents with children in intensive care.

In the second phase, Kruger implemented the requests by involving the nursing students in these activities during

their clinical experience. Her final report at the end of the second phase recommended that the beginning collaboration be continued. The decision to maintain the position and to seek a reciprocal arrangement by a nurse in practice was approved by an administrative committee representing both institutions.

A similar arrangement is reported by Arlton and Miercort (1980) whereby faculty developed and operated a nursing clinic in a large senior citizens center in a northwestern region of the nation. Initially designed for faculty supervised baccalaureate student learning, clinic services were expanded to meet the older adults' needs. The authors report that the clinic provided an exciting and rewarding venture. Their access to various community resources and cooperation of physicians in the community assured them of its value. Major problems pertained to legal parameters of maintaining a nursing clinic, lack of continuity of care due to its closure during the summer months, and the patients' fears of being deserted.

Another modified means of collaboration is described in a case study by Dexter and Laidig (1980) at a midwestern state university school of nursing. Recognizing that they were fairly unfamiliar with an increasingly important concept in nursing practice, the authors used nursing service administrators, from agencies where most of their graduates practice. Each practiced in a collaborative mode. They

gathered information from published policies and procedures, interviews with administrative personnel and stacks of admission chart forms, discharge summaries, nursing notes and standardized nursing care plans. Then, using a team approach, the authors and administrators devised changes in nursing care plans, discharge planning and patient teaching tools to make them more realistic for graduates' needs in practice.

Munroe, et al. (1987) describes a collaborative model that was implemented by a newly established nursing education unit within a major research university. Having the advantage of establishing new traditions rather than revising the old, the model illustrates the critical role of education and service collaboration in negotiating and supporting nursing faculty practice. It also demonstrates the value the university places on clinical practice and its basis for combining research and teaching roles. The model in operation has three primary affiliations (formal agreements for nursing faculty practice) and two secondary affiliations (formal agreements for student clinical practice). The current model is providing an environment for successful faculty practice. Furthermore, faculty promotion and tenure criteria provide clinical practice with status and value which, in turn, encourage greater participation (p. 299).

Another study explores the use of the status-risk theory of receptivity to the unification model among deans and tenured and non-tenured nursing faculty (Yarcheski & Mahon,

1986). The status-risk theory of receptivity argues that "receptivity to change is due primarily to structural forces: the statuses or positions that people hold and the degree to which an innovation either threatens or benefits their statuses" (p. 65). In this theory, receptivity refers to the feelings of individuals to proposed innovation. The risk concept refers to the probability of loss or damage from an action of innovation.

Of 222 respondents in the study, tenured faculty demonstrated significant differences in receptivity and indirect perceived risk for a proposed unification model in nursing education according to their institution's requirement of a doctorate for tenure. Tenured faculty affiliated with institutions which require the doctorate projected less effective performances, i.e., less effective academicians, in combining roles through unification and thus less receptivity to innovation than their peers affiliated with institutions where no doctoral requirement existed. Doctorally prepared non-tenured faculty similarly demonstrated less risk-receptivity to unification. Among deans, no informal organizational status variables affected receptivity to proposed introduction of the unification model. Once the formal status of dean is achieved, differences in informal statuses are perceived as insignificant. The reason for this, Yarcheski and Mahon contend, is that in order to maintain the status of dean,

educators must project a positive attitude toward innovation and its benefits.

In an earlier study Yarcheski and Mahon (1985) examined receptivity to the unification model among the same group of respondents. Contrary to the later study, a majority of respondents held positive attitudes toward the model and their job after the model was introduced. The investigators indicated one possible reason for the difference was the positive description of the model sent to the educators.

Additional research related to practice models was reported by McClean (1985) at the 1985 Symposium on Nursing Faculty Practice sponsored by the American Academy of Nursing. The research describes one institution's effort to draw upon a national data base to design compensation guidelines for faculty in roles combining teaching, practice and research. At the outset, the investigator sought to identify current models in progress, and contact was made with schools with faculty in combined roles. All eligible schools of nursing who agreed to participate were sent survey protocols as a basis for a later telephone interview (p. 172). Of 14 surveys sent to schools with combined roles, nine were completed. Results of telephone surveys regarding implementation and institutional support for combined roles revealed wide variation among the nine schools. Essentially, two major patterns emerged. Six schools perceived clinical practice as a supplementary role for faculty who spend some

specified part of their time in a clinical setting. As an example, in one school faculty set aside one day a week during their twelve-month appointment for practice. At another, faculty expand their nine-month appointments by adding three months of clinical practice. The remaining three schools viewed combining faculty clinical practice and education as essential aspects of faculty identity. In both sets, variation was too broad to make generalizations.

The faculty practice models used among the schools were primarily unification and collaboration. Reports regarding extent of faculty involvement and tenure track appointments evidenced wide variations. In two schools tenure track was nonexistent.

By contast, all schools of nursing with combined faculty roles share compensation with the affiliated clinical agency. Four types of financial arrangements surfaced; however, all with combined roles, with one exception, provide higher salaries for their faculty.

Although results indicate wide variations, McClean contends that faculty compensation is inextricably linked to the structure and relationships among institutions. In her view combined roles are more likely to develop where one administrator is responsible for education and practice.

Kramer, Polifroni and Organek (1986) focused on the effects of faculty practice on student learning outcomes. As the only research identified on students, this study

determined the relationship between faculty practice and student acquisition of beliefs, values and attributes associated with professional socialization. Dependent variables studied include autonomy, locus of control, self-concept and self esteem, professional and bicultural role behavior, and characteristics associated with the professional role. Based upon Bandura's social learning theory, the investigators hypothesized that students exposed to practicing faculty would score higher on the dependent variables than those taught by nonpracticing faculty. One hundred thirty-four baccalaureate students and 14 faculty were included in the study. The results indicated that students taught by faculty in practice scored significantly higher on the dependent variable behaviors than those taught by faculty not in practice.

In summary, the above review has described research related to nursing faculty practice. Nursing leaders have considered faculty practice a vital link between professional nurses whose primary responsibility is education and those whose primary responsibility is service. Hence, descriptive, exploratory and self-report studies have dominated the literature. A few studies have reported faculty and administrator perceptions of faculty practice. As schools of nursing have emphasized the need for faculty to return to the practice arena, the potential for and reported role conflict between and within faculty and administrators has surfaced.

studies related to these characteristics, perceptions, social support and compensation for faculty practice have been identified.

Furthermore, numerous case studies describing and relating successful faculty practice models were reviewed. Institutional models as well as individual efforts to promote the advancement of the discipline of nursing (Algase, 1986) were included.

Finally, one study focused on the effects of faculty practice on student learning outcomes. As the only research identified on students, however, it was limited to affective role characteristics, rather than cognitive outcomes.

The review has demonstrated that a dearth of research pertaining to faculty practice currently exists. While it has described a variety of approaches and implementation models, research pertaining to whether differences exist in cognitive instruction, specifically critical thinking skills, between nursing faculty who are engaged in practice and those who are not, is currently non-existent.

Instruction and Cognitive Behavior

Research pertaining to the relationship of cognitive behavior with teaching tools will be described in the following order: 1) studies pertaining to promoting higher cognitive levels of instruction within varied disciplines such as philosophy, logic, sociology, psychology, ethics, literature survey, foreign language, hard sciences, and

professional programs such as business, law, and nursing; 2) methodologies which promote higher levels of cognition such as classroom verbalizations, individualized instruction, and problem-solving techniques; and 3) case studies depicting successful cognitive strategies for teaching critical thinking.

Discipline-based research. Cruickshank (1986) contends that educators have no skills for teaching cognitive learning since they have not been prepared in their advanced studies programs to teach critical thinking. His primary recommendations are to assist teachers with problem solving techniques, to employ these techniques as professionals, and to engage in reflection. In a survey of participants enrolled in 30 faculty development workshops held in 1983-1984 sponsored by Phi Delta Kappa chapters, Cruickshank reports that the the following question was asked: What are the potential benefits for teachers who engage in higher-level thinking including problem-solving and reflection? Although responses varied, they were all reported as positive. Respondents believed that faculty would be more sensitive, accepting and empathetic, tolerant, open-minded, flexible, wise, reasonable, resourceful, creative and informed (p. 87). Faculty also would be able to produce generalizations about teaching and learning, understand what these are about and analyze them more effectively. According to these practitioners, higher level mental activity results

in substantial improvement in the classroom and in student learning.

Ennis (1985) contends that teaching materials and tests for improving critical thinking need to be developed, that faculty need to be retrained, and that critical thinking as a concept needs to be addressed in a separate course. Ennis, as Director of the Illinois Critical Thinking Project, believes that elements of critical thinking are general and that they bridge subjects; hence, they need not be taught in subject-specific areas. However, since trained faculty and quality-based research materials are currently nonexistent, critical thinking elements need to be introduced in all subject-matter areas until the former are available.

In 1980 the Commission on the Humanities (Crow & Haws, 1985) confirmed that the premise for reasoning, namely critical thinking, should have an important place in the American educational system. Sponsored by the Rockefeller Foundation, the Commission stated: "The Department of Education should define critical thinking as one of the basic skills that provides the foundation for advanced skills of all kinds" (p. 2).

In Norris' (1985) view, research on the effectiveness of critical thinking instruction is insensitive to methodological issues. Using Annis and Annis (1979), Moll and Allen (1982), and Wright (1977), as examples, these studies investigate student experiences and do not use

control groups; hence, he cautions readers regarding interpretation of results.

Mayhew (1981) views subject matter as a vehicle for instruction. A combination of specific courses in the major and in general education does not comprise the total curriculum. The strongest premise Mayhew proposes is to develop respect for the human mind and teach students to liberate their mind and to develop their own intellect and creative thinking skills.

Annis and Annis (1979) conducted a study to determine if a course in philosophy has an impact upon students' ability to think critically. Given the critical nature of philosophy, the authors' purpose was to investigate overall critical thinking effects on students. One hundred twenty-one college students enrolled in four courses: Logic, Ethics, Introduction to Philosophy, and a non-Philosophy control class. Students completed different forms of the Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 1964) in the first and last week of the term in order to determine the effect of course content on their critical thinking ability. Using multivariate analyses, the study revealed that students in Logic performed better than students in the other three courses. Although differences existed in the total scores on the Watson-Glaser Appraisal, the Logic group scored ten points higher than the control group and the Philosophy classes scored higher than the control. However, these

differences were not statistically significant.

In a similar study Ross and Semb (1981) used the same Waston-Glaser Critical Thinking Appraisal instrument to test three groups of students. One group (experimental) enrolled in a course which included programmed philosophy; another group enrolled in a conventional philosophy course; and the third group was enrolled in a non-philosophy course (control). Each group was tested at the beginning and at the end of the term. Improvement in critical thinking skills for the programmed philosophy group as measured by the Appraisal test was statistically significant within the group.

Additionally, upon comparing all three groups--experimental, control and conventional--the experimental group again showed significant increases in the post-test results.

The use of logic as a branch of philosophy to teach critical thinking skills was explored in another study conducted by Crow and Haws (1985). Incorporated into a geology course for non-science college majors, logic was examined with two groups of community college students: one group received instruction in logic and one group received no logic instruction. Critical thinking tests were given to both groups and the results demonstrated that students who were taught specific rules of thinking achieved significantly greater change in critical thinking ability than those who did not.

In assessing the inclusion of critical thinking in the teaching of sociology, Baker (1981) reviews the research of philosophers, educators and sociologists. He reviews the earliest empirical studies relevant to sociology for Ralph Tyler in 1936 and Edward Glaser in 1941 which investigated questions of critical thinking. Tyler, for example, launched a major eight-year experimental project which promulgated the development of new critical thinking achievement tests. These were later used to study the effects of sociology instruction on college students. Glaser similarly developed a battery of critical thinking tests which were administered as pre- and post-test instruments in four experimental classrooms and in four control classrooms. Later labelled with "cautious optimism" (p. 337), Glaser reported that the experiment was successful. In his view, a carefully constructed curriculum could enhance the acquisition of critical thinking skills.

Baker (1981) also cites the extensive sociology curriculum entitled Sociological Resources for the Sociological Sciences (SRSS) (p. 338) which includes emphasis on problem solving and rigorous inductive learning originally designed for high school and college curricula. Additionally, the Harvard Social Studies Project (p. 340), a developmental and research model, served as an empirical appraisal of a critical thinking test. At the college level, according to Baker, relevant studies are extremely sparse.

Using Tyler's measure of critical thinking, he reports Cook and Karninger's 1950 study employing a flexible group-work teaching plan in which students engaged in various problem solving discussions.

In another study Logan (1976) attempted to answer the question of whether sociologists teach college students to think more critically than do faculty in other disciplines. Constructing a 21-item instrument, Logan presented students with written material containing violations of critical thinking principles. His control group consisted of all students (n=470) taking sociology. Baker used another sociology section (n=84) as an experimental group (p. 34). In the experimental group, he provided explicit attention to developing generalized habits of critical and scientific thinking regarding social problems. The test results revealed that students who had completed the experimental course were more inclined to think critically and analyze items than all control group subjects. Those within the experimental group had even lower pretest scores than those in the control groups.

According to Baker (1981), Logan's success with a teaching strategy to increase critical thinking emphasizes the significance of critical thinking and the teaching of sociology. He pleads for sociology faculty to develop theoretical criteria and operational techniques in order to construct examinations which incorporate critical thinking.

Knowledge to improve faculty-made testing, Baker contends, must begin with course objectives. If faculty claim to develop classroom critical thinking, they must devise a system of assessing learning outcomes in order to support their claim.

Halonen (1985) reported involvement in a nationwide three-year project supported by the Fund for Improvement of Post-Secondary Education (FIPSE). The project was designed to construct a model for teaching critical thinking in psychology. The model begins with the experience of the student. When the student is confronted with an event which cannot be explained, critical thinking is initiated to reduce the tension created by the ill-fit and to restore a sense of balance. The author applied the model to the psychology curriculum at one private parochial midwestern institution. Initiated with the knowledge base of the learner, critical thinking concepts are introduced as the learner adapts to the classroom environment. From there, the faculty assists the student to go through the process of the model including evaluation of his/her own thinking skills. Results of using the model indicated increasing comfort with using critical thinking skills about psychology. Although questions regarding using critical thinking skills in the psychology curriculum remain, faculty reported increased support for the model in their overall mission.

A much earlier exploratory study on teaching critical

thinking in the psychology classroom was conducted by Lyle (1958). Using two groups of students, 27 in the control group and 28 in the experimental group, psychology was taught in two strikingly contrasting manners. The control group received conventional methods of lectures, discussion and examinations over textbook materials. Students in the experimental group were presented with study questions, problem assignments and term papers devoted to problems. Both groups completed pre- and post-tests of the Appraisal Test of Critical Thinking, form G and the American Council on Education Psychological Examination (Dressel & Mayhew, 1954) (a 40-item achievement test). Results revealed that students in the experimental group showed more independent, critical thinking in essay questions on final examinations and more critical analysis on term papers than those in the control group. Top ranking students in the experimental group who appeared to flourish in that atmosphere exceeded those in the other group. Low ranking students in the control group, however, achieved higher overall scores on both tests.

In the field of speech communication, Katula and Martin (1984) reported an assessment of the composing process to determine use of critical thinking . Their intent was not how to deliver an effective speech; rather, it was to learn about the process of speech communication. D'Angelo's theory of rhetoric (D'Angelo, 1975) was used as an aid to rhetorical invention for the speech communication classroom.

Results indicate that as one method of teaching critical thinking, D'Angelo's theory reveals that whole pieces of discourse are observed, verbal patterns are usually present and that these patterns order individuals' daily thinking patterns. Putting the theory to work, students reported they were discovering and learning contemporary methods of critical thinking.

Page's (1987) research similarly addresses teaching critical thinking in a community college English literature survey course. Using three current investigations on the status, learning and developmental level of students in higher education, Page's study uses the recommendations of these reports in her classroom. She devotes in-depth study for content and emphasis since most students have no previous contact with the material. Historical background is similarly considered essential since "new students", as defined by Cross, require "more concrete, practical and immediate learning experiences" (Page, 1987, p. 3), and have had limited background in English history. Questions asking who, what, when and where are addressed before more analytical inquiry is attempted. The assignment of papers similarly facilitate growth by the nature of their requirements. Likewise, test construction moves from half objective and half essay toward more essay as student confidence with course materials increases. The author emphasizes the importance of "teaching dialectically" (p. 23)

to enable faculty to understand students' means of "making meaning" (p. 23).

Matthews (1986) reports projects on teaching critical thinking that are in use in college courses. One project (Stiffler, 1986) reveals that prose and poetry can serve to construct a critical view. Using three structures--narration, description and diction--he contends that students who successfully use these tools can construct interpretation of many varied writings.

Another project (Tippens, 1986) reported by Matthews helped improve students' learning process and communication in classes within other disciplines at a midwestern suburban community college. As a "traveling writing teacher" (p. 36) during one academic semester, Tippen's project involved evaluating other faculty assignments. Six faculty in other disciplines volunteered to participate and work with their respective classes of students collectively and individually to accomplish this project. Results revealed that when faculty encouraged written expression in several smaller, more frequent writing assignments, students' writing and learning improved. Restated, better written expression was the key to better learning. Tippens concluded that students repeatedly need help in the same basic areas, summarizing, analyzing and synthesizing, regardless of the course in which they are enrolled. The lack of critical thinking was the root of all their problems.

One other project reported by Bryant (1986) in Matthews pertained to a writing course in Literature at a southern state university. After spending weeks of writing lengthy critique-based comments to her class, the author recognized that critical thinking demanded much more time than a one-day class session. A subsequent report by the author provided the opportunity to present a whole unit of four class days on critical thinking in a rhetoric course at a midwestern flagship university. Focusing on how critical thinking is implemented and using analysis as a standard essay structure yielded drastically improved results in student papers and minimal critique-based comments by faculty.

In relation to developing critical thinking in the field of natural sciences, Moll and Allen (1982) conducted a study within the Biology department of a public southeastern university by developing an Introductory Biology Program. Since the program enrolled students from diverse disciplines, the researchers had ample opportunity to examine several factors that may affect students' progress. Using short videotape presentations to supply information quickly and efficiently, faculty in the program followed with lengthy analytically-based discussions to help students derive basic biological concepts. To measure the value of this type of program, college students enrolled in one section of the Introductory Biology Program were administered the same pre-test during the first week of class and post-test at the end

of the semester. The 50-item test was designed to measure recall and critical thinking.

A comparison of average pre- and post-test scores indicated highly significant improvement ($p < .001$) on content recall, critical thinking and total raw scores. The results revealed that science majors evidenced minimal differences when compared with non-science majors. Similarly, both males and females scored equally well. Moreover, an examination of the effect of ability at entry, in other words good versus poor high school preparation, demonstrated no significant correlation. The researchers' findings indicate that improvement is not a function of major, sex or ability at entry, but is a function of instructional procedures which stimulate critical thinking.

Although the above data clearly indicate overall improvement in critical thinking, some contend that improvement is a result of increased content. To refute that argument, Larkin, et al. (1980) examined differences in performance between experts and novices in solving physics problems. Given the same content so that all students use knowledge of the same set of equations, "experts" used differing problem-solving processes which incorporated critical thinking to solve the physics problems, than those who were "novices" (pp. 1339-1341).

Similarly, two studies were conducted by diSessa (1982) regarding knowledge-based learning of physics. One study

involved elementary-level students; the other, university-level students. Using the "Aristotelian" expectation that "objects simply move in the direction you push them" (p. 41), naive students in both groups revealed a surprisingly uniform and detailed collection of problem-solving strategies in learning to control a computer-implemented Newtonian object. Thus, the studies revealed that classroom physics training lacked influence on naive students' knowledge of physics.

Conversely, Wilson and Wagner (1981) examined a group of university students enrolled in physics whose major was pre-medicine. Each student's grade point average in a course especially designed to stress critical thinking served as the criterion measure. Fifty-five students (33 males and 22 females) comprised the sample. The Watson Glaser Critical Thinking Appraisal Test (WGCTA) was administered and scores for the test and grades from the course evidenced significant correlation. There was an even greater relationship between the students' entrance score on the College Board Scholastic Aptitude Test (SAT) and the critical thinking course in physics.

A pilot study conducted by Bryden (1984) examined how law professors teach students to think. He noted that at reputable schools, the mission of law faculty is to teach students how to think like lawyers. Since law school examinations and recitation are the sole means of evaluating law students, professors usually place "functional analysis",

a type of reasoning most often used for legal interpretations, in examinations. The author prepared two examinations which test these analytical skills and administered them to samples of third-year ie., senior classes at three distinguished law schools. These tests were repeated for three groups of freshmen the next fall at the same schools. Freshmen were tested in order to establish rough base lines by which to measure development of functional analysis skills. Although this was a pilot and not a definitive study, results were "suggestively consistent" (p. 500) from skill to skill, school to school and gender to gender. The senior students were nearly always more proficient than entering freshmen. The investigator contends that it seems unlikely students at other comparable law schools would do much better on the same exams since law teachers have similar educational backgrounds, teach similar courses and employ the same range of teaching styles. However, the lack of reasoning skills in the classroom and on written examinations confirms the author's belief that good analytical skills are omitted from the law classroom (p. 503). In courses where critical thinking is emphasized, cognitive learning was enhanced.

Meyers (1984) explored differences in cognitive strategies among and between freshmen English students and their faculty. A pilot study to identify and describe students and faculty according to types of cognitive

strategies they typically use to learn was conducted. Three classes of 46 freshmen enrolled in English Composition and 25 faculty at a public southern university participated in the study. They completed a previously validated instrument for assessing their preferences during the first and final weeks of the 15-week semester. The results indicated that Freshmen English students most preferred analytical (formal logic and deduction, p. 64) cognitive strategies; "realistic" (empirical view and induction, p. 64) ranked second, "pragmatic" (eclectic view; whatever works, p. 64) third, and "idealistic" (assimilative, holistic view, p. 64) fourth both at the beginning and at the end of the semester. Faculty, however, strongly preferred "idealistic" strategies, with "analytic" in second place (p. 66). The study raised a number of questions for the researcher: Are the preference profiles typical of other Freshman English students and instructors? How might students in remedial, advanced or creative writing classes differ? How can the knowledge of writing differences help instructors individualize instruction? Can viewing cognitive strategy differences more introspectively affect differences in writing tasks? Will use of selected writing activities consciously affect cognitive learning? Meyers concluded that faculty need to understand their own use of cognitive strategies and the needs of their students to determine differences.

Another study analyzing the teaching of critical

thinking was reported by McDermott (1980). One research question raised by the investigator pertained to teaching strategies used by 103 schools of nursing who were accredited by the National League for Nursing (NLN). The schools of nursing consistently acknowledged the value of critical thinking as a major aim. However, numerous schools did not define critical thinking nor document ways that the curriculum was promoting critical thinking. References to skills regarding critical thinking far outnumbered references to knowledge and attitudes. The findings suggest that faculty must not only verbally affirm the aim, but also be convinced of its importance and familiar enough with the concept in order to indicate how to achieve it.

A similar study conducted by Gross, Takazawa and Rose (1987) examined the impact of nursing education on nursing students' critical thinking abilities. They viewed critical thinking synonymously with problem-solving. They also viewed nursing as a problem-solving process which is client focused. Hence, the use of the problem-solving process eg., nursing process should increase nursing students' critical thinking ability. Using the Watson-Glaser test as a standard tool for measuring critical thinking, a sample of 108 associate and baccalaureate nursing students in one program were examined at entry and at exit. For those who took pre- and post-tests, comparable improvements in critical thinking were noted. Students who scored high in critical thinking

ability also earned high cumulative grade point averages. Additional findings revealed that older, baccalaureate participants showed highly significant correlations with critical thinking.

In summary, studies pertaining to the instruction of critical thinking within varied disciplines such as philosophy, logic, ethics, sociology, psychology, literature, biology, physics, and programs of pre-medicine, law and nursing reveal varied results. In courses where cognitive teaching strategies emphasize critical thinking, significant improvements are noted. However, where teaching basically emphasizes topical content, no significant differences in cognitive learning are found.

Higher cognition methodologies. The following review presents studies pertaining to methodologies which promote higher levels of cognition through education. These general studies involving classroom verbalizations, individualized instruction, and problem-solving techniques are limited in that the majority are directed to primary and secondary education.

In three recent national reports pertaining to the status of curriculum in higher education, critical thinking as a major educational outcome has been centrally discussed. The first of these reports, Involvement in Learning: Realizing the Potential of American Higher Education by the Study Group on Conditions of Excellence in American Higher

Education (1984) recommended increased student involvement by urging faculty to make greater use of active modes of teaching. Examples included involving students in faculty research projects, carefully monitoring internships and experiential learning, organizing small class discussion groups, requiring in-class presentations, providing simulations in appropriate content areas and creating opportunities for individual learning projects (p. 41).

In a second report, A Nation at Risk, the National Commission on Excellence in Education (1983) emphasized the need to develop critical thinking skills which the Commission believes are nonexistent in many 17-year olds who are entering college as freshmen. "Nearly 40 percent cannot draw inferences from written material, only one-fifth can write a persuasive essay, only one-third can solve a mathematics problem requiring several steps" (p. 9).

The Association of American Colleges report, Integrity in the College Curriculum (1985), similarly identified the critical concern of the 1980's as the erosion of undergraduate education. It proposed an entire restructuring of the curriculum around nine essential unprescribed experiences, not subjects. The first stresses inquiry about abstract logical thinking. Along with explaining eight other elements, the report indicates that the American college curriculum has not failed to offer up knowledge. Its problem is that, "it offers too much knowledge with too little

attention to how that knowledge has been created and what methods and styles of inquiry have led to its creation" (Association of American Colleges, 1985, p. 24).

Although there is a dearth of research on critical thinking methodologies, increasing responses to the critical concern over higher education curriculum are reflected in the literature. For example, in classroom verbalization, researchers have developed systems for classifying faculty questioning. Based on numerous studies, these fall into two major categories: fact and higher cognition. At all levels of education, an emphasis on higher cognitive questions generally produces better learning than emphasis on fact questions (Dillon, 1984; Gall, 1984; Gooding, 1983; Hunkins, 1976; Rosenshine, 1971; Stodolsky, Ferguson, & Wimpelberg, 1981). Certain types of questions also can either inhibit or encourage class discussion as Roby (1979, 1984), Swift and Gooding (1983), and Swift (1983) have identified.

One study which examines questioning behavior across multiple variables was conducted by Barnes (1983). Research objectives related to the following: a) What cognitive levels are elicited? b) What questioning patterns are present? c) Is there a relationship between faculty and students' level of cognition and their general cognitive level of talk?

The sample consisted of 40 classes at two large public and two small private undergraduate institutions. Fifteen

classes were randomly chosen from each large institution, and five classes were randomly selected from each small one. Each class contained 47 students. A total of 155 class sessions were recorded. Faculty were randomly selected to participate. Using the Amidon Modified Category System (MCS) (Flanders, 1970), each tape was coded and then further broken down according to the Aschner-Gallagher System for Classifying Thought Processes in the Context of Classroom Verbal Interaction (p. 64) and readied for analysis.

The portion of total class time spent in questioning revealed no significant differences across any of the disciplines examined. The overwhelming percentage of all questions asked was on the lowest cognitive level across disciplines and at both beginning- and advanced-level courses. The questioning level was similarly independent of institution type. Questioning levels of convergent thinking did differ across institution size with large schools having a higher percentage of questioning at this level. Large private institutions had a high incidence of divergent-thinking questions. Although a very small portion of most college classes was spent in questioning, professors in mathematics and science asked more cognitive memory questions than those in the humanities who asked more convergent and divergent questions. In general, the findings of this study indicated to the researcher a void of intellectual interchange between professors and students and an apparent

lack of excitement and vigor.

College classroom interactions and critical thinking were similarly studied by Smith (1977). The focus for process analysis was on active student involvement in learning. In particular, activities identified as related to involvement were: a) degree to which faculty encouraged students, b) degree and nature of faculty questions, c) degree and level of student participation in cognitive learning, and d) the degree of peer-to-peer interactions. Using a modified version of Flander's Interaction Analysis System (Flanders, 1970) for interactions and the Watson-Glaser Critical Thinking Appraisal and Chickering's behavioral self report index for critical thinking (Chickering, 1972), Smith studied 12 classrooms and 12 faculty. Of 210 students in 12 varied disciplines, 148 (70%) participated in the study at the beginning of the term and 138 (66%) completed the instruments at the end of the term. Using canonical correlations, analysis of variance and univariate analyses, the author found that student participation along with faculty encouragement and peer-to-peer interaction consistently emerged as significantly and positively related to critical thinking. Though the study was designed as an exploratory investigation, it supported the general notion of the importance of active student involvement and faculty encouragement in cognitive instruction.

Another study related to teaching critical thinking skills was conducted by Statkiewicz and Allen (1983). The study focused on involvement and active participation through out-of-class exercises. The study's hypothesis was that consistent execution of the exercises would lead to significant increases in critical and analytical reasoning ability. It was tested by measuring longitudinal changes in practice and examimation grades. After one class session, 112 students were given 10 to 12 problems on a weekly basis. Practice problems were graded and returned promptly. Additionally, an examination was given every four weeks during the semester. Total scores on practice problems were correlated with examination performance. Grade groupings for letter grades of "A", "B", "C" and "D" were determined by students' grades. Random sample sizes for each grade were 12. Students receiving a grade of "F" were excluded from the study.

The research results indicated significant ($p = .009$) performance on practice problems. Higher grade groups over the semester tended to increase; the lowest grade group of "D" decreased. Another important finding revealed that students' improved skills of performing exercises helped them transfer those skills to new situations. Hence, the use of written practice exercises provide a valuable step toward developing analytical reasoning. The authors' study reveals some significant changes over a long period of time.

Martin (1984) sought to determine if certain teaching strategies improve cognitive instruction in teacher education programs at a private institution of higher learning in the eastern United States. Using a group of 24 students in both an experimental and a control group in an educational psychology course, specialized cognitive activities were presented to the experimental class. Instructors introduced a paper and pencil activity which provides practice in cognitive skill development. Skills practiced included projecting vertical relationships, comparing, analyzing, orientation in space, creating precise instructions, temporal relationships, cause and effects, categorization, logic and synthesis. Class discussions involved strategies for solving a problem. Students then worked individually or in pairs to find solutions, and faculty with students brainstormed and listed ways to apply those practices to daily teaching demands. On a measure designed to assess verbal skills, an analysis of experimental students' writing showed clear improvement in precision of description, explanation of meanings behind pictorial stimuli, a statement of similarities and a statement of differences (p. 70). No such trend was evidenced in the control group. On a learning styles' post-test, the experimental students demonstrated statistically significant differences in preference for a reflective style as opposed to the control group's preference for impulsive style. Furthermore, the experimental group was

reported to have better discussion leaders in their own classrooms.

Fontes (1987) similarly used classroom strategies to promote discovery and inductive learning by active student involvement. From the total class group, small work groups were formed with four to nine students in each group. The faculty member distributed a set of issues related to course objectives to each group for exploration and critical evaluation. The investigator reported that a total group report followed by discussion, summary and analysis of the process indicates a noteworthy, successful strategy for class sessions.

In another study White (1985) reported using Rogers theory of learning (Rogers, 1969) to teach a student-centered senior-level calculus course. Since the course was designed to be anxiety-free, the author served as a facilitator while his students discussed their learning bases on the use of several pre-agreed references. The approach increased the vitality of student interactions, their questions as well as their range of questions. Seeking to raise the students' cognitive level of questioning and thinking about the subject, the investigator found he had much more semester time to devote to the subject matter. Students, however, indicated that although they learned "a lot" (p. 46), they might have learned more with a conventional lecture and text. Because it appeared to be play vis-a-vis work, they were

afraid inadquate demand was made of them. Statistically both faculty and students were transformed by their participation in the learning process. As students gained confidence in the growth of their knowledge by their new discoveries, this increased their ability to measure it with intrinsic standards.

Another strategy conducted by Fry (1985) pertained to incorporating simple principles of memory theory into classroom lectures and materials to enhance student involvement and success in learning. By participating in a Fund for the Improvement of Post-Secondary Education (FIPSE) observation project, the author discovered a variety of memory strategies centered on notetaking in classes. Although his report did not specify statistical project results, the author's interviews of college students identified the following principles to enhance memory success. One is that efficiency depends on organization of groups of memorized items as well as individual items. They involve links formed in storage. The notion of chunking consolidates units into groupings. Further, material using maximum associations with known items, enhances new associations. Concrete visual imagery also helps since it includes the sense of vision. Finally, listening to the structure recited orally, daily, completely, and with variety, impacts the learners' memory and enhances understanding.

A generative effect of notetaking during lectures was evidenced in two experiments conducted by Peper and Mayer (1986). Three hypotheses concerning how notetaking affects the learners' cognitive process during encoding were investigated. The first two hypotheses are based upon a quantitative question of "how much is learned?" (p. 34). However, the third hypothesis, related to generative effects, seeks to determine additional processes, such as the degree to which the learner is able to relate the material to existing knowledge. Results of the first experiment indicated that of 40 students, the majority of notetakers performed significantly better on far-transfer items i.e., problem-solving tests and worse on near-transfer items i.e., recall, fact retention tests than the non-notetaking group. A second experiment replicated the first and extended the results by examining predictions of the generative hypotheses. Using 89 college students for the experiment, the pattern occurred for subjects who were moderately unfamiliar with the material but not for subjects who were highly familiar. Other treatments such as answering conceptual questions produced similar results. Results indicated that notetaking can be a problem-solving activity that encourages students to build connections between what they know with what is presented.

Knefelkamp (1974) unequivocally supports designing a curriculum that increases students' cognitive learning

concomitant with their psychosocial growth and development. Using Perry's model of intellectual and ethical development (Perry, 1970) to design a course, the investigator explored whether freshmen who are enrolled in that course at a large, flagship midwestern university can be positively affected. The investigation was also intended to explore if teaching methods can be designed which will be differentially effective in moving students upward along the Perry scale. An interdisciplinary course combining literature and psychology was designed to focus upon four major identity themes of college freshmen. Two sections of the course were taught, each with a different instructional method. One section was designed to foster the movement of dualistic-thinking students to relativism; the other was to foster movement of relativistic-thinking students toward commitment-making ability. Using a sample of 31 college freshmen, each class session was taped and analyzed by trained raters. Students in both classes were given pre- and post-tests to measure developmental growth. They also kept log books, completed a midterm project and final examination and a lengthy satisfaction questionnaire incorporating all aspects of the course.

Results of this study indicated curriculum intervention caused movement upward along the developmental scale. In brief, faculty dominated class time 73% of the time in the dualistic treatment as opposed to 51% in the relativistic

treatment. They expressed alternate ways of viewing an issue 2.3 times per rated segment in the dualistic group as opposed to 1.7 times in the relativistic treatment. Faculty emphasized the need to make commitment .9 times per rated segment in the relativistic section and .6 times in the dualistic section. Students similarly initiated ideas, suggestions and questions approximately 7.4 items in the dualistic vis-a-vis 5.8 times in the relativistic section. Enough evidence was obtained to warrant further research on the impact of faculty instruction on student cognition.

Stonewater and Daniels (1983) similarly studied the effects of classroom instruction on student congitive development. They compared development of students in a career guidance course based on Chickering's theory (Chickering, 1969) with that of students enrolled in two comparison courses not designed to incorporate developmental theory. Specifically, the study was designed to measure effects of instruction on psychosocial development such as autonomy, sense of purpose, and freeing interpersonal relationships through small group sessions. Results of the study showed that the effects of instruction on psychosocial development were mixed. Those outcomes related to cognitive development, however, indicated significant pre-course to post-course gains for students in the Guidance 100 course. Of 23 students studied, the resultant mean change was .34 positions per student, a statistically significant shift in

level of cognitive functioning. Also, where cognitive development was greatest, students showed no psychosocial development gain. Conversely, where students showed the greatest pre- and post-tests gains in psychosocial development, they demonstrated no changes in cognitive development. The researchers speculate that perhaps certain levels of development in one area may be necessary before other areas proceed.

Another intervention which designed curricula to specifically target critical thinking was reported by Keenley, Browne, and Kreutzer (1982). Despite the current plethora of interest and concern of educators to design curricula that emphasize critical thinking, the authors recognize that remarkably little research has reflected this impact. The researchers used a series of open ended and broad essay examination questions to determine the impact of cognitive instruction on freshmen vis-a-vis seniors at a large mid-atlantic university. Both classes were randomly divided into two equally sized groups. Half of each group was given a general essay and half was given a specific essay to answer. Results indicated that when asked to apply specific evaluating skills, seniors were superior to freshmen. However, they also evidenced important deficiences. Forty to sixty percent of the group failed to provide one example of a logical flow, a significant ambiguity, or a misuse of data. The authors concluded that

more explicit direct teaching of critical thinking skills with demonstrative feedback is needed in the classroom in order to evidence a clear understanding of these skills.

Cranston and McCort (1985) evidenced similar interest in freshmen students by conducting a study of beginning nursing students in a southwestern state. To determine the subgoupings, a class of 60 was selected and randomly divided into two groups. The first group was administered the Modified Joseph Hill Cognitive Styles Map (Ehrhardt, 1983) and the other was administered the Grasha-Richmann Student Learning Style Scale (Grasha & Richmann, 1982). Additional instructor interpretation was provided for the first group, since the test is generally given to each incoming student. Analysis of the results revealed no statistically significant difference in scores between the two groups. However, mean scores for Group One were slightly higher than those in Group Two. Findings also indicated the learning style preferences of students in Group Two, which the authors believe, should assist faculty in designing improved cognitive instruction tools. Follow-up recommendations included a close study of instructional strategies, resource utilization, course goals and outcomes which should indicate the type of learner analysis tool that is needed.

The WARRANT Project was a three-year effort sponsored by the Fund for the Improvement of Post-Secondary Education (FIPSE) to design and implement a computer system for college

freshmen to develop critical thinking skills in writing, reading and thinking. Reported by Geisler (1986), the project was published in its beginning and unrefined stages. The author and his colleagues at a prestigious eastern university are committed to developing a set of goals, methods and a time-frame for teaching. At publication the author has gathered data with three foci: knowledge about experts, knowledge about uninstructed students and knowledge about instructed students. The data thus far have evidenced disjointed critical thinking skills from experts as compared with uninstructed students.

Tentham and Halpin (1979) conducted a study to determine the effects of individualized undergraduate instruction on cognition and attitudes. Fifty-one students were pretested and then randomly assigned to two experimental groups. One group received unsupervised, independent packaged instruction; the second group used the learning center approach in learning areas for problem-solving discussions, games, instructional media and readings. Post-test scores for the second group were significantly different from those of the first group in that cognitive gains were significantly greater. The students also indicated more favorable attitudes toward the learning resource center as compared with those in the first group because students were more involved with their faculty.

Perkin's (1985) research examined whether postsecondary

education enhances informal reasoning skills such as skill in the construction of arguments. Eight groups of 40 students were balanced for sex, but varied in levels of educational preparation. Each student was interviewed for demographic information, presented an issue, given five minutes alone to think and reach a conclusion about it, given follow-up questions to further probe his/her reasoning skills, and administered the Slosson Intelligence Test (Slosson, 1981), a short-form IQ test. (Perkin, 1985, p. 564).

Findings revealed that once the reasoner had determined a simple mental model, he/she did not critique the model deliberately or consider alternate mental models of reasoning. The researcher contends that higher education has provided "borderline statistically significant impact" (p. 561) on students' reasoning skills. Most commonly, he explains, education minimally teaches students to exercise these skills.

Woods (1977) conducted a longitudinal study to determine how to improve the teaching of problem-solving at a large northwestern university. Over 1000 academic departments in the United States, Canada and England were asked to describe how they teach problem-solving. Based upon a wide range of responses, the researcher summarized and placed them into five general categories. These were: a) separate course on problem-solving; b) problem-solving as the core of course design; c) case studies as the curriculum core; d) problem-

solving steps; and e) the strategy of problem-solving (p. 93). Based upon these results, Woods provided suggestions for the university faculty to use in overcoming the concerns of diverse students' backgrounds, difficult course content, and students and faculty difficulties with the problem-solving concept.

Case studies. Several case studies involving institutions of higher learning which reveal successful cognitive instruction that develop critical thinking skills will next be reviewed.

One study reported by Stern (1978) revealed how a "hands-on" (p.225) problem-solving approach can be used in an introductory political science methods course within a southern public university. The course was divided into three sections: a) defining an empirical problem; b) the logic of problem-solving as applied to critiquing; and c) the logic of problem-solving as applied to writing one's own work, including writing a research proposal. Students have reported that the course provides them with a basic introduction to empirical problem-solving and exposes them to practical methods for solving problems.

Another case study reported by Nugent and Munroe (1983) was developed via a grant from FIPSE to help unprepared students in their freshmen year learn to engage in critical thinking and problem-solving at a public northeastern institution. The course was designed according to the

authors' findings in cognitive psychology, psycholinguistic theory and rhetorical research. Their findings resulted in four guiding priniciples: a) intellectual strategies needed in critical thinking can be defined and taught; b) writing is one of the best methods to develop long term use of intellectual strategies; c) both reading and writing processes can be improved by certain activities; d) language skill development is most effectively accomplished in realistic problem-solving situations (pp. 6-7).

As a pilot, the course resulted in the decision to place problem-solving as the core and to increase attention to the needs and expectations of general education faculty as well as enrichment of the course to challenge the better prepared students. It reinforced the need for all general education faculty to incorporate the concepts and submit a list of problems for students to practice. This exchange of information would benefit the learner as well as the faculty member who percieves more self-involvement as a problem-solver.

The premise that three-quarters of high school and college students operate at a concrete level of thinking led Hendrickson (1986) to design a special course at a land-grant midwestern university. Entitled, "Developing Critical Thinking Skills" (p. 2), it was intended to help students develop logical reasoning skills. The course provides experiences with methods and materials diverse enough to

appeal to the needs of the differing thinking styles of students. The general approach is first to have concrete situations with language and written symbols; these are then carefully represented with language and symbolic description. They are finally replaced with more abstract situations.

Responses of the students in the class indicate that college students needed concrete experiences when first exposed to unfamiliar material. If concrete materials are abandoned prematurely in favor of more symbolic and abstract methods, students request a return to concrete situations (p. 20).

Although initially planned as a liberal education component to help freshmen and sophomores become better equipped to meet the thinking demands of various content courses on campus, the above course currently enrolls numerous juniors and seniors. At this writing two sections of the course have been offered every quarter for the past five years. Course credits have been increased from three to four. For the faculty, one of the most significant by products of the course has been a recognition of the need for a major overhauling of the secondary school curriculum so that students' prevailing orientation to college directs them toward thinking their way through problems rather than searching for memorized formulas and procedures.

Another case study reported by Flower and Hayes (1977) described the authors' attempt to introduce problem-solving

processes in written composition. Initiated as a teaching experiment, the authors incorporated the heuristic concept for thinking through problems. Their intent was to treat writing as a thinking process which uses a discovery procedure to achieve their goal. Their use of heuristics focuses on generating ideas in language form and constructing those ideas into written structure adapted to the reader's needs and the writer's goals (p. 452). The authors present the heuristic strategy in three parts: a) planning; b) generating ideas in words; and c) constructing for an audience. In their view, use of the heuristic process has facilitated the written composition process by offering the writer a new thinking technique and encourages analytic and experimental dynamics.

Another case study conducted by Phipps (1984) at a northwestern state community college focused on the development of critical thinking skills in adult students. Lamenting the apparent inability of adult community college students to think analytically, to synthesize, and to creatively apply material presented in class or text, the author was led to examine Piaget's (1969, 1970) research which theorized that six levels of development exist through which the learner must progress. Piaget divided these levels into two phases, concrete, subject-specific knowledge and critical or abstract thinking. The author applied these levels of development in preparing an 11-week writing course

at the college. Enrolled adult students were able to acquire concrete knowledge and skill and with assistance to progress to higher level, critical thinking about that knowledge.

Another case study for depicting successful cognitive teaching strategies was conducted by Fritz and Weaver (1986, April). Using critical thinking within a liberal arts framework at a midwestern comprehensive university, the authors report how these skills are taught in a basic speech communication course. A series of exercises tested in the classroom is currently being used to teach critical thinking. Students begin with forming heuristic skills such as investigation, discovery and criticism. They progress to framing (organizing) skill exercises which are followed by self-analysis, audience analysis, composition and speech imaging skills. Students were tested to determine the value of the use of critical thinking exercises in the course. The Kneupper-Williams assessment (Kneupper & Williams, 1984). Watson-Glaser Critical Thinking Appraisal (Herber, 1970), and the Test for Thematic Analysis (Winter, et al., 1978) demonstrated improved students' critical thinking skills.

In enhancing critical thinking within students, Gamson and Associates (1984) present four accounts of varied approaches to such an education. In the first, the CORE program at a private liberal arts institution consists of a series of 10 courses totalling 45 credits which are required of all students. Running throughout the eight undergraduate

semesters, the CORE is built around six themes which use materials and approaches from several disciplines. It is designed to make psychological as well as epistemological sense with a focus on the nature of the human condition. Course themes move from a narrow to a broad perspective. Rather than leaving basic skills, such as English composition and speech communication, to faculty specialists, the approach is integrative. It merges content with skills. Hence, writing, speaking, reading, and thinking are all treated in relation to one another. A crucial factor in its success was the establishment of an ongoing dialogue among the CORE faculty, which include 60% of the total faculty, about how to teach basic skills and integrate them into the required CORE courses. Along with a recognition of intellectual integration is a sense of personal integration. Confrontation with diversity provides a powerful effect on students' participation in an intellectual community.

Student interviews by the authors confirm the overwhelmingly positive results of the CORE project. Students indicated that an integrative and thematic curriculum does not surrender quality or depth; that the effort was liberating for faculty as well as students; and that CORE made students think more seriously about their world and its values (p. 40).

The second program, an external degree program in a northeastern state college, is geared to adult rural students

who have commuting difficulty to any one of the five state colleges. Each student builds a hand-tailored program which is delineated in a mutually agreed contract each term. Assigned to every regional cluster is a mentor who serves as a "college" (p. 42) to each student. While concurrently balancing a student's individualized contract with a strong commitment to liberal learning, review of the program indicated that each mentor does reach enough agreement on the components of a liberal education. Moreover, all aspects of the program--courses, clusters, and mentors--are evaluated for their potential to stimulate students' critical thinking development. According to Daloz (1981), students report that their education has affected their learning process and how they view themselves as responsible agents in the world.

Also located in the northeast region, the third college is a small private liberal arts institution. Rather than standing independently, like most liberal arts colleges of its size, it shares courses and other activities with three private institutions and one public institution. It brings together several disciplines within the four schools according to their characteristic mode of inquiry. As a young, innovative college with students between 18 and 22, it requires students to shape their studies in terms of their own interests. In order to survive, however, students must develop general inquiry skills and use them in a variety of academic and non-acedemic settings. Instead of requiring

students to take praticular courses, they are required to complete projects and papers on topics of their choice. Rather than letter grades, students receive extensive evaluations of their performance.

As students proceed through three divisions which serve as graduation requirements, differing requirements must be achieved. A strong emphasis is placed on the learning process itself. Students are encouraged to ask questions, review the literature, and try different solutions to problems; they quickly learn that nothing is given to them without strenous effort (p. 54). Since evaluation is based upon performance, faculty spend their time working with students,identifying problems, clarifying questions, experimenting with solutions, designing ways to test answers and review findings, and critiquing papers (p. 54).

At the fourth college, students receive practice in how to use their critical thinking skills in making choices. They learn how to assess themselves, receive support and criticism, set priorities and test options. They are encouraged to develop critical awareness when it is coupled with exposure to diversity. For them it is the first step in learning to make learning usable (p. 59).

A final case study described by Meyers (1986) reveals a midwestern public institution that was created as an alternative, competence-based university for adults whose educational needs were not being met by traditional

institutions (p. 103-104). Throughout the institution's early years faculty spent much time developing the curriculum and discussing teaching strategies with other faculty in the community.

The teaching seminar was initiated as an alternative to faculty workshops. Each seminar was self-paced and long-term; faculty were committed for a minimum of six months. A second seminar focused on the teaching of critical thinking. Group members represented a disciplinary mix. They were asked to share examples of problems or issues they wanted students to be able to analyze. Many different analytical frameworks were represented and most faculty were unable to define critical thinking. As each session was shaped, participants learned how to define the term and to incorporate it into their own analytical framework for critical thinking. The teaching seminar model provided an effective means of improving the teaching of critical thinking, since seminar participants took the lead in resourcefully sharing teaching concerns and devising ways to improve teaching. It has also demonstrated its success by the ease with which it can be used in other colleges and universities (p. 113).

In summary, research pertaining to the relationship of cognitive behavior with teaching tools was described and divided into three major sections. The first section pertained to studies which promoted critical thinking in

instruction within various disciplines, including philosophy, logic, sociology, psychology, ethics, literature survey, foreign language, hard sciences, and within professional programs such as business, law and nursing.

The second section pertained to research studies of methodologies which promote critical thinking such as classroom verbalizations, individualized instruction, and problem-solving techniques.

Finally, case studies involving institutions of higher learning which reveal successful cognitive instruction that develop higher levels of cognitive skills were reviewed.

Bloom's Taxonomy

The following review will describe the research of Bloom and his colleagues relating to the use of the Taxonomy of Educational Objectives (Bloom, 1956). Bloom's conceptual framework for designing educational objectives has been used in extensive research on student examinations and the curriculum. At an informal meeting of college educators attending the 1948 American Psychological Association Convention, a need was expressed to promote a system of classifying goals of the educational process. It became the first in a series of meetings which resulted in the creation of a concise model for the analysis of educational outcomes in the cognitive areas of remembering, thinking and problem-solving (Bloom, 1956).

The informal meetings of over 30 college educators

continued at a different university each year (p. 9). Some changes in membership evolved, but the nucleus remained. Bloom and his colleagues considered numerous problems in organizing and examining educational research. Although three domains of educational objectives were identified--Cognitive, Affective and Psychomotor--Bloom's group focused only on the various parts of the Cognitive domain (p. 5). Other members continued efforts toward developing the Affective portion. They avoided creating a classification for the third domain, Psychomotor, since they believed a classification would have little value for higher education at that time.

In order to engender as much criticism and evaluation of the cognitive classification as possible, all committee members discussed the Taxonomy with their colleagues, graduate students and other faculty in their corresponding institutions, a process thus involving several hundred readers (p. 9). The Handbook (Bloom, 1956) incorporates all of those responses. A subsequent presentation was made at a symposium of the American Psychological Association in 1951.

Following the symposium, 1000 copies of a preliminary edition of the Handbook were distributed to a larger representative group of higher education faculty, administrators, and educational researchers for further review and recommendations. Their responses were considered in the final version of the Handbook (p. 8).

Several guiding principles were used to prepare the Taxonomy. First, major distinctions between classifications reflected those made regarding student behaviors. Second, the Taxonomy had to be logically developed and internally consistent. Third, it had to be consistent with an understanding of psychological phenomena. The classification also had to reflect a purely descriptive scheme in which every type of educational goal could be represented. Restated, any intended behavior could be classifiable in this system. Finally, the classification levels had to be arranged on a simple to a more complex continuum.

The cognitive domain includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills (p. 7). In developing the Taxonomy, the committee members gathered a large list of educational objectives from their own institutions and the existing literature. They determined which part of the objective stated the behavior intended and which stated the object of the behavior. They divided the behaviors into groups, divided the cognitive objectives in subdivisions from the simplest behavior to the most complex, and then proceeded to define each subdivison (p. 15). As the Taxonomy was organized, it contained six major categories: 1) Knowledge, 2) Comprehension, 3) application, 4) Analysis, 5) Synthesis, 6) Evaluation (Bloom, 1956, p. 18).

Bloom (1956) reported that early drafts of the Taxonomy

were already extensively used. For example, examiners found it helpful for the faculty to formulate objectives more precisely. Major categories have been used as a basis for classifying test materials. Diagnostic reports of student test results in relation to the Taxonomy have been made in at least one institution. Reports to the faculty on the reltationship of test results to the objectives and learning experiences were analyzed according to the Taxonomy.

Through the use of the Taxonomy, studies on the relationship between measures of scholastic aptitude and testing behaviors have been conducted. These studies have indicated a very low relationship between tests of cognitive abilities and measures of intelligence (Furst, 1950). Rather, critical thinking is learned; it is cultivated by instruction which facilitates the learners' thinking skills (p. 615). Additional evidence (Furst, 1954) has supported the generalization that relationships among measures of different objectives are determined by the nature of the students' learning experiences.

Research supporting the use of Bloom's Taxonomy in higher education has focused on formulating and selecting educational objectives, designing curricula based upon selected objectives, determining students' learning by mastery achievement and in the evaluation of students' learning. Research validating specific categories in the Taxonomy has similarly been conducted. Beyer (1984) contends

that faculty's lack of success in teaching critical thinking skills stems from five factors: confusion over which skills to teach; failure to identify components of those skills; use of inappropriate teaching techniques; attempts to cover too many skills; and the lack of congruence between teaching and evaluating those skills (p. 556). In Beyer's view, Bloom and his colleagues have provided the best inventory of skills to use in teaching. And, these skills should be used for both teaching and testing students in teaching and learning are to be improved. Bloom's (1976) later efforts substantiate Beyer's claims. Quality instruction does produce great differences in learning outcomes in level and rate of learning achievement.

Based upon Bloom's assumptions Fischer and Grant (1983) designed a study to describe levels of cognitive skills used in classroom discourse and to measure their relation to factors in faculty teaching style and in college environment. Two instruments selected were the Florida Taxonomy of Cognitive Behavior (FTCB) (Webb, 1970) based on Bloom's Taxonomy and the Amodon Modified Category System (MCS), an adaptation of Flander's Interaction Analysis System (Flanders, 1970) which measures the teacher-control ratio in classroom interaction (p. 52).

The sample consisted of 40 classes at two public and two private undergraduate institutions. Full-time undergraduate faculty were randomly selected from each institution. After

obtaining faculty permission to tape class sessions, a total of 155 sessions were recorded. Using the above two instruments, all tapes were coded and faculty and student cognitive levels were compared.

The results were "startling and disappointing" (p. 54) to the researchers. Discourse in college classrooms rarely produced higher order thinking; most discussion was conducted on the lowest cognitive level, "Knowledge", the transmission of facts. At this level discussion occurred almost twice as often as at all other categories combined, regardless of the type of institution, course level, subject area, or length of class. Class size demonstrated a difference in the kinds of information-processing skills applied. Professors in large classes of 46 to 300 students used the first three levels of the Taxonomy more often and Evaluation less often than their couterparts in smaller classes. Students similarly made less use of higher order thinking processes in larger than in smaller classes.

Class size was also significantly related to students' use of cognitive skills. Students enrolled in small classes of 15 or less made greater use of higher order thinking processes than those in medium or large classes. Those in medium classes of 16 to 46 students, exhibited more second level cognitive discourse than those in small and large classes. Thus, students in small and medium classes made broader use of higher cognitive processes than did the

professors in those same classes. Students in large classes functioned at the same cognitive level as their professor.

Institution size was also significantly related to students' use of cognitive skills. Students enrolled in small colleges of less than 8000 students, made the most frequent use of the lowest cognitive level, Knowledge. Students in large institutions performed most often at the third level, Interpretation. Students in large colleges had more opportunity to apply higher cognitive processes to course content. Students also had a higher level of discourse than professors at large institutions and than did professors and students in small institutions.

Additionally, teaching style was related to students' use of information-processing skills. When professors used indirect teaching, students used higher cognitive levels in classroom discourse. As the frequency of professors' discourse increased, frequency of students' discourse decreased on all cognitive levels (p. 56). The study suggests that students are receiving minimal practice in applying higher order thinking processes to subject mattter. The findings support the need for faculty to develop effective teaching skills in classroom discourse in order to promote cognitive development (p. 58).

Additional support for Bloom's Taxonomy includes investigations into the taxonomic categories. The first study, conducted by Stanley and Bolton (1957), determined

whether 46 graduate education students would be able to classify educational objectives on test items. To identify potentially good classifiers, they were administered a concept mastery test. The eight highest scorers were then invited to classify 227 test exercises to determine the degree of agreement among them. After studying the newly created Taxonomy, the classifiers agreed on half--Knowledge, Analysis, Synthesis--of the six Taxonomy items.

A 34-item test was constructed from the exercises upon which agreement was made and administered to the other 36 graduate students in the course. The results indicated a .67 correlation. Since the above items were taken from old examinations, the authors re-applied the Taxonomy to items in the Graduate Record Examination (GRE) published by the Educational Testing Service in 1954 (p. 633). Agreement of graduate students on subcategories for quantitative and verbal ability items was high and better than on the achievement items in the Concept Mastery Test. Hence, the researchers contend that the Taxonomy has great potential value in classifying and clarifying educational objectives. However, in their view test publishers should match the level of objectives with test items so that higher levels of inquiry will be used.

A second study was conducted by Scannell and Stellwagon (1960). Although they addressed that need for investigating high school and college faculty and students, only 166 four-

year schools on the westcoast with enrollments between 500 and 2000 were selected to participate. The study compared chenistry course objectives with final examination questions to determine if a direct relationship exists between the two and to validate the degree in which tests measure intended objectives.

The results of the study suggested that faculty primarily emphasize "Knowledge" or the informational aspects of chemistry in their course objectives. Approximately 60 percent of the objectives are listed in the "Knowledge" category. Another 26 percent are directed to level two, "Comprehension". Faculty also stated that sixty-two percent of their instructional time is devoted to Knowledge; 26.5% is devoted to Comprehension; and only 11% is devoted to Application, Analysis, Synthesis and Evaluation. For the Chemistry tests reviewed, 60% of the items were factual at level 2 and 35% were at level 2, Comprehension (p. 13).

Course objectives as they related to the Taxonomy, were less reliably classified than test items since most objectives were non-cognitive and thus unclassifiable. Although the researchers recognized these problems, a "reasonable degree of accuracy" (p. 13) was obtained in classifying the exam items and course objectives. The results supported the potential value of using Bloom's Taxonomy to describe cognitive behaviors students are expected to achieve.

Cox (1965) similarly investigated the reliability of Bloom"s Taxonomy in the field of natural sciences. A random sample of 1000 males and 1000 females from a total of 3150 students who had taken the natural science examinations were selected to participate in the study. A total of 379 multiple-choice items from an introductory natural science course examination comprised the pool. All items were classified according to Bloom's Taxonomy and evaluated with approximately 85% agreement by three judges working independently. The index of difficulty for a particular item was determined by the percentage of students in the upper and lower 27% of the total test scores who passed the item. Those upper and lower 270 students (27%) in each distribution were used to complete the indices of item difficulty and discrimintion. Since values of difficulty and discrimination differ within the Taxonomy categories, average difficulty levels increased with increasing categories for both males and females. Restated, Knowledge items were easiest, while Analysis and Synthesis were more difficult (p. 183). Average discrimination indices followed a similar pattern for males and females. Generally, Comprehension items were more discriminating than Analysis. Although results revealed a biasing effect of items on the selected tests, a high percentage of agreement was demonstrated by judges testing the reliability of the Taxonomic categories.

Questions have been raised concerning the difficulty of

categorizing and validating items according to the Taxonomy. Anderson (1964), however, reported agreement on classification of the Taxonomy items. His investigation determined whether students' abilities using Taxonomy classifications differed when CHEM Study (experimental) as opposed to conventional study of chemistry was used for instruction. After the sample of 638 students was divided into the two groups, each was further subdivided according to high, average, and low ability levels according to scholastic achievement test results. Five months lapsed between pre- and post-tests using the Watson-Glaser Critical Thinking Approval, Form AM. The treatment group performed higher on this test than the conventional group. Factor analyses, using the process tests as varables, were performed on pre- and post-test scores for both groups, and they tended to support the hierarchical nature of the Taxonomy.

In a preliminary study, Stoker and Kropp (1964) similarly reported an investigation concerning the empirical validity of the Taxonomy. Data were collected using two tests specifically designed for the study. Each was a reading comprehension test dealing with science content; one dealt with atomic structure and the other concerned relationships and size. Both tests used items nearly equally distributed across Bloom's six levels. Following the tests, five judges independently classified the items on the atomic structure test and four judges on the relationship test. All

nine judges were doctoral students in the field of educational measurement and were familiar with the Taxonomy (p. 39). Thirty-six percent of the items demonstrated unanimous agreement among the judges. On other items, agreement was generally achieved to support the hierarchical structure of the Taxonomy. The data did suggest, however, a possible misplacement of Evaluation in the hierarchical structure. There was some support that it be placed as fifth rather than last in the categories. Kropp and Stoker's (1966) final report described a three-year series of studies which examined the construct validity of the Taxonomy. The study is considered the most comprehensive work to deal with the Taxonomy (Seddon, 1978).

Although the Taxonomy was constructed to be hierarchical and cumulative, few studies in the literature directed attention to its validity as a hierarchical structure. Hence, the entire project was directed to that purpose. Four special tests were constructed for use. Preliminary forms of each were pretested such as described above. They were administered to 1600 students at each ninth-through twelfth-grade level in 10 Florida schools from a five-county school system. The majority of students were administered all four taxonomy-type tests which required eight hours; no student was administered fewer than two of the forms.

Thirty-seven cognitive aptitude tests were chosen from the Kit of Reference Tests for Cognitive Factors (French, et

al., 1963) for use in the study. Approximately 275 students from each grade level took the cognitive reference tests. Scoring was made by trained staff and the tests were intermittently run for quality-control checks.

Results indicated that the hierarchical structure of the Taxonomy was generally supported. In the social science tests, means for all student levels were in the predicted hierarchical order. Only one science test at all grade levels revealed a systematic reversal of means on the placement of synthesis and evaluation (p. 168).

Numerous recommendations arose during the project. First, students should "overlearn" (p. 169) relevant content to confirm storage until more refined measurement techniques are available to determine whether knowledge is a process of recall or a measure of stored content. Second, guidelines for interpretation of item analysis data from taxonomy-type tests must be established. Third, data from the study should be used as a practical, relevant guide for validating the Taxonomy. Fourth, the evaluation process as described in the Taxonomy deserves further study. And, finally, research should be conducted on item-writing techniques in order to make evaluation and synthesis more amenable to multiple-choice assessment.

Tyler's investigation in 1966 also determined the reliability of the Taxonomy by selecting two independent judges to evaluate 384 test items on a geography examination

and achieving 75% perfect agreement with the taxonomic categoried (p. 305). Used to analyze programmed instruction, the Taxonomy served as a useful tool to evaluate the program's narrowed emphasis on the knowledge and comprehension categories.

Herron's (1966) investigation sought to determine a better description of differences between a new curriculum entitled CHEM study and a conventional chemistry course in terms of cognitive gains. The CHEM study curriculum develops cognitive abilities or processing skills as described by the Taxonomy. The course emphasizes application of chemical principles in the laboratory, on quantitative problems, and in course tests. Students in four schools of comparable size each enrolling between 150-200 chemistry students participated in the study. The enrollees were divided into three ability groups on the basis of their centile rank on the Iowa Test of Educational Development (Lindquist & Feldt, 1972) and were given a validated Taxonomy test and the Watson-Glaser Appraisal Test in a pre- and post-test design (p. 161). Both treatment groups showed significant gains in mean on all subtests. But the specified changes between the two groups indicate the CHEM study class had higher order cognitive abilities and were thus superior to the students in the conventional class.

Poole (1971, 1972) similarly explored the conceptual scheme of the Taxonomy by testing a validated item-based

examination's use with eighth and eleventh grade students. In both studies the panel of judges emphasized a general lack of agreement among categoric levels. However, data supported a partial hierarchy formed at levels One and Two i.e., Knowledge and Comprehension (1972, p. 87). Reanalysis of the items using a longer test in the second study yielded higher taxonomic levels proposed by the Taxonomy. The data also revealed a difference between what an item was intended to measure and what it actually did measure.

Madaus, Woods and Nuttall (1973) administered four taxonomic-type tests to 1128 students in grades nine through tewlve to test if mental ability vis-a-vis command of knowledge is measured along the lines of the Taxonomy. Two of the tests were in natural science and two were in social science. Each of the four tests consisted of two parts. Part A included knowledge, comprehension, application and analysis items; Part B included synthesis and evaluation. The researchers also administered the Kit of Reference Tests for Cognitive Factors (KIT) (French, et al., 1963). Through the KIT, the validity of any proposed hierarchy is tested in terms of direct and indirect relationship between the categories. This time, rather than a simplex model approach, a causal model design was used (p. 254). Testing indicated a decrease in direct links or linear relationships as levels become more complex. Failing to comply with conditions of a cumulative hierarchy, Madaus, et al. suggested that the

Taxonomy had a Y structure; the stem of the Y formed from Knowledge and Comprehension to Application. It subsequently divided into one branch of Analysis and another branch incorporating Synthesis and Evaluation. Moreover, the first four levels measured achievement, which are dependent upon learning and experience; and the latter two levels measure general ability (p. 261).

Another investigation conducted by Fairbrother (1975) attempted to test the validity of two examinations by paying closer attention to the abilities which individual questions attempt to assess. It was designed to determine whether agreement exists among faculty regarding the abilities tested. The papers used were advanced physics examinations from the Oxford and Cambridge Examination Boards of 1970 and 1971 respectively. Of 63 British faculty contacted, a final sample of 22 participated. They used four cognitive levels based on Bloom's Taxonomy--Knowledge, Comprehension, Application and Analysis/Evaluation. The 1970 study revealed that agreement among faculty appeared low. The 1971 study showed a considerable improvement; however, the total number of acceptable items remained less than half the total number. Since parametric statistical evaluation was difficult, faculty opinions were correlated with cognitive values and coefficients were obtained. These results appeared to support Bloom's Taxonomy.

Givens (1976) similarly investigated the cognitive level

of verbal discourse and the association between professors and students. She also studied the relationship between their cognitive levels, size and type of institutions and courses, faculty influence, and varations of the level of courses among institutions. The sample comprised 40 professors at four differing institutions who each were audiotaped during four class sessions within one semester.

The tapes were analyzed using the The Florida Taxonomy of Cognitive Behavior (FTCB), which was based on Bloom's Taxonomy, to determine cognitive levels of discourse. Major findings included: 1) lower level classroom discourse is present twice as often as other types; 2) students have less fluctuation between cognitive levels than faculty; 3) no significant differences were found between cognitive levels of discourse among classes, times, and institution; 4) professors in large classes use lower level discourse than those in small classes; 5) students in large institutions engage in a higher level of discourse than in small institutions; 6) students in small classes have a higher cognitive level of discourse than those in other classes; and 7) as professors increasingly use lower cognitive discourse, students' discourse on all levels decreases (p. 2665-A).

An effective teaching strategy for learning Sociology incorporating Bloom's Taxonomy was experimentally initiated by Rice (1978). Designed to provide a vehicle for preparing students to develop their highest critical faculties, the

model is a systematic process that uses a simple-to-complex format. As a system of mapping and transformation of knowledge--basic to the model--it was adapted from Hill's Manual Learning Through Discussion (Hill, 1969). It was a learning instrument which consisted of eight steps designed to move class group discussions systematicallythrough a body of written materials. The technique has since been used for the initial experiment reported by Rice.

McDaniel's (1979) concern for literacy decay at all levels of education led him to promote effective essay assignments to force students to conceptualize at higher levels of thinking. Using Bloom's Taxonomy to organize his instruction around essays, he required students to organize their learning around intellectually demanding essay questions (p. 120). In history and philosophy courses, the author clarifies to his students that essay questions provide the vehicle for their learning and his evaluation of their learning. A guide sheet, which reinforces the intellectual tasks that are implicit in each question, specifies the category of Bloom's Taxonomy. Furthermore, he provides students with a data bank or "evidence grid" (p. 122) to help them collect data with which to learn critical thinking skills.

On a similar note, Stillion's (1979) work with death education courses led her to examine educational principles in designing courses on death and dying. She contends that

many differing courses from numerous fields make the inclusion of Bloom's Taxonomy in setting up the courses imperative. Objectives of the course subject matter, exercises, methods of instruction and eveluation all incorporate Bloom's cognitive (and affective) categories and assist faculty in creating sytematic, appropriate death education.

Additional evidence of the use of Bloom's Taxonomy was revealed through Braxton and Nordvall's (1985) investigation. Their study focused on whether examination questions at more selective colleges or universities differ from those at less selective schools. Since undergraduate admissions selectivity suggests a measure of institutional quality, the authors indicated a need to search for differences in educational outcomes, specifically course-level academic outcomes to determine if differences exist.

One copy of course examinations was obtained from a random sample of faculty in four academic disciplines, biology, chemistry, history and sociology, at liberal arts institutions in 12 states. From a total of 240 faculty (120 from Selectivity I and 120 from Selectivity II), 83 faculty provided 83 examinations. All examination questions were classified by trained coders according to Bloom's cognitive Taxonomy. The questions were then condensed into four levels: Knowledge, Comprehension, Application and Critical Thinking. The upper three levels of Analysis, Synthesis and

Evaluation were collapsed into Critical Thinking (p. 543). The findings suggest that course examination questions given at more selective liberal arts institutions tend to demand higher level thinking than do those at less selective institutions. Although the study does not prove that cognitive development of students is greater at more selective colleges, it does infer that higher levels of course understanding lead to greater development of complex cognitive processes and thinking skills (p. 551).

In an effort to evaluate the performance of nursing students at higher cognitive levels, the National Council of State Boards of Nursing, Inc. set July, 1982 as the target date for implementing a new comprehensive examination for professional Registered Nurse (RN) licensure. Incorporating Bloom's Taxonomy in the cognitive domain, the examination was designed to test four of the six categories--Knowledge, Comprehensive, Application, and Analysis (A New..., 1980). Demetrulius and McCubbin's (1982) report lists the six levels that comprise Bloom's Taxonomy and their required thinking processes. The authors remind the reader that even though educators' primary objective is to foster students' abilities to think critically and analytically, analysis of tests reveals that faculty continue to ask questions at lower cognitive levels. Based upon these criticisms, the authors examine objectives, teaching strategies and measurement instruments for educators. They also provide examples of

test items at all six levels of the cognitive domain.

In an effort to determine the status of nursing graduates by employers, field, Gullman, Nicholson and Dieher (1984) investigated 4165 clinical program objectives for evaluating baccalaureate nursing students from 64 NLN accredited programs. Using Bloom's Taxonomy in the cognitive domain to determine the extent of the use of cognitive objectives, several findings were delineated. The results indicated that the majority of program objectives i.e., 53% for clinical performance were reported to be in the evaluation domain. The authors questioned whether students can legitimately function at an evaluation level without having the "building blocks" (p. 291) prepared for them. Furthermore, a disproportionately small number was written in the psychomotor domain.

Using the Taxonomy, Sides (1984) similarly conducted a study to determine if differences exist in cognitive skill patterns of nurse graduates from baccalaureate, associate degree and dimploma programs. The study also interpreted herarchical skill patterns in nursing. A validated test to measure mental process skills was based upon the six levels of Bloom's Taxonomy. One hundred and seventy baccalaureate, 268 associate degree, and 205 diploma graduates took the tests. Program differences existed in total test performance with diploma graduates performing best. No differences were found on mental process skills among the differing programs.

Aptitude was a good prediction of higher mental processes which had the strongest influence in baccalaureate education.

Paul (1985) criticizes Bloom' Taxonomy especially in reference to the first level, Knowledge. In his view, taxonomic authors who lead readers to conclude that Knowledge is a one-way heirarchical component, which makes it simpler than Comprehension and other categories, are misleading. It limits insight into cognitive processes. Paul contends that Knowledge should be viewed as distinctive construction by the learner, something that ensues out of a rational use of mental processes. It is an achievement; hence, it cannot be neutral (p. 39).

In summary, extensive study by Bloom and others led to the development of a classification system for educational objectives and evaluation. Guiding principles incorporated student behaviors, logical development, internal consistency, a descriptive schema and a simple-to-complex format. It was labelled the Taxonomy of Educational Objectives.

Early drafts of the Taxonomy were widely used to formulate objectives and classify test materials. The first studies validating Bloom's Taxonomy investigated taxonomic categories by relating objectives to examination items. Additional studies were described to test the reliability of the Taconomy and determine general agreement about the categories.

Later studies used categories of the Taxonomy to: a)

validate examination questions which determine the cognitive level of faculty-student discourse, b) design a model as a teaching strategy; c) design course process and content, and d) provide a comprehensive examination which all nursing graduates must successfully prass for professional nurse licensure.

Finally, this review described use of the Taxonomy in research to determine if differences exist in examinations at selective liberal arts colleges and cognitive skills patterns among graduate nurses from differing levels of formal education.

Some criticism remains regarding the identification of the lowest level, Knowledge, with recall, the placement of Synthesis and Evaluation in the hierarchy, and whether the Taxonomy is a one-way hierarchy. All of the above notwithstanding, Bloom's Taxonomy of Educational Objectives is a remarkable model which has provided a far-reaching, insightful classification system for cognitive processes. Supported by empirical evidence the Taxonomy is probably one of the most influential, unsurpassed documents in all of education.

Summary

To summarize this chapter, a review of the literature focused on three major areas: a) faculty clinical practice; b) relationship of cognitive behavior to the use of teaching tools; and, c) Bloom's (1956) conceptual framework of

educational objectives in the cocnitive domain.

In the first area of faculty clinical practice, the review was limited due to the lack of research regarding differences in cognitive instruction between nursing faculty who are and who are not in clinical practice. The review described studies regarding faculty and administrator perceptions of faculty clinical practice and case studies of implementation models.

The second area, research pertaining to the relationship of cognitive behavior with teaching tools in higher education was described in the following order: a) studies pertaining to promoting higher cognitive levels of instruction within various disciplines such as philosophy, logic, sociology, psychology, ethics, literature survey, foreign language, hard sciences and in professional programs such as business, law, and nursing; b) methodologies which promote higher levels of cognitive thinking such as classroom verbalization, individualized instruction, and problem-solving techniques; c) case studies depicting successful strategies for teaching higher levels of cognitive thinking.

The final area of review focused on Bloom's (1956) conceptual framework of educational objectives in the cognitive domain. It briefly described the early development of the Taxonomy, use of the Taxonomy's early drafts and research using the Taxonomy in higher education.

CHAPTER III

METHODOLOGY

The major purpose of this study is to determine whether differences exist in the cognitive levels of instruction used by undergraduate nursing faculty engaged in clinical practice and those not engaged in clinical practice. More specifically, the study ascertains the degree to which course or unit objectives, assignment instructions and examination questions are used at the undergraduate level to promote higher level cognition. Secondary goals of the study include collecting demographic and professional characteristics of faculty in both groups. Additionally, faculty perceptions of the value and importance administrators give to clinical practice are examined. Finally, the study explores faculty perceptions of level of clinical competence among those with and without clinical practice.

This chapter describes the targeted population and the selection of the sample. It also describes the development of the survey instrument and the methods used for data collection and analysis.

Population

Since the study pertains to nursing faculty in institutions of higher learning, all nursing faculty in Illinois comprise the population. The total number of

reported faculty is 2128. They are employed in 59 baccalaureate, associate degree and diploma nursing programs. Of that total, an estimated 678 nursing faculty hold positions in 26 baccalaureate and higher degree nursing programs (Department..., 1987).

Selection of the Sample

A sample of nurse educators who met certain criteria was selected for the study. Specifically, faculty were selected only from institutions which have NLN accredited baccalaureate programs in nursing. Of the 26 programs in Illinois, 20 were chosen for inclusion in the sample because they were housed in four-year institutions of higher education (Department..., 1987). The remaining six institutions not included were non-NLN accredited and/or free-standing and health-science agencies.

For faculty at the 20 institutions, additional parameters were used to select the faculty sample. First, faculty were required to minimally hold a Master of Science Degree with a major in Nursing in order to reflect advanced academic preparation. In order to demonstrate professional teaching experience, a requirement of a minimum of one year of teaching was also set. A third criterion was that faculty should have tenure or tenure-track status in order to ensure that faculty in various institutions had appointments with similar academic tracks. Fourth, faculty were required to have taught a theory-based nursing course or unit within

one course for which they prepared their own educational objectives, assignments, and examination questions. Additionally, faculty were required to be engaged currently or in the immediately preceding year in clinical instruction in order to assess perceptions of their own clinical competence. Faculty in nursing practice met a final criterion if they were currently in clinical practice or had been in practice in the year immediately preceding this study. Of the 393 total nursing faculty at the 20 institutions, 362 were asked to participate in the study. Chief nursing school administrators were contacted to help in identifying the names of the 362 faculty who met the sample criteria (see section on data collection).

Instrumentation

A survey instrument was designed by the investigator which sought information regarding the professional and demographic characteristics of faculty respondents (see Appendix A). Professional characteristics pertained to: position title (Q-1), length of employment (Q-2), current tenure status (Q-3), academic activities for tenure (Q-4), specialization (Q-5), certification status (Q-6), instructional responsibilities (Q-8 through 11), clinical practice (Q-13 through 16), workload (Q-17), and course preparation (Q-21 and 22). Demographic items included highest degree earned (Q-7) and age range (Q-12).

Another survey item related to faculty perceptions (Q-

18) regarding rewards for academic activities. The item was designed to provide data for the third research objective which addresses faculty perceptions regarding the value and importance of combining clinical practice with teaching, research and service. Questions 19 and 20 were added to obtain responses for the fourth research objective related to faculty perceptions of their level of clinical competence. The format of the instrument was prepared after examining the literature on descriptive survey methods (Jahoda, et al., 1970), a review of sample survey instruments.

In addition to the survey instrument, faculty respondents were asked to submit course materials used as instructional tools. These materials included course or unit objectives, reading assignments with their respective study guide questions, instructions for completing case studies and/or problem-solving situations, instructions for required projects, and samples of course or unit final examination questions. These instructional tools were arranged into three categories by the researcher: a) course or unit objectives; b) study guide questions and assignment instructions; and c) course or unit examination questions.

Pilot Study

After approval by Loyola's Institutional Review Board, a pilot study of the survey instrument was conducted during Spring 1987. Two faculty and three doctoral students in the field of higher education and one nurse educator were asked

to review the survey items and a proposed cover letter. The pilot study participants provided valuable assistance in clarifying directions to be sent to respondents and the wording of survey items. The pilot study confirmed that the instrument and cover letter were capable of producing desired results.

Data Collection

Data were collected during the summer and early fall of 1987. In order to obtain permission for faculty participation, the investigator first telephoned the Dean/Chairperson/Director of the School/Department of Nursing in each of the 20 institutions during May, June and July 1987 (see Appendix B). Seven-to-ten days following the telephone contact, the investigator sent a letter to the chief nursing administrator confirming the phone call and requesting a list of all undergraduate faculty names and addresses (see Appendix C). In circumstances where the administrator hesitated to provide home addresses, the investigator offered to contact faculty only at their institution. Thus with administrative consent the investigator contacted each nursing faculty member via first-class mail. Since many faculty were unavailable during the summer months, nursing administrators in five institutions asked the investigator to send a designated number of surveys in bulk to their office for distribution.

A cover letter and the questionnaire were either mailed

to each participant in the study, or in the case of the five institutions, personally delivered or sent by bulk mailing to the school. In addition to completing and returning the survey, each respondent was asked to submit a course syllabus, samples of assigned instructional components, and a copy of the final examination from the designated course. The cover letter introduced the investigator, described the study and its rationale, ensured subject anonymity and confidentiality, and provided instructions for return of the survey. Respondents were requested to return the survey and the instructional components, via a self-addressed, stamped envelope which was provided by the researcher. If respondents were interested in receiving a summary of the study, they were asked to return a self-addressed mailing label and envelope under separate cover.

The initial deadline for respondents' return of the survey was August 15, 1987. However, since time lapsed between some of the phone contacts, the confirming letters and the provision of faculty lists, the return date was extended to September 4, 1987. In order to identify unreturned surveys and facilitate a follow-up, the investigator precoded all instruments with an identification number. The first mailing to 362 faculty yielded 15 responses from individuals who either declined to participate or were teaching at the graduate level. Thus, the final sample of potential faculty became 347. A total of 114

(32.8%) faculty submitted completed surveys. Seventy-six (21.9%) of this group also submitted the requested curricular materials.

A follow-up letter (see Appendix D) and duplicate questionnaire were sent in January 1988 to a random selection of 69 non-participating faculty for two reasons. Faculty employed in the five institutions where the bulk mailing was sent were not recontacted because it was impossible to ascertain which faculty by name from these institutions had or had not returned the survey. Further, faculty who indicated refusal to participate were not recontacted. Where applicable, the investigator also sent follow-up letters to 38 respondents who returned the questionnaire, but, omitted course materials (see Appendix E). The follow-up yielded 11 additional surveys and six sets of curricular materials. Since two of the follow-up respondents were graduate program faculty, a final response rate was 123 (35.4%) surveys and 80 (23.0%) sets of curricular materials.

Data Analyses

Survey responses from 123 nursing faculty were transferred to coding sheets and subsequently entered into the International Business Machines (IBM 3081D) mainframe computer system at Loyola University of Chicago. The data were processed using the Statistical Analysis System (SAS) (SAS Institute, 1979).

One open-ended item and 21 closed-ended items were

examined by compiling descriptive statistics such as frequencies, percentages, means and standard deviations. Three of the 21 closed-ended items provided opportunity for respondent comment. Due to the type of data collected, parametric statistics were used for items 19, 20, 21 and 22. Comparisons of item results were made between faculty engaged in clinical practice and those not engaged in clinical practice using T-Test and Chi-Square analyses.

An instrument which classifies Bloom's Taxonomy of Educational Objectives (Bloom, 1956) was used to measure cognitive levels of instruction. Entitled, The Florida Taxonomy of Cognitive Behavior (FTCB) (Webb, 1974, pp. 205-206), the instrument is one of a battery of three observation instruments which allows for the collection of coordinated information on cognitive functioning, beliefs about experimentalism versus practice and the social-emotional climate (p. 203). As a standardized tool it maintains interrater reliability since the three instruments were used for teachers' training in recording repeated, systematic classroom observations (see Appendix F). The instrument contains 55 items that describe increasingly complex levels of cognitive behavior. No hierarchy is assumed among the items within each level (Fisher & Grant, 1983). Although the tool separates Bloom's second level, Comprehension, into Translation and Interpretation, the investigator retained the original six levels as described by Bloom. Written approval

to use FTCB for recording the behaviors was obtained from the senior author (Brown, 1987) (see Appendix G).

The investigator and a colleague whose graduate study's professor and mentor was Benjamin S. Bloom at the University of Chicago, classified the data collection. The coders used the FTCB instrument to address research Objectives 1 and 2. They are: 1) to determine the cognitive level of course or unit objectives, assignment instructions, and examination questions prepared by nursing faculty with and without clinical practice; and 2) to determine the degree with which course or unit objectives, assignment instructions, and examination questions are used to promote higher level cognition by faculty with and without clinical practice. Behaviors listed in each of the course or unit materials were compared with those stated in the FTCB instrument. To ascertain interrater reliability, the investigator and colleague compared and achieved concensus on each other's classification. Course or unit materials submitted were assigned the same identification number as the corresponding survey instruments.

The coded data were analyzed in several ways; however, two steps preceded analysis. First, using Bloom's taxonomy each course/unit objective was classified according to whether it promotes the following cognitive behaviors: knowledge, comprehension, application, analysis, synthesis and/or evaluation. In instances where course objectives

included clinical behaviors, only classroom-based objectives were used. In other instances where individual course and unit objectives were submitted, the investigator and associate classified only course objectives. If individual faculty submitted more than one unit's objectives, recording and classification were restricted to the first unit. A similar process of classification was used for each of the study questions and assignment instruction requirements. Individual final examination questions also were placed into one of Bloom's six categories. All true and false questions from each curricular set were omitted from classification. In instances where multiple matching items were submitted as part of one question, only the first item was classifified into a category (since each is considered the knowledge level of the Taxonomy).

Next, the total number of course objectives representing each of the six categories was averaged into a composite score for each respondent, with its respective percentages, for each category. The same process was used for determining the average score in each category for the instructional requirements and the final examination questions.

Descriptive statistics were used to analyze these data. Faculty in clinical practice were separated from those not in clinical practice. Analyses of variance were used to compare the two faculty groups' percentages of course objectives with each of Bloom's six categories, with the course requirements,

and with the composite of final examination questions in each category. Non-parametric statistics were used to determine if differences exist in cognitive levels of instruction between nursing faculty in practice and those not in practice. First, the Friedman two-way analysis of variance (ANOVA) test was conducted to determine if differences in proportions exist among the levels of Bloom's Taxonomy. It was followed by the Wilcoxon-Signed-Ranks test to determine whether a difference exists between pairs of levels of Bloom's Taxonomy. Finally, the Mann-Whitney U test was used to determine if there are significant differences among the proportion of objectives in each of the categories for objectives, assignment instructions and examination questions.

Summary

This chapter has described the methodology used in this study to determine if differences exist in cognitive levels of instruction used by nursing faculty with and without clinical practice. It has identified selection of the population and the sample, development of the instrument, collection of data and data analysis.

CHAPTER IV

RESULTS

This study was designed to determine whether differences exist in cognitive instruction between nursing faculty who are in clinical practice and those who are not. The data compiled from receipt of the survey instruments and the curricular materials were classified and tallied in order to address the following research objectives:

1. Using Bloom's Taxonomy of Educational Objectives, to determine the cognitive level of educational objectives, assignment instructions and examination questions for courses prepared by faculty engaged in clinical practice versus faculty not engaged in clinical practice.

2. To determine the differences in cognitive levels of instruction used by faculty engaged in clinical practice and those faculty not engaged in clinical practice.

3. To determine faculty perceptions regarding the rewards given by nursing and institutional administrators for combining clinical practice with teaching, research and service.

4. To determine faculty perceptions of the level of clinical competence of faculty engaged in clinical practice versus those not engaged in clinical practice.

Major findings in this chapter are arranged in the order

of the research objectives. However, they are prefaced by a description of the sample which reflects professional and demographic characteristics of the faculty respondents.

Description of Sample

A total of 362 nursing faculty at 20 schools of nursing in the state of Illinois was contacted for participation in this study. One hundred twenty-nine faculty responded; however, 15 of this number declined to complete the survey which was sent. The remaining 114 faculty submitted completed surveys. This response represents a 32.8% rate of participation. Seventy-six respondents (21.9%) also submitted the requested curricular materials.

A follow-up letter, which was mailed to a random selection of non-respondents, yielded 11 additional surveys and six sets of curricular materials. Since two of the follow-up respondents were graduate program faculty, a final total of 123 surveys (35.4%) and 80 sets (23%) of curricular materials was received. Of the total respondents, 56 (46%) nursing faculty were in clinical practice and 67 (54%) were not in practice. This extremely low rate of return from the nursing faculty presents a major limitation in the interpretation of the findings.

As Table 1 reveals almost half (46.3%) of non-practicing nursing faculty respondents hold the Assistant Professor title. Associate Professor ranked next with 19 (28.4%). Of the practicing nursing faculty, 24 (42.9%) hold

Assistant Professor rank and 16 (28.6%) are at the Instructor level. Thus, a greater percentage of non-practicing nursing faculty hold higher rank than practicing faculty. This is not surprising since the data reveal more non-practicing faculty have earned higher academic credentials, are involved in research and have previous teaching experience.

Table 1

Professional and Demographic Characteristics of Nursing Faculty Respondents in Practice (c.p.) and Not in Practice (non c.p.)

Characteristic	c.p. n=56 freq.	%	non-c.p. n=67 freq.	%
Current Position				
Instructor	16	28.6	12	17.9
Assistant Professor	24	42.9	31	46.3
Associate Professor	12	21.4	19	28.4
Professor	4	7.1	3	4.5
Other			2	3.0
Total	56	100.0	67	100.0
Length of Employment				
Less than 1 year	6	10.7	3	4.5
1-3 years	11	19.6	14	20.9
4-6 years	18	32.1	18	26.9
7-9 years	10	17.9	16	23.9
10 years and over	11	19.6	16	23.9
Total	56	100.0	67	100.0
Tenure Status				
Tenured	23	41.8	27	40.3
Non-tenured, on track	21	38.2	30	44.8
Non-tenured, non-track	8	14.5	7	10.4
No policy	2	3.6	2	3.0
Other (part-time)	1	1.8	1	1.5
Total	55	100.0	67	100.0

Table 1 (continued)

Characteristic	c.p. n=56 freq.	%	non-c.p. n=67 freq.	%
Activities Needed for Tenure				
Increased scholarship	14	58.3	18	58.1
Increased credentials	6	25.0	6	19.4
Increased service	1	4.2	-	-
Increase faculty years	2	8.3	2	6.5
Other	1	4.2	5	16.1
Total	24	100.0	31	100.0
Area of Clinical Specialization				
Adult Medical-Surgical	24	43.6	28	41.8
Women and Newborn	5	9.1	5	7.5
Child Health/Pediatrics	3	5.5	4	6.0
Community Health	9	16.4	15	22.4
Psychiatric/Mental Health	10	18.2	10	14.9
Other	4	7.3	5	7.5
Total	55	100.0	67	100.0
Additional Areas of Specialization				
Certified nurse practitioner	1	5.6		
Critical Care	3	16.7		
Child & adolescence	1	5.6	1	8.3
Clinical specialist	2	11.1		
Community health	3	16.7	2	16.7
Maternity	2	11.1		
Medical-Surgical	2	11.1		
Mobile intensive	1	5.6		
Operating room	1	5.6		
Psychiatric/mental health	2	11.1	1	8.3
Administration; curriculum			1	8.3
Family nurse practitioner			2	16.7
Gerontology			2	16.7
Neurology			1	8.3
Non-nursing			1	8.3
Public health			1	8.3
Total	18	100.0	12	100.0
Certification Status				
Yes	20	35.7	9	13.4
No	36	64.3	58	86.6
Total	56	100.0	67	100.0

Table 1 (continued)

Characteristic	c.p. n=56 freq.	%	non-c.p. n=67 freq.	%
Highest Degree Earned				
BSN,BS	1	1.8	1	1.5
MSN, MS, MN	39	69.6	40	59.7
MA, MEd	1	1.8	1	1.5
PhD, EdD			22	32.8
DNSc	14	25.0	1	1.5
Other	1	1.8	2	3.0
Total	56	100.0	67	100.0
Clinical Instruction				
Yes	54	98.2	56	86.2
No	1	1.8	9	13.8
Total	55	100.0	56	100.0
Contact Hours for Clinical Instruction per Week				
1-5 hours	6	11.3	4	7.3
6-10	20	37.7	19	34.5
11-15	27	50.0	32	58.2
Total	53	100.0	55	100.0
Student Contact Hours per Week				
1-5 hours	7	13.0	4	6.1
6-10	9	16.7	16	24.2
11-15	16	29.6	18	27.3
16-20	18	33.3	22	33.3
21-25	4	7.4	6	9.1
Total	54	100.0	66	100.0
Current Age Range				
25-34 years	9	16.1	4	6.2
35-44 years	24	42.9	29	44.6
45-54 years	17	30.4	24	36.9
55-64 years	5	8.9	8	12.3
65 and over	1	1.8	--	--
Total (2 unlisted)	56	100.0	65	100.0

Table 1 (continued)

Characteristic	c.p. n=56 freq.	%	non-c.p. n=67 freq.	%
Hours Per Week in Clinical Practice				
1-4	19	34.5	--	--
5-9	22	40.0	--	--
10-14	4	7.3	1	--
15-19	4	7.3	--	--
20 and over	6	10.9	--	--
Total	55	100.0	1	--
Time of Performance				
Academic year	40	72.7	--	--
During calender year	14	25.5	--	--
Vacations, summers	1	1.8	--	--
Total	55	100.0		
Type of Practice				
Unification	2	3.5	--	--
Collaboration	2	3.5	--	--
Integration	3	5.3	--	--
Private Practice	9	16.1	--	--
Moonlighting	40	71.4	--	--
Total	56	100.0		

Some similarities exist in length of employment among the two faculty groups as listed in Table 1. Although more practicing faculty were employed in their current position less than one year than were non-practicing faculty, approximately the same percentage for both groups was revealed in the one-to-three and four-to-six year ranges respectively. As the length of employment increased, non-practicing faculty revealed greater longevity.

Regarding tenure, both faculty groups revealed having approximately the same percentage with tenure. However, 30

(44.8%) non-practicing as opposed to 21 (38%) practicing faculty were non-tenured and on the tenure track.

Of the 55 non-tenured faculty who reported activities needed to achieve tenure, 58% of practicing and non-practicing faculty revealed the need for increased scholarship. However, as Table 1 indicates, 25% practicing and 19% non-practicing faculty reported that increased credentials are needed for tenure. And, among practicing faculty, 19 of the 24 respondents reported more than one activity was needed in order to achieve tenure status.

As expected, adult medical-surgical nursing was the most frequently mentioned area of clinical specialization for both groups of nursing faculty. In addition, several respondents indicated secondary areas of specialization (see Table 1).

In comparing the two groups of faculty who have attained certification status, a wide difference existed. As expected, fewer (13.4%) non-practicing faculty have certification status. This compared to 35.7% for practicing faculty. Since certification signifies validation of higher level competencies in a specialized area of practice, it is expected that those who were non-practicing would likely not be certified. For those with certification, areas of certification included adult nurse practitioner, pediatric nurse practitioner, psychiatric nurse practitioner, midwifery, school nursing, clinical specialist, and critical care certification.

Although 41 (61%) non-practicing faculty were academically prepared at the master's level, five of those indicated they were in doctoral programs or were doctoral candidates. Twenty-three (34%) of 67 non-practicing respondents were doctorally prepared. Of those, only one reported a professional doctorate (DNSc). The remaining 22 reported academic doctoral degrees in education or philosophy. Among practicing faculty, 40 (71.4%) were masters prepared, and 15 (26.8%) were prepared at the doctoral level. In the latter group, however, all but one had earned a professional (ie., Doctorate in Nursing Science [DNSc]) doctorate. Thus, as expected, an emphasis on clinical expertise by practicing faculty was revealed in their self-report. Three practicing faculty listed additional post-graduate course work.

The vast majority of non-practicing (56 or 86.2%) and practicing (54 or 98.2%) faculty respondents were currently engaged in clinical instruction or had been in the previous year. Overall, 50% or more of respondents in both groups indicated they spent from 11-15 or more hours in clinical instruction per week. Large percentages of both groups of faculty also reported that the total hours of student contact per week ranged from 11 to 20 hours.

The age range representing the most faculty in both groups was between 35 and 44 years. More respondents in younger age categories designated involvement in clinical

practice than those who were non-practicing faculty. Sixteen percent of practicing faculty as opposed to 6% of non-practicing faculty were between 25 and 34 years.

A majority of faculty in clinical practice (74.5%) provide from one-to-nine hours of practice per week, with 40% providing five-to-nine hours. The vast majority (40 or 72.7%) of practicing faculty indicated they generally conducted their practice during the academic year only when classes are in session.

When provided five practice "options", a large majority of practicing faculty (71.4%) defined their type of practice as "moonlighting" and the next highest frequency included "private practice" (16.1%). Focus on the "moonlighting" model was unexpected since it is most frequently used by nurse practitioner faculty rather than those in traditional academic positions. The remaining types were scattered with two engaged in "unification", two in "collaboration", and three in "integration". Only five practicing faculty reported appointments such as clinical chief, clinical specialist, co-operative clinical, and nurse-practitioner. Six reported types of agency in which they practice, all of which were hospitals/medical centers.

Teaching loads comprised the greatest percentage of workload for both practicing and non-practicing faculty with an overall mean of 57.8% and 60.2% allocation respectively (see Table 2). As expected the research workload component

for respondents differed. Forty-seven non-practicing faculty devoted an average of 17% of their workload to research whereas 38 practicing faculty allocated an average of 11%. Similarities existed among practicing and non-practicing faculty regarding respondents' allocation of workload to service in their institution. For 56 practicing respondents, the mean workload for service was 17.8%; whereas, for 59 non-practicing faculty, it was 18.9%.

Table 2

Workload Allocation for Practice (cp) and Non-Practice (non-cp) Faculty

Workload Activity by Highest Percentage in Quartiles	c.p. n = 56 frequency	%	non-c.p. n = 67 frequency	%
Teaching				
0-25%	9	16.10	5	7.66
26-50%	14	25.10	24	32.30
51-75%	20	35.70	25	38.50
76-100%	13	23.30	14	21.60
Total	56	100.00	65	99.96
Mean		57.80		60.24
Research				
0-25%	36	94.80	33	70.10
26-50%	2	5.20	13	27.70
51-75%	-	-	1	2.10
76-100%	-	-	-	-
Total	38	100.00	47	99.90
Mean		11.76		17.10

Table 2 (continued)

Workload Activity by Highest Percentage in Quartiles	c.p. n = 56 frequency	%	non-c.p. n = 67 frequency	%
Service to College				
0-25%	45	78.78	54	78.00
26-50%	11	21.00	13	22.10
51-75%	-		-	-
76-100%	-		-	-
Total	56	99.78	67	100.10
Mean		17.77		18.93
Clinical Practice				
0-25%	37	88.10	4	80.00
26-50%	1	2.40	1	20.00
51-75%	4	12.00		
76-100%	-			
Total	42	100.00	5	100.00
Mean		16.45		16.20
Other				
0-25%	6	52.60	17	78.00
26-50%	4	36.40	5	20.00
51-75%	1	9.10	1	4.00
76-100%	-		2	8.00
Total	11	100.00	25	100.00
Mean		30.45		30.92
Specify Other				
Administration	7	40.00	10	41.70
Advising	1	6.70	3	12.60
Graduate study	1	6.70	5	21.00
Consultation	1	6.70	1	4.20
Committees	1	6.70	3	12.60
Scholarship	1	6.70	2	8.40
Clinical Practice	3	20.10	-	
Total	15	100.00	24	100.00

Interestingly, four of five "non-practicing" faculty indicated they allocated up to 25% of their workload to clinical practice; whereas, 37 of 42 (88%) practicing

respondents reported devoting up to 25% of their workload to clinical practice.

Twenty-five non-practicing faculty reported a variety of additional responsibilities which consumed their workload with 10 of 25 responses designating administration. Of 11 reporting clinical practice faculty, additional responsibilities included administration, advising, clinical specialization, and graduate study.

In summary, workload allocation for the majority of practicing and non-practicing faculty revealed that the highest percentage of time is devoted to teaching for both groups. However, of the remaining workload categories of research, service, clinical practice and "other", only the research category differed among the two groups.

Cognitive Levels of Objectives, Instructions, and Examination Questions

As indicated in Table 3, a majority (52 or 81.3%) of non-practicing faculty reported they "always" or "usually" prepared their own course objectives. By comparison, only 38 or 67.8% of the practicing faculty reported they "always" or "usually" prepare their own course objectives. This is expected since more non-practicing faculty reported greater tenure status, higher academic rank and greater number of years of teaching experience at their current institution.

Table 3

Faculty Preparation of Course/Unit Objectives

Characteristic	c.p. freq.	%	non-c.p. freq.	%
Extent of Preparing Own Objectives				
Always	27	48.2	40	62.5
Usually	11	19.6	12	18.8
Sometimes	10	17.9	7	10.9
Rarely	8	14.3	5	7.8
Total	56	100.0	64	100.0
Submitting Own Objectives				
Yes	40	72.7	54	83.1
No	15	27.3	11	16.9
Total	55	100.0	65	100.0

The difference between the means of the two groups regarding the extent of preparing one's own course/unit objectives was tested with a T-Test (Table 4). The test revealed no statistically significant differences between faculty in practice and those not in practice.

Table 4

T-Test for Differences Between Practicing and Non-Practicing Faculty Who Prepared Own Objectives

Group	N	Mean	Std.Dev.	Probability
Practice	56	1.9821	0.1496	0.07
Non-Practice	65	1.6406	0.9655	0.07

Range of Possible Mean Scores

Always	1.00
Usually	2.00
Sometimes	3.00
Rarely	4.00

The last survey question pertained to whether faculty prepared the course objectives they were submitting for this study. Among non-practicing faculty, 54 (83.1%) reported they were submitting their own, whereas 40 (72.7%) practicing faculty indicated they submitted their own objectives (see Table 3). Faculty in both groups who did not prepare their own course objectives were asked to submit a unit from a course for which they did prepare objectives. Although 54 (83.1%) non-practicing participants indicated they were submitting their own course or unit objectives only 43 (64.2%) submitted course or unit objectives, 34 (50.7%) submitted course assignment instructions, and 18 (26.9%) submitted examination questions. Among clinical practice respondents, 35 (62.5%) as compared with 40 who indicated they were submitting their own, actually submitted

course/unit objectives; 24 (43.6%) submitted assigment instructions, and 15 (27.3%) submitted course examination questions.

A Chi-Square test to determine differences between both nursing faculty groups revealed no significant differences between them in their submission of their own course objectives (see Table 5).

Table 5

Chi-Square Test to Determine Differences Between Practicing and Non-Practicing Faculty Who Submitted Own Objectives

	Yes	No	Total
Frequency Percent Row PCT Col PCT			
Practicing	40 33.33 72.73 42.55	15 12.50 27.27 57.69	55 45.83 100.00 100.00
Non-Practicing	54 45.00 83.08 57.45	11 9.17 16.92 42.31	65 54.17 100.00 100.00
Total	94 78.33	26 21.67	120 100.00

Chi-Square DF 1 Value 1.880 Probability 0.17

Research Objective Number One

Bloom's Taxonomy of Educational Objectives for cognitive levels was used to assess course or unit objectives, assignment instructions, and examination questions and to

compare non-practicing with practicing faculty. This assessment of cognitive levels was conducted in order to address this study's first research objective. Cognitive level data are reported in the order of objectives, assignment instructions and examination questions for non-practicing and practicing faculty respectively. These are followed by percentage ranges of each level of Bloom's Taxonomy used for course/unit objectives, assignment instructions and examination questions by nursing faculty in clinical practice (cp) and not in clinical practice (non-cp).

Course/Unit Objectives

An analysis of course objectives submitted by 43 non-practicing faculty revealed that 28 faculty prepared objectives found in Bloom's Knowledge category (see Table 6). For these 28 faculty, objectives found in the Knowledge category ranged from a minimum of 3% of all objectives to a maximum of 44% of all objectives, with a mean of 17.9%. Forty-one non-practicing respondents had objectives in the Comprehension category with a range from 10% to 88% and a mean of 39.9%. Objectives in the Application category for 37 non-practicing respondents ranged from less than 1% to 80% with a mean of 28%. In the Analysis category, from 7% to 50% (mean, 23%) of the objectives were used by 30 non-practicing faculty. Only 19 non-practicing faculty used Synthesis objectives; these ranged from 3% to 53% with a mean at 15% of the objectives. Eleven faculty prepared from 8% to 25% of

their objectives in the Evaluation category (see Appendix H for examples).

Table 6

Number and Percentage Range of Course/Unit Objectives Allocated by Bloom's Cognitive Category

Bloom's Cognitive Level	c.p. n	c.p. Range%	c.p. X	non c.p. n	non c.p. Range%	non c.p. X
Knowledge	22	8-59	25.6	28	3-44	17.9
Comprehension	32	9-80	39.4	41	10-88	39.9
Application	29	6-67	31.8	37	1-80	28.0
Analysis	18	8-50	30.0	30	7-50	22.9
Synthesis	10	2-33	15.1	19	3-53	15.2
Evaluation	5	8-20	14.0	11	8-25	14.4

Among 35 practicing faculty who submitted objectives, 22 were found to have from 8% to 59% (mean, 25.6%) Knowledge objectives. Thirty-two respondents had from 9% to 80% (mean, 39.5%) Comprehension objectives; whereas, 29 had from 6% to 67% (mean, 31.8%) as Application. At the Analysis level, 18 were found to have from 8% to 50% (mean, 30.0%). Ten had from 2% to 33% (mean, 15.1%) Synthesis objectives, and only five had 8% to 20% (mean, 14.0%) Evaluation objectives (see Appendix I for examples).

Table 6 reveals a wide range of differences for both non-practicing and practicing faculty at all six levels of

Bloom's Taxonomy. However, in viewing the means for each level, only two major differences appear to exist at two cognitive levels between the two groups of nursing faculty. Practicing faculty were found to have used on the average a higher percent of both Knowledge and Analysis objectives than non-practicing faculty.

Assignment Instructions

Of 43 reporting faculty, 20 non-practicing faculty were found to have between 6% and 100% (mean, 30%) of their assignment instructions at the Knowledge level. Similar responses were noted in the Comprehension category. In the Application category, however, 23 respondents allocated anywhere from 1% to 80% (mean, 32%) of their instructions to Application. Twenty-three respondents used Analysis ranging from 6% to 43% (mean, 22%) for their assignment instructions. The Synthesis category was used by 21 respondents at a rate of less than 1% to 100% (mean, 20%). A similar range in the Evaluation category was noted for 17 respondents.

By comparison, 15 practicing respondents were found to have a range of 10 to 86% (mean, 40%) assignments at the Knowledge level. A similar range was revealed at the Comprehension and Application levels. At the next three levels, Analysis, Synthesis and Evaluation, 12, 12, and 8 practicing respondents respectively were found to use decreased percentages of instructions.

Table 7 reveals that differences in levels of

assignment instructions between practicing and non-practicing faculty do appear to exist. In the Knowledge and Comprehension categories for example, higher means were revealed among practicing faculty (Knowledge, 40.1% and Comprehension, 39.6%) as compared with non-practicing faculty (Knowledge, 30.1% and Comprehension, 34.5%). However, by contrast, non-practicing faculty revealed a higher mean in the Application category (31.8%) than practicing faculty (24.6%).

Table 7

Number and Percentage Range of Assignment Instructions Allocated by Bloom's Cognitive Category

Bloom's Cognitive Level	c.p. n	c.p. Range%	c.p. X	non c.p. n	non c.p. Range%	non c.p. X
Knowledge	15	10-86	40.1	20	6-100	30.1
Comprehension	18	14-100	39.4	23	10-100	34.5
Application	20	6-100	24.8	23	1-80	31.8
Analysis	12	2-75	24.1	23	6-43	21.5
Synthesis	12	4-33	18.8	21	1-100	21.0
Evaluation	8	2-50	23.1	17	1-100	19.9

Examination Questions

For 18 non-practicing faculty who submitted examination questions, a range of 11% to 69% (mean, 36%) of these questions were found in the Knowledge level for 16

respondents (see Table 8). Comprehension questions ranged from 12% to 92% (mean, 43%) for 18 respondents. Fifteen respondents had from 3% to 46% (mean, 21%) of their questions at the Application level. At the Analysis level 12 respondents were found to have 1% to 25% (mean, 11%). At the Synthesis and Evaluation levels, only one and two respondents respectively had only 3% and 4% of their questions at those levels.

Table 8

Number and Percentage of Range of Examination Questions Allocated by Bloom's Cognitive Category

Bloom's Cognitive Level	c.p. n	c.p. Range%	c.p. X	non c.p. n	non c.p. Range%	non c.p. X
Knowledge	14	19-80	51.4	16	11-69	36.3
Comprehension	13	23-54	35.5	18	12-92	42.8
Application	10	1-33	14.1	15	3-46	20.8
Analysis	3	3-7	5.7	12	1-25	10.5
Synthesis	2	4	3.9	1	3	3.0
Evaluation	4	2-33	12.2	2	4	3.4

For 14 practicing respondents, between 19% and 80% (mean, 51%) examination questions were found at the Knowledge level. From 23% to 54% (mean, 35%) of the questions for 13 respondents were at Comprehension. Ten respondents had from 1% to 46% (mean, 14%) of their questions at the Application

level. At the Analysis and Synthesis levels, only three and two respondents respectively had from 3% to 7% of examination questions at these levels. Four respondents at the Evaluation level allocated a range of 2% to 33% (mean, 12%).

Major differences appear to exist in cognitive levels of examination questions between practicing and non-practicing faculty. Practicing faculty used more Knowledge level (51.4%) questions than non-practicing faculty (36.3%). By comparison, non-practicing faculty had higher means in the Comprehension (42.8%), Application (20.8%) and Analysis (10.5%) categories than practicing faculty in those categories (35.5%, 14.1%, 5.7%). Although total numbers of respondents in the Evaluation category were extremely limited, practicing faculty used more questions at the evaluation level than non-practicing faculty (i.e., 12% versus 3%).

In summary, the data reveal that the percentage means for practicing faculty's use of the Knowledge category for their course objectives, assignment instructions and examination questions was higher than non-practicing faculty. However, the mean for non-practicing faculty's use of the Comprehension category was higher than practicing faculty in the examination category (see Table 9). In the Application category, non-practicing faculty also maintained a higher mean for both examination questions and assignments than practicing faculty (see Table 9). In relation to Analysis,

however, the practicing faculty percentage mean was greater in the use of course objectives than non-practicing faculty. By comparison, non-practicing faculty revealed a higher percentage mean in the examination category for Analysis than practicing faculty (see Table 9). No apparent differences appear to exist between the two faculty groups on the Synthesis level for either objectives, assignment or examination questions. Although greater numbers of non-practicing faculty used the Evaluation category in their objectives and instructions, few differences were noted among the two groups for either objectives, instructions or questions (see Table 9).

Table 9

A Summary of Percentage Means for Each Level of Bloom's Taxonomy Used for Course Objectives, Assignment Instructions and Examination Questions by Nursing Faculty in Clinical Practice (c.p.) and Not in Clinical Practice (n.c.p.)

	Course Objectives		Assignment Instructions		Examination Questions	
	c.p.	n.c.p.	c.p.	n.c.p.	c.p.	n.c.p.
Knowledge	25.6	17.9	40.1	30.1	51.4	36.3
Comprehension	39.4	39.9	39.4	34.5	35.5	42.8
Application	31.8	28.0	24.8	31.8	14.1	20.8
Analysis	30.0	22.9	24.1	21.5	5.7	10.5
Synthesis	15.1	15.2	18.8	21.0	3.9	3.0
Evaluation	14.0	14.4	23.1	19.9	12.2	3.4

Research Objective Number Two

Testing for Differences in Cognitive Levels of Objectives, Assignments, and Examination Questions

Non-parametric statistics were used to determine if differences existed in cognitive levels of instruction between nursing faculty in practice and those not in practice. Using ordinal data for two, small, related samples of nursing faculty, the Friedman two-way analysis of variance (ANOVA) test was conducted for the two nursing faculty groups together. The purpose of this test was to determine if

differences in proportions exist among the levels of Bloom's Taxonomy. Using Bloom's Taxonomy the proportions were ranked from the lowest to the highest proportion to obtain the average rank across all subjects. After the mean rank was calculated for each variable and assigned to all cases, the test statistic was calculated with the approximate chi-square distribution. Table 10 depicts the mean proportion for objectives, assignment instructions and examination questions. Each result is statistically significant for the objectives at the 0.0000 level, assignment instructions at the 0.0071 level, and examination questions at 0.0000. These findings reveal that for both nursing groups combined, significant differences do exist among the six levels of Bloom's Taxonomy for course objectives, assignment instructions, and for examination questions.

Table 10

Friedman Two-Way Analysis of Variance using Combined Nursing Faculty Groups for Objectives, Assignment Instructions, and Examination Questions (n=80)

Mean Rank	Variable	
3.27	Obj. 01	Obj - Knowledge
4.92	Obj. 02	Obj - Comprehension
4.39	Obj. 03	Obj - Application
3.63	Obj. 04	Obj - Analysis
2.54	Obj. 05	Obj - Synthesis
2.24	Obj. 06	Obj - Evaluation
Cases 80	Chi-Square 123.3017	Significance .0000*
3.54	Assign. 01	Assign - Knowledge
3.97	Assign. 02	Assign - Comprehension
3.83	Assign. 03	Assign - application
3.47	Assign. 04	Assign - Analysis
3.21	Assign. 05	Assign - Synthesis
2.97	Assign. 06	Assign - Evaluation
Cases 80	Chi-Square 15.9285	Significance .0071*
4.13	Exam. 01	Exam - Knowledge
4.16	Exam. 02	Exam - Comprehension
3.64	Exam. 03	Exam - Application
3.19	Exam. 04	Exam - Analysis
2.90	Exam. 05	Exam - Synthesis
2.98	Exam. 06	Exam - Evaluation
Cases 80	Chi-Square 35.7677	Significance .0000*

* = Significant Difference

Next, the Friedman test was conducted for practicing and non-practicing faculty groups separately. For 36 practicing respondents, test results revealed statistical significance for course/unit objectives at the 0.0000 level and for

examination questions at 0.0090 (see Table 11). No significance was found for assignment instructions. For 44 non-practicing faculty, similar statistical significance was found for course/unit objectives at the 0.0000 level and for examination questions at 0.0004 (Table 12). Again, no significant difference was found for assignment instructions.

Table 11

Friedman Two-Way Analysis of Variance Using Practicing Nursing Faculty for Objectives, Assignment Instructions, and Examination Questions (N=36)

Mean Rank		Variable
3.50	Obj. 01	Knowledge
4.78	Obj. 02	Comprehension
4.46	Obj. 03	Application
3.49	Obj. 04	Analysis
2.51	Obj. 05	Synthesis
2.26	Obj. 06	Evaluation
	Chi-Square 51.9603	Significance .0000*
3.69	Assign. 01	Knowledge
3.99	Assign. 02	Comprehension
3.82	Assign. 03	Application
3.31	Assign. 04	Analysis
3.26	Assign. 05	Synthesis
2.93	Assign. 06	Evaluation
	Chi-Square 8.1666	Significance .1473
4.28	Exam. 01	Knowledge
4.04	Exam. 02	Comprehension
3.50	Exam. 03	Application
3.01	Exam. 04	Analysis
3.01	Exam. 05	Synthesis
3.15	Exam. 06	Avaluation
	Chi-Square 15.3412	Significance .0090*

* = Significant Difference

Table 12

Friedman Two-Way Analysis of Variance Using Non-Practicing Nursing Faculty for Objectives, Assignment Instructions, and Examination Questions (N = 44)

Mean Rank		Variable
3.09	Obj. 01	Knowledge
5.05	Obj. 02	Comprehension
4.33	Obj. 03	Application
3.75	Obj. 04	Analysis
2.57	Obj. 05	Synthesis
2.22	Obj. 06	Evaluation
	Chi-Square 73.2108	Significance .0000*
3.42	Assign. 01	Knowledge
3.95	Assign. 02	Comprehension
3.84	Assign. 03	Application
3.61	Assign. 04	Analysis
3.17	Assign. 05	Snythesis
3.00	Assign. 06	Evaluation
	Chi-Square 8.8082	Significance .1170
4.00	Exam. 01	Knowledge
4.25	Exam. 02	Comprehension
3.76	Exam. 03	Application
3.34	Exam. 04	Analysis
2.81	Exam. 05	Synthesis
2.84	Exam. 06	Evaluation
	Chi-Square 22.8926	Significance .0004*

* = Significant Difference

The Friedman two-way analysis of variance (ANOVA) test was followed by the Wilcoxon Signed-Ranks non-parametric test (see Table 13, Appendix I). As an analog of the correlated T-Test, it determined whether a difference exists between the

pairs of levels of Bloom's Taxonomy for both groups of nursing faculty together. Evaluation was matched with Knowledge, Comprehension, Application, Analysis, and Synthesis. Next, Synthesis was matched with Knowledge, Comprehension, Application, and Analysis and so forth. As Table 13 indicates, each of the pairings for the combined groups was significant, with the exception of one set, with significant p ranging from 0.0000 to 0.0355. No significance was found between the pairs of levels for Analysis and Knowledge.

Table 13

Wilcoxon Post Hoc Analysis of Differences in Course Objectives Between Two Levels of Bloom's Taxonomy for Practicing and Non-Practicing Faculty

Objectives	1	2	3	4	5	6
1						
2	.0000*					
3	.0014*	.0089*				
4	.3609	.0000*	.0075*			
5	.0023*	.0000*	.0000*	.0000*		
6	.0000*	.0000*	.0000*	.0000*	.0355*	

Total cases = 80
1 = Knowledge
2 = Comprehension
3 = Application
4 = Analysis
5 = Synthesis
6 = Evaluation

*Significant at .05

The Wilcoxon Signed-Ranks test was also conducted for each group of nursing faculty separately. Data analyses included course objectives, assignment instructions and examination questions. For practicing faculty (see Table 14, Appendix I), statistical significance was found for instructional objectives between Knowledge and Comprehension with the mean higher for Comprehension. Between Knowledge and Synthesis and Knowledge and Evaluation, however, statistical significance revealed that the mean rank was higher for Knowledge. Significant differences were also found between the following pairs with the lower Taxonomy level revealing lesser rank. These were Comprehension and Analysis, Comprehension and Synthesis, Comprehension and Evaluation, Application and Synthesis, Application and Evaluation, Analysis and Synthesis, and Analysis and Evaluation.

For assignments (See Table 15, Appendix I) prepared by practicing faculty, a similar significance was found between Knowledge and Synthesis, Knowledge and Evaluation, Comprehension and Synthesis, Comprehension and Evaluation, Application and Synthesis, and Application and Evaluation.

Statistical significance for examination questions prepared by practicing faculty (see Table 16) was found for all pairs except Application and Evaluation, Analysis and Synthesis, Analysis and Evaluation, and Synthesis and Evaluation. Again, the lower Taxonomy level of the pair

revealed higher means than the upper Taxonomy level.

Table 14

Wilcoxon Post Hoc Analysis for Differences in Course Objectives Between Two Pairs of Levels of Bloom's Taxonomy for Practicing Faculty

Objectives	1	2	3	4	5	6
1						
2	.0013*					
3	.9727	.1306				
4	.9308	.0026*	.0745			
5	.0063*	.0000*	.0000*	.0055*		
6	.0005*	.0000*	.0000*	.0005*	.1551	

Total Cases = 36 Practicing Faculty
1 = Knowledge
2 = Comprehension
3 = Application
4 = Analysis
5 = Synthesis
6 = Evaluation

*Significant at .05

Table 15

Wilcoxon Post Hoc Analysis for Differences in Assignment Instructions Between Two Pairs of Levels of Bloom's Taxonomy for Practicing Faculty

Assignments

	1	2	3	4	5	6
1						
2	.5721					
3	.5869	.2736				
4	.1208	.0664	.1488			
5	.0442*	.0277*	.0332*	.4802		
6	.0349*	.0228*	.0049*	.3739	.3882	

Total Cases = 36 Practicing Faculty
1 = Knowledge
2 = Comprehension
3 = Application
4 = Analysis
5 = Synthesis
6 = Evaluation

*Significant at .05

Table 16

Wilcoxon Post Hoc Analysis for Differences in Examination Questions Between Two Pairs of Levels of Bloom's Taxonomy for Practicing Faculty

Examinations	1	2	3	4	5	6
1						
2	.0342*					
3	.0022*	.0024*				
4	.0015*	.0022*	.0077*			
5	.0015*	.0022*	.0093*	1.000		
6	.0022*	.0029*	.1141	.3452	.2733	

Total Cases = 36 Practicing Faculty
1 = Knowledge
2 = Comprehension
3 = Application
4 = Analysis
5 = Synthesis
6 = Evaluation

*Significant at .05

For non-practicing faculty (see Table 17, Appendix I), the Wilcoxon test revealed a significant difference for instructional objectives between Knowledge and Comprehension, Application, and Evaluation with the higher mean revealed for each of the latter Taxonomy levels. Statistical differences found between Comprehension and Application, Analysis, Synthesis and Evaluation, between Application and Analysis,

Synthesis, and Evaluation, and between Analysis and Synthesis, and Analysis and Evaluation, however, revealed higher mean rank for the lower Taxonomy levels.

Table 17

Wilcoxon Post Hoc Analysis for Differences in Course Objectives Between Two Pairs of Levels of Bloom's Taxonomy for Non-Practicing Faculty

Objectives	1	2	3	4	5	6
1						
2	.0000*					
3	.0048*	.0285*				
4	.2224	.0001*	.0326*			
5	.1195	.0000*	.0000*	.0008*		
6	.0073*	.0000*	.0000*	.0000*	.1274	

Total Cases = 44 Non-Practicing Faculty
1 = Knowledge
2 = Comprehension
3 = Application
4 = Analysis
5 = Synthesis
6 = Evaluation

*Significant at .05

Assignments for non-practicing faculty revealed statistical differences between Comprehension and Synthesis with a higher mean rank for Synthesis. By comparison, significances between Comprehension and Evaluation,

Application and Evaluation, and Analysis and Evaluation revealed a higher rank for the lower Taxonomy levels (see Table 18, Appendix I).

Table 18

Wilcoxon Post Hoc Analysis for Eifferences in Assignment Instructions Between Two Pairs of Levels of Bloom's Taxonomy for Non-Practicing Faculty

Assignments	1	2	3	4	5	6
1						
2	.2713					
3	.3740	.6938				
4	.9036	.0656	.1270			
5	.4386	.0488*	.0619	.2145		
6	.1615	.0088*	.0082*	.0245*	.2959	

Total Cases = 44 Non-Practicing Faculty
1 = Knowledge
2 = Comprehension
3 = Application
4 = Analysis
5 = Synthesis
6 = Evaluation

*Significant at .05

Table 19 and Appendix I reveal that for examination questions, a significant difference was similarly found for non-practicing faculty on all pairs with three exceptions: Knowledge and Comprehension, Knowledge and Application, and

Synthesis and Evaluation. Restated, significant differences among the examination questions were found between all but the lowest and highest levels of the Taxonomy.

Table 19

Wilcoxon Post Hoc Analysis for Differences in Examination Questions Between Two Pairs of Levels of Bloom's Taxonomy for Non-Practicing Faculty

Examinations	1	2	3	4	5	6
1						
2	.2485					
3	.1221	.0018*				
4	.0009*	.0002*	.0494*			
5	.0004*	.0002*	.0007*	.0033*		
6	.0004*	.0002*	.0008*	.0024*	.5930	

Total Cases = 44 Non-Practicing Faculty
1 = Knowledge
2 = Comprehension
3 = Application
4 = Analysis
5 = Synthesis
6 = Evaluation

*Significant at .05

The Mann-Whitney U non-parametric test for two independent samples was used to rank the two sample scores (practice versus non-practice). Since the data collected were ordinal, the investigator examined whether the two

nursing faculty groups have the same probability distribution, or whether practicing nursing faculty have lesser (or greater) probability distribution than non-practicing faculty.

With the two faculty groups drawn from the same population, a mean rank was determined for each group at each of Bloom's cognitive levels and course/unit objectives, assignment instructions, and examination questions. A Wilcoxon test ranked pairs of levels of the Taxonomy, a Z statistic was calculated and two-tailed probabilities were revealed. Of all the probabilities associated with the observed values of U, only one demonstrated a statistically significant difference in the population distribution. Significance was found between the two faculty groups at the cognitive level Analysis for examination questions. Group one, practicing faculty, revealed a significantly smaller mean rank than group two, the non-practicing faculty. Thus, practicing faculty revealed significantly less use of Analysis in examination questions than non-practicing faculty. Specific results of the Mann-Whitney U test are reported in Table 20.

Table 20

Mann-Whitney U Test with Mean Rank for Faculty in Practice (1) and not in Practice (2) and 2-Tailed Probabilities for the Combined Groups

---

Objective 01 by Group 1,2 - Knowledge
U 734.0 2-tailed p= 0.5632

Objective 02 by Group 1,2 - Comprehension
U 718.5 2-tailed p= 0.4767

Objective 03 by Group 1,2 - Application
U 781.0 2-tailed p= 0.9149

Objective 04 by Group 1,2 - Analysis
U 725.5 2-tailed p= 0.5061

Objective 05 by Group 1,2 - Synthesis
U 682.0 2-tailed p= 0.2164

Objective 06 by Group 1,2 - Evaluation
U 704.5 2-tailed p= 0.2257

Assignment Instruction 01 by Group 1,2 - Knowledge
U 785.5 2-tailed p= 0.9443

Assignment Instruction 02 by Group 1,2 - Comprehension
U 758.0 2-tailed p=0.7252

Assignment Instruction 03 by Group 1,2 - Application
U 731.0 2-tailed p= 0.5322

Assignment Instruction 04 by Group 1,2 - Analysis
U 631.5 2-tailed p= 0.0868

Assigment Instruction by Group 1,2 - Snythesis
U 696.5 2-tailed p= 0.3007

Assignment Instruction by Group 1,2 - Evaluation
U 682.5 2-tailed p= 0.1974

Examination 01 by Group 1,2 - Knowledge
U 1505.5 2-tailed p= 0.5936

Examination 02 by Group 1,2 - Comprehension
U 1369.0 2-tailed p= 0.3222

Table 20 (continued)

Examination 03 by Group 1,2 - Application
U 1704.5 2-tailed p= 0.2965
Examination 04 by Group 1,2 - Analysis
U 616.0 2-tailed p= 0.0102*
Examination 05 by Group 1,2 - Synthesis
U 765.0 2-tailed p= 0.4276
Examination 06 by Group 1,2 - Evaluation
U 739.0 2-tailed p= 0.2614

* = Significant Difference

Research Objective Number Three

Faculty Perceptions of Rewards for Combining Practice with Teaching, Research and Service

Faculty perceptions regarding the value and importance administrators place on combining practice with teaching, research and service are reported for non-practicing and practicing respondents. These results report faculty perceptions of both nursing and institutional administrators.

Respondents reported the types of reward provided to faculty by nursing administrators for teaching, research, service and practice (see Table 21). Thirty-three non-practicing (58%) and 24 (49%) practicing faculty reported that promotion and tenure were the type of reward most often provided for teaching. However, the promotion and tenure reward for research was much more highly reported for nonpracticing (39 or 71%) as compared with practicing faculty

(24 or 49%). In addition, 16 (32%) practicing as opposed to only 8 (15%) non-practicing faculty reported that professional recognition by nursing administrators was also provided. Almost one-half of both faculty groups also reported that nursing administrators would provide no reward for clinical practice.

Table 21

Faculty Perceptions of Rewards by Nursing Administration for Combining Practice with Teaching, Research and Service

	c.p.		non-c.p.	
	freq.	%	freq.	%
Teaching Rewards by Nursing Adminstration				
Promotion, Tenure	24	49.0	33	57.9
Financial	11	22.4	4	7.0
Professional Recognition	7	14.3	6	10.5
No reward	6	12.2	9	15.8
Not applicable	1	2.0	5	8.8
Total	49	100.0	57	100.0
Research Rewards by Nursing Administration				
Promotion, Tenure	24	49.0	39	70.9
Financial	6	12.2	1	1.8
Professional Recognition	16	32.7	8	14.5
No reward	3	6.1	4	7.3
Not applicable	--	--	3	5.5
Total	49	100.0	55	100.0
Service Rewards by Nursing Administration				
Promotion, Tenure	19	41.3	22	39.3
Financial	7	15.2	3	5.4
Professional Recognition	13	28.3	15	26.8
No reward	7	15.2	14	25.0
Not applicable	--	--	2	3.6
Total	46	100.0	56	100.0

Table 21 (continued)

	c.p. freq.	c.p. %	non-c.p. freq.	non-c.p. %
Practice Rewards by Nursing Administration				
promotion, Tenure	6	12.5	7	13.0
Financial	6	12.5	5	9.3
Professional Recognition	12	25.0	11	20.4
No reward	22	45.8	25	46.3
Not applicable	2	4.2	6	11.1
Total	42	100.0	54	100.0

Similar rewards for teaching and research were reported by non-practicing and practicing faculty to have priority among institutional administrators (see Table 22). Forty-three (67%) non-practicing and 34 (64%) practicing faculty perceived that both teaching and research were rewarded with promotion and/or tenure by their institution's administration. Both faculty groups also reported that service was rewarded by institutional administrators with promotion and/or tenure. Further, both groups perceived that institutional administrators would not reward clinical practice among nursing faculty (see Table 22).

Table 22

Faculty Perceptions of Rewards by Institution's Administration for Combining Practice with Teaching, Research and Service

	c.p. freq.	c.p. %	non-c.p. freq.	non-c.p. %
Teaching Rewards by Institution's Administration				
Promotion, Tenure	34	64.0	43	67.4
Financial	9	16.7	5	8.1
Professional Recognition	4	7.4	6	9.7
No reward	7	13.0	7	11.3
Not applicable	--	--	1	1.6
Total	54	100.0	62	100.0
Research Rewards by Institution's Administration				
Promotion, Tenure	31	57.4	46	75.4
Financial	7	13.0	3	4.9
Professional Recognition	11	20.4	6	9.8
No Reward	5	9.3	5	8.2
Not applicable	--	--	1	1.6
Total	54	100.0	61	100.0
Service Rewards by Institution's Administration				
Promotion, Tenure	30	58.8	27	45.8
Financial	4	7.8	2	3.4
Professional Recognition	6	11.8	12	20.3
No reward	11	21.6	17	28.7
Not applicable	--	--	1	1.7
Total	51	100.0	59	100.0
Practice Rewards by Institution's Administration				
Promotion, Tenure	11	20.8	8	14.0
Financial	4	7.5	2	3.5
Professional Recognition	6	11.3	6	10.5
No reward	27	50.9	37	64.9
Not applicable	--	--	4	7.0
Total	53	100.0	57	100.0

Research Objective Number Four

Faculty Perceptions of Clinical Competence

Nursing faculty perceptions regarding their own current level of clinical competence in their clinical area of specialization is reported (see Table 23). Fifty (77%) non-practicing faculty reported being either very (57%) or extremely (20%) competent in their level of nursing practice. However, as expected, greater proportions of practicing faculty (n = 51) reported feeling extremely competent (54%) and very competent (38%) respectively. The major mechanism through which a majority (48 or 73%) of non-practicing faculty maintained their level of clinical competence is indirectly through their clinical teaching. The majority of those in practice (37 or 66%) reported they maintain their clinical competence through a paid practice which is not part of their faculty contract. Interestingly, over one-fourth (27%) of the practicing faculty also reported that they are involved in practice for no pay.

Table 23

Faculty Perceptions and Methods of Maintaining Clinical Competence

Variable	c.p. freq.	c.p. %	non-c.p. freq.	non-c.p. %
Perceptions of Clinical Competence				
(1) Extremely competent	30	53.6	13	20.0
(2) Very competent	21	37.5	37	56.9
(3) Competent	4	7.1	10	15.4
(4) Somewhat competent	1	1.8	2	3.1
(0) No longer competent	--	--	3	4.6
Total	56	100.0	65	100.0
Mean	1.57		2.15	
S.D.	0.709		0.939	
Method to Maintain Clinical Competence				
Indirectly-clinical teaching	3	5.4	48	72.7
Practice in contract	1	1.8	4	6.1
Paid Practice-no contract	37	66.1	2	3.0
Voluntary pract.-no contract	15	26.8	2	3.0
Unable to practice	--	--	9	13.6
Total	56	100.0	66	100.0

In order to determine statistical significance between the mean scores for clinical competence for the two faculty groups, a two-sample T-Test was conducted (see Table 24). Using a .05 level of significance as the criterion, the T-Test revealed a significant probability value at 0.0002.

Table 24

Tests for Differences Practicing and non-Practicing Faculty Perceptions Regarding their Level of Clinical Competence

Faculty	N	Mean	StdDev	Probability
Clinical Practice	56	1.5714	0.7098	0.0002
Non-Practice	65	2.1538	0.9392	0.0002

Range of Mean Scores

Extremely Competent	1.00
Very Competent	2.00
Competent	3.00
Somewhat Competent	4.00
Not Competent	0.00

The Chi-Square distribution test (see Table 25) was used to determine if a significant difference exists between the two faculty groups for methods through which non-practicing and practicing faculty maintain their level of clinical competence. The survey instrument provided respondents with five methods for maintaining clinical competence: a) indirectly giving nursing care during clinical instruction; b) having a clinical appointment as part of faculty contract; c) providing direct client care with pay in addition to faculty position; d) providing direct client care without pay in addition to faculty position; and e) unable to maintain clinical practice skills. In a distribution with 4 Degrees of Freedom and a Chi-Square value of 91.695, the probability value was highly significant at 0.000. Hence, the data reveal that a significant difference exists between the

methods used for maintaining level of clinical competence between the two nursing faculty groups. The majority of practicing faculty use option "c", a position involving direct client care for which they are paid, to maintain their level of clinical competence. On the other hand, the majority of non-practicing faculty use option "a", by indirectly giving nursing care in the course of clinical teaching, to maintain their level of clinical competence (see Table 24).

Table 25

Chi-Square Test Indicating Probability Value for Mechanism Used for Practicing and Non-Practicing Faculty to Maintain Clinical Competency

Frequency Percent Row PCT Col PCT	(a) Indirect Instr.	(b) Clinical Appt.	(c) Direct With Pay	(d) Direct No Pay	(e) no CP
Practicing	3	1	37	15	0
	2.48	0.83	30.58	12.40	0.00
	5.36	1.79	66.07	26.79	0.00
	5.88	20.00	94.87	88.24	0.00
Non-Practicing	48	4	2	2	9
	39.67	3.31	1.65	1.65	7.44
	73.85	6.15	3.08	3.08	13.85
	94.12	80.00	5.13	11.76	100.00
Total	51	5	39	17	9
	42.15	4.13	32.23	14.05	7.44
Chi-Square	DF-4	Value 91.695		Probability 0.000	

Summary

The study was designed to determine whether differences exist in cognitive instruction between nursing faculty in clinical practice and those not in practice. A demographic survey was sent and curricular materials were requested from 347 nursing faculty in 20, Illinois, NLN-accredited, baccalaureate schools of nursing. Survey responses from 123 faculty and 80 sets of curricular materials were received.

Professional and demographic chararacterics of the two groups of nursing faculty were reported. These characteristics included: professional title, length of employment, area of clinical specialization, certification status, educational level, clinical instruction responsibilities and hours of weekly student contact, previous teaching experiences, age range, type and extent of clinical practice, general workload, and extent of preparation of course or unit objectives.

The study's findings were organized and reported in accordance with the research objectives of the study. Data related to Objective One, which sought to identify cognitive levels of course objectives, instructions and examination questions, were reported for both non-practicing and practicing faculty.

Objective Two was focused on an examination of differences in cognitive levels of instruction between the two groups of nursing faculty. First, using the Friedman

two-way analysis of variance, statistical significance was found in proportions among the levels of Bloom's Taxonomy. Further, the Wilcoxon Signed-Ranks test demonstrated that a significant difference exists between the pairs of levels of Bloom's Taxonomy. The Mann Whitney U test followed which indicated that no significant difference exists between the two faculty groups except at Bloom's Analysis level for examination questions. In this instance, non-practicing faculty revealed significantly greater use of Analysis than practicing faculty.

Faculty perceptions of combining clinical practice with teaching, research and service, which relate to Objective Three, were reported. Nursing and institutional administrators are perceived by faculty to primarily reward teaching and research. Minimal or no reward was perceived by faculty for clinical practice.

Finally, Objective Four, which relates to faculty perceptions of their own clinical competence, was addressed by using a two-sample, parametric T-Test which revealed a significant difference between the means for the two populations. It was followed by the Chi-square test which determined that the two groups differed in the major mechanism through which faculty maintain their level of clinical competence. The majority of practicing faculty provide direct client care in order to maintain their level of clinical competence. The majority of non-practicing

faculty, however, indirectly give nursing care during clinical instruction in order to maintain their clinical competence.

The following and final chapter of this study discusses results of the research conducted. It also summarizes the study, presents conclusions based upon the data analysis and identifies recommendations for future research and policy.

CHAPTER V

SUMMARY

This research study was designed to determine whether differences exist in cognitive levels of instruction between nursing faculty engaged in clinical practice and those not engaged in clinical practice. Benjamin S. Bloom's Taxonomy of Educational Objectives (1956) within the cognitive domain provided the organizing framework for the study.

A review of the literature for the study focused on three major areas: a) research on faculty clinical practice which includes faculty and administrator perceptions and case studies of faculty practice models; b) the relationship of cognitive behavior to the use of teaching tools; and, c) research focused on higher education using Bloom's (1956) conceptual framework of educational objectives in the cognitive domain. Although numerous studies pertaining to the use of faculty instructional tools and evaluation instruments in classroom and clinical settings were identified, no studies were identified which seek to determine if differences exist in cognitive levels of instructional tools between the two groups of nursing faculty.

For this study, a sample of nurse educators who held appointments in Illinois, NLN-accredited institutions of

higher learning were selected. Sampled faculty had a minimum of one year of teaching experience, minimally held a Master of Science Degree with a major in Nursing, were actively or in the previous year had been engaged in clinical instruction, and were tenured or in a tenure-track position. Additionally, these faculty were teaching an upper division, theory-based course, or unit within a course, for which they prepared their own educational objectives. Faculty in nursing practice were, at the time of the study, either in practice or had clinical practice in the previous year of employment.

A total of 362 nursing faculty at 20 schools of nursing in the state of Illinois was contacted for participation in this study. One hundred twenty-nine faculty responded; however, 15 of this number declined to complete the survey which was sent. The remaining faculty submitted completed surveys. This response represented a 32.8% rate of participation. Seventy-six respondents (21.9%) also submitted the requested curricular materials.

A follow-up letter, which was mailed to a random selection of 69 non-respondents, yielded 11 additional surveys and six sets of curricular materials. Since two of the follow-up respondents were graduate program faculty, a final total of 123 surveys (35.4%) and 80 sets (23%) of curricular materials was received. This extremely low rate of return presents a major limitation in the interpretation

of the findings.

The research data were compiled from the surveys and sets of curricular materials consisting of course or unit objectives, assignment instructions and examination questions which were received from nursing faculty respondents. Of these, 56 nursing faculty were in clinical practice and 67 were not in practice.

Since the research data were not based upon continuous variables, non-parametric statistics were used to determine if differences exist in cognitive levels of instruction between the two groups of nursing faculty. First, the Friedman two-way analysis of variance (ANOVA) test followed by the Wilcoxon Signed-Ranks test determined that differences in proportions exist among the levels of Bloom's Taxonomy. These findings revealed that for both nursing faculty groups combined, significant differences do exist among the six levels of Bloom's Taxonomy for course objectives, for assignment instructions and for examination questions.

Next, the Mann-Whitney U test for two independent samples was used to determine if significant differences exist among the proportions of Bloom's cognitive levels falling into each of the categories for objectives, assignment instructions and examination questions. Of all the probabilities associated with the observed values of U, only one demonstrated a significant difference in the population distribution. The difference revealed

differentiation between the two faculty groups in the inclusion of Analysis for examination questions. Group One, practicing faculty, revealed significantly less use of Analysis for examination questions than Group Two, the non-practicing faculty.

Faculty perceptions of administrator views regarding rewards for combining practice with teaching, research and service were reported by descriptive data. Both faculty groups perceived that the greatest rewards were for teaching and research. Faculty perceived that minimal or no rewards exist for clinical practice.

Nursing faculty in clinical practice viewed themselves as extremely competent whereas non-practicing faculty viewed themselves as very competent. A two-sample T-Test revealed that a significant difference exists between the faculty groups regarding their perceptions about their own clinical competence. The Chi-Square test that followed also revealed a significant difference between the two nursing groups' perceptions of the major mechanism for maintaining their level of clinical competence. In a Distribution with 4 Degrees of Freedom, and a Chi-Square value of 91.695, the probability value was highly significant at 0.000. This finding indicated that the majority of practicing faculty provided direct client care in order to maintain their level of clinical competence. The majority of non-practicing faculty, however, indirectly gave nursing care during

clinical instruction in order to maintain their clinical competence.

Discussion

A discussion of the research findings regarding the differences between nursing faculty in clinical practice and those not in clinical practice follows. It is introduced by a discussion of the profile of both groups of nursing faculty related to academic rank, tenure status, doctoral education, certification status, clinical instruction responsibilities and age. Next, models of faculty practice are discussed. This is followed by a discussion of nursing faculty's perceptions of administrator rewards. Finally, findings related to each research objective regarding both nursing faculty groups are discussed.

A review of faculty characteristics reveals that a majority of non-practicing faculty hold either the Assistant or Associate Professor title, whereas a majority of practicing faculty hold lesser rank in the Assistant or Instructor position. This finding was expected since more non-practicing faculty were doctorally prepared or were engaged in doctoral study than practicing faculty. Surprisingly, however, a majority of faculty in both groups was either tenured or on the tenure-track. Since a majority of practicing faculty had lesser rank and lacked doctoral preparation, the researcher assumed that they would not be tenured or on tenure-track. Years of previous teaching

experience reported by more than one-half of the practicing faculty may explain this finding. At the time of the survey, these experienced faculty most likely were appointed at a more advanced rank and/or had several years of previous experience at their current institution. Also, differing tenure policies among institutions may have affected the tenure status of practicing faculty. For example, one participating institution has historically placed greater emphasis on teaching excellence and service to the college and community for reward vis-a-vis research-based activities. As expected, both groups indicated that increased scholarship was the most important activity needed to achieve tenure status.

There was a higher incidence of respondents who were doctorally prepared or in doctoral study among non-practicing faculty. This finding is expected since non-practicing faculty held a higher rank and were either tenured or on tenure-track. By contrast, fewer practicing respondents were doctorally prepared or engaged in doctoral study; those who had doctorates reported having a professional (i.e., D.NSc.) vis-a-vis an academic doctorate (i.e., Ph.D.). Again, this is not surprising since a professional doctorate is practiced-based and prepares faculty with a scientific basis for their nursing practice. Also, practicing faculty view nursing as a practice discipline and prefer to emphasize practice in their role as faculty members.

In comparing the two groups of faculty who have attained certification status, a wide difference was found. As expected, a majority of non-practicing faculty held no clinical certification status. By contrast, more practicing faculty earned certification status in their clinical specialty. Since certification signifies validation of higher level competencies, it is likely that practicing faculty would be certified in their specialized area of practice.

Since a majority of both groups reported clinical instruction responsibilities, weekly student contact remained high. The total contact hours reported by a majority of both groups of faculty ranged between 15 and 20. A few nursing faculty in both groups reported even greater numbers of contact hours and added comments such as, "Get serious here!" and "Clinical instruction alone demands more hours than you have listed". The researcher sensed that faculty in both groups feel burdened by their heavy student contact hours. This indicates that minimal time is available for scholarship, service, and clinical practice.

Surprisingly, the age range among both groups of faculty was in the lower middle and middle-middle age (i.e., 35-44, 45-54) categories. Although the sample was very small, the researcher assumed that the majority of practicing faculty would be younger than those non-practicing faculty. This was expected because the mean position rank, tenure status and

academic credentials were greater for non-practicing than practicing faculty. Also, length of employment was greater among non-practicing faculty (see Table 1). From these findings however, the researcher assumes that faculty who chose to respond were possibly similar in age and/or (less likely) typified those who generally teach in the undergraduate level; thus, these faculty met the selected criteria for participation. In either case, it appears that faculty in both groups have many remaining years to continue their professional development and productivity.

Since a small number of respondents reported having faculty practice contracts, practice among nursing faculty was predominantly by moonlighting vis-a-vis faculty contract. This finding is not surprising. Nursing faculty lack support for their practice. Only a few institutions include faculty practice as a criterion for promotion and tenure. This may be due to the fact that faculty practice is difficult to evaluate (Kent, 1980). In Dickens' (1983) study, for example, only 15% of the Southern Council on Collegiate Education for Nursing members had established mechanisms for evaluating faculty practice. Also, if institutions do not value faculty practice, faculty may be reluctant to practice if they are not compensated for their work. Holm (1981), as a practitioner-teacher, found that the lack of monetary reward was the major barrier to practice.

This study's findings also revealed that time involved

in faculty practice ranged between one and nine hours per week. Since these hours were in addition to the faculty-contracted workload, they likely took place on weekends, evenings and/or during the summer months when faculty were not under contract. Here again, since Holm's (1981) study revealed that time commitment was the second major barrier to faculty practice, a lack of time may be the primary reason cited for the limited number of hours spent in practice. The majority of nursing faculty are women who may have to balance many responsibilities such as their teaching load, doctoral studies, scholarship, community service, home and family and clinical practice. Thus, time for faculty practice is very limited to when the faculty are available.

Respondents in both groups recognized that both institutional and nursing administrators primarily reward teaching and research for promotion and tenure. By contrast, respondents reported that no rewards prevail for clinical practice. Why, then, do faculty practice if they perceive that adminstrators place minimal value on clinical practice? The Just, et al. (1989) study revealed three reasons for faculty practice: personal reasons, patient care reasons and scholarly reasons. Personal reasons, such as maintenance of skills, were ranked as most important. Those findings supported previous research conducted by Anderson and Pierson (1983) and McClure (1987) which revealed that practicing faculty focus on learning, improving and mastering technical

aspects of delivering nursing care. Benefits of this are applicable both to the instruction of nursing students and to the practice of nursing. Practicing faculty contend they earn a greater degree of credibility with students than non-practicing faculty. Increased knowledge and understanding of the practice experiences and settings improve the relevency of their teaching and provide greater opportunity for clinical research.

The research study conducted by Just, et al. (1989) also revealed that monetary benefits were another personal reason for faculty practice. It appeared to be important to many faculty who believe that a fee-for-service or specific part-time salary is needed to provide quality-based health care.

Even though administrators apparently do not reward practice, practicing faculty in this study reported that having certification status was important in order to maintain professional recognition. This finding was expected since certified faculty practicing in agencies demonstrate their expertise, become role models, and gain new respect from agency staff and adminstrators. They are likely to establish improved relationships between nursing service and nursing education. As resource experts, certified faculty also serve as consultants in the agency which helps to maintain their own professional recognition. Finally, practicing faculty who are certified may improve their credibility with their educator colleagues. They are viewed

as expert practitioners by those within their discipline. The importance of having certification status also supports the Just, et al. (1989) study that personal factors are the most important reason for faculty to engage in clinical practice.

In addressing Research Objective One, which relates to determining cognitive levels of course or unit objectives, assignment instructions and examination questions according to Bloom's Taxonomy, some descriptive differences were noted between both groups of nursing faculty. Table 9 demonstrates that practicing faculty had higher percentage means at the Knowledge level in their course objectives, assignment instructions and in examination questions than non-practicing faculty. This finding is not suprising since practicing faculty are considered pragmatic, concrete, fact-finding practitioners who strive to improve and maintain their clinical skills. Hence, they appear to demonstrate use of these skills in their curriculum development. Practicing faculty also demonstrated higher percentage means for course objectives at the Application and Analysis levels and for assignment instructions at the Analysis level. Nursing faculty consider the profession to be a practice discipline. Hence, practicing faculty are more likely to use clinical application examples in their cognitive instruction.

Of particular interest is that even though total reporting for the Evaluation category was minimal, a similar

higher mean was evidenced in both assignment instructions and examination questions for practicing faculty (see Table 9). Most likely, practicing faculty respondents who submitted higher cognitive examination questions again use "real world" evaluation examples from their own practice; hence, they may be better able to prepare Evaluation questions from these examples for examination requirements.

A higher percentage mean for non-practicing faculty was evidenced at the Application level for assignment instructions and examination questions and at the Analysis level for examination questions than practicing faculty (see Table 9). A similar higher mean for non-practicing faculty was noted at the Synthesis level for assignment instructions. Although no definitive explanation exists, the researcher suspects that non-practicing faculty who are engaged in research-based scholarship likely design and implement projects which are based on their problem-solving efforts. Hence, their preparation of instructional tools are facilitated by their researched-based activities. These projects may be similar to the assignment and examination tools that they design.

Research Objective Two examined whether significant differences exist in cognitive levels of instruction used by both faculty respondent groups. Although the sample was small, data analyses revealed that no significant differences exist between faculty in practice and faculty not in practice

except on one level of instruction (see Table 19). Differentiation between the two groups indicated that non-practicing faculty used the cognitive level of Analysis significantly more than practicing faculty for examination questions. This suggests that non-practicing faculty's academic preparation, institutional affiliation and scholarly productivity may have influenced their use of higher cognition in instruction. In the preparation of course or unit objectives and assignment instructions for both groups, however, no significant differences were noted. To the researcher, lack of significant differences implies that faculty's primary focus is curriculum development, implementation and evaluation with or without practice.

Research Objective Three addressed faculty perceptions of the value and importance assigned by administrators to combining clinical practice with teaching, research and service. Faculty reported that administrators do not recognize the necessity for nursing practice. Minimal if any institutional credence and reward were given to nursing faculty for their practice. Rather, traditional academic rewards were granted for those who excell in teaching and research.

In a dearth of institutions, practice was professionally recognized and/or encouraged by administrators; but, for a majority of faculty respondents, recognition was nonexistent and clinical practice demanded unrealistic expectations of

faculty. This finding is not surprising for several reasons. One, a small number of institutions nationwide include faculty practice as a criterion for meeting tenure requirements. Apparently, most academic institutions do not value practice. Practice is likely equated with a technical and/or professional program and not higher learning. Traditionally, Joel (1983) reports, research has been the criterion for scholarship among university faculty; practice has not been a viable component. Second, a small number of institutions have established mechanisms for evaluating faculty practice. In a survey of 118 NLN-accredited Bachelor of Science with a major in Nursing programs, Bellinger (1983) determined that 82 schools (70%) had no faculty practice policy. Institutional administrators probably don't understand how to evaluate practice; they likely have had no experience with a professional education program; and they lack insight regarding what is involved in practice. Also, they have no other program with which to compare in order to evaluate the practice.

The third and final probable reason why faculty practice is not a criterion for meeting tenure is that the status of nursing educators within settings of higher learning remains uncertain. On some campuses, they, as predominantly women, are viewed as dishwashers away from home, academically underprepared, and a financial burden for the institution. Also, since nursing education continues to be offered as

multi-faceted programs, colleagues in other disciplines may remain skeptical about the purpose and value of baccalaureate nursing education.

Objective Four addressed faculty perceptions regarding their own level of clinical competence. A majority of non-practicing faculty consider themselves very competent, and fewer reported they felt extremely competent. In their view, non-practicing faculty can remain competent indirectly by providing weekly clinical instruction. Most likely, non-practicing faculty defined faculty practice as that which somehow involves the provision of patient care; their clinical instruction was considered an acceptable avenue for maintaining clinical practice. They probably contend that since they are responsible for their students' assigned patient's care and are teaching in the clinical areas on a regular basis, they <u>are</u> keeping up with practice.

By contrast, the majority of practicing faculty consider themselves extremely and/or very competent with fewer reporting competent and no one reporting they lack competence. Since the majority of faculty practice outside of their contract, this finding is expected. However, it would be interesting to determine the purpose for their practice. What motivates them to practice only between one and nine hours per week? Are they practicing for personal reasons, such as increasing or maintaining their clinical skills? Or, do they have a prevailing fear that if they

discontinue practice, they will lose their competence, self-confidence and credibility? Where do monetary and research-based benefits rank in their order of priority? In the Just, et al. (1989) study, faculty reported that earning extra money was an impetus for practice. Findings indicated, however, that scholarly reasons were the least important.

Although non-practicing faculty consider themselves competent as practitioners, further examination of additional reasons they do not practice would likely reveal no new insights. Just, et al., (1989) reported that non-practicing faculty lack time and support. In fact, their responses to Just et al.'s research were strongly expresssed as feeling overburdened and undervalued. This reminds the reader that research has traditionally been the criterion for scholarship among college and university faculty. Practice has had no value to institutional administrators.

In summary, both groups of respondents perceive themselves to be competent nursing faculty irrespective of their practice status. Most likely this also reveals faculty self-confidence in their own performance whether it is by direct practice and/or indirect measures of clinical instruction.

Conclusions

Over the past decade the importance of clinical practice for nursing faculty has been extensively debated; however, no consensus about its definition, implementation, and

effectiveness has been reached. This investigator also has attempted to study the issue of faculty practice by examining whether differences exist in cognitive levels of instruction between practicing and non-practicing faculty. The findings of this study, however, appear to provide little, if any, resolution to this debate. The investigator will identify findings related to demographics and differences that appear to be revealed in cognitive levels of instruction between the two nursing faculty groups.

Overall, minimal differences in respondent characteristics appear to exist between nursing faculty with and without practice. A majority of non-practicing faculty had higher rank and were doctorally prepared or were engaged in doctoral study than practicing faculty. However, among practicing faculty, a majority had certification status and were involved in faculty practice between one and nine hours per week. Also, since nursing faculty lack administrative support and only a small number of practicing faculty have faculty practice contracts, practice among nursing faculty was predominantly by moonlighting. This research study suggests that significant differences in cognitive levels of instruction between practicing and non-practicing faculty are minimal. Regarding Objective One, some descriptive differences were noted between both groups (see Table 9). Practicing faculty in this study had higher percentage means at the Knowledge, Application and Analysis levels in their

course objectives than non-practicing faculty. They also demonstrated higher means at the Knowledge, Comprehension, Analysis and Evaluation levels in assignment instructions than non-practicing faculty. In addition, practicing faculty showed higher means at Knowledge and Evaluation levels in examination questions than non-practicing faculty. For non-practicing faculty in the study, higher means were revealed at the Application and Synthesis levels in assignment instructions than practicing faculty. By comparison, non-practicing faculty also demonstrated higher means at the Comprehension, Application and Analysis levels in their examination questions than practicing faculty. They also demonstrated higher means for course objectives at the Application and Analysis levels and for assignment instructions at the Analysis level. These additional differences are important for non-practicing faculty; the higher cognitive levels of instruction demonstrated in the areas of assignment instructions and examination questions revealed that they are apparently implementing the goals designed for faculty's course/unit objectives. However, overall, no consistently higher mean for practicing faculty vis-a-vis non-practicing faculty was demonstrated in cognitive levels of instruction.

Moreover, no significant difference exists in cognitive instruction between faculty in clinical practice and those not in practice except on the Analysis level of Bloom's

Taxonomy. Non-practicing faculty used the cognitive level of Analysis significantly more than practicing faculty for examination questions (see Table 19). This finding suggests that although practicing faculty may demonstrate higher cognitive levels of course objectives in their instruction, they may lack the follow-through in assignment instructions and examination questions they use. What is goal-directed (i.e., course objectives) is likely not fostered in the implementation and synthesis stages of the course outline. Apparently lacking is the relationship between instructional tools used for learning and learning outcome measures. Thus as Table 19 demonstrates, inquiry-based objectives, instructions and questioning reveal the critical absence of a much-needed link to improve problem-solving.

The findings regarding Objective Three are important for faculty perceptions of combining clinical practice with teaching, research and service (see Tables 21, 22). Since faculty perceptions of administrators generally dictate faculty's behavior, then the study suggests a noteworthy finding. As long as faculty perceive that administrators view clinical practice as unimportant for promotion and tenure, faculty will resist practicing for professional reward and achievement. Furthermore, when faculty perceive that they earn no reward or merit for practice, they will view this non-reward as unproductive and unwarranted for their future growth and achievement.

The conclusions from Objective Four suggest that faculty don't need clinical practice to feel a sense of self-competence. Non-practicing faculty believe they remain competent with their clinical instruction experiences and do not need to practice in order to feel competent as practitioners.

Limitations

This preliminary study had several limitations. First, it was limited by the small sample that was available to collect data. Second, respondent participation also remained minimal. Thus, the findings cannot be generalized to the population. The low faculty response rate may have been due to several factors. Some faculty protective of their printed materials chose not to participate for fear of the investigator's exploitation of the submitted materials for personal use. Others indicated that the course materials were the property of the university. Still others declined to participate because they were planning for an accreditation visit from the National League for Nursing (NLN) and reported that they were hesitant to share curricular materials. Logistical factors presented still another reason for lack of participation. Factors such as part-time status, providing only clinical instruction vis-a-vis classroom theory, unavailable materials for distribution and faculty teaching at the graduate level were all stated by participants as reasons they did not meet the study's

criteria.

Another logistical limitation affected the follow-up of non-respondents. For five out of the twenty institutions in the study, the investigator was required to send faculty requests for participation directly to the Dean/Director, Chair of the Department/Division/School of Nursing. Hence, the investigator was unable to determine which specific non-respondents to follow in those five institutions.

A third, major limitation of the study was the absence of direct contact between the investigator and the faculty in their classroom setting, in discussions with students, and in their clinical instruction roles. Since the investigator had no control over the independent variables, the research study used the survey method to elicit information. The investigator had to rely on faculty statements and course materials they submitted and indicated they used.

Fourth, submitted course materials varied widely in content, credit hour requirement, and whether they were theory-based or a combination of theory and clinical instruction. Also, the submitted unit/course materials may not have been prepared by the faculty member who submitted them. In spite of investigator screening, they may have been prepared by a team which required coordinator's approval and/or have been prepared by other faculty and used by successors in that position.

Additionally, incomplete submission of course materials

by some faculty respondents posed a fifth limitation for the study. Several respondents chose to submit unit or course materials but declined to submit examination questions pertaining to the content. Others submitted unit/course objectives but omitted additional instructional tools. Still others submitted complete sets of curricular materials.

Another limitation is that the study was cross-sectional vis-a-vis longitudinal. As a time-limited study, it precluded any opportunity for gathering data over an extended period to determine any pattern of behavior related to the presence or absence of faculty practice.

Finally, the study was limited to educational institutions within one midwestern state. A wider data source may have revealed differences in patterns, attitudes toward and extent of faculty practice from those of the current study's respondents.

Implications for Nursing Education

Although many benefits of faculty practice have been cited in the literature, there is little empirical evidence to support these claims. No consensus can been reached to determine if differences exist in levels of cognitive instruction between nursing faculty with and without clinical practice. And, since these data are inconclusive, the findings from this research study provide little additional support; thus, the debate of faculty practice continues.

The implications from the conclusions of this research

study are numerous, however. Nursing leaders have long emphasized the necessity for bridging the functions of nursing service and nursing education (Millonig, 1986), and this study contributes to a research base which examines the interaction of service with education. Previous studies on nursing practice have heretofore been associated with afffective gains (Kramer, et al., 1986). Based upon the results of this preliminary study, however, differences in cognitive levels of instruction used by faculty in practice revealed no support for faculty practice.

If, as indicated by the conclusions that no major differences in cognitive levels of instruction exist between faculty with and without practice, this study's results may reduce the current role strain faculty experience in trying to meet their multi-faceted roles as nurse educators. Since this study's findings revealed no differences in cognitive levels of instruction among faulty with and without practice, previous demands for faculty practice by well-intentioned colleagues and administrators seem inappropriate and unnecessary.

Furthermore, educators should resolve their differences over practice vis-a-vis non-practice and direct their energies toward strengthening the profession by recognizing the contributions of both practicing and non-practicing faculty to the academic institution and health care delivery system. If, as Millonig (1986) iterates, nursing is a

practice discipline, why hasn't the profession of nursing moved forward and established faculty practice as a viable entity in the role of nurse educators? And, since research (Bellinger, 1985; Dickens 1983) shows that the majority of faculty do not practice, the data from this preliminary study add further assumptions to the ongoing debate. Change must be an inherent part of the future of nursing education if nursing is to grow as a profession. Change cannot be effected when internal dissension and resistance interfere with the growth and development of the profession. However, as this preliminary research study has identified, alternate approaches to faculty clinical practice do exist. In Fagin's (1985) view, for example, a nursing faculty department may comprise both groups. There are educators whose primary interests lie in clinical practice and teaching, and educators whose primary interests lie in research and teaching. Both communicate their worth to students, both are valued by the institution and both have promotion, tenure and merit-increase options.

Moreover, these findings have implications for the nursing curriculum. Since faculty in practice revealed greater use of the Application level in their teaching, findings also may have implications for greater use by non-practicing faculty. The findings may promote revisions of assignment instructions and examination questions which reflect expectations of the course or unit objectives.

Faculty in both groups may be motivated to use Application instructions in their assignment requirements and Application examples in their examination questions.

Since a significant difference was found between both faculty groups at the Analysis level of Bloom's Taxonomy for assignment instructions and examination questions, this finding suggests practicing faculty should be encouraged to place as much emphasis on Analysis in their instructional tools as do non-practicing faculty.

Findings of this study, however, may eliminate any hope of establishing greater nursing and institutional administrators' support toward having faculty practice. Since no differences between faculty groups were revealed in cognitive levels of instruction, the debate will likely persist; it is unlikely that consensus regarding faculty practice will be reached. Also, traditional reward policies for faculty regardless of practice status will continue to be made through individual institutions.

Finally, implications of these conclusions for nursing service and nursing education functions are evident. Nursing service and nursing education must bridge roles to recognize each other's strengths, priorities and goals for quality-based health care delivery and student learning respectively. Regardless of faculty status with or without practice, this collaboration should effectively contribute to and promote over-all growth of the health care delivery system, the

profession and nursing education.

Recommendations for Future Research

As a result of this research study, several recommendations for future research are indicated. They are identified as follows.

Since the current study has been exploratory, this research should be replicated and expanded to incorporate a larger faculty sample with a broader geographic base of representation. It would also be helpful for nursing educators and administrators to know if differences in type of clinical practice (eg., unification vis-a-vis moonlighting) have any impact on cognitive instruction.

Furthermore, the critical issue from this investigator's research is the impact of faculty clinical practice upon cognitive levels of instruction. Nursing leaders' assumption is that as higher cognitive levels of teaching are used, critical thinking skills of nursing students should improve. This has not been empirically tested. Students' cognitive growth may be far less advanced than nursing educators assume. Since no research has been done indicating cognitive changes in student outcomes, this will be one focus for the investigator's continuing study. Within the academic community candidate performance has often been used as a basis for evaluating the program's curriculum. Hence, comparing licensure examination scores for nursing graduates may be one way of evaluating outcomes with and without

faculty practice.

This study also suggests the need for individualized research regarding varied teaching methodologies which may enhance higher cognitive learning. Questions pertaining to effectiveness of situation strategies such as analysis of arguments which provide higher cognitive thinking are suggested. Also, research is needed to determine impact of the environment on cognitive learning outcomes. Research is needed to determine effectiveness of preparatory courses in improving thinking skills.

The context for cognitive development should be examined, as well. Students' extent of devotion to studies and their frequency of library use must be documented. The study also suggests that questions regarding the effectiveness of peer collaboration efforts need to be met among faculty. Faculty who successfully emphasize thinking skills should be studied. Questions should include: What makes them successful? How do they conduct their classes? How are their students examined? How do faculty engage in discussion with the students? What is the process by which faculty plan their course materials?

Moreover, a period of socialization into the professional role and a chance to grow in reasoning ability are essential for the new graduate. Given that time for growth, it may be advisable to compare the experienced with the newer graduate to determine if differences in critical

thinking skills exist and the impact of faculty practice, if any, on that change.

This exploratory study also has implications for expanding the research base on cognitive instruction. This study is a beginning for viewing cognitive differences in instruction among faculty groups. No research at this writing exists regarding whether differences in cognitive levels of instruction by both faculty groups affect students' learning outcomes. This researcher believes this follow-up research is critical to the future of nursing education.

Another recommendation is to evaluate cognitive instruction and student outcomes of nursing faculty with and without practice in one institution where both activities are in progress (eg. University of Pennsylvania). It would also be useful to examine faculty workload and the extent of stress in both groups at the same institution.

Additionally, no efforts have been made to empirically examine the results of the current practice models in any of the institutions. Although numerous anecdotal reports of the varied models are freely available, research is needed to scientifically justify their existence.

Finally, research should be expanded to examine if differences in cognitive instruction exist among practicing faculty whose administrators provide conventional rewards for practice. Although commitment and motivation are key factors in the faculty practice movement, individuals and settings

differ. If faculty practice is viewed as an inherent part of the educational reward (ie., promotion and tenure) system, it should demonstrate not only commitment and motivation but change in faculty cognitive output.

REFERENCES

A new licensing exam for nurses. (1980, April). American Journal of Nursing, 80 (4), 723-726.

Alase, D. (1985, November-December). Financing faculty practice: Elements of a strategic plan. Nursing Economics, 3, 328-331.

Anderson, E., & Pierson, P. (1983). An exploratory study of faculty practice views of those faculty engaged in practice who teach in an NLN-accredited program. Western Journal of Nursing Research, 5, 129-143.

Anderson, J. S. (1964). A comparative study of chemical educational material study and traditional chemistry in terms of students' ability to use selected cognitive processes. Unpublished doctoral dissertation. Florida State University. (Order No. 65-309).

Andreoli, K., & Musser, A. (1985). Faculty productivity. In H. Werley & J. Fitzpatrick (Eds.), Annual Review of Nursing Research, Vol. 3 (pp. 177-193). New York: Springer.

Annis, D. & Annis, L. (1979, Fall). Does philosophy improve critical thinking? Teaching Philosophy, 3 (2), 145-152.

Annis, L. F. & Annis, D. B. (1979a). The impact of philosophy on students' critical thinking ability. Contemporary Educational Psychology, 4, 217-226.

Arlton, D. & Miercortt, O. (1980). A nursing clinic: the challenge for student learning opportunities. Journal of Nursing Education, 19 (1), 53-58.

Aron, A., Orme-Johnson, D., & Brubaker, P. (1980). The transcendental meditation program in the college curriculum: A 4-year longitudinal study of effects on cognitive and affective functioning. College Student Journal, 15, 140-146.

Ashby-Davis, C. (1985). Suggestions for staff development in teaching critical thinking. Washington, D.C.: National Institute of Education (ERIC No. ED 251191).

Ashley, J. (1976). Hospital, paternalism and the role of nurse. New York: Columbia University.

Association of American Colleges. (1985, February). Integrity in the College Curriculum. Washington, D.C.: Association of American Colleges.

Association of American Medical Colleges. (1977). An In-Depth Study of Seven Medical Practice Plans Final Report. Washington, D.C.:Association of American Medical Colleges.

Baker, C. (1981, September-October). Moving toward interdependence: Strategies for collaboration. Nurse Educator, 6, 27-31.

Baker, P. (1981, April). Learning sociology and assessing critical thinking. Teaching Sociology, 8 (3), 325-363.

Barger, S. (1986, July-August). Academic nursing centers. Journal of Professional Nursing, 2, 246-251.

Barham, V. (1965, Winter). Identifying effective behavior of the nursing instructor through critical incidents. Nursing Research, 14 (1), 65-69.

Barnes, C. P. (1983). Questioning in college classrooms. In C.L. Ellner & C.P. Barnes, Studies in College Teaching. Lexington, MA.: Lexington Books.

Basteyns, M. (1980). Developing the practitioner/teacher role. In L. Machan (Ed.), The practitioner-teacher role (p. 9). Wakefield, MA: Nursing Resources.

Bauder, L. (1982). Discontent and crisis at schools of nursing: The consequences of unmet human needs. Western Journal of Nursing Research, 4 (1), 35-48.

Bellinger, K., Reid, J., & Sander, D. (1985, May). Faculty practice policy. Journal of Nursing Education, 24, 214-216.

Beyer, B. K. (1984, April). Improving thinking skills in practical approaches. Phi Delta Kappan, 65, 556-560.

Blai, B. J. (1982, December). Faculty perceptions of effective teachers. (ERIC Document Reproduction Service No. ED 219 029) Baltimore, MD.

Bloom, B. (1954). The thought processes of students in discussion. In J. French (Ed.), Accent on teaching. New York: Harper and Brothers.

Bloom, B. (Ed.) (1956). Taxonomy of educational objectives. New York: David McKay Co., Inc.

Bloom, B. (1963). Testing cognitive ability and achievement. In N. L. Gage (Ed.). Handbook of Research on Teaching. Chicago, IL.: Rand McNally.

Bloom, B. (1976). Human Characteristics and School Learning. New York: McGraw-Hill.

Bloom, B., Madaus, G., & Hastings, J.T. (1981). Evaluation to Improve Learning. New York: McGraw Hill.

Boyer, C., & Lewis, D. (1985). And on the Seventh Day: Faculty Consulting and Supplemental Income. In J. Fife (Ed.) ASHE-ERIC Higher Education (Report No. 3). Washington, D.C.: Clearinghouse on Higher Education, Association for the Study of Higher Education.

Braskamp, L., Brandenberg, D., & Ory, J. (1984). Evaluating Teaching Effectiveness. Beverly Hills: Sage Publications.

Braxton, J., & Nordvall, R. (1985). Selective liberal arts colleges. Journal of Higher Education, 56, 538-553.

Bridges, C., Ware, W., Brown, B., & Greenwood, G. (1971). Characteristics of best and worst college teachers. Science Education, 55 (4), 545-553.

Brimmer, P.F., Skoner, M.M., Pender, N.J., Williams, C.A., Fleming, J.W., & Werley, H.H. (1983). Nurses with doctorate degrees. Research in Nursing and Health, 6, 157- 165.

Brookfield, S.D. (1987). Developing Critical Thinkers. San Francisco: Jossey-Bass.

Brown, A. L. (1985). The importance of diagnosis in cognitive skill instruction. In S.F. Chipman, J.W. Segal & R. Glaser (Eds.), Thinking and Learning Skills: Current Research and Open Questions, 2. Hillsdale, New Jersey: Erlbaum, 319-337.

Brown, S. (1981, November). Faculty and student perceptions of effective clinical teaching. Journal of Nursing Education, 20, 4-15.

Bryden, D.P. (1984). What do law students learn? A pilot study. Journal of Legal Education, 34, 479-506.

Burgess, G. (1980, March). The self-concept of undergraduate nursing students in relation to clinical performance and selected biographical variables. Journal of Nursing Education, 19, (3), 37-44.

Calamari, S. (1968, November). Factors that influence evaluation conferences in clinical experience. The Journal of Nursing Education, 7, 11-14.

Campbell, E. (1970, March). The clinical nurse specialist: Joint appointee. American Journal of Nursing, 70, 543-546.

Charleston Faculty Practice Conference Group (1986, January). Nursing faculty collaboration viewed through feminist process. Advances in Nursing Science, 8 (2), 29-38.

Charron, S. (1985). Role issues and the nurse educator. Journal of Nursing Education, 24 (2), 77-79.

Chickadonz, G., Bush, E., Korthuis, K., & Utz, S. (1981, December). Mobilizing faculty toward integration of practice into faculty roles. Nursing and Health Care, 2, 548-553.

Chickering, A.W. (1984). The Modern American College. San Francisco: Jossey-Bass.

Chickering, A.W. (1972). Undergraduate academic experience. Journal of Educational Psychology, 63, 134-143.

Chickering, A. W. (1969). Education and identity. San Francisco: Jossey-Bass.

Chickering, A.W., McDowell, J., & Campagna, D. (1969). Institutional differences and student development. Journal of Educational Psychology, 60 (4), 315-326.

Chipman, S.F., Segal, J.W., & Glaser, R. (Eds.) (1985). Thinking and learning skills: Current research and open questions. Hillsdale, N.J.: Erlbaum.

Christman, L. (1979, Spring). On the scene: Uniting service and education at Rush-Presbyterian-St. Lukes Medical Center. Nursing Administration Quarterly, 3, 7-13.

Christman, L., & Kirkman, R. (1972, October). A significant innovation in nursing education. Peabody Journal of Education, 50, 1-6.

Christy, T. (1980). Clinical practice as a function of nursing education: An historical analysis. Nursing Outlook, 27, 493-497.

Collins, A. and Stevens, A.L. (1983). A cognitive theory of interactive teaching. In C.M. Reigeluth (Ed.). Instructional Design Theories and Models: An Overview. New York: Academic Press.

Collins, A., & Stevens, A.L. (1982). Goals and strategies of inquiry teachers. In R. Glaser (Ed.), Advances in Instructional Psychology, 2, 65-119. Hillsdale, New Jersey: Earlbaum.

Conner, M. (1983). Thinking styles and foreign language learning. Improving College and University Teaching, 31 (1), 23-24.

Conti, G. (1985, Summer). The relationship between teaching style and adult student learning. Adult Education Quarterly, 35, 220-228.

Coudret, N. A. (1980). Faculty workload in undergraduate nursing programs (Doctoral dissertation, Indiana University, 1980). Dissertation Abstracts International, 41, 548-A.

Coudret, N. A. (1981, March-April). Determining faculty workload. Nurse Educator, VI (2), 38-41.

Cox, C. (1985). Nursing practice in action: Diary of a casualty. In American Academy of Nursing (AAN) (Ed.). Kansas City, MI: American Academy of Nursing, (pp. 130-138).

Cox, R.C. (1965). Item selection techniques and evaluation of instructional objectives. Journal of Educational Measurement, 2, 181-185.

Cranston, C.M., & McCort, B. (1985, April). A learner analysis experiment: Cognitive style versus learning style in undergraduate nursing education. Journal of Nursing Education, 24 (4), 136-138.

Cross, K.P. (1971). Beyond the Open Door: New Students to Higher Education. San Francisco: Jossey-Bass.

Cross, K.P. (1976). Accent on Learning. San Francisco: Jossey-Bass.

Cross, K.P. (1982). Adults as Learners. San Francisco: Jossey-Bass.

Crow, L.W. & Haws, S.G. (1985, August). The effects of teaching logical reasoning upon students' critical thinking and science advancement. Texas: (ERIC Reproduction Service No. ED 255 371).

Cruikshank, D.R. (1986, Winter). Critical thinking skills for teachers. Teacher Education Quarterly, 13, 82-89.

Curran, D., & Riley, D. (1984, September-October). Faculty practice plans: Will they work for nurses? Nursing Economics, 2, 319-324.

Dadich, K. (1985). The reintegration of a nurse. In American Academy of Nursing (Ed.), Faculty practice in action (pp. 119-129). Kansas City, MO: AAN.

D'Angelo, F. (1975). A Conceptual Theory of Rhetoric. Cambridge: Winthrop publisher, 16, 42.

Davis, J. & Williams, D. (1985). The nurse educator: Functional role development. Nurse Educator, 10 (6), 20-25.

Demetrulias, D.A., & McCubbin, L.E. (1982, Autumn). Constructing test questions for higher level thinking. Nurse Educator, 7 (5), 13-17.

Department of Registration and Education. (1987, February). 1986 Biennial Survey of Illinois Registered Nurses Final Report. Springfield, IL: Department of Registration and Education.

Dexter, P., & Laidig, J. (1980, March). Breaking the education/service barrier. Nursing Outlook, 28, 179-186.

Dickens, M. (1983, December). Faculty practice and social support. Nursing Leadership, 6, 121-128.

Diers, D. (1980). Faculty practice: Model, methods and madness. In NLN (Ed.), Cognitive dissonance: Interpreting and implementing faculty practice roles in nursing education (pp. 7-16). New York: National League for Nursing.

Dillon, J.T. (1982, Winter). Cognitive correspondence between question/statement and response. American Educational Research Journal, 19 (4), 540-551.

Dillon, J.T. (1984). Research on questioning and discussion. Educational Leadership, 42 (3), 50-56.

Dinsmore, V., & Pollow, R. (1981). Credit for faculty practice model: A proposal. Nursing and Health Care, 2, 17-21.

diSessa, A.A. (1982). Unlearning aristotelian physics: A study of knowledge-based learning. Cognitive Science, 6, 37-75.

Dixon, J., & Koerner, B. (1976, July-August). Faculty and student perceptions of effective classroom teaching in nursing. Nursing Research, 25, 300-305.

Donovan, C. (1985). Clinical nurse specialist in an acute care setting. In AAN (Ed.), Faculty practice in action (pp. 111-118). Kansas City, MO: American Academy of Nursing.

Dressel, P.L. & Mayhew, L.B. (1954). General Education: Explorations in Evaluation. Washington, D.C.: American Council on Education, 174-307.

Dressel, P.L., & Marcus, D. (1982). On Teaching and Learning in College. San Francisco, CA: Jossey-Bass.

Eble, K. (1979). The Craft of Teaching. San Francisco: Jossey-Bass.

Ehrhart, H.B. (1983). Utilization of cognitive style in the clinical laboratory sciences. American Journal of Medical Technology, 49, 569-576.

Ennis, R.H. (1962, Winter). A concept of critical thinking. Harvard Educational Review, 32 (1), 81-111.

Ennis, R.H. (1983). Problems in Testing Informal Logic Critical Thinking Reasoning Ability. Stanford, CA: Center for Advanced Study in the Behavioral Sciences, 3-9.

Ennis, R.H. (1985, Winter). Critical thinking and the curriculum. Phi Kappa Phi Journal, 65 (10), 28-31.

Ericksen, S.E. (1983). Private measures of good teaching. Teaching of Psychology, 10, 133-136.

Fagin, C. M. (1985, January 24). Institutionalizing practice: Historical and future perspectives. Keynote address presented at the Second Annual Faculty Practice Symposium, American Academy of Nursing, Phoenix, AZ.

Fagin, C. (1986). Institutionalizing faculty practice. Nursing Outlook, 34, 140-144.

Fairbrother, R.W. (1975). The reliability of teachers' judgments of the abilities being tested by multiple choice items. Educational Research, 17, 202-210.

Field, W., Gallman, L., Nicholson, R., & Dreher, M. (1984, September). Clinical competencies of baccalaureate students. Journal of Nursing Education, 23, 284-293.

Fischer, C.G., & Grant, G. (1983). Intellectual levels in college classrooms. In C. Ellner & C. Barnes, Studies of College Teaching. Lexington, MA: Lexington Books.

Flanders, N. (1970). Analyzing Teaching Behavior. Reading, MA: Addison-Wesley.

Flanders, N. (1976). Research on teaching and improving teaching. British Journal of Teacher Education, 2 (2), 169-173.

Flower, L., & Hayes, J. (1977, December). Problem-solving strategies in the writing process. College English, 39 (4), 449-461.

Fontes, H.C. (1987, May). Small group work: a strategy to promote active learning. Journal of Nursing Education, 26 (50), 212-214.

Ford, L. (1981). Unification model of nursing at the University of Rochester. Nursing Administration Quarterly, 11 (1), 1-9.

Ford, L., & Kitzman, H. (1983). Organizational perspectives on faculty practice: Issues and challenges. In K. Barnard (Ed.), Structure to outcome: Making it work (pp. 13-29). Kansas City, MO: American Academy of Nursing.

French, J.W., Ekstrom, R.B., & Price, L.A. (1963). Manual for Kit of Reference Tests for Cognitive Factors. Princeton: Educational Testing Service.

Frisch, N. (1987, Spring). Cognitive maturity of nursing students. Image, 19 (1), 25-27.

Fritz, P.A., & Weaver, R.L. (1986, April). Teaching critical thinking skills in the basic speaking course: A liberal arts perspective. Communication Education, 35 (2), 174-182.

Fry, D. (1985, March). Helping students remember. In J. Katz (Ed.), Teaching as though students mattered. New Directions for Teaching and Learning, 21, San Francisco: Jossey-Bass, 79-85.

Furedy, J. & Furedy, C. (1979, Summer). Course design for critical thinking. Improving College and University Teaching, 27 (3), 99-101.

Furst, E. J. (1950, April). Relationship between tests of intelligence and tests of critical thinking and knowledge. Journal of Educational Research, 43 (8), 614-625.

Furst, E. J. (1954, March). Effect of the organization of learning experiences upon the organization of learning outcomes. Journal of Experimental Education XVIII, 215-228.

Gage, N.L. (Ed.). (1963). Handbook of research on teaching. Chicago: Rand McNally, 1118-1172.

Gall, M. (1984, November). Synthesis of research on teachers' questioning. Educational Leadership, 42, 40-47.

Gamson, Z. (1984). Liberating education. San Francisco: Jossey-Bass.

Geissler, C. (1986, August). WARRANT: Developing a curriculum for critical thinking. (Report No. CS 008 370). Philadelphia, PA: National Council of Teachers of English. (ERIC Document Reproduction Service No. ED 267 390)

Givens, C. (1976). A descriptive study of the cognitive level of classroom discourse of college professors and students. Dissertation Abstracts International, 37, 2665-A. (University Microfilms No. 76-23,931)

Glaser, R. (1984, February). Education and thinking. American Psychologist, 39 (2), 93-104.

Grasha, A.F., & Riechmann, S. (1982). Observations on relating teaching goals to student response styles and classroom methods. American Psychologist, 27, 144-147.

Gray, J.E., Murray, B.L., Roy, J.F., & Sawyer, J.R. (1977). Do graduates of technical and professional nursing programs differ in practice? Nursing Research, 26 (5), 368-373.

Gross, Y., Takazawa, E. & Rose, C. (1987). Critical thinking and nursing education. Journal of Nursing Education, 26 (8), 317-323.

Halonen, J. S. (1985/1986). Critical thinking throughout the undergraduate psychology curriculum. Paper presented at the Mid-America Conference for Teachers of Psychology, Indiana. (ERIC Document Reproduction Serivce No. ED 269 281)

Harmon, Y. (1986, February). A nursing faculty practice in VA Medical Center: An asset to service and education. Journal of Nursing Education, 25 (2), 81-84.

Harrington, H. (1980). The nurse educator's dilemma. In L. Machan (Ed.), The practitioner-teacher role (pp. 55-59). Wakefield, MA: Nursing Resources.

Hart, M.E., Payne, D.A., & Lewis, L.A. (1981, February). Prediction of basic science learning outcomes with cognitive style and traditional admissions criteria. Journal of Medical Education, 56, 137-139.

Hartnett, D. (1975). The relation of cognitive style and hemispheric preference to deductive and inductive second language learning. Unpublished master's thesis. University of California, Los Angeles, CA.

Hauf, B. (1977). An evaluative study of a nursing center for community health nursing student experiences. Journal of Nursing Education, 16 (8), 7-11.

Hays, W. (1981). Statistics (3rd. Ed.). New York: Holt, Rinehart & Winston, 587-591, 594-595.

Hendrickson, A.D. (1986, April). Developing critical thinking skills. (Report No. SE 046 256). Duluth, MN: University of Minnesota. (ERIC Document Reproduction Service No. ED 264 093)

Herning, J.G. (1976). A multivariate analysis of the relationship of field dependent-field independent cognitive style to learning of geographical concepts of information among college students. (Doctoral dissertation, Oklahoma State University, 1976). Dissertation Abstracts International, 37, 5700-A. (University Microfilms No. 77-5096, 219).

Herron, J.D. (1966). Evaluation and the new curricula. Journal of Research in Science Teaching, 4, 159-170.

Hildebrand, M. (1973). The character and skills of the effective professor. Journal of Higher Education, 44, 41-50.

Hill, W.F. (1969). Learning Through Discussion: Guide for Leaders and Members of Discussion Groups. Beverly Hills: Sage.

Hill, W.F. (1982). Principles of Learning: A Handbook of Applications. Palo Alto, CA: Mayfield.

Hilles, W.C., Agro, G., Rosenthal, J., & Sinclair D. (1977). An in-depth study of seven medical practice plans. Washington, D.C.: Association of American Medical Colleges.

Hinds, P., Burgess, P., Leon, J., McCormick, H.J. & Svetich, L. (1985, February). Self-identified stressors in the role of nursing faculty. Journal of Nursing Education, 24 (2), 63-68.

Holm, K. (1981). Faculty practice-noble intentions gone awry? Nursing Outlook, 29, 655-657.

Hunkins, F. (1976). Involving Students in Questioning. Boston: Allyn & Bacon.

Irby, D., & Rakestraw, P. (1981, March). Evaluating clinical teaching in medicine. Journal of Medical Education. 56, 181-186.

Jacobson, M. (1966, Summer). Effective and ineffective behavior of teachers of nursing as determined by their students. Nursing Research, 15, 218-224.

Jahoda, M., Deutsch, M., & Cook, S. (1962). Research methods in social relations. Part 2. New York: Holt, Rinehart & Winston.

Jezek, J. (1980). Economic realities of faculty practice. In NLN (Ed.), Cognitive dissonance: Interpreting and implementing faculty practice in nursing education (pp. 37-41). New York: National League for Nursing.

Johnson, J.A. (1980). The education/service split: Who loses? Nursing Outlook, 28, 412-415.

Jones, A. (1975, July-August). Overview of a nursing center for family health services in freeport. Nurse Practitioner, 26-31.

Joyce, B. (1985, May). Models for teaching thinking. Educational Leadership, 42, 4-7.

Joyce, B. & Weil, M. (1972). Models of Teaching. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 319.

Just, G., Adam, E., & DeYoung, S. (1989, April). Faculty practice: Nurse educators' views and proposed models. Journal of Nursing Education, 28 (4), 161-168.

Katula, R.A., & Martin, C.A. (1984, April). Teaching critical thinking in the speech communication classroom. Communication Education, 33, 160-167.

Kavanagh, J. (1986). Educational statistics. Foundations 480. Presented at Loyola University of Chicago, Chicago, IL.

Keeley, S.M., & Brocune, M.N. (1978, July). Improving student evaluation forms. Peabody Journal of Education, 56, 305-308.

Keeley, S.M., Browne, M.N., & Kreutzer, J.S. (1982). A comparison of freshmen and seniors on general and specific essay tests of critical thinking. Research in Higher Education, 17 (2), 139-154.

Keenan, T., Aiken, L., Cluff, L.E. (Eds.). (1981). Nurses and doctors: Their education and practice (pp. 3-18). Cambridge, MA: Oelgeschlager, Gunn, & Hain Publishers, Inc.

Kelley, J.A. (1981). Faculty educational preparation: A case for practice what you teach. In Cognitive Dissonance: An Examination of CBHDP Effect on Educational Programs. Publication No. 15-1581, National League for Nursing.

Kent, N. (1980). Evaluating the practice components for faculty rank and tenure. In NLN (Ed.), Cognitive dissonance: Interpreting and implementing faculty practice in nursing education (pp. 21-26). New York: National League for Nursing.

Knefelkamp, L.L. (1974). Developmental instruction: Fostering intellectual and personal growth in college Students. Unpublished doctoral dissertation. Minneapolis: University of Minnesota, 1-149.

Knox, J., & Morgan, J. (1985). Important clinical teacher behaviors as perceived by university nursing faculty, students and graduates. Journal of Advanced Nursing, 10, 25-30.

Kramer, M. (1972). The concept of modeling as a teaching strategy. Nursing Forum, 11 (1), 48-70.

Kramer, M., Polifroni, D., & Organek, N. (1986). Effects of faculty practice on student learning outcomes. Journal of Professional Nursing, 2 (5), 289-301.

Kropp, R., & Stoker, H. (1966, February). The construction and validation of tests of the cognitive processes in the taxonomy of educational objectives. Florida State University. (ERIC Document Reproduction Service No. ED 010 044)

Kruger, S. (1985). The demonstration of a joint faculty/practice position. Journal of Nursing Education, 24 (8), 350-352.

Lambert, C. & Lambert, V. (1988, February). A review and synthesis of the research on role conflict and its impact on nurses involved in faculty practice programs. Journal of Nursing Education, 27 (2), 54-59.

Lanziotti, S.S., Finestone, A.J., Sobel, E. & Marks, A.D. (1986, Fall). The practice integrated learning sequence: Linking education with the practice of medicine. Adult Education Quarterly, 37 (1), 38-47.

Larkin, J. (1980, June). Expert and novice performance in solving physics problems. Science, 208, 1335-1342.

Lindquist, E.F., & Feldt, L.S. (1972). Iowa Tests of Educational Development (2nd Ed.). Science Research Associates, Inc.

Littlefield, J., Hendricson, B., Kleffner, J., & Burns, G. (1979). Improving instructional skills of health science educators. San Antonio: University of Texas Health Science Center. (ERIC ED 170 277)

Llewellyn, J. (1985). The integrated role of practitioner faculty. In AAN (Ed.), Faculty practice in action (pp. 57-67). Kansas City, MO: American Academy of Nursing.

Logan, C. H. (1987, October). Do sociologists teach students to think more critically? Teaching Sociology, 4 (1), 29-48.

Lombardi, J. (1974, October). Faculty workload. Los Angeles, CA: University of California. (ERIC Document Reproduction Service No. ED 097 925)

Lowman, J. (1984). Mastering the Techniques of Teaching. San Francisco: Jossey-Bass, 1-22.

Lyle, E. (1958, December). An exploration in the teaching of critical thinking in general psychology. Journal of Educational Research. 52 (4), 129-132.

Machan, L. (1980). Practitioner-teacher role of practice what you teach. Wakefield, MA: Nursing Resources, 3-4, 51-53.

MacPhail, J. (1981). Implementation and evaluation of the Case Western Reserve University unification model. In L. Aiken (Ed.), Health policy and nursing practice (pp. 211-217). New York: McGraw-Hill.

Madaus, G., Woods, E., & Nuttall, R. (1973, Fall). A causal model analysis of Bloom's taxonomy. American Educational Research Journal, 10 (4), 253-262.

Maddox, H. (1970, Spring). University teaching methods. University Quarterly, 24, 157-165.

Malasanos, L. (1977). The educator and nursing role acquisition. In Socialization and Resocialization of Nurses for Professional Nursing Practice. New York: National League for Nursing, Publication 15-1659.

Martin, D.S. (1984, November). Infusing cognitive strategies in teacher preparation programs. Educational Leadership, 42 (3), 68-72.

Matthews, C. (1979). Nursing diagnoses from the perspective concept attainment and critical thinking. Advances in Nursing Science, 21, 17-26.

Mauksch, I. (1980). Faculty practice: A professional imperative. Nurse Educator, 3, 21-24.

Mayhew, L. (1981). Meta-theory in general education. Improving College and University Teaching, 29 (3), 103-109.

McCarthy, M. (1975). Functions and responsibilities of incumbents of joint appointments in baccalaureate nursing programs in university medical center. Unpublished doctoral dissertation, Teachers College, Columbia University.

McCarthy, P. (1981). Will faculty practice make perfect? Nursing Outlook, 29 (3), 163.

McClean, L. (1985). Compensation of faculty in combined roles. In K. Barnard & G.Smith (Eds.), Faculty practice in action. Kansas City: American Academy of Nursing, 169-182.

McClure, M.L. (1981, November/December). Promoting practice-based research: A critical need. Journal of Nursing Administration, 11, 66-74.

McClure, M.L. (1987, July/August). Faculty practice: New opportunities. Nursing Outlook, 35 (4), 162-166.

McDaniel, T.R. (1979, Summer). Designing essay questions for different levels of learning. Improving College and University Teaching, 27 (3), 120-123.

McDermott, M.A. (1980, September). An analysis of teaching of critical thinking in baccalaureate schools of nursing as reported in NLN accreditation reports. (Doctoral dissertation, Northern Illinois University, 1980). Dissertation Abstracts International, 41, 924-A. (University Microfilms No. 8020773, 182).

McFall, R.W. (1964, Fall). The development and validation of an achievement test for measuring higher level cognitive processes in general science. The Journal of Experimental Education, 33 (1), 103-106.

McGuire, C. (1963, February). Research in the Process Approach to the Construction and Analysis of Medical Examinations. Paper read at National Council on Measurement in Education, Chicago, IL.

McKeachie, W.J. (1970). Research on college teaching: A Review. Washington, D.C.: ERIC Clearinghouse on Higher Education.

Meleca, C., Schimpfhauser, F., Witteman, J., & Sachs, L. (1981). Clinical instruction in nursing. Journal of Nursing Education, 20, 32-40.

Meleca, C., Schimpfhauser, F., Witteman, J., & Sachs, L. (1983). Clinical instruction in medicine: A national survey. Journal of Medical Education, 58, 395-403.

Melvin, K., & Carrier, C. (1986, April). Connecting teaching theory to classroom practice: An examination of instructors in business. Performance and Instruction, 25, 18-22.

Meyers, C.D. (1984, Winter). Exploring differences in cognitive strategies among and between freshmen English students and instructors: A research model. The Writing Instructor, 61-74.

Meyers, C.D. (1986). Teaching students to think critically. San Francisco: Jossey-Bass.

Merriam, S. (1986). The research-to-practice dilemma. Lifelong Learning: An Omnibus of Practice and Research, 10 (1), 4-6.

Millonig, V. (1986, May-June). Faculty practice: A view of its development, current benefits and barriers. Journal of Professional Nursing, 2, 166-172.

Mills, B., & Free, T. (1984, May-June). Nursing faculty practice. Pediatric Nursing, 10, 212-214.

Moll, M.B., & Allen, R.D. (1982). Developing critical thinking skills in Biology. Journal of College Science Teaching, 12 (2), 95-98.

Morris, F. (1983). Utilization of cognitive style mapping in conjunction with individualized instruction. American Journal of Medical Technology, 49, 723-725.

Morrison, E. (1985). Faculty practice in an urban academic community. In AAN (Ed.), Faculty practice in action. Kansas City, MO: American Academy of Nursing, 67-73.

Munroe, D.J., Sullivan, T.J., Lee, E.J. & Sarter, B. (1987, September). Establishing an envioronment for faculty practice: The primary affiliation. Journal of Nursing Education. 26 (7), 297-299.

Nagai-Jacobson, M., et al. (1986, January). Nursing faculty collaboration viewed through feminist process. Advances in Nursing Science, 8, 29-38.

National Commission on Excellence in Education (1983). A nation at risk. Washington, D.C.: National Commission on Excellence in Education.

National Council of State Boards of Nursing, Inc. (1987). Test Plan for the National Council Licensure Examination for Registered Nurses. Chicago, IL: National Council of State Boards of Nursing, 1-9.

National Institute of Education Study Group on the Conditions of Excellence in American Higher Education. (1984, October). Text of new report on excellence in undergraduate education. Involvement in learning: Realizing the potential of American higher education. The Chronicle of Higher Education, 30, 36-49.

Nayer, D. (1980). Unification: Bringing nursing service and nursing education together. American Journal of Nursing, 80, 1110-1114.

Nettles-Carlson, B., Field, M., Freemna, B., Schoonover, & Smith, L. (1985). Group faculty practice: Dreams versus reality. Nurse Educator, 10 (5), 8-12.

Nickerson, R. (1984). Kinds of thinking taught in current programs. Educational Leadership, 42 (1), 26-36.

Norris, S. (1985, May). Synthesis of research on critical thinking. Educational Leadership, 42, 40-45.

Nugent, H., & Monroe, S. (1983, July). Critical thinking and problem-solving: The evolution of a course. Paper presented at the Annual Meeting of the New England Association of Teachers of English. (ERIC Document Reproduction Service No. ED 226 361)

O'Koren, M. (1986, March-April). Reflections on facilitating collaboration between nursing service and nursing education. Journal of Professional Nursing, 73-74.

O'Shea, H.S. (1982, September-October). Role orientation and role strain of clinical nurse faculty in baccalaureate programs. Nursing research, 31 (5), 306-310.

Pace, C.R. (1979). Measuring Outcomes of College. San Francisco: Jossey-Bass.

Page, H.W. (1987, June). Teaching critical thinking in the English literature survey courses. (Report No. CS 209 988). Chicago, IL: City Colleges of Chicago. (ERIC Document Reproduction Service ED 272 896)

Parascenzo, L. (1983). Nursing faculty clinical practice: Myth or reality? A descriptive study of the practice role of nursing faculty in accredited baccalaureate nursing programs. (Doctoral dissertation, University of Pittsburgh, 1983) DA 8411806.

Partridge, R. (1983). Learning styles: A review of selected models. Journal of Nursing Education, 22, 243-248.

Patterson, E., & Keel, R. (1976). Teaching effectiveness: Considerations for nursing. Journal of Continuing Education in Nursing, 7, 23-32.

Paul, R.W. (1985, May). Bloom's taxonomy and critical thinking instruction. Educational Leadership, 42, 36-39.

Peper, R.J., & Mayer, R.E. (1986). Generative effects of note-taking during science lectures. Journal of Educational Psychology, 78 (1), 34-38.

Perkins, D.N. (1985). Post primary education has little impact on informal reasoning. Journal of Educational Psychology, 77, 562-571.

Perry, W.G. (1970). Forms of intellectual and ethical development in the college years. New York: Hart, Rinehart & Winston, Inc.

Perry, W.J. (1984). Cognitive and ethical growth: The making of meaning. In A.W. Chickering, The modern American college (pp. 76-116). San Francisco: Jossey-Bass.

Peters, & Truntham (1981, February). Academic profiles and decision-making implications. (ERIC Document Reproduction Service No. ED 192 704).

Phipps, R. (1985, June). Critical thinking and community college students. Seattle, WA: North Seattle Community College. (ERIC Document Reproduction Service No. ED 253 264)

Pierik, M. (1973). Joint appointments: Collaboration for better patient care. Nursing Outlook, 22, 576-579.

Plawecki, J.R. & Plawecki, H.M. (1976). Factors that influence attraction and retention of qualified nurse educators. Nursing Research, 25 (2), 133-135.

Pohlman, J. (1975). A description of teaching effectiveness as measured by student ratings. Journal of Educational Measurement, 12, 49-54.

Poole, R.L. (1971). Characteristics of the taxonomy of educational objectives: Cognitive domain - A replication. Psychology in the Schools, 8, 83-92.

Poole, R.L. (1972). Characteristics of the taxonomy of educational objectives: Cognitive domain - A replication. Psychology in the Schools, 9, 379-385.

Powers, M. (1976). The unification model in nursing. Nursing Outlook, 24, 482-487.

Rauen, K. (1974, August). The clinical instructor as role model. Journal of Nursing Education, 13, 33-40.

Redman, R., Cassells, J., & Jackson (1985, November-December). Generic baccalaureate nursing programs. Journal of Professional Nursing, 1, 369-380.

Remmers, H. (1952). Report of the committee on the criteria of teacher effectiveness. Review of Educational Research, 22, 245-246.

Rice, T. (1978, April). Cognitive mapping: Small group techniques in teaching. Teaching Sociology, 5 (3), 259-274.

Rosenshine, B. (1976). Classroom instruction. In N.L. Gage (Ed.), Psychology of teaching Methods. The 75th Yearbook of National Society for the Study of Education, Part I. Chicago, IL: University of Chicago Press, 335-371.

Ross, G.A., Semb, G. (1981, April). Philogsophy can teach critical thinking skills. Teaching Philosophy, 4 (2), 111-122.

Rosswum, M. (1981). Characteristics of 23 faculty group nurse practices. Nursing and Health Care, 2, 327-330.

Ryan, S. (1985). Practice in action: A community-linked model. In AAN (Ed.), Faculty practice in action (pp. 222-228). Kansas City, MO: American Academy of Nursing.

Ryan, S., & Barger-Lux, M.J. (1986, February). Faculty expertise in practice: A school succeeding. Nursing and Health Care, 6, 75-78.

Saljo, R. (1981). Learning approach and outcome: Some empirical observations. Instructional Science, 10, 47-65.

Sarbin, T.R., & Allen, V. (1968). Role theory. In G. Lindzey & E. Aronson (Eds.), Handbook of social psychology. (pp. 488-567). Reading, MA: Addison-Wesley Publishing Co.

Scannell, D.P., & Stellwagon, W.R. (1960). Teaching and testing for degrees of understanding. California Journal of Instructional Improvement, 3 (1), 8-14.

Schenkat, R., & Battaslini, D. (1981). Teaching reasoning. (ERIC Document Reproduction Service No. ED 204318).

Schlotfeldt, R., & MacPhail, J. (1969). An experiment in nursing. American Journal of Nursing, 69, 1018-1023.

Schlotfeldt, R., & MacPhail, J. (1969). Introduction to change. American Journal of Nursing, 69, 1247-1251.

Schlotfeldt, R., & MacPhail, J. (1969). Implementing planned change. American Journal of Nursing, 69, 1475-1488.

Seddon, G.M. (1978). Properties of Bloom's taxonomy of educational objectives for the cognitive domain. Review of Educational Research, 48, 303-323.

Sherwen, L., & Salvio, K. (1983). The teacher-practitioner shared appointment: Making it work. Nurse Educator, 8, 30-33.

Sides, M.B. (1985). Interpreting cognitive skill patterns of nurses from different levels of formal education. (Doctoral dissertation, University of Chicago, 1984). Dissertation Abstracts International, 45 (7), 2107-B.

Siegal, H. (1980, November). Critical thinking as an educational ideal. The Educational Forum, 7-23.

Simon, A. & Ward, L.O. (1974). The performance in the Watson-Glaser critical thinking appraisal of university students classified. Educational & Psychological Measurement, 34, 957-960.

Slosson, R.L. (1981). Slosson Intelligence Test. New York: Slosson Educational Publications.

Smith, A.B. (1965, February). An analysis of the scability of the "knowledge" and "comprehension" levels of the taxonomy of educational objectives: Cognitive domain. Paper read at AERA, Chicago, IL.

Smith, D. (1964). Myths and methods in nursing practice. American Journal of Nursing, 64, 68-72.

Smith, D. (1965). Education and service under one administration. Nursing Outlook, 13, 54-56.

Smith, D.G. (1977). College classroom interactions and critical thinking. Journal of Educational Psychology, 69, 180-190.

Smith, D. (1983). Instructions and outcomes in an undergraduate setting. In C. L. Ellner & C. P. Barnes (Eds.), Studies of College Teaching (pp. 83-115), Lexington, MA: Lexington Books.

Solomon, H. Jordison, N. & Powell, S. (1980). How faculty members spend their time. Nursing Outlook, 28 (3), 160-165.

Spero, J. (1980, August). Nursing: A professional practice discipline in academia. Nursing and Health Care, 22-25.

Stanley, J.C., & Bolton, D.T. (1957). A review of Bloom's taxonomy of educational objectives. Educational & Psychological Measurement, 17, 631-634.

Statkiewicz, W.R., & Allen, R.D. (1983, February). Practical exercises to develop critical thinking skills. Journal of College Science Teaching, 12 (2), 262-266.

Stern, M. (1978). Hands-on problem-solving in introductory political science. Improving College and University Teaching, 26 (40), 225-227.

Sternberg, R. (1983, February). Criteria for intellectual skills training. Educational Researcher, 12, 6-12, 26.

Stillion, J. (1979). Rediscovering the taxonomies: A structural framework for death education courses. Death Education, 3, 157-164.

Stoker, H.W., & Kropp, R.P. (1964). Measurement of cognitive processes. Journal of Educational Measurement, 1 (1), 39-42.

Stonewater, B.B. (1986, October 9). Assessing cognitive development. Paper presented at the Illinois College Personnel Association Conference, Chicago, IL.

Stonewater, B.B., & Stonewater, J.K. (1983). Developmental cues: An aid for the practitioner. NAPSA Journal, 2, 52-59.

Stonewater, J.K., & Daniels, M.H. (1983, September). Psychosocial and cognitive development in a career decision-making course. Journal of College Student Personnel, 24, 403-410.

Strong, R.W., Silver, H.F., & Hanson, R. (1985, May). Integrating teaching strategies and thinking styles with the elements of effective instruction. Educational Leadership, 42, 10-15.

Stuebbe, B. (1980). Student and faculty perspectives on the role of a nursing instructor. Journal of Nursing Education, 19 (7), 4-9.

Thistlewaite, D. (1962). Fields of study and development of motivation to seek advanced training. Journal of Educational Psychology, 53, 53-64.

Trentham, L. & Halpin, G. (1979, Summer). Effects of individidual undergraduate instruction on cognition and attitudes. College and University Teaching, 27 (3), 126-129.

Tyler, L.E. (1965). The Psychology of Human Differences (3rd ed.). New York: Appleton-Century-Crofts, 211-235.

Tyler, L.L. (1966). The taxonomy of eductional objectives: Cognitive domain. Its use in evaluating programmed instruction. CA Journal of Educational Research, 17, 26-32.

Tyler, R. (1949). Achievement testing and curriculum. In E. Williamson (Ed.), Trends in student personnel work (pp. 391-407). Minneapolis, MN: University of Minnesota Press.

Tyler, R., & Smith, E. (1942). Appraising and recording student progress (Vol. III). New York: Harper and Brothers.

Van Rossum, E.J., & Schenk, S.M. (1984). The relationship between learning conception, study strategy and learning outcome. Journal of Educational Psychology, 54, 73-83.

Vaughan, B.A. (1973, December). Role fusion, diffusion and confusion. Nursing Clinics of North America, 4, 703-713.

Vittertoe, M. (1983). A study of learning style preferences of medical technology and physical therapy students. American Journal of Medical Technology, 49, 726-729.

Wakefield-Fischer, M. (1983). The issue: Faculty practice. Journal of Nursing Education, 22 (5), 207-210.

Walsh, G. (1972, Summer). One in five made us think. Improving College and University Teaching, 20, 153-155.

Waltz, C. F. (1978, March April). Faculty influence on nursing students' preferences for practice. Nursing Research, 27 (2), 89-97.

Watson, G. & Glaser, E. (1964). Watson-Glaser Critical Thinking Appraisal Test and Manual. New York: Harcourt, Brace and World.

Webb, J.N. (1974). The Florida taxonomy of cognitive behavior. In A. Simon & E.G. Boyer, et al., (Eds.). Mirrors for behavior: An anthology of classroom observation instruments. Vol. 1 (pp. 302-206). Philadelphia: Research for Better Schools.

Westcot, L. (1981, September). Nursing education and nursing service: A collaborative model. Nursing and Health Care, 2, 376-379.

White, A.M. (1985, March). Teaching mathematics as though students mattered. In J. Katz (Ed.)., Teaching as though students mattered. New directions for teaching and learning. No. 21. San Francisco: Jossey-Bass.

Williams, W.C. (1985). Effective teaching. Journal of Higher Education, 56, 320-337.

Wilson, D.G., & Wagner, E.E. (1981). The Watson-Glaser Critical Thinking appraisal as a predictor of performance in a critical thinking course. Educational and Psychological Measurement, 41, 1319-1322.

Wilson, R.C., & Gaff, J.G. (1975). College Professors and Their Impact on Students. New York: John Wiley & Sons.

Winter, D., McClelland, D. & Stewart, A. (1980). A New Case for the Liberal Arts. San Francisco: Jossey-Bass, 26-51.

Wisniewski, R., & Kline, P. (1984, April). Teacher moonlighting: An unstudied phenomenon. Phi Delta Kappan, 65, 552-554.

Witkin, H., Moore, D., Goodenough, D., & Cox, P. (1977, Winter). Field-dependent and field-independent cognitive styles and their educational implication. Review of Educational Research, 47, 1-64.

Wittrock, M.C. (1978). The cognitive movement in instruction. Educational Psychologist, 13, 15-29.

Wong, S., & Wong, J. (1980). The effectiveness of clinical teaching: A model for self-evaluation. Journal of Advanced Nursing, 5, 531-537.

Woods, D. (1977). On teaching problem-solving. Part I. What is being done? Part II. The challenges. Chemical Engineering Education, 10, 86-94, 140-142.

Yarcheski, A., & Mahon, N. (1986). The unification model in nursing: Risk-receptivity profiles among deans, tenured, and nontenured faculty in the United States. Western Journal of Nursing Research, 8, 63-81.

APPENDIX A

SURVEY OF NURSING FACULTY IN PRACTICE

DIRECTIONS: Please circle the letter corresponding to your answer for each item.

1. Current position title
   a. Instructor
   b. Assistant professor
   c. Associate professor
   d. Professor
   e. Other (please specify)_____

2. Length of employment at current institution
   a. Less than one year
   b. 1-3 years
   c. 4-6 years
   d. 7-9 years
   e. 10 years and over

3. Current tenure status at institution
   a. Tenured (If you select this answer, proceed to item 5)
   b. Non-tenured; on tenure track
   c. Non-tenured; on non-tenure track (proceed to item 5)
   d. No institutional tenure policy (proceed to item 5)
   e. Other (please specify)_____

4. Indicate what academic activities will be necessary for you to achieve tenure status.(Circle as many letters as needed)
   a. Increased scholarly activity (eg.research, publications)
   b. Increased academic credentials
   c. Increased academic service
   d. Increased number of years as faculty
   e. Other (please specify)_____

5. Area of clinical specialization
   a. Adult health/medical-surgical
   b. Women and newborn/maternity
   c. Child health/pediatrics
   d. Community health
   e. Psychiatric/Mental health
   f. Other (please specify)_____

6. Certification status: Are you certified in an area of practice?
   a. Yes (indicate area of certification and name of agency)_____
   b. No

SURVEY, cont.

7. Highest degree earned
   Baccalaureate: a. B.S., B.S.N., B.A.
   Masters: b. M.S.N., M.S., M.N.
   c. M.A., M.Ed.
   Doctorate: d. Ph.D., Ed.D.
   e. D.NSc.
   f. Other (please specify)_____

8. Clinical instruction responsibilities
   Are you currently teaching (or within the previous academic year have taught) a course which includes clinical instruction? If not, proceed to item 10.
   a. Yes (please specify name of course/courses)
   _____
   b. No

9. Usual number of contact hours for clinical instruction per week.
   a. 1-5 hours
   b. 6-10 hours
   c. 11-15 hours

10. Usual number of hours for student contact per week
   a. 1-5
   b. 6-10
   c. 11-15
   d. 16-20
   e. 21-25

11. Do you have previous teaching experiences at other higher education institutions?
   a. Yes (please specify number of years)___
   b. No

12. Current age range
   a. 25-34 years
   b. 35-44 years
   c. 45-54 years
   d. 55-64 years
   e. 65 and over

TASKS/ROLES
Listed below are questions pertaining to tasks or roles performed by you as a member of the nursing faculty. In order to maintain continuity of answers, please use the following definitions of terms to guide your responses.
   Teaching: Activities or tasks related to classroom and clinical instruction of students and the preparation and evaluation thereof.

SURVEY, cont.

Research: Scholarly activities such as conducting research; writing articles, books or portions of books for publication; presentation of papers at professional meetings; serving as editor of book or journal, or member of journal review board.

Service: Activities related to university (committees, student advising and counseling); professional association activities; public-community service

Practice: Health care directly provided by faculty to clients for which faculty is accountable; does not include care provided indirectly through students during course of clinical instruction.

CLINICAL PRACTICE

If you are currently engaged in clinical practice (or have been in the past academic year) as a registered nurse (RN) outside of your faculty position, please answer questions 13 through 16. If not, proceed to question 17.

13. Please indicate the approximate length of time per week you are engaged in clinical practice.
    a. 1-4 hours
    b. 5-9 hours
    c. 10-14 hours
    d. 15-19 hours
    e. 20 and over

14. Please indicate when this type of practice is performed.
    a. Academic year only while classes are in session
    b. Any time during the calender year
    c. Vacations, summers

15. Please circle the number which best describes your type of practice (terms in parentheses specify practice models).
    a. As part of my faculty contract, I fulfill clinical and faculty practice simultaneously (i.e. unification).
    b. As part of my contract, I have a joint appointment (i.e. collaboration).
    c. As part of my contract, I provide direct practice along with the students during school hours during the week (i.e. integrated).
    d. Although not in my contract, I provide client care during week day hours through private practice.
    e. I practice on my own time on weekends, evenings,and/or summers (i.e. moonlighting).

SURVEY, cont.

16. If your answer to question 15 is "b", please specify the following: Title of appointment_____
Type of agency_____

17. If you were to consider 100% as the total amount of time available for your workload, indicate the percentage of time that is devoted to the following activities (total should equal 100%).
    a. ____ Teaching (classroom and clinical)
    b. ____ Research
    c. ____ Service to the college/university and/or community
    d. ____ Clinical practice
    e. ____ Other (specify_____)
    (Total equals 100%)

18. Faculty activities are often rewarded differently. How are the following activities rewarded by nursing administration and the institution's administration. Use the following types of rewards for your answers.
    1. Academic promotion and/or tenure
    2 Financial reward
    3. Professional recognition
    4. No reward
    5. Not applicable

ACTIVITY	NURSING ADMINISTRATION	INSTITUTION'S ADMINISTRATION
Teaching	___	___
Research	___	___
Service	___	___
Practice	___	___

19. Circle the letter of the one statement that best describes your perceptions about your current level of clinical competence in your clinical area of specialization:
    a. I am extremely competent in my level of nursing practice abilities.
    b. I am very competent in my level of nursing practice abilities.
    c. I am competent in my level of nursing practice abilities.
    d. I am somewhat competent in my level of nursing practice abilities.
    e. I no longer feel competent in my nursing practice abilities.

SURVEY, cont.

20. Circle the letter of the one statement that best describes the major mechanism through which you maintain your level of clinical competence. If you do not feel competent in your nursing practice skills, circle option "e" and proceed as directed.
    a. I maintain clinical practice skills by indirectly giving nursing care to clients in the course of clinical teaching.
    b. I maintain clinical practice skills by having a clinical appointment which is part of my contract.
    c. I maintain clinical practice skills by having a position involving direct client care for which I am paid in addition to my faculty position (not part of contract).
    d. I maintain clinical practice skills by having a position involving direct client care for which I am not paid in addition to my faculty position (not part of contract).
    e. I am unable to maintain my clinical practice skills.

21. To what extent do you prepare your own course objectives?
    a. Always
    b. Usually
    c. Sometimes
    d. Rarely

22. In the cover letter I have asked you to submit course/unit objectives for one upper level, theory-based course for which you prepare your own objectives. For the course/unit materials you are submitting, did you prepare your own course objectives?
    a. Yes ___ b. No ___

You are finished with the survey. Many thanks for your patience and assistance.

Please remember: SUBMIT THIS SURVEY AND YOUR COURSE MATERIALS BY August 30, 1987.

Also, if you are interested in receiving a summary of the results of this study, please place your name and address on the enclosed mailing label and return it under separate cover in the self-addressed envelope provided.

4/23/87
AJL

APPENDIX B

7650 West Suffield Street
Morton Grove, Illinois 60053

May 14, 1987

Dear _____:

As a nurse educator and doctoral candidate in the field of Higher Education at Loyola University of Chicago, I am writing to seek your assistance regarding research for my dissertation project.

I am currently conducting research which compares nursing faculty who are in clinical practice with those who are not. Specifically, I am exploring whether differences exist in the use of cognitive instructional tools between nursing faculty who practice and those who do not. In addition, I will examine if faculty in practice use tools which promote critical thinking as opposed to faculty who are not in practice.

In order to conduct this research, I need the participation of both nurse educators who are involved in clinical practice and those who are not throughout the state of Illinois. Therefore, your facilitative support in conducting the study is most essential to its success. Pending your approval, I would like to contact your faculty during the summer interim and ask them to participate. If faculty members are unavailable at the institution, I would so appreciate your providing me with their current address so that I may reach them at this time.

In order to address some significant criteria for participation in the research study, I have sought approval from my institution's Review Board and am enclosing a copy of the cover letter that will be sent to each faculty member which ensures confidentiality. I plan to follow this letter to you by phone contact between May 19 and 21, 1987 to obtain your response.

In closing, thank you in advance for your assistance in this critically needed research study.

Sincere wishes,

Alma J. Labunski, R.N.,M.S.N.

Enclosure

APPENDIX C

7650 West Suffield Street
Morton Grove, Illinois 60053

April 20, 1987

Dear Colleague:

I am a nurse educator and doctoral student in the field of Higher Education at Loyola University of Chicago and am writing to seek your assistance in a very important research project.

Almost since its inception the profession of nursing has attempted to bridge the functions of nursing service and nursing eduction. One relatively recent approach has been to emphasize the importance of having nursing faculty engaged in clinical practice. I am currently conducting research for my doctoral dissertation which compares nursing faculty who are in clinical practice with those who are not. Specifically, I am exploring whether differences exist in the use of instructional tools between nursing faculty who practice and those who do not. In order to conduct this research, I need the participation of both nurse educators who are involved in clinical practice and those who are not. Studies comparing the use of instructional tools between nursing faculty who practice and those who do not are currently nonexistent. Therefore, your participation is most essential to the success of this study.

I ask that you please complete the brief survey instrument attached and return it to me. In addition, please forward a copy of <u>one</u> course syllabus for an upper-level, theory-based course which you teach. I also need for you to send me one copy of any instructional materials, including the final examination, you utilize in connection with that course (i.e.,study guide questions, instructions for required projects, and case studies or client situations). The survey and course materials should be returned to me in the self-addressed, stamped envelope I have provided no later than _____ 1987.

Please be assured that all information submitted will be confidential. As the investigator, I anticipate presenting the results of the study in aggregate form; no individuals or institutions will be singled out. If you are interested in receiving a summary of the results, please place your name and address on the enclosed mailing label and return it to me <u>under separate cover</u> by using the self-addressed envelope that is provided.

LETTER, cont.

In closing, thank you in advance for your participation in this study. Please remember to return the materials to me by

_____1987.

Sincerely yours,

Alma J. Labunski, R.N., M.S.N.

Enclosures
Survey
Mailing label
2 Return envelopes

APPENDIX D

March 1, 1988

7650 West Suffield Street
Morton Grove, Illinois 60053

Dear Colleague:

You may recall that I as a nurse educator and doctoral candidate in the field of Higher Education at Loyola University of Chicago contacted you last summer/early fall to seek your assistance in my dissertation research project.

Since you may have responded but I have not heard from you, I am again seeking your participation at this time. To reiterate the purpose, I am currently conducting research which compares nursing faculty who are in clinical practice with those who are not. Specifically, I am exploring whether differences exist in cognitive instruction, i.e., the promotion of critical thinking skills, between faculty who are in clinical practice and those who are not. As an educator, your participation is absolutely essential to the success of this study.

I ask that you please complete the brief demographic instrument attached and return it to me. In addition, please forward a copy of one course or unit syllabus and any instructional materials including examples of questions from an examination you utilize in connection with that course. The instrument and course materials should be returned to me in the original, self addressed, postage-paid envelope that I previously supplied no later than April 22, 1988. No course materials will be duplicated; in fact, at your request, I will gladly return all documents upon completion of my study.

In closing, thank you for reconsidering your participation in this study. Please remember to return the materials by April 22, 1988.

Sincerely yours,

Alma J. Labunski, R.N., M.S.N.

1 Enclosure

APPENDIX E

March 10, 1988

7650 West Suffield Street
Morton Grove, Illinois 60053

Dear Colleague:

You may recall that I as a nurse educator and doctoral candidate in the field of Higher Education at Loyola University of Chicago contacted you last summer/early fall to seek your assistance in my dissertation research project. Thank you so kindly for completing the demographic survey that I sent you.

I am again seeking your participation at this time. As I indicated, I am currently conducting research which compares nursing faculty who are in clinical practice with those who are not. Specifically, I am exploring whether differences exist in cognitive instruction, i.e., the promotion of critical thinking skills, between faculty who are in clinical practice and those who are not.

As an educator, your participation is absolutely essential to the success of this study. Hence, I ask that you please forward a copy of one course or unit syllabus and any instructional materials in connection with that course. No course materials will be duplicated; in fact, at your request, I will gladly return all documents upon completion of my study. The materials should be returned to me in the original, self-addressed, postage-paid envelope that I previously supplied no later than April 22, 1988.

In closing, thank you again for the returned survey and for reconsidering your participation in the study.

Sincerely yours,

Alma J. Labunski, R.N.,M.S.N.

APPENDIX F

FLORIDA TAXONOMY OF COGNITIVE BEHAVIOR (FTCB)

BOB BURTON BROWN

University of Florida
Gainesville, Florida

RICHARD L. OBER

West Virginia University
Morgantown, West Virginia

ROBERT S. SOAR

University of Florida
Gainesville, Florida

JEANINNE NELSON WEBB

University of Alabama
Tuscaloosa, Alabama

The Florida Taxonomy of Cognitive Behaviors provides a framework for observing and recording the cognitive behaviors of teachers and students in the classroom. The system can be used directly by an observer in the classroom to assess the cognitive level of functioning of teachers and students: knowledge level, translation (paraphrase, express graphically, etc.), application, analysis, synthesis and evaluation. This system is one of a battery of three observation instruments which allows for the collection of coordinated information on cognitive functioning plus "beliefs about experimentalism versus practice" (System 18) and social-emotional climate (System 64).

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FLORIDA TAXONOMY OF COGNITIVE BEHAVIOR (FTCB)

SUBJECT OF OBSERVATION

- Teacher and Pupils
- Teacher Only
- Pupil Only
- Small Groups
- Family Dyads
- Counselor or Therapist with Patient
- Administrators/Supervisors and Supervisees

SETTINGS IN WHICH USED

- Classroom, any content
- Classroom, for specific subject
- Commercial or Industrial
- Counseling or Therapy
- Group Dynamics
- Other

NUMBER OF SUBJECTS OBSERVED

- 1 Only
- Dyad
- More Than 2 People But Not Classroom Setting
- More Than 2 People in Classroom Setting
- Point-Time Sample

CODING UNITS

- Category Change
- Time Unit
- Topic or Content Change
- Speaker Change
- Time Sample
- Other

COLLECTION METHODS REPORTED

- Live *(no special equipment needed)*
- Live *(special coding equipment needed)*
- Video and/or Audio Tape Required

COLLECTING AND CODING PERSONNEL NEEDED

- One Person Only
- Team of Two
- 2 Teams of Two

CATEGORY DIMENSIONS OF THE SYSTEM

- Affective
- Cognitive
- Procedure or Routine
- Physical Environment *(material, equipment, etc.)*
- Psychomotor *(body movement)*
- Activity *(doing something)*
- Sociological Structure *(role, who to whom, etc.)*
- Other

USES REPORTED BY AUTHOR

- Research
- Training
- Evaluation

19

CATEGORIES FOR

FLORIDA TAXONOMY OF COGNITIVE BEHAVIOR (FTCB)

Bob Burton Brown
Richard L. Ober
Robert Soar
Jeaninne Nelson Webb

1.10 KNOWLEDGE OF SPECIFICS

1. Reads
2. Spells
3. Identifies something by name
4. Defines meaning of term
5. Gives a specific fact
6. Tells about an event

1.20 KNOWLEDGE OF WAYS AND MEANS OF DEALING WITH SPECIFICS

7. Recognizes symbol
8. Cites rule
9. Gives chronological sequence
10. Gives steps of process, describes method
11. Cites trend
12. Names classification system or standard
13. Names what fits given system or standard

1.30 KNOWLEDGE OF UNIVERSALS AND ABSTRACTIONS

14. States generalized concept or idea
15. States a principle, law, theory
16. Tells about organization or structure
17. Recalls name of principle, law, theory

2.00 TRANSLATION

18. Restates in own words or briefer terms
19. Gives concrete example of an abstract idea
20. Verbalizes from a graphic representation
21. Translates verbalization into graphic form
22. Translates figurative statements to literal statements, or vice versa
23. Translates foreign language to English or vice versa

3.00 INTERPRETATION

24. Gives reason (tells why)
25. Shows similarities, differences
26. Summarizes or concludes from observations of evidence
27. Shows cause and effect relationship

28. Gives analogy, simile, metaphor
29. Performs a directed task or process

4.00 APPLICATION

30. Applies previous learning to new situation
31. Applies principle to new situation
32. Apply abstract knowledge in a practical situation
33. Identifies, selects, and carries out process

5.00 ANALYSIS

34. Distinguishes fact from opinion
35. Distinguishes fact from hypothesis
36. Distinguishes conclusion from statements which support it
37. Points out unstated assumption
38. Shows interaction or relation of elements
39. Points out particulars to justify conclusion
40. Checks hypothesis with given information
41. Distinguishes relevant from irrelevant statements
42. Detects error in thinking
43. Infers purpose, point of view, thoughts, feelings
44. Recognizes bias or propaganda

6.00 SYNTHESIS (Creativity)

45. Reorganizes ideas, materials, process
46. Produces unique communication, divergent idea
47. Produces a plan, proposed set of operations
48. Designs an apparatus
49. Designs a structure
50. Devises scheme for classifying information
51. Formulates hypothesis, intelligent guess
52. Makes deductions from abstract symbols, propositions
53. Draws inductive generalization from specifics

7.00 EVALUATION

54. Evaluates something from evidence
55. Evaluated something from criteria

APPENDIX G

7650 West Suffield Street
Morton Grove, Illinois 60053
August 25, 1987

Bob Burton Brown
University of Florida
Gainesville, Florida 32610

Dear Dr. Brown:

I am writing you regarding the document Florida Taxonomy of Cognitive Behaviors to which your name is attached. I reviewed it in a chapter by Fischer and Grant, Intellectual Levels in College Classrooms, in the book entitled, Studies of College Teaching (1983) on page 51.

I am a nurse educator and doctoral candidate in the field of Higher Education at Loyola University of Chicago and am currently conducting research for my doctoral dissertation. I am exploring cognitive instruction among nursing faculty who are engaged in clinical nursing practice by comparing them with those who are not in clinical practice. I am specifically using faculty instructional materials such as their course syllabi; instructions for required projects, case studies and client situations; and copies of final examination questions along with a demographic instrument for my data. Bloom's Taxonomy of Educational Objectives will provide the organizing framework for the study. Therefore, I am seeking your permission to use the Florida Taxonomy with a minor adaptation of placing Interpretation and Translation under the heading of Comprehension as Bloom has originally listed. It should serve as a standardized tool which may be used to qualify all incoming faculty instructional materials.

I would so appreciate your consideration of this request. If you grant permission for me to use the document, it will indeed be appropriately credited. For your convenience in responding, I am enclosing a self-addressed stamped envelope.

Thank you in advance for your assistance.

Sincerely,

Alma J. Lakuneski

Alma J. Lakuneski, RN,MSN

1 enclosure

9/14/87
You have my permission
To use FLA TAX in your project
in any way you see fit. Good luck
with your study.
Sincerely,
B Brown

APPENDIX H

Selected Examples Of Respondents Using Bloom's Taxonomy for Levels of Cognitive Instruction

Course/Unit Objectives

Level	Example
Knowledge	Identify community responsibilities for persons with disabilities... Identify the internal and external structures of the female reproductive system Describe the components of the physical assessment of ... List community resources that provide services ...
Comprehension	Differentiate between information processing... Relate the association theory to the retrieval of information Give example of theory of brain function Intrepret the effects of historical, economic,legal... on past...roles...
Application	Recognize and utilize opportunities for learning and professional development... Apply the steps of the nursing process... Apply principles of communication and family dynamics to maintain an effective...
Analysis	Use critical thinking and decision-making skills to determine researchable problems in nursing practice... Examine the nurse's role in collaborating with other health care professionals... Analyze the professional nurse's responsibility on issues ... Analyze concetps, issues, and values...
Synthesis	Design partially compensatory nursing systems... Use research findings to generate alternative approaches in resolving ...problems... Articulate your own views and feelings about Abortion

EXAMPLES cont.

Evaluation	Evaluate the purpose and goals of Planned Parenthood. Evaluate the patient's response to the referral process for community services

APPENDIX I

Wilcoxon Signed-Rank Test for Differences between Two Levels of Bloom's Taxonomy for Practicing and Non-Practicing Faculty

(N = 80)

Evaluation with Knowledge
Mean rank z = -4.4113
20.29
30.15 2-tailed p = .0000*

Evaluation with Comprehension
Mean rank z = -7.1309
12.00
36.19 2-tailed p = .0000*

Evaluation with Application
Mean rank z = -6.5709
16.75
34.07 2-tailed p = .0000*

Evaluation with Analysis
Mean rank z = -5.3367
10.86
27.36 2-tailed p = .0000*

Evaluation with Synthesis
Mean rank z = -2.1022
14.50
13.82 2-tailed p = .0355*

Synthesis with Knowledge
Mean rank z = -3.0437
24.31
28.84 2-tailed p = .0023*

Synthesis with Comprehension
Mean rank z = -6.5590
17.80
35.81 2-tailed p = .0000*

Synthesis with Application
Mean rank z = -6.1198
36.88
33.28 2-tailed p = .0000*

Synthesis with Analysis
Mean rank z = -4.3370
17.65
26.88 2-tailed p = .0000*

Analysis with Knowledge

Mean rank		
26.00	z = -.9136	
32.67	2-tailed p = .3609	

Analysis with Comprehension

Mean rank		
20.56	z = -4.9603	
37.64	2-tailed p = .0000*	

Analysis with Application

Mean rank		
32.32	z = -2.6736	
34.82	2-tailed p = .0075*	

Application with Knowledge

Mean rank		
36.70	z = -3.2014	
28.48	2-tailed p = .0014*	

Analysis with Comprehension

Mean rank		
30.80	z = -2.6158	
37.39	2-tailed p = .0089*	

Comprehension with Knowledge

Mean rank		
34.29	z = -5.8611	
26.86	2-tailed p = .0000*	

---

* = Significant Difference

Wilcoxon Signed-Rank Test for Differences in Course Objectives Between Two Pairs of Levels of Bloom's Taxonomy for Non-Practicing Faculty (N = 44)

Objective 01 with Objective 02
Mean Rank z = -5.0086
9.75
19.53 2-Tailed p = .0000*

Objective 01 with Objective 03
Mean Rank z = -2.8200
13.95
20.50 2-Tailed p = .0048*

Objective 01 with Objective 04
Mean Rank z = -1.2202
21.86
16.23 2-Tailed p = .2224

Objective 01 with Objective 05
Mean Rank z = -1.5569
15.24
14.55 2-Tailed p = .1195

Objective 01 with Objective 06
Mean Rank z = -2.6847
16.74
13.88 2-Tailed p = .0073*

Objective 02 with Objective 03
Mean Rank z = -2.1909
21.04
17.92 2-Tailed p = .0285*

Objective 02 with Objective 04
Mean Rank z = -3.900
21.86
10.11 2-Tailed p = .0001*

Objective 02 with Objective 05
Mean Rank z = -4.9819
20.75
11.00 2-Tailed p = .0000*

Objective 02 with Objective 06
Mean Rank z = -5.3564
20.73
11.50 2-Tailed p = .0000*

```
Objective 03 with Objective 04
     Mean Rank            z = -2.1366
          20.39
          15.15           2-Tailed p = .0326*

Objective 03 with Objective 05
     Mean Rank            z = -4.1935
          19.73
          22.38           2-Tailed p = .0000*

Objective 03 with Objective 06
     Mean Rank            z = -4.7673
          19.63
          11.83           2-Tailed p = .0000*

Objective 04 with Objective 05
     Mean Rank            z = -3.3395
          14.91
          10.00           2-Tailed p = .0008*

Objective 04 with Objective 06
     Mean Rank            z = -4.0602
          14.92
           6.67           2-Tailed p = .0000*

Objective 05 with Objective 06
     Mean Rank            z = -1.5243
           9.27
          10.10           2-Tailed p = .1274
```

* = Significant Difference

01 = Knowledge
02 = Comprehension
03 = Application
04 = Analysis
05 = Synthesis
06 = Evaluation

Wilcoxon Signed-Rank Test for Differences in Assignment Instructions Between Two Pairs of Levels of Bloom's Taxonomy for Non-Practicing Faculty (N = 44)

Assignment 01 with Assignment 02
Mean Rank — z = --1.1000
15.93
11.09 — 2-Tailed p = .2713

Assignment 01 with Assignment 03
Mean Rank — z = -.8889
11.71
15.04 — 2-Tailed p = .3740

Assignment 01 with Assignment 04
Mean Rank — z = -.1211
15.80
11.13 — 2-Tailed p = .9036

Assignment 01 with Assignment 05
Mean Rank — z = -.7746
14.71
12.08 — 2-Tailed p = .4386

Assignment 01 with Assignment 06
Mean Rank — z = -1.4000
12.44
12.63 — 2-Tailed p = .1615

Assignment 02 with Assignment 03
Mean Rank — z = -.3937
14.69
12.31 — 2-Tailed p = .6938

Assignment 02 with Assignment 04
Mean Rank — z = -1.8414
16.53
5.36 — 2-Tailed p = .0656

Assignment 02 with Assignment 05
Mean Rank — z = -1.9700
13.55
15.29 — 2-Tailed p = .0488*

Assignment 02 with Assignment 06
Mean Rank — z = -2.6187
14.90
11.43 — 2-Tailed p = .0088*

```
Assignment 03 with Assignment 04
     Mean Rank            z = -1.5259
          12.39
           9.94           2-Taled p = .1270

Assignment 03 with Assignment 05
     Mean Rank            z = -1.8668
          11.50
          11.50           2-Tailed p = .0619

Assignment 03 with Assignment 06
     Mean Rank            z = -2.6429
          13.47
           9.58           2-Tailed p = .0082*

Asignment 04 with Assignment 05
     Mean Rank            z = -1.2412
           8.77
          11.40           2-Tailed p = .2145

Assignment 04 with Assignment 06
     Mean Rank            z = -2.2486
          10.33
           5.80           2-Tailed p = .0245*

Assignment 05 with Assignment 06
     Mean Rank            z = -1.0452
           9.95
           8.79           2-Tailed p = .2959
```

---

* = Significant Difference

01 = Knowledge
02 = Comprehension
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05 = Synthesis
06 = Evaluation

Wilcoxon Signed-Rank Test for Differences in Examination Questions Between Two Pairs of Levels of Bloom's Taxonomy for Non-Practicing Faculty (N = 44)

Examination 01 with Examination 02
Mean Rank — z = -1.1541
7.38
11.20 — 2-Tailed p = .2485

Examination 01 with Examination 03
Mean Rank — z = -1.5460
12.10
6.25 — 2-Tailed p = .1221

Examination 01 with Examination 04
Mean Rank — z = -3.3094
9.43
2.00 — 2-Tailed p = .0009*

Examination 01 with Examination 05
Mean Rank — z = -3.5162
8.50
.00 — 2-Tailed p = .0004*

Examination 01 with Examination 06
Mean Rank — z = -3.5162
8.50
.00 — 2-Tailed p = .0004*

Examination 02 with Examination 03
Mean Rank — z = -3.1138
10.47
4.67 — 2-Tailed p = .0018

Examination 02 with Examination 04
Mean Rank — z = -3.6800
10.00
1.00 — 2-Tailed p = .0002*

Examination 02 with Examination 05
Mean Rank — z = -3.7236
9.50
.00 — 2-Tailed p = .0002*

Examination 02 with Examination 06
Mean Rank — z = -3.7236
9.50
.00 — 2-Tailed p = .0002*

```
Examination 03 with Examination 04
     Mean Rank            z = -1.9649
           8.83
           7.50           2-Tailed p = .0494*

Examination 03 with Examination 05
     Mean Rank            z = -3.4078
           8.00
            .00           2-Tailed p = .0007*

Examination 03 with Examination 06
     Mean Rank            z = -3.3611
           8.87
           3.00           2-Tailed p = .0008*

Examination 04 with Exammination 05
     Mean Rank            z = -2.9341
           6.00
            .00           2-Tailed p = .0033*

Examination 04 with Examination 06
     Mean Rank            z = -3.0400
           7.42
           2.00           2-Tailed p = .0024*

Examination 05 with Examination 06
     Mean Rank            z = -.5345
           2.00
           2.00           2-Tailed p = .5930
```

---

* = Significant Difference

01 = Knowledge
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03 = Application
04 = Analysis
05 = Synthesis
06 = Evaluation

Wilcoxon Signed-Rank Test for Differences in Course Objectives Between Two Pairs of Levels of Bloom's Taxonomy for Practicing Faculty (N = 36)

Objective 01 with Objective 02
Mean Rank z = -3.2110
13.80
15.25 2-tailed p = .0013*

Objective 01 with Objective 03
Mean Rank z = -1.6559
14.86
16.63 2-tailed p = .9777

Objective 01 with Objective 04
Mean Rank z = .0869
11.30
10.73 2-tailed p = .9308

Objective 01 with Objective 05
Mean Rank z = -2.7311
13.89
10.17 2-tailed p = .0063*

Objective 01 with Objective 06
Mean Rank z = -3.5000
13.63
6.88 2-tailed p = .0005*

Objective 02 with Objective 03
Mean Rank z = -1.5118
17.00
13.25 2-tailed p = .1306

Objective 02 with Objective 04
Mean Rank z = -3.0164
16.23
11.14 2-tailed p = .0026*

Objective 02 with Objective 05
Mean Rank z = -4.3152
15.10
6.75 2-tailed p = .0000*

Objective 02 with Objective 06
Mean Rank z = -4.7101
15.91
3.50 2-tailed p = .0000*

```
Objective 03 with Objective 04
     Mean Rank            z = -1.7833
          15.44
          17.44           2-tailed p = .0745

Objective 03 with Objective 05
     Mean Rank            z = -4.5407
          14.00
            .00           2-tailed p = .0000*

Objective 03 with Objective 06
     Mean Rank            z = z = -4.5543
          14.93
           3.00           2-tailed p = .0000*

Objective 04 with Objective 05
     Mean Rank            z = -2.7758
          12.47
           8.20           2-tailed p = .0055*

Objective 04 with Objective 06
     Mean Rank            z = -3.4576
          12.94
           5.00           2-tailed p = .0005*

Objective 05 with Objective 06
     Mean Rank            z = -1.4216
           4.93
           5.25           2-tailed p = .1551
```

---

* = Significant difference

01 = Knowledge
02 = Comprehension
03 = Application
04 = Analysis
05 = Synthesis
06 = Evaluation

Wilcoxon Signed-Rank Test for Differences in Assignment Instructions Between Two Pairs of Levels of Bloom's Taxonomy for Practicing Faculty (N = 36)

Assignment 01 with Assignment 02
Mean Rank — z = -.5650
8.70
6.83 — 2-tailed p = .5721

Asignment 01 with Assignment 03
Mean Rank — z = -.5437
9.86
10.19 — 2-tailed p = .5869

Assignment 01 with Assignment 04
Mean Rank — z = -1.5513
9.80
6.33 — 2-tailed p = .1208

Assignment 01 with Assignment 05
Mean Rank — z = -2.0121
13.18
5.63 — 2-tailed p = .0442*

Assignment 01 with Assignment 06
Mean Rank — z = -2.1093
11.54
8.08 — 2-tailed p = .0349*

Assignment 02 with Assignment 03
Mean Rank — z = -1.0949
11.31
10.50 — 2-tailed p = .2736

Assignment 02 with Assignment 04
Mean Rank — z = -1.88357
8.63
8.13 — 2-tailed p = .0664

Assignment 02 with Assignment 05
Mean Rank — z = -2.2012
10.25
6.00 — 2-tailed p = .0277*

Assignment 02 with Assignment 06
Mean Rank — z = -2.2766
11.31
10.00 — 2-tailed p = .0228*

```
Assignment 03 with Assignment 04
     Mean Rank            z = -1.4438
           8.23
          11.50           2-tailed p = .1488

Assignment 03 with Assignment 05
     Mean Rank            z = -2.1299
           8.13
           7.50           2-tailed p = .0332*

Assignment 03 with Assignment 06
     Mean Rank            z = -2.8166
           9.07
           8.50           2-tailed p = .0049*

Assignment 04 with Assignment 05
     Mean Rank            z = -.7060
           6.86
           6.00           2-tailed p = .4802

Assignment 04 with Assignment 06
     Mean Rank            z = .8891
           5.38
           7.67           2-tailed p = .3739

Assignment 05 with Assignment 06
     Mean Rank            z = .8629
           6.25
           7.00           2-tailed p = .3882
```

---

* = Significant Difference

01 = Knowledge
02 = Comprehension
03 = Application
04 = Analysis
05 = Synthesis
06 = Evaluation

Wilcoxon Signed-Rank Test for Differences in Examination Questions Between Two Pairs of Levels of Bloom's Taxonomy for Practicing Faculty (N = 36)

Examination 01 with Examination 02
Mean Rank z = -2.1181
7.33
4.00 2-tailed p = .0342*

Examination 01 with Examination 03
Mean Rank z = -3.0594
6.50
.00 2-tailed p = .0022*

Examination 01 with Examination 04
Mean Rank z = -3.1798
7.00
.00 2-tailed p = .0015*

Examination 01 with Examination 05
Mean Rank z = -3.1798
7.00
.00 2-tailed p = .0015*

Examination 01 with Examination 06
Mean Rank z = -3.0594
6.50
.00 2-tailed p = .0022*

Examination 02 with Examination 03
Mean Rank z = -3.0400
7.42
2.00 2-tailed p = .0024*

Examination 02 with Examination 04
Mean Rank z = -3.0594
6.50
.00 2-tailed p = .0022*

Examination 02 with Examination 05
Mean Rank z = -3.0594
6.50
.00 2-tailed p = .0022*

Examination 02 with Examination 06
Mean Rank z = -2.9810
7.00
1.00 2-tailed p = .0029*

```
Examination 03 with Examination 04
     Mean Rank                    z = -2.6656
           5.00
            .00                   2-tailed p = .0077*

Examination 03 with Examination 05
     Mean Rank                    z = -2.5992
 5.89
 2.00                             2-tailed p = .0093*

Examination 03 with Examination 06
     Mean Rank                    z = -1.5799
           5.38
           6.00                   2-tailed p = .1141

Examination 04 with Examination 05
     Mean Rank                    z = .0000
           2.50
           2.50                   2-tailed p = 1.0000

Examination 04 with Examination 06
     Mean Rank                    z = .9439
           2.00
           3.67                   2-tailed p = .3452

Examination 05 with Examination 06
     Mean Rank                    z = -1.0954
           2.00
           2.67                   2-tailed p = .2733
```

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* = Significant Difference

01 = Knowledge
02 = Comprehension
03 = Application
04 = Analysis
05 = Synthesis
06 = Evaluation

APPROVAL SHEET

The dissertation submitted by Alma Joel Labunski has been read and approved by the following committee:

Dr. Terry E. Williams, Director
Associate Professor, Educational Leadership and Policy Studies, Loyola University of Chicago

Dr. Jack A. Kavanagh
Professor, Counseling and Educational Psychology, Loyola University of Chicago

Dr. Dona J. Snyder
Associate Professor, Marcella Niehoff School of Nursing, Loyola University of Chicago

Dr. Barbara K. Townsend
Assistant Professor, Educational Leadership and Policy Studies, Loyola University of Chicago

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Education.

November 17, 1989
Date

Terry E. Williams
Director's Signature