

A COMPARISON OF DISCUSSION AND LECTURE
METHODS OF INSTRUCTION

A THESIS
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

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DENTON, TEXAS
AUGUST 1979

The Graduate School
Texas Woman's University
Denton, Texas

July 18 1979

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our supervision by Mary Jo Dummer Clark

entitled A Comparison of Discussion and Lecture

Methods of Instruction

be accepted as fulfilling this part of the requirements for the Degree of

Master of Science

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ACKNOWLEDGEMENTS

Acknowledgement and grateful thanks are given to the following persons:

To Jean Stair, chairman of my committee, for her understanding and patience

To Helen Bush and Jeri Goosen for their help with this study

To my students who made this study possible by their willing participation

And, especially, to my husband Phil for his loving understanding and support

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CHAPTER I

INTRODUCTION

Every teacher, from kindergarten to graduate school and beyond, whether in nursing or an unrelated field, faces the problem of selecting techniques that will effectively achieve the objectives of the educational process. Making a choice among the myriad possibilities is no easy matter. Much has been written on the need for individualized instruction and on the fact that learning occurs at different rates and in different ways. A great deal of work has been done on discovering how people learn. Learning theories have been propounded that are as widely varied as Skinner's (1938) operant conditioning theory and the application of Lewin's (1942) field psychology in the cognitive-field theory of learning. However, the application of theory continues to present a challenge to educators.

Much of the educational process continues to function under the auspices of traditional methods of instruction. The most widely employed of these methods is the lecture. Even in the face of much criticism, the lecture

continues to be the method of choice for most teachers, especially in higher education.

In spite of the increasing amount of literature devoted to the need for varied methods of instruction, little is written about the selection of a particular method for use in a particular situation. The research upon which such decisions should be based has been scanty and the results confusing rather than helpful.

There is some research in the field of education related to the effectiveness of specific teaching techniques. However, there is little in the literature regarding the effectiveness of particular methods in achieving the aims of nursing education. This study was undertaken to investigate the effectiveness of two specific methods, lecture and discussion, for student acquisition of knowledge related to venereal disease, which is basic to nursing practice.

Statement of Problem

The problem for the study was to determine if there is a difference in the amount of knowledge acquired by nursing students taught by the discussion method and those taught by the traditional lecture method.

Statement of Purposes

The purposes of this study were to:

1. Determine the amount of knowledge acquired by students taught by the discussion method
2. Determine the amount of knowledge acquired by students taught by the lecture method
3. Compare the amount of knowledge acquired by means of the two methods

Background and Significance

Neither the discussion nor the lecture are new teaching techniques. The consistent use of the lecture as a means of transmitting knowledge arose from the difficulty of obtaining printed material prior to the advent of the printing press. It was the most efficient method when the instructor was the only source of information (Leonard, Fallon, and von Arx 1972). The discussion method dates from at least the time of Socrates (Hill 1969), and was first introduced into medical education by Bourhave in the seventeenth century (Leake 1973). Both the lecture and discussion methods have been in use over a considerable period of time. Only since about 1930, however, has the need to study their effectiveness been recognized (Hill 1960).

Educational methodology is only a means to an end. One uses method to create an environment in which learning can take place (Leonard, Fallow, and von Arx 1972). As expressed by Staton (1960, p. 25), "Every step of every method is merely a device by which the instructor attempts to utilize those principles of educational psychology that help to promote learning." Any method of instruction must accomplish several objectives:

1. Motivate student learning
2. Maintain attention
3. Promote thought
4. Create a clear picture of the material to be learned
5. Develop comprehension of the significance, practicality, and implications of the material (Staton 1960)

Selection of a method to meet these objectives in a particular instance may be difficult. As Hayes (1954) stated,

. it is easy to say, and to get everyone to agree, that education aims at the production of educated men and women. If we could go on from this point to agree what it is to be an educated man, agreement might seem possible also on what are the best methods for turning out such a product. (p. 3)

However, such universal agreement in regard to the use of

instructional methods is far from the case. If there is no ideal method, then one must decide which of a variety of methods is best suited to a particular situation (Hill 1960).

Selection of a particular strategy should be based upon knowledge of its effectiveness. Throughout the literature, the need for research to determine the effectiveness of specific instructional methods is a consistent theme. Authors referred to the need for further study regarding both the lecture and discussion methods (Buxton 1956). Bloom (1953) discussed the need for research, not only in terms of the effectiveness for learning, but also in terms of cost effectiveness. Selection of a technique of instruction also should be based on relevant theory (Kushel 1974), but

. regardless of whatever theoretical considerations may incline an instructor to prefer any particular classroom procedure, the ultimate worth of any method can only be determined by scientifically controlled experimentation (Bane 1925, p. 301).

This need for scientific experimentation was also the subject of Kaplan's (1960) comments on the need to secure more objective data regarding the lecture and discussion methods of instruction.

Nursing literature, as well as that of the general education field, makes frequent reference to the need for

research in educational methods. The National Commission for the Study of Nursing and Nursing Education made four general recommendations, two of which dealt with nursing education and research. First was a recommendation for increased research in nursing practice and education. Secondly, a recommendation was made for the enhancement of educational systems and curricula on the basis of research findings. More specifically, the recommendation was made that funding be made available for research. The funded research should be in the areas of curriculum development, articulation of educational programs, instructional methodologies, and educational facilities (National Commission for the Study of Nursing and Nursing Education 1970).

As in other areas of education, enrollment in schools of nursing has increased without a concomitant increase in the numbers of faculty members. For this reason, nurse educators must experiment with teaching strategies to arrive at those most efficient and effective in transmitting information to large numbers of students (Kondrachi and Moser 1977). Clarke (1977) spoke to the paucity of nursing research aimed at the understanding of the process of education. The author found that, although much work has been done on the selection of candidates for educational programs in England, only one study of teaching

methods had been completed. Another study was in progress at the time of her writing. A few studies comparing programmed study with the lecture method had been undertaken (Clarke 1977).

The research on lecture and discussion techniques has provided no conclusive findings. Several studies found no significant difference between lecture and discussion techniques in the acquisition of knowledge (Gerberich and Warner 1936 and Hill 1960). Some of the researchers found a slight, but not significant, tendency for students in the lecture groups to score higher on evaluative tests than students in the discussion groups (Husband 1951 and DiVesta 1954). Hill and McGee, on the other hand, found a slight tendency in the opposite direction (Hill 1969). Only one study found any significant difference between the two methods. In this study, discussion was found to be superior to the lecture for transfer of knowledge, but was equaled by the lecture method in the acquisition of knowledge (Huckabay, Cooper, and Neal 1977).

As can be seen from this discussion of related literature, there has been no conclusive evidence as to the superiority of either the lecture or discussion techniques of instruction. Huckabay and associates (1977)

ascribe the resultant confusion to the failure of researchers to delineate specifically the objectives to be met by the particular teaching strategies.

Hill (1969) contended that previous study results may have been questionable due to the time needed to accclimate students to the use of the less familiar discussion method. He also noted that the results might have been different if varied types of evaluative procedures had been used (Hill 1969). Hill (1960) provided a rather extensive list of the difficulties encountered in previous studies. These included:

1. Difficulty in estimating the validity and reliability of evaluative tools
2. The type of student groups (i.e. professional groups might be more amenable to discussion than non-professional groups)
3. Small sample sizes
4. Lack of control groups in some studies
5. Lack of consideration of teacher attitudes toward and competence in the two methods
6. Occasional lack of pre- and posttest measurements
7. Lack of consideration of outside influences

(i.e., previous student experiences with and attitude toward instructional methods)

8. Use of methods with disparate size groups
9. Lack of control of other variables (i.e. homework)
10. Lack of regard for the significance of the method within the school (Hill 1960)

In view of these difficulties, it was thought to be essential that further research be carried out under carefully controlled circumstances.

Theoretical Framework

As previously noted, use of a teaching strategy should be based on the foundations of theory and relevant research. Teachers are always faced with a choice of techniques, and "Choices regarding teaching practices need to be grounded in critical awareness of theoretical alternatives underlying the various practical alternatives available (Brown 1968, p. 1)." All teaching practice is related, whether consciously or not, to theory (Brown 1968). This study had its theoretical base in learning theory. Rogers (1969) stated,

. . . The only learning which significantly influences behavior is self-directed, self-appropriated learning. Such self-directed learning . . . cannot be directly communicated to another. (p. 153)

He viewed the teacher as the facilitator of the process in which the learner is engaged. Rogers based his approach to facilitation on a number of principles which he identified. These principles are as follows:

1. Human beings have the natural desire and potential to learn
2. Learning takes place when the learner perceives content as being relevant to his needs
3. Learning involves a change in self-organization and is, therefore, threatening and often resisted
4. Learning which is threatening is more easily perceived and assimilated when the external threat is decreased
5. Experience can be perceived in a differentiated fashion and learning can take place when the threat to the self is low
6. Significant learning often takes place through doing
7. Learning is facilitated through responsible student participation
8. Self-initiated learning that involves feelings as well as intellect is the most lasting and pervasive
9. Self-evaluation, as opposed to outside evaluation, fosters independence and creativity

10. Learning how to learn is the most useful type of learning

This study has addressed itself particularly to principle number seven as cited by Rogers (1969). The principle implies that the active participation of students necessitated in the discussion method would result in increased acquisition of knowledge.

Hypothesis

The null hypothesis tested was:

There is no significant difference between amount of knowledge acquired by students instructed by the discussion method and by students instructed by the lecture method.

Definition of Terms

Specific terms used in this study were defined as follows:

1. Discussion--a teaching strategy involving the sharing of information and ideas on the subject of venereal disease by a group of students. This sharing took place with instructor guidance and participation limited to the correction of misinformation and the provision of answers to direct questions. The format for the discussion was that of the epidemiologic method (Appendix A)

2. Lecture--a teaching strategy involving instructor presentation of subject matter on venereal disease following the epidemiologic method format. Students' questions were answered

3. Epidemiologic method--a process of systematic investigation of a health problem (Benson and McDevitt 1976)

4. Acquisition of knowledge--operationally defined as the improvement score

5. Improvement score--the difference between pre- and posttest scores

6. Venereal disease--gonorrhea and syphilis. All other forms of venereal disease were excluded

Limitations

A number of variables beyond the control of the researcher which contributed to the limitations of this study were as follows:

1. Limited generalizability of the findings due to the fact that subjects were drawn from the enrollment of one particular educational institution

2. Possibility of historical error due to the fact that experimental and control groups were studied at different times

3. Differing levels of experience among students.

All were senior nursing students, but some had completed more courses prior to the time of the study than others

4. Varying levels of student interest in venereal disease content

5. Inability to develop numerical coefficients of validity and reliability for the true-false tool

6. Student differences in familiarity with the discussion method of instruction

7. Interference with student performance resulting from anxiety regarding grades

Delimitations

Efforts were made in the implementation of the study to account for a number of extraneous variables which were amenable to control by the researcher. These efforts included the following delimitations:

1. Only senior nursing students who had completed three years of college, including all third year nursing courses, took part in the study

2. Subjects were enrolled in a baccalaureate program in nursing at a state-supported university

3. Subjects had at least the 2.5 grade point average required by the school of nursing

4. Subjects were enrolled in the required course in public health nursing

5. None of the subjects had been formally introduced to material on venereal disease prior to the study

6. Subjects included both generic students and registered nurse students who met the other criteria of the study

Assumptions

The basic assumptions underlying the study were:

1. Students are either intrinsically or extrinsically motivated to learn the content presented

2. Venereal disease content is "factual content" and, as such, knowledge of content can be tested using an objective-type test

Summary

This study was intended to determine whether or not there is a difference in the amount of knowledge acquired by nursing students taught by means of the discussion method and those taught by the lecture method. Subsequent chapters of this report will present a review of the related literature as well as the details of the methodology employed and the findings of the study. Chapter two presents a survey of relevant research on the

two methods of instruction. Chapter three describes the details of the study, including the characteristics of the study population and the procedure used for data collection.

Chapter four presents an analysis of the data obtained. The data are compiled on the basis of the total sample and, also, on a quarter-by-quarter comparison of control and experimental subjects. Chapter five provides a summary of findings and those conclusions which can be drawn from the data. The implications of the study and recommendations for further research are discussed.

CHAPTER II

REVIEW OF LITERATURE

Both the lecture and discussion methods of teaching have been in use for several centuries (Leonard, Fallon, and von Arx 1972; Hill 1969). However, systematic investigation of the relative effectiveness of the two methods was not undertaken until the 1920s (Dubin and Taveggia 1968). A review of the literature revealed that subsequent research has been conducted in a variety of fields including the liberal arts, sciences, education, and the health professions.

Early Research: 1925 - 1968

Research comparing the effectiveness of the lecture and discussion as teaching techniques was originally conducted primarily in the fields of liberal arts and education. However, there were a few investigations of the methods' effectiveness for science and professional education.

In the area of liberal arts, Gerberich and Warner (1936) studied the relative efficacy of lecture and discussion in terms of acquisition of knowledge. Subjects

involved in the study were students enrolled in two sections of a course in American government. The experiment was conducted during one semester of the 1932-33 school year and one semester of the 1933-34 school year. During the first semester, 23 subjects were assigned to the discussion section and 28 subjects to the lecture section. During the second semester of the study the lecture section consisted of 28 subjects and the discussion section was composed of 31 subjects. The difference in treatment between the two groups in each semester consisted of the use of the traditional lecture as the instructional method for one group and the use of a teacher-led discussion as the instructional method for the other.

A test of aptitude and background knowledge of American government, developed by the investigators, was administered to all subjects at the beginning of the course. The tool was altered slightly for the second year and the reliability coefficients for the test were .91 and .87 for the first and second years of the study respectively. Following the course, an objective examination including nearly 200 multiple-choice, matching, and true-false items was administered to the subjects. Significant coefficients of correlation obtained for aptitude and

final examination scores for the first and second years were .64 and .58 respectively.

Subjects were assigned to lecture and discussion sections in such a way as to provide comparability of the two groups on aptitude and previous knowledge of American government. Subjects within each group were classified as above-average or below-average based on aptitude scores.

On the whole, the authors found no significant difference between the lecture and discussion groups in regard to acquisition of knowledge. The difference between mean achievement scores for the lecture and discussion groups in the first semester was 2.50. That for the second semester was .24. In both instances the data favored the lecture method, but the difference was not significant.

When subjects were considered according to their ability, the lecture was found to be more effective for the above-average student. Discussion, on the other hand, was shown to be more effective for the below-average student. The mean difference in scores for the above-average students in the lecture and discussion groups was 5.56 for the first year of the study and .88 for the second year. While these differences favored the lecture, neither was found to be statistically significant. In regard to the

below-average students, the mean difference in scores for subjects in the two treatment groups was -4.67 for the first year and -.77 for the second year. These two differences favored the discussion method, but, again, were not significant. A question was raised by the investigators regarding the reliability of the results for above-average and below-average students based on the wide variations in mean scores and standard deviations for these groups. However, it was felt that further controlled research would support the reliability of the findings. In view of the total study results, the authors concluded that lecture and discussion seemed to be equally effective methods for use with heterogeneous groups of students. Other conclusions were that the lecture method was superior for the above-average student and that the discussion method was superior for the below-average student (Gerberich and Warner 1936).

Another early study investigated the effects of the lecture and discussion methods with respect to content mastery in four courses in philosophy and two courses in psychology (Ruja 1954). Sixty-one subjects in two philosophy courses and 41 subjects in a psychology course were instructed by means of the lecture method. Fifty-one subjects in the remaining two philosophy courses and 44

subjects in the remaining psychology course were instructed via the group discussion method. The material covered, assignments made, textual materials used, and examinations administered were held constant for all four philosophy courses. These variables were also controlled in the two courses in psychology.

The research hypothesis related to cognitive achievement stated that ". . . students in discussion classes in comparison with students in lecture classes (will) show greater subject-matter mastery, as measured by course examinations" (Ruja 1954, p. 386). The evaluative examinations consisted of 32 to 94 multiple-choice items. Four examinations were administered in each of the philosophy courses and five in each of the psychology courses. Split-half coefficients of reliability corrected for length using the Spearman-Brown formula ranged from .56 to .91. An item analysis was done for each test and items inconsistent with the whole test were not included for scoring purposes. The tests evaluated factual knowledge, understanding, and reasoning ability.

An analysis of covariance was utilized to determine the significance of differences in performance scores. A difference of 24 points favoring the lecture was found in the psychology courses. This difference was

found to be significant at the .01 level. In the four philosophy courses differences were found in favor of the discussion method. However, these differences were not statistically significant. The findings of this study suggested that method superiority may depend upon the type of subject matter involved (Ruja 1954).

In 1958 an extensive study comparing the efficacy of lecture and discussion techniques for acquisition of knowledge in anthropology was conducted by Hill (1960). The study involved three lecture groups: two groups of 25 subjects each and one group of 133 subjects. Large and small groups were used to counteract claims that lecture effectiveness is influenced by class size. Twelve discussion groups were included in the study. These groups consisted of 22 to 28 members with a median size of 24. The total number of subjects in the discussion and lecture groups was 293 and 283 respectively. Subject matter, number of sessions, and reading assignments were held constant for all lecture and discussion groups.

A pretest-posttest design was utilized in the study. Different tools were used for pre- and posttest measurements. The degree of difficulty was essentially the same for the two tests based on findings of a pre-testing situation with students in an introductory

anthropology course. The mean scores in the pretest situation were 6.46 and 6.51 for pre- and posttest tools respectively.

Pretest scores for the study population indicated that subjects in the lecture group had greater previous knowledge of anthropological concepts than subjects in the discussion groups. The differences in raw scores were statistically significant at this point. However, at the end of the course, no significant difference was found between raw scores for the lecture and discussion groups.

Acquisition of knowledge was also compared in terms of improvement scores, or the difference between pre- and posttest scores. Overall, the differences in improvement scores indicated the slight superiority of the discussion method. The mean improvement score for the lecture group was 1.09, while that for the discussion group was 1.37. The difference between mean improvement scores was reported as not statistically significant. The statistical test employed was not reported.

Improvement scores for women, non-professionals, and subjects with no previous college experience tended to favor the discussion technique, while scores for professionals favored the lecture. The mean improvement scores for women in the lecture and discussion groups were .9

and 1.5 respectively. The mean improvement score for non-professionals in the lecture group was .3, while that of non-professionals in the discussion group was 1.6. Scores for subjects with no previous college experience in lecture and discussion groups were -.6 and .6 respectively. The improvement score for professionals in the discussion group was 1.2, while that of the professionals in the lecture group was 1.4.

No difference in improvement scores was found for men or for persons over 40 in light of the separate treatments. The mean improvement score for men in both the lecture and discussion groups was 1.1. The score for persons over 40 years of age was 1.2 for both treatment groups. No test of statistical significance of the findings was reported in the study.

The findings of the study indicated the slight superiority of the discussion method. However, the researcher maintained that further research was necessary to support this conclusion (Hill 1960).

Research has been conducted by Bane (1931) in the field of teacher education. He began to investigate the effectiveness of the lecture and discussion methods as early as 1922. Subjects in a series of five experiments conducted over a period of three years were 510 college

juniors and seniors. Subject matter areas included courses in the history of education, methods of teaching, and educational psychology. Within each experiment, the amount of teaching time, course content, reading assignments, and examinations remained constant.

Subject performance was evaluated by means of scores on objective content examinations. Intelligence, as measured by forms A and B of Morgan's Mental Test and the Terman Group Intelligence Tests, was taken into account in determining performance scores. Reliability for the data on intelligence was computed at .85. Achievement tests consisted of primarily true-false items varying in number from 40 to 180 in the different experiments. Statistical reliability of the tests was computed using the Pearson Product Moment Coefficient of Correlation and ranged from .41 to .86. Tests were used to determine both immediate and delayed recall of content.

Subject achievement and intelligence scores were computed to result in an "A.Q." (achievement in relation to intelligence). Group achievement scores were arrived at by three separate methods:

1. Totaling of subjects' A.Q. scores
2. Totaling the scores of subjects in the two treatment groups who had been paired for equal intelligence

3. Totaling achievement scores of subjects without reference to intelligence scores

The third method was felt to be obviously inadequate, while the second method was considered to be the most appropriate.

The researcher reported the use of "the usual statistical devices" (Bane 1931, p. 18) to test the significance of differences found. In each of the five experiments, the group discussion method resulted in higher group scores for delayed recall. The mean score of the discussion group on delayed recall for the first experiment was 34.824, while the mean score for the lecture group was 29.706. The reported chance that the difference of 5.118 was significant was 160 to 1. The difference of 9.03 on immediate recall scores favored the lecture method. The probability of the results occurring by chance was described as 15 to 1.

In the second experiment, immediate recall scores for the lecture group surpassed those of the discussion group by a difference of 1.11 with a statistical significance of 6 to 1. The delayed recall mean of the discussion group surpassed that of the lecture group by 3.78 with a significance of 13 to 1. During the third experiment, the mean of the discussion group for immediate

recall was significantly higher than that of the lecture group. The difference in mean scores was 17.7 and was reported to be near "statistical certainty" (Bane 1931). In terms of delayed recall, the mean of the discussion group also surpassed that of the lecture group. The difference was 6.4. A statistically significant difference (5 to 1) of 1.15 in the mean scores for delayed recall favored the discussion group in the fourth experiment. In terms of immediate recall, the difference of 3.06 favored the lecture method.

In the fifth experiment, the mean immediate recall and delayed recall scores resulted in differences of 3.12 and 5.40 respectively. Both figures favored the discussion method. The statistical significance of the difference in scores for delayed recall was 5 to 1. Overall, the discussion method resulted in significantly better scores for delayed recall for each of the five experiments. In terms of immediate recall, group scores tended to favor the lecture in three of the five experiments, while discussion was favored for immediate recall in the remaining two experiments. The researcher concluded that the lecture is better suited to immediate recall situations and that the discussion is better adapted for retention of material (Bane 1931).

In the area of science education, Ward (1956) compared lecture and discussion in terms of retention of information and understanding of its implications. This study was designed to test three hypotheses:

1. There would be no significant difference between achievement of students instructed by the lecture-demonstration method and those instructed by the group discussion method

2. There would be no difference on recall-recognition type of test items

3. There would be no difference on understanding type items

Data related to the first hypothesis were analyzed using a univariate analysis of variance and covariance. Data for the second and third hypotheses were tested by means of a multivariate analysis of variance.

Subjects were randomly assigned to treatment groups. The treatment methods were the lecture-demonstration method and the group discussion method. Twenty-three subjects were assigned to the lecture-demonstration group and 14 subjects to the discussion group. Subject matter and sequence were the same for lecture and discussion groups and the same audio-visual aids and reading materials were available for each group.

Subjects within each group were divided into subgroups of "less capable students" and "more capable students" on the basis of scores on the American Council on Education Psychology Examination.

Achievement was measured by means of two tests. Test 1 had a reliability coefficient of .804 and was administered at the midpoint in the course in physical science education and again six months later as retest 1. Test 2, which had a reliability coefficient of .57, was administered as a posttest at the end of the course. Study findings indicated that the discussion method resulted in greater retention and better understanding on the part of the more capable student. However, the lecture method was superior for the less capable student (Ward 1956). These findings contradicted those of Gerberich and Warner (1936).

Educators in the health professions also were engaged in early research investigating the relative effectiveness of the lecture and discussion methods of instruction. Scores of subjects studying anatomy of the pelvis via two one-hour discussion groups per week were compared to those of subjects who had received the same information via lectures in the previous year's course. Subjects in the discussion group were informed of points

to be emphasized and course content remained constant over the two years of the study.

Subjects included 52 first-year medical students. Evaluation of acquisition of knowledge was based on two sets of objective tests, one during the course and one at the end. The tests were followed by a written examination consisting of two essay questions and by an oral examination composed of questions scaled as to degree of importance. Tests were scored on the basis of whether the student knew the answer or not. Test scores on pelvic anatomy for subjects in the discussion group were compared to those of subjects in a lecture group of the previous year. Subjects' scores on pelvic anatomy also were compared to the same subjects' scores for the unit on thoracic anatomy which was taught by the lecture method.

In the objective tests, 24 subjects in the discussion group scored above 70% while only 8 subjects in the lecture group scored above 70%. Only 8 subjects in the discussion group scored below 50% compared to 14 subjects in the lecture group. The scores for tests on the thorax were similar for subjects in the lecture and discussion groups. Thus, subjects in the two groups were considered to be of equal ability. Comparisons of the scores for

objective tests on the thorax and pelvis for the previous year showed the tests to be of equal difficulty.

The essay examination failed to show any difference between treatments. However, the results of the oral examination showed a superior result for the discussion group. Scores for discussion subjects on the test of pelvic anatomy showed 36 subjects obtained a score of 70% or above while only 23 subjects scored over 70% on the oral test of thoracic anatomy, which had been taught by the lecture method. No statistical tests were employed in the analysis of the data. However, the data generally supported the superiority of the discussion method in the teaching of anatomy (Erskine and Tomkin 1963).

Lifson, Rempel, and Johnson (1956) conducted a study of the effectiveness of the lecture and discussion techniques in teaching physiology to freshmen medical students. The study consisted of an experimental group of 28 subjects and a control group of 81 subjects. Group assignment was made on the basis of random selection stratified on the basis of previous grades. The researchers reported no significant difference between the lecture and discussion groups in terms of pretest scores and assumed the comparability of the two groups in terms

of student abilities. Specific pretest scores were not reported.

The control group was instructed by means of the lecture, laboratory, and demonstration techniques. The experimental group also engaged in these activities, but substituted discussion of experimental studies for one-third of the lecture hours. Evaluation of achievement was based on scores on two examinations: a midterm and a final. Each test consisted of two portions, one dealing with factual content and one dealing with application. The reliability of the two tests was determined and found to be "sufficiently high for the purposes of group measurement" (Lifson, Rempel, and Johnson 1956, p. 378). Data were subjected to the t-test of significance of difference.

The mean difference between groups on the midterm examination was .5, while that for the final exam was 0.0. Scores on the application portion of the midterm and final examinations showed differences of 3.0 and 2.8 respectively. Both figures favored the discussion method and were significant at the .01 level. Scores on the factual content portion of the midterm and final examinations showed differences of 5.2 and 2.8 respectively. These differences also were significant at the .01 level, but

avored the lecture rather than the discussion method (Lifson, Rempel, and Johnson 1956).

Dubin and Taveggia (1968) compiled a detailed analysis of studies related to the comparison of lecture and discussion techniques over the forty years prior to their writing. They explored 88 independent comparisons of discussion and lecture methods in 36 separate research studies. Their findings indicated that 45 of the 88 comparisons (51.1%) favored the lecture method, while 43 (48.9%) favored the discussion method. They found the average difference in performance scores to be 0.09 and concluded that both methods appeared to be equally effective.

The authors also reviewed 8 comparisons of lecture to combinations of lecture and discussion. These findings also were indefinite in that 3 studies (37.5%) favored the lecture, 4 studies (50%) favored a combination of lecture and discussion methods, and 1 study (12.5%) showed no difference between methods (Dubin and Taveggia 1968).

Recent Research: 1969 - 1978

Within the last decade additional research has been conducted regarding the comparative effectiveness of the lecture and discussion as instructional techniques.

Fields in which research has been conducted included the liberal arts, education, and professional education in such areas as medicine, dentistry, nursing, and health education.

Much of the research in the liberal arts area has been concerned with psychology as subject matter. One such study was conducted in four sections of a course in introductory psychology over a period of two semesters (Hill 1969). Each of the groups consisted of 50 to 60 students. Two sections were taught by the lecture method and two by the discussion method. Subjects were administratively assigned to sections based on their class schedules. A multiple-choice test was administered at two points during the course and again upon completion of the course. The mean score on the first test was found to be higher for the lecture group than for the discussion group. On the second test, no difference in the mean scores was noted, while the mean score for the discussion group was higher than that for the lecture group on the last test. The difference was reported as not statistically significant. Specific test scores and statistical tests employed were not reported (Hill 1969).

Another investigation in the area of psychology was conducted by Domino (1971) who studied the interactive

effects of teaching style and student achievement orientation on academic achievement. The sample consisted of 100 subjects chosen on the basis of extreme scores on the Achievement-via-conformance (Ac) and Achievement-via-independence (Ai) scales of the California Psychological Inventory. Subjects were assigned to one of four sections of a course in introductory psychology. Two sections of the course consisted of subjects with high Ai scores and two of subjects with high Ac scores. All sections had an equal number of subjects with comparable SAT scores. Sex composition of all sections was also equal. One high Ai section and one high Ac section were taught in a "conforming manner" utilizing the lecture method. The other high Ai and Ac sections were taught in an "independent manner" utilizing active student participation in discussion. Textbook readings and examinations were the same for all sections, although examination scores were not used for grading purposes in the independent sections.

Evaluation of cognitive achievement was made on the basis of a final examination consisting of 200 multiple-choice items and 6 essay questions. Answers to essay questions were independently rated by three psychologists. The test contained items related to factual content and items related to original thinking. Data were

subjected to correlational analysis and a two factor analysis of variance.

The results of the study indicated interaction between achievement orientation and teaching style. The F score on factual knowledge for the high-Ac-with-conforming teaching-style group was 10.68. That for original thinking items for the high-Ai-independent group was 66.73, while the F scores for teacher effectiveness for the high-Ai-independent group and the high-Ac-conforming group were 7.66 and 14.42 respectively. All of the F scores were significant at the .01 level. The study indicated that the conforming style of the lecture was more appropriate for subjects with high ratings on the Ac scale. Conversely, the increased participation of the discussion method was found to be more appropriate for subjects with high Ai scores. Teacher effectiveness was increased when teaching style was tailored to student achievement orientation (Domino 1971).

Dowaliby and Schumer (1973) conducted a similar study designed to compare aptitude-treatment interactions and their effect on student achievement in a course in introductory psychology. Sixty-nine subjects were assigned to either of two sections of the course. One section was arbitrarily designated as teacher-centered and

the other as student-centered. The sexual composition of both groups was similar. The teacher-centered format consisted of lecture with a five-minute answer session at the end of each class period and of periodic demonstrations. Subject interactions were discouraged. The student-centered format consisted of group discussion. Questions and subject-initiated responses were encouraged. Subjects were expected, at the end of each discussion session, to be able to summarize the material presented.

The teacher-centered and student-centered groups were found to be comparable in terms of individual difference measures obtained by means of the Taylor Manifest Anxiety Scale and a mental ability test. Criterion measures of student achievement were two examinations, each consisting of 35 multiple-choice questions drawn exclusively from class sessions. No difference between lecture and discussion groups was found for either test. Split-half reliability estimates for the two tests were .75 for the test on basic conditioning and .95 for the test on psychological measurement. The group mean for the lecture section on the first test was 19.68 while that for the discussion group was 18.48. On the second test the group means were 19.84 for the lecture group and 20.77 for the discussion group.

To analyze the effects of interaction between instructional treatment and level of anxiety, tests of parallelism of slope were performed. The resulting F scores were 8.57 for the first test and 4.75 for the second test. The results indicated that the student-centered mode was more effective for those subjects with low anxiety scores, while the teacher-centered mode was more effective for those with high scores. Analysis was also made on the basis of the Pearson Product Moment Coefficient of Correlation. The coefficient of correlation for the first test and the teacher-centered mode was .21. That for the same mode and the second test was -.02. For the discussion mode the correlations for the first and second test were -.54 and -.52 respectively. These figures correlated anxiety level and teaching treatment for each of the criterion measures. The results reinforced those of the tests of parallelism of slope. Overall, the results of this study supported previous findings that effectiveness of a particular method of instruction may depend on the characteristics of the individual learner (Dowaliby and Schumer 1973).

A study in psychology education was conducted by Gaynor and Millham (1976). Four hundred students in an introductory course in psychology were assigned to one of

three sections. Each of the three sections experienced one lecture per week. One group had a subsequent laboratory session, one received a second lecture, and the third group spent the subsequent session in a discussion of experimental research findings related to the lecture content.

Evaluation of achievement was based on noncumulative course examinations consisting of multiple-choice items. Analysis of data was achieved by means of an analysis of variance. Both the lecture-lecture and the lecture-laboratory treatments resulted in significantly higher scores than the lecture-discussion method. The level of statistical significance for the lecture-laboratory to lecture-discussion comparison was .01, while that for the lecture-lecture to lecture-discussion comparison was .05. The authors concluded that the effectiveness of the lecture-lecture condition stemmed from the elaboration and clarification of the material presented, while the lecture-laboratory method provided direct experience through experimentation. The lower scores for the lecture-discussion group were attributed to interference caused by introduction of new material not integrated with the first lecture (Gaynor and Millham 1976).

Recent research in the field of teacher education also has investigated the effectiveness of student-centered and teacher-centered methods of instruction. Coop and Brown (1970) conducted a study designed to determine interactive effects of cognitive style and teaching method on student achievement. They hypothesized that:

1. Students with an analytic cognitive style would achieve significantly higher scores on factual content tests than students with nonanalytic cognitive styles

2. Students with nonanalytic cognitive styles would achieve higher scores on concept-generalization content tests than students with analytic styles

3. Students taught by the teacher-structured presentation would score higher on factual content tests regardless of cognitive style

4. Students taught by the independent-problem-solving method would score higher on conceptual-generalization content tests regardless of cognitive style

5. There would be significant interaction between cognitive style and teaching method on factual content tests

6. There would be significant interaction between cognitive style and teaching method on conceptual-generalization content tests

The subjects of the study consisted of 80 students in an educational psychology course. Initially, 180 students were given the Sigel Cognitive Style Test. The analytic individual was defined as one who scored above the median on descriptive part-whole responses and below the median on relational-contextual responses and categorical-inferential responses. The nonanalytic individual was defined as one who scored above the median on relational-contextual responses but below the median on descriptive part-whole responses and categorical-inferential responses. Subjects selected for inclusion in the study were the 40 most analytic and 40 least analytic students. Ten analytic and 10 nonanalytic subjects were randomly assigned to each of four classes in educational psychology. Teachers were also randomly assigned to these classes. Two of the teachers employed a teacher-structured approach and two employed an independent-problem-solving approach. The problem-solving approach consisted of a film accompanied by a discussion guide which the students could use alone or in groups. The teacher-structured approach consisted of factual concepts presented by the

teacher in lecture. The study itself concerned a unit on classroom-interaction-analysis systems.

Student achievement was measured by means of a test consisting of 60 objective questions. Thirty of the questions were determined to be factual in nature, while the remaining 30 were conceptual in nature. The resulting data were analyzed using a 2 X 2 analysis of variance factorial design. The data indicated a significant difference at the .01 level between the two methods in relation to factual content ($F = 53$). The difference favored the teacher-structured presentation.

The teacher-structured method also was shown to be superior to the problem-solving method for conceptual content items ($F = 28.31$). The difference was significant at the .01 level. No significant differences were found between analytic and nonanalytic subjects for either factual or conceptual content. No significant interaction was noted between cognitive style and teaching method on either variable.

The conclusions drawn by the researchers were that:

1. The teacher-structured presentation was significantly superior to the problem solving approach for both factual and conceptual content

2. There was no interaction between cognitive style and teaching method for either the factual or conceptual variable

3. There was no significant difference between cognitive styles for either variable

In view of these conclusions, the authors advocated the use of the teacher-structured method for purposes of both conceptual and factual achievement (Coop and Brown 1970).

Williamson, Sewell, and McCoy (1976) explored the effectiveness of various combinations of traditional and personalized instructional techniques with 156 students enrolled in an undergraduate learning course over a two-year period. Subjects were assigned to six groups who received the same subject-matter content, textual materials, study guide questions, and final examinations. A different combination of instructional methods was used for each group. The six combinations utilized were:

1. Lecture-midterm examination
2. Readiness tests alone
3. Readiness tests-midterm
4. Readiness tests-discussion
5. Readiness tests-lecture
6. Readiness tests-lecture-midterm-laboratory

A final examination consisting of questions representative of all areas of course material was utilized as the measure of student achievement. Group data were analyzed by means of the Kruskal-Wallis test which indicated significant differences between groups ($H = 13.57$). Individual scores were subjected to analysis by the Mann-Whitney U statistic. The U score for the readiness test-lecture to readiness test-discussion comparison was 2.47. The score favored the readiness test-lecture combination and was significant at the .01 level. The U scores for the lecture-midterm and readiness test-midterm compared with the readiness test-discussion combination favored the lecture-midterm and the readiness test-midterm respectively, but were not statistically significant. The scores were 1.46 and 1.07 for the two comparisons. The data indicated that the addition of the lecture component to the readiness test was more effective than the addition of the discussion component. Also, the addition of the midterm exam proved to be more effective than the addition of the discussion to the readiness test method. In fact, the only additional component which did not result in greater achievement was the discussion (Williamson, Sewell, and McCoy 1976).

Several research studies comparing the effectiveness of the lecture and discussion techniques have been conducted in the area of the health professions including studies in such fields as medicine, dentistry, nursing, and health education. Kent and Spivey (1971) carried out an investigation of lecture and nonlecture approaches to teaching gastrointestinal pathology. The sample consisted of two randomly selected groups of 62 students each. The nonlecture approach consisted of a series of question and answer sessions. All students received a class schedule, a list of slides to be viewed, a list of unit objectives, and a list of unit content topics.

Subjects were evaluated on the basis of scores on two multiple-choice tests each consisting of 25 items. One test was administered at the end of the unit and the other two months later. Both tests consisted of 55% factual questions, 15% understanding of facts questions, and 30% problem-solving questions. Forty percent of the questions were considered easy, 40% of moderate difficulty, and 20% were considered difficult. The degree of difficulty for both tests was determined to be equal. Data were tested using the t-test and chi-square techniques.

The lecture and discussion groups were compared in terms of grade point average, college science grades,

MCAT scores, and subjects' grades in histology, anatomy, neuro-anatomy, physiology, and biochemistry. No significant differences were reported. Specific scores and the statistical tests employed in the comparison of the two groups on these characteristics were not reported.

The mean scores for the lecture group on tests 1 and 2 were 18.0 and 13.7 respectively. The mean composite score for this group was 31.3. The mean scores for the nonlecture group on tests 1 and 2 were 15.8 and 13.3 respectively. The composite mean for the discussion group was 28.9. The difference in composite mean scores for the lecture and nonlecture groups was significant at the .005 level and favored the lecture. The mean scores for the lecture group on factual items, items of understanding, and problem-solving items were 17.4, 4.6, and 9.3 respectively. Those for the nonlecture group were 16.6, 4.4, and 7.9 respectively. The difference on the problem-solving scores was shown to be significant at the .001 level. The other differences were not found to be significant. These results indicated the relative superiority of the lecture method. The conclusion was reached that effectiveness of a teaching method may depend upon the objectives of the educational situation. The lecture method was found to be more appropriate for increasing

overall cognitive achievement (Kent and Spivey 1971).

Fiel (1976) conducted an investigation designed to determine the effectiveness of a single lecture in terms of content mastery. The lecture was followed by a question and answer session. "Required" content was highlighted in the lecture. The study sample consisted of second year medical students divided into 21 subjects in group A and 29 in group B.

Two separate tools were used as pre- and posttest measures. Each test consisted of 15 multiple choice items, two of which were included on both tests. Test 1 served as pretest for group A and posttest for group B. Test 2 was used as a posttest for group A and as a pretest for group B. The posttest was administered immediately after the lecture which was given to both groups simultaneously.

Mean scores for group A on the pretest and posttest were 9.86 and 14.0 respectively. The results, analyzed by the paired t-test, showed a difference significant at the .005 level. The mean pre- and posttest scores for group B were 8.96 and 13.64 respectively. The difference between scores for this group was significant at the .005 level. No difference was found between pretest scores for groups A and B or between posttest scores. This lack of difference indicated a comparable degree of

difficulty for both tests. The similar improvement of both groups between pre- and posttest scores indicated that significant learning did take place as a result of the lecture (Fiel 1976).

Verbrugh, DeVries, and Eastham (1971) conducted an investigation of the efficacy of the discussion method with medical students as group leaders. The study was conducted over a period of three years, once each year in a preclinical pathology course. One hundred thirty-three subjects participated in 1968 and 138 in 1970. No figures were provided for the 1969 group. During the first year of the study, staff members functioned as group leaders. This approach was found to be unsatisfactory as students stopped attending the discussion sessions. In subsequent years fourth and fifth-year students functioned as group leaders. The treatment for all groups, each consisting of 12 to 14 members, was a group discussion on aspects of pathology.

Performance was evaluated in terms of passing scores on course examinations composed of multiple-choice and precoded essay items. The percentage of passing scores increased for each year of the study. Specific percentages of subjects with passing scores were 75% in 1968, 79% in 1969, and 81% in 1970. No comparison was

made with scores of previous years when the course was taught by the lecture method. The researchers concluded that the student-lead discussion technique was an effective one for cognitive achievement (Verbrugh, DeVries, and Eastham 1971).

A further study of the group discussion method in medical education was conducted by Rasche, Bernstein, and Veenhuis (1974). The study involved 102 second-year medical students enrolled in a course on patient interviewing. The course consisted of 16 weekly sessions of four hours each. During the first hour students interviewed individual patients. The second hour consisted of discussion of the interviews. During the third hour, students observed an interview conducted by the instructor, while the fourth hour was spent discussing the concepts and implications brought out in the interviews.

Prior to the study the Physician-patient Situation Test was administered to subjects as a pretest. This test consisted of 35 incidents followed by five possible responses. For each item the possible responses included an evaluative response, a hostile response, a reassuring response, a probing response, and an understanding response. Split-half estimates of reliability were .77 for evaluative responses, .80 for hostile responses, .74

for reassuring responses, .88 for probing responses, and .92 for understanding responses. This same test was later administered as a posttest.

In order to validate student application of interview concepts, two groups of eight subjects each taped their first and last patient interviews. These tapes were then coded by the researchers and scored by five independent judges. Estimated reliability scores for the ratings were .95 for understanding responses, .96 for probing responses, .94 for hostile responses, and .88 for reassuring responses. No estimate of reliability was provided for evaluative responses. Tapes also were scored on overall quality of the interview. The reliability estimate for this area was .96. The judges had some difficulty arriving at cohesive judgments regarding the probing category of responses. Ultimately, they decided to subdivide the category into three types of probing responses. These types were: facilitative probing responses, non-facilitative probing responses, and neutral probing responses.

The t-test was employed to test the statistical significance of difference in pre- and posttest scores and scored interviews. Comparisons of scores on the pre- and posttest tools indicated an increase in understanding

responses with a corresponding decrease in the other types of responses. The t score for understanding responses was 18.94. The t scores for the evaluative, reassuring, hostile, and probing categories were -3.08, -12.61, -7.42, and -7.14 respectively. The differences on all types of responses from pre- to posttest measures were shown to be significant at the .001 level.

In terms of the recorded interviews, the data indicated an increase from pretraining to posttraining interviews significant at the .005 level for the category of understanding responses. The t score for this type of response was 3.84. A significant decrease was noted in the number of evaluative responses. The t score for this category was 2.78 and was found to be significant at the .01 level. No significant differences were noted in the number of hostile or reassuring responses. In the probing response category, a decrease was noted in the number of nonfacilitative responses, while an increase was noted in the number of facilitative and neutral responses. The differences in the facilitative and nonfacilitative categories were found to be significant at the .001 level. The difference in the neutral category was significant at the .01 level. The scores for overall quality of interviews showed a significant increase. The t score was

4.83 and was found to be significant at the .001 level. The researchers concluded that second-year medical students were able to learn and utilize concepts of interviewing by means of the experiential-discussion method (Rasche, Bernstein, and Veenhuis 1974).

In the area of dental education, Plainfield, Poupard, and Sosnow (1970) conducted a study to compare the effects of lecture and seminar approaches in a course in dental psychology. The sample consisted of 94 junior dental and dental hygiene students. Subjects were assigned to groups alphabetically. Every other student in the alphabetical list was put in the control lecture group. Every third one of the remaining students was placed in one seminar group. Then every other one of the remaining students was chosen for a second seminar group. The remaining students comprised the third seminar group. In addition, the control group was informed that 16 placements were open in a seminar group and volunteers were solicited. Thirty-nine of the 47 participants in the lecture group volunteered. The 16 subjects who would also participate in the seminar groups were determined by lottery. The final outcome was 31 subjects in the control group, 47 in the seminar group, and 16 in a group taught by both methods. The subjects in the experimental group were

instructed by means of a group discussion with role-playing. The control group was instructed by means of the lecture. The combination group received both treatments.

Students were evaluated in terms of their cognitive achievement by means of four examinations. These four tests included a midterm and final for the first quarter and a midterm and final for the second quarter. The final, administered at the end of the second quarter, covered all of the material covered throughout the two-quarter course.

Test scores were analyzed by means of a one way analysis of variance for unequal group sizes. At the time of the fall quarter midterm, no statistically significant difference was found between the lecture, seminar, and combination groups. The final for that quarter revealed a statistical superiority for the combination group significant at the .05 level. The midterm for the second quarter also showed significantly higher scores for the combination group. However, the final examination for the second quarter showed no significant differences between groups. It was felt by the authors that the study findings were contaminated by student crossovers in methods and by an unexpected degree of communication of

information between groups. Therefore, no conclusions were made on the basis of their findings (Plainfield, Poupard, and Sosnow 1970).

Huckabay, Cooper, and Neal (1977) studied the effects of various teaching techniques on cognitive achievement and transfer of learning for inservice education in nursing. The techniques investigated were a filmstrip, a filmstrip followed by discussion, a lecture, and a lecture followed by discussion. The sample consisted of 131 staff nurses in a continuing education course on grief and mourning. Thirty-six subjects were assigned to the filmstrip-discussion group, 33 to the lecture group, and 31 subjects to each of the other groups.

A pretest-posttest design was employed. The instrument used consisted of two parts. Part 1 consisted of 15 multiple-choice items designed to test theoretical content. Part 2 consisted of an equal number of multiple-choice items designed to test transfer of learning. The tool possessed face validity based on relevant literature. Content validity was also determined by a panel of experts with overall agreement of 95.8% and 97.4% obtained for parts 1 and 2 respectively. Reliability was determined on the basis of a test-retest procedure and was determined

to be .97 for part 1 and .85 for part 2. Comparisons of mean scores were made using the t test.

All groups made significant gains in cognitive learning between pre- and posttest situations. These gains were significant at the .0001 level. The specific t scores were 8.43 for the filmstrip-discussion method, 5.63 for the filmstrip group, 8.99 for the lecture-discussion group, and 6.23 for the lecture group. The filmstrip and filmstrip-discussion groups taken together made greater gains than the lecture and lecture-discussion groups together, but the difference was not statistically significant.

In terms of the transfer of learning, the filmstrip-discussion group was significantly superior to the lecture. Significant gains in transfer ability were made by each of the groups with the exception of the lecture-discussion method group. Significantly better transfer of learning occurred with the combined film treatments compared to the lecture treatments. The difference was 2.17 and was significant at the .03 level. The two groups utilizing the discussion approach showed greater gains in the amount learned and in transfer of learning, but the differences fell short of statistical significance. The authors concluded that for the purposes of acquisition of knowledge

all four methods were equally effective. However, audio-visual aids and opportunity for discussion resulted in better transfer of learning (Huckabay, Cooper, and Neal 1977).

In the area of health education, a study was conducted by Irwin, Creswell, and Stauffer (1970) which compared instructional approaches and their effects on knowledge about smoking in seventh graders. Subjects for the study were 575 seventh-grade students in four junior high schools. The number of students per class ranged from 71 to 90.

The three instructional approaches utilized were the individual, the peer-led, and the teacher-led approach. In the individual approach, students studied and interpreted instructional materials on their own. Any teacher-student contact was initiated by the subject. The peer-led approach consisted of subject discussion of the materials. The teacher-led approach combined materials, individual study, discussion, and teacher participation.

Evaluation of cognitive achievement was made on the basis of pre- and posttest scores on a test of knowledge of smoking. Data were subjected to multivariate analysis of variance for unequal cells. Significant effects also were analyzed by the Neuman Keuls technique.

The increase in student knowledge for all groups was 15%. Significant differences between treatments were found favoring the individual and teacher-led approaches over the peer-led approach. The implications of the study were that inclusion of the individual approach was more beneficial to cognitive achievement than the inclusion of peer group discussion (Irwin, Creswell, and Stauffer 1970).

The review of literature reported in this chapter indicated that research on the effectiveness of the lecture and discussion methods of instruction has been conducted in a variety of fields. These areas of inquiry included the liberal arts, education, math and science, and such professional disciplines as medicine, dentistry, nursing, and health education. However, research to date has provided no conclusive evidence in support of either method for the purposes of cognitive achievement. Both methods have been shown to be effective in a variety of settings. Additional investigation may determine which method is suitable for a particular situation.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The data for this study were collected over the period of one academic year. Prior to the collection of data, approval of the study was obtained from the Human Research Committee of Texas Woman's University. Permission to conduct the study was also obtained from the Human Subjects Committee and the School of Nursing of the educational institution involved (Appendix F).

Setting

The study was conducted in a baccalaureate degree nursing program in a state-sponsored university. The institution had an enrollment of ten thousand students, approximately six hundred of whom listed baccalaureate nursing as their major. The university was in a semi-rural area and drew its student enrollment from the entire southeast portion of the country. It was located in an area which has recorded a high rate of venereal disease morbidity.

The data were collected during the course in public health nursing. The course was offered twice in each quarter and approximately equal numbers of subjects were

enrolled in each half of a particular quarter. One session of each quarter constituted the experimental discussion group and one the control group. Sixty-one subjects were assigned by means of a table of random numbers to experimental or control groups. Because of the demands of their program, 6 registered nurse students were administratively assigned to the experimental group during the spring quarter. The total number of subjects enrolled in the course varied from quarter to quarter, but the number assigned to each group within the quarter was approximately equal.

Population

The population of the study included all senior nursing students enrolled in the course in public health nursing during the academic year. Students had at least the 2.5 grade point average required by the School of Nursing, and had completed all of the lower division and junior year requirements. Those subjects enrolled in the course during winter and spring quarters of 1979 had completed other senior courses as well.

The sample consisted of 61 generic nursing students and 6 registered nurse students. The researcher did not eliminate the registered nurses from the study. Any previously acquired knowledge of venereal disease was

accounted for by means of a pretest and posttest and by means of the use of the improvement scores as an indication of acquisition of knowledge during the course.

Prior to each quarter during the study, students enrolled in the course were assigned to either the control or experimental groups. The assignment was made on the basis of a table of random numbers, except for the group of registered nurses previously mentioned. Because of their particular curriculum, the registered nurse students were required to take the course at a time which placed them in the experimental group during the spring quarter. Each of the other students was assigned a number and half of them were selected by the researcher for the experimental group using a table of random numbers. The remaining subjects comprised the control group.

At the beginning of the course, subjects were asked to sign consent forms agreeing to participate in the study (Appendix G). This action took place after subjects were informed of the nature of the study. Subjects were told only that the intent of the study was to test acquisition of knowledge under differing circumstances and that it would not entail any extra work on their part. All students elected to participate in the study. Students had the option of withdrawing from the study at any time.

A debriefing as to the details of the study took place at the end of each quarter (Appendix C).

Tool

The tool utilized in the collection of data was a modification of a true-false test on knowledge of venereal disease developed by the Los Angeles County Department of Health Services Division of Venereal Disease Control (Appendix D). It was originally developed as a pre- and posttest in venereal disease inservice programs for nurses. No numerical coefficient of validity has been established for the tool. However, the tool possessed both face validity and content validity as determined by a panel of experts. The panel consisted of physicians and nurses involved in a venereal disease control program. A panel of experts in the field of education reviewed the tool to determine the adequacy of the test items. Several minor changes in the wording of specific questions were made on the basis of the recommendations of this panel. No attempt was made to pretest the tool prior to the study.

The tool was administered to subjects as a pretest at the beginning of the course and as a posttest at the end of the course. The posttest was administered approximately five weeks after the pretest. Comparisons were made on the basis of the improvement scores. Information tested by

the tool was presented in the lecture sessions and was obtainable from references listed in the bibliography given to the subjects.

Procedure for Data Collection

Collection of data took place over a period of one academic year with a total of three experimental and three control groups. The size of each particular group varied according to the number of students enrolled in the course each quarter. However, the control and experimental groups in any one quarter contained approximately equal numbers of subjects. The sample was comprised of 80% of the senior nursing students during the year of the study. During the fall quarter, 1978, the control group consisted of 16 subjects and the experimental group consisted of 17 subjects. Eight subjects were assigned to the control group and 9 subjects to the experimental group during winter quarter, 1979. Spring quarter, 1979, the control group consisted of 9 subjects and the experimental group consisted of 8 subjects. The total number of subjects included in the experimental group was 34. The total number of subjects included as controls was 33. Due to the curriculum schema at the institution where the study was conducted, the control subjects took the course during the first 5 weeks

of each quarter and the experimental subjects took it during the second 5 weeks of each quarter.

At the beginning of the course subjects completed the pretest to determine the degree of previously acquired knowledge of venereal disease. At this time, subjects were given a course bibliography including a bibliography related to venereal disease and a study guide related to the use of the epidemiologic method (Appendix A and B). They were also informed that the topic of venereal disease would be covered during a specific class period near the end of the course. Subjects in the discussion groups were informed that they would be responsible for class discussion of the topic on the date specified and that the basic format for the discussion would be the epidemiologic method. Subjects in the control group were given the date for the presentation of the material on venereal disease along with the dates for presentation of other course content. To make allowances for subjects' expenditure of time, subjects in the discussion groups were exempted from writing a formal paper which was a usual requirement of the course. Subjects in the control groups were expected to complete the assigned paper.

During the specified class period, subjects in the experimental group conducted a discussion on the topic of

venereal disease within the framework of the epidemiologic method. All subjects had been exposed to the use of the epidemiologic method prior to the unit on venereal disease and had received a study guide on its use. The instructor provided guidance for the discussion to keep it within the framework. She participated to the extent of answering direct questions and correcting misinformation. The instructor did not volunteer information during the discussion sessions. Information necessary for successful completion of the posttest was available to subjects in the references provided in the venereal disease bibliography.

The content on venereal disease was conveyed to the subjects in the control groups in a lecture presentation by the same instructor, utilizing the epidemiologic method as the organizational structure for the presentation. Subjects' questions regarding the material were answered, but discussion was discouraged. Information tested for in the true-false tool was presented during the lecture. Comparisons between experimental and control groups were made on the basis of improvement between pre- and posttest scores. Following the collection of data in each quarter, subjects were informed of the details of the study.

Due to the change in faculty assignment at the educational institution where the study was conducted, the course was taught by a different instructor during spring quarter, 1979. However, the unit on venereal disease was taught to both experimental and control groups by the same instructor as the two previous groups. All other aspects of the study remained constant during the three quarters in which it was conducted.

Treatment of Data

Data from the experimental and control groups were subjected to statistical analysis by means of the t-test for independent samples. Comparisons were made between experimental and control groups for each quarter during which the study was conducted and between the total groups. Data were interpreted at the .05 level of confidence. Comparisons were also made on the basis of measures of central tendency and variability.

Summary

The study was conducted with a sample of senior nursing students enrolled in a course in public health nursing in a state-supported university. The sample contained both generic and registered nurse students. The 61 generic students were assigned by means of a table of random

numbers to groups taught by either the discussion method or the lecture method. The 6 registered nurse students were administratively assigned to the experimental group during the spring quarter. Subjects completed a pretest and a posttest and the improvement scores were used as a measure of acquisition of knowledge of venereal disease. Comparisons of the amount of knowledge acquired were made between experimental and control groups for each quarter and for the total sample. These findings are described in detail in Chapter four.

CHAPTER IV

ANALYSIS OF DATA

The study was designed to test the null hypothesis that there is no significant difference in the amount of knowledge acquired by students instructed by the discussion method and by students instructed by the lecture method. A total of 67 subjects participated in the study. Thirty-four (51%) subjects comprised the experimental group. The remaining 33 (49%) subjects constituted the control group. Subjects were senior nursing students enrolled in a course in public health nursing. Of the 67 students enrolled, no student refused to participate.

Subjects ranged in age from 20 to 50 years. Forty-nine (73%) of the 67 subjects were in the 20 to 23 age range. Nine (13.5%) subjects were in the 24 to 29 age range, while the remaining 9 (13.5%) were in the 30 to 50 age range. In the control group, 25 (76%) subjects were in the 20 to 23 age range, 4 (12%) subjects were in the 24 to 29 age range, and 4 (12%) subjects were in the 30 to 50 age range. The experimental group consisted of 24 (70%) subjects in the 20 to 23 age range, 5 (15%) subjects in the 24 to 29 age range, and 5 (15%) subjects in the 30

to 50 age range. Age-related data are presented in table 1.

TABLE 1
NUMBER AND PERCENTAGE OF CONTROL AND EXPERIMENTAL
SUBJECTS BY AGE RANGE

Age Range	Control Subjects		Experimental Subjects		Total	
	No.	%	No.	%	No.	%
20-23 years	25	76	24	70	49	73
24-29 years	4	12	5	15	9	13.5
30-50 years	4	12	5	15	9	13.5
Total	33		34		67	

Six (9%) of the subjects were male and 61 (91%) were female. The controls consisted of 3 (9%) male subjects and 30 (91%) female subjects. Three (9%) males and 31 (91%) females constituted the experimental subjects. Six (9%) registered nurse students and 61 (91%) generic nursing students participated in the study. Thirty-three (100%) of the control subjects were generic students. The experimental subjects consisted of 6 (18%) registered nurse students and 28 (82%) generic students. Data related to subjects' status as generic or registered nurse students are presented in table 2.

TABLE 2

NUMBER AND PERCENTAGE OF CONTROL AND EXPERIMENTAL
SUBJECTS BY GENERIC AND REGISTERED
NURSE STATUS

Student Status	Control Subjects		Experimental Subjects		Total	
	No.	%	No.	%	No.	%
Generic student	33	100	28	82	61	91
Registered nurse student	--	--	6	18	6	9
Total	33		34		67	

The 6 registered nurse students were included among the experimental subjects in the spring quarter. Additional demographic data regarding age, sex, and student status are presented in Appendix E for each of the three quarters during which the study was conducted.

Data related to the effectiveness of the lecture and discussion techniques for teaching venereal disease content were compiled within each of the three quarters and for the total experimental and control groups. The data used for comparisons were subjects' improvement scores.

Mean improvement scores range from 21 to 13. The mean improvement score for the control subjects was 18,

while that for the experimental subjects was 15. Similar means were noted within each quarter. During the fall quarter, mean scores for the control and experimental subjects were 16 and 14 respectively. The mean for the control subjects during the winter quarter was 21, while that for the experimental subjects was 13. During spring quarter, the respective means for control and experimental subjects were 19 and 17.

The median score for the control subjects was 18, while that of the experimental subjects was 15. The median improvement scores ranged from 12 to 21 during the three quarters in which the study was conducted. The greatest variation between median scores for lecture and discussion subjects occurred during the winter quarter. During this quarter the median for the control subjects was 21 and the median for the experimental subjects was 12. During the fall quarter the median score for control and experimental subjects was 16, while scores for control and experimental subjects in the spring quarter were 16 and 18 respectively.

The composite range of scores for the control subjects was 37, while that for the experimental subjects was 39. In the three quarters during which the study was conducted, the range of improvement scores varied from a high of 39 for the experimental subjects in the fall

quarter to a low of 17 for the control subjects in the winter quarter.

The variance in scores for the control subjects was 61.57, while that for the experimental subjects was 63.35. The standard deviation for the experimental subjects' scores was 7.95. The standard deviation for scores of subjects in the control group was 7.85. Both standard deviations and variances fluctuated from quarter to quarter. However, no apparent pattern was observed for the control or experimental subjects. Variance in scores ranged from 22 to 138.78. The variances for scores of the fall, winter, and spring control subjects were 28.75, 22, and 138.78 respectively. The variances for scores of the experimental subjects during fall, winter, and spring quarters were 83.06, 34.78, and 47 respectively.

Over the three quarter period of the study, standard deviations for subjects' scores ranged from 4.69 to 11.78. Standard deviations for scores of the control subjects were 5.36 in the fall quarter, 4.69 in the winter quarter, and 11.78 in the spring quarter. Standard deviations for the scores of the experimental subjects in the fall, winter, and spring quarters were 9.11, 5.90, and 6.86 respectively. Measures of central tendency and variability for subjects' improvement scores are shown in

table 3. The data are presented for the total study and for each quarter.

TABLE 3

MEASURES OF CENTRAL TENDENCY AND VARIABILITY
FOR IMPROVEMENT SCORES: FALL, WINTER,
AND SPRING QUARTERS

Measure	Fall		Winter		Spring		Total	
	I*	II**	I	II	I	II	I	II
Mean	16	14	21	13	19	17	18	15
Median	16	16	21	12	16	18	18	15
Range	23	39	17	21	37	21	37	39
Variance	28.75	83.06	22	34.78	138.78	47	61.57	63.35
Standard deviation	5.36	9.11	4.69	5.90	11.78	6.86	7.85	7.95

*I control (lecture) subjects

**II experimental (discussion) subjects

Differences in acquisition of knowledge, as measured by the improvement scores, were analyzed by means of the t-test for independent samples. A difference of 1.554 between control and experimental subjects' scores was not statistically significant. The t value for the fall quarter subjects' scores was .744. This score was not significant. In the winter quarter, the difference in scores

of experimental and control subjects was 3.106, while that during spring quarter was .433. The difference between scores of subjects in the experimental and control groups found in the winter quarter was found to be statistically significant. The difference favored the lecture method and was significant at the .01 level. The t values for the experimental-control subject comparison and for comparisons for each quarter are shown in table 4.

TABLE 4

t VALUES FOR EXPERIMENTAL AND CONTROL SUBJECTS'
SCORES: FALL, WINTER, AND SPRING QUARTERS

Fall	Winter	Spring	Total
.774	3.106*	.433	1.554

*significant at the .01 level

In summary, the analysis of the data indicated that there was no significant difference in student achievement following the lecture and discussion methods of instruction. The exception occurred during the winter quarter, when a significant difference ($t = 3.106$) favoring the lecture method was found. An inspection of subjects' scores on tests of other content taught during the course in public health nursing revealed that subjects

in the winter lecture group demonstrated higher scores on all tests than subjects in the other lecture and discussion groups. Conversely, on inspection of test scores for other course content, those subjects in the discussion group during winter quarter demonstrated lower scores than subjects in other discussion and lecture groups. In view of those findings and those of the other two quarters, as well as the lack of significant difference found in the comparison of scores of the total lecture and discussion groups, the null hypothesis was accepted. No significant difference was found in the amount of knowledge acquired by students taught by the discussion method and students taught by the lecture method.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The present study was conducted to test the effectiveness of the discussion method of instruction for the acquisition of knowledge in nursing education. In view of the problems of faculty-student ratios and concerns for cost effectiveness, nurse educators are encouraged to select teaching methods which are effective and efficient. Research in educational methods in nursing has been limited. Therefore, this study was undertaken to clarify the issue of the relative effectiveness of the lecture and discussion methods for the purposes of nursing education.

Summary

This investigation of the efficacy of the lecture and discussion methods of instruction focused on specific subject matter related to venereal disease. This content area was selected in view of the high rate of venereal disease morbidity in the geographic area in which the study was conducted.

The study was conducted in a baccalaureate nursing program within a state-sponsored university. Subjects

were senior generic and registered nurse students enrolled in a course in public health nursing. All students enrolled in the course elected to participate in the study. Sixty-one generic students were assigned by means of a table of random numbers to experimental and control groups. Six registered nurse students were administratively assigned to the experimental group during the spring quarter. The sample of 67 subjects included 34 experimental subjects and 33 control subjects.

Subjects received a bibliography on venereal disease and a study guide on the use of the epidemiologic method. Control subjects received instruction on venereal disease via the traditional lecture method, while experimental subjects were responsible for presenting a group discussion on the topic of venereal disease. Both the lecture and discussion were presented within the format of the epidemiologic method.

Subjects completed a true-false test on venereal disease as a pretest and, subsequently, as a posttest. Improvement between pre- and posttest scores was utilized as the measure of acquisition of knowledge. Comparisons were made between the improvement scores of control and experimental subjects using the t-test for independent samples. No significant difference was found between the

amount of knowledge acquired by the lecture method and that acquired using the discussion method ($t = 1.554$).

Data also were examined for each quarter during which the study was conducted. During fall ($t = .774$) and spring ($t = .433$) quarters no significant differences were found between scores of control and experimental subjects. A significant difference ($t = 3.106$) favoring the lecture method was found during the winter quarter. This difference was significant at the .01 level. An inspection of the subjects' scores on tests of other content covered during the course in public health nursing revealed that control subjects in the winter quarter demonstrated higher scores than subjects in the other quarters. Experimental subjects in the winter quarter demonstrated lower scores on other tests during the course than did subjects in other quarters. The difference in subjects' scores during winter quarter was attributed to greater academic abilities on the part of control subjects, as opposed to experimental subjects, rather than to the instructional method itself. The null hypothesis was accepted.

Conclusions

The researcher concluded that the lecture and discussion methods of instruction are equally effective for purposes of acquisition of knowledge regarding venereal

disease. The author also concluded that the significant difference between subjects' improvement scores found during the winter quarter was attributable to greater academic ability on the part of students in the lecture group rather than to the instructional method. This conclusion was based on the superior scores of subjects in the lecture group on tests of other course content, compared to scores of subjects in the discussion group.

Data for the spring quarter experimental subjects, who were primarily registered nurse students, were consistent with those for other experimental and control subjects. Thus, the author concluded that the discussion is no more or less effective for the acquisition of factual content regarding venereal disease for the registered nurse student than for the generic student.

Another conclusion related to the theoretical framework which formed the basis for the study. Rogers (1969) asserted that learning takes place with more extensive participation of the learner. However, the degree of participation necessitated by the discussion method has no more effect than the less extensive participation of the lecture method on the acquisition of knowledge regarding venereal disease.

Implications

The implications of the study are that nurse educators should make greater use of the lecture method when their objective is acquisition of factual content such as that related to venereal disease. A second implication is that nurse educators need not differentiate between lecture and discussion methods for the registered nurse and the generic student.

Recommendations

Recommendations for future investigation include a similar study utilizing a larger sample of subjects from other parts of the country and other subject matter. A second recommendation is the development and testing of a more refined tool for measuring acquisition of knowledge regarding venereal disease. The final recommendation is that a study be conducted to compare the lecture and discussion methods in which both experimental and control groups contain a large representation of registered nurse students.

APPENDIX A

BIBLIOGRAPHY ON VENEREAL DISEASE

MEDICAL SCHOOL LIBRARY

<u>Call #</u>	<u>Title</u>	<u>Pub. Date</u>
(1) WC 140 B881s	<u>Syphilis & Other Venereal Diseases</u>	1970
(2) WC 140 C368s	<u>A Short Textbook of Venereology: The Sexually Transmitted Diseases</u>	1974
(3) WC 140 K52v	<u>Venereal Disease</u>	1975
(4) WC 140 S367s	<u>Sexually Transmitted Diseases</u>	1975
(5) WC 140 W811c	<u>Color Atlas of Venereology</u>	
(6) WC 140 M889v	<u>VD: A Guide for Nurses & Counselors</u>	
(7) ZWC 140 V456	<u>Venereal Disease Bibliography</u>	1972

DEPARTMENT LIBRARY

Syphilis, A Synopsis

Medical Clinics of North America: Symposium on Venereal Diseases,
September 1972.

SHERROD LIBRARY

<u>Call #</u>	<u>Title</u>	<u>Pub. Date</u>
(1) 614.58 As78	<u>Today's Venereal Disease Control Problem</u>	1961
(2) 614.951 B432	<u>Venereal Disease</u>	1975
(3) 614.951 B791	<u>The VD Story</u>	1971
(4) 614.951 F339	<u>Sexual Pollution</u>	1974
(5) 614.951 G919	<u>Venereal Disease: The ABCs</u>	1971
(6) 614.951 H994	<u>Venereal Disease: The Silent Epidemic</u>	1973
(7) 614.951 K521	<u>Venereal Disease: The People to People Diseases</u>	1972

VENEREAL DISEASE - ARTICLES

- (1) "Nurse in a 'Special Clinic'," Nursing Times, July 8, 1975, pp. 1059-60.
- (2) "Venereal Disease: U.S. Number 1 Epidemic," Journal of Practical Nursing, June 1974, pp. 20-3.
- (3) "Adapting the Venereal Disease Clinic to Today's Problem," American Journal of Public Health, May 1974, pp. 433-7 (medical library).
- (4) "Ignorance & Indifference: 25 Facts About Venereal Disease," Nursing Mirror, April 19, 1974, p. 59.
- (5) "The Sexually Transmitted Diseases," Nursing Mirror, December 29, 1972, pp. 18-21.
- (6) "Gonorrhea," Nursing Mirror, July 20, 1973, pp. 30-32.
- (7) "Adolescents & Venereal Disease," Nursing Outlook, February 1973, pp. 99-103.
- (8) "Sexually Transmitted Diseases: Clinical Aspects Part 1," Nursing Times, May 17, 1973, pp. 630-3.
- (9) "Sexually Transmitted Diseases: Confidentiality--Attitudes of Patients Part 2," Nursing Times, May 17, 1973, pp. 633-5.
- (10) "Sexually Transmitted Diseases: Social Aspects Part 4," Nursing Times, May 17, 1973, pp. 638-9.
- (11) "A New Approach for Gonorrhea Epidemiology," AJPH, May 22, 1972, pp. 710-712.
- (12) "Women, the Unwitting Carriers of Gonorrhea," AJN, April 1971, pp. 716-719.
- (13) "Communities Strike Back," AJN, April 1971, p. 724.

APPENDIX B

STUDY GUIDE FOR USE OF THE
EPIDEMIOLOGIC METHOD

What are other names for Gonorrhea? for Syphilis?

What is the natural history of the disease?

What do we know about the host?

What difference to the intrinsic factors of age, race, and sex make, if any?

How does the disease affect the host's physical constitution?

What are the symptoms?

What about his psychical constitution?

What about immunity to the disease?

What do we know about the agent? What is it?

What are the portals of entry and exit?

How is the agent transmitted?

What is its life cycle? How long is it communicable?

What is its chemical composition?

What do we know about the environment?

What conditions increase the incidence of disease?

Is there a reservoir? Intermediaries?

What is the social environment?

What is the extent of the problem?

Population affected? Severity of effects?

Complications? What residual effects remain?

What are the time relationships and trends?

What is the geographic distribution?

What are possible solutions to the problem?

How is diagnosis made? How is it treated?

What preventive measures are available?

How would you implement your solution?

How would you determine the effectiveness of your solution?

How would you determine the effectiveness of treatment?

What kind of research could contribute to the solution of the problem?

APPENDIX C

ORAL PRESENTATION TO SUBJECTS

I would appreciate your participation in a study that I am conducting for my Master's thesis. The study involves a comparison of the acquisition of knowledge using various teaching methods. The comparison will be made on the basis of your test scores. The purpose of the study is to determine which teaching methods are most effective for nursing students. There will be no discomfort for you related to the study and it will not require any extra work on your part.

I cannot tell you at this time whether you would be in the experimental or control group as this could influence your performance and lead to inaccurate results. At the end of the quarter, I will explain further and let you know which group you were in. If you do not wish to participate, please see me after class and we will work out something else. The same tests will be taken by all of you whether you are participating in the study or not. Test scores for non-participants will not be included in data for the study.

Are there any questions? If not, please sign these consent forms and return them to me if you wish to participate in the study.

APPENDIX D

TEST OF VENEREAL DISEASE KNOWLEDGE

TRUE-FALSE: Mark 1 (one) if true and 2 (two) if false.

1. All untreated acquired syphilis is infectious regardless of the duration of the disease.
2. It is more important to elicit all male contacts to female cases of gonorrhea than female contacts to male cases.
3. In order to make a clinical diagnosis of gonorrhea, a laboratory confirmation is required.
4. A single positive serologic test is all that is necessary to make a diagnosis of syphilis.
5. Late latent syphilis is defined as any case of asymptomatic syphilis of more than two years duration.
6. It is more important to locate the familial contact to late syphilis than the sex contact to secondary syphilis.
7. Even though a patient has had an adequate course of treatment for syphilis, he may again have the disease if re-exposed.
8. Since penicillin is considered effective for the treatment of syphilis, it is not necessary to investigate contacts elicited from known cases.
9. Congenital syphilis is not infectious.
10. The two-year old child with congenital syphilis may safely be regarded as non-infectious.
11. The diagnosis of syphilis in the newborn may be delayed as there is a lifetime in which to diagnose and treat.
12. Penicillin used in the treatment of gonorrhea may mask symptoms of early syphilis.
13. A negative blood test at the beginning of treatment for gonorrhea rules out syphilis.
14. Both the spirochete and the gonococcus are resistant to drying and to the usual methods of disinfection.

15. Smears are more accurate than cultures in diagnosing gonorrhea.
16. The amount of titre in a quantitative serologic test indicates the infectiousness of syphilis.
17. A syphilitic person always has a positive serologic test.
18. It is not necessary to retreat the woman with syphilis during each pregnancy if she has been adequately treated for the same infection.
19. "Congenital syphilitic" refers to a person who became infected in utero.
20. Physical signs of syphilis are present at birth if the baby is infected.
21. The cord blood test is a reliable diagnostic measure of congenital syphilis.
22. Reversing the blood test in late syphilis is not an objective of treatment.
23. The classical lesion of early syphilis is painful.
24. The incubation period for syphilis is 10 to 90 days.
25. The term "latency" means hidden.
26. The lesions of late syphilis are infectious.
27. The blood test is usually not positive during the early period of the primary lesion of syphilis.
28. Infectious relapses usually occur within the first two years of infection with untreated syphilis.
29. Antibiotics can control the infectiousness of syphilis.
30. Offspring of a mother diagnosed as having syphilis should have serologic tests until they are five years of age, even though the tests are consistently negative.
31. Syphilis is transferred genetically.
32. Skin sores of early syphilis will vanish without treatment.

33. Syphilis and gonorrhea are spread by means of contaminated toilet seats from one adult to another.
34. Blood test for treponema pallidum should be used as confirmatory evidence before a diagnosis of syphilis is made.
35. Laboratories are required by most states to report reactive serologies to the local health officer.
36. Syphilis should not be diagnosed as being in the secondary stage until after the second clinic visit.
37. Many females with gonorrhea are not aware of any symptoms.
38. Once a person has syphilis and is cured in an early stage (primary or secondary), he cannot get the disease again.
39. One percent silver nitrate dropped in the eyes of newborns at the time of delivery is required in most states to prevent gonorrhea.
40. Gonorrhea is the leading cause of sterility in females.
41. Gonorrhea commonly affects the reproductive system in both male and female.
42. The syphilis organism is becoming resistant to penicillin.
43. Both gonorrhea and syphilis can be cured at any stage of the disease.
44. Blood tests are available for both gonorrhea and syphilis.
45. Syphilis and gonorrhea do not coexist in a patient.
46. Once the secondary stage is reached, syphilis is considered a systematic disease.
47. There is hope of vaccine for gonorrhea.
48. Gonorrhea commonly affects the urinary tract system in both male and female.
49. The causative organism of syphilis is found in the early skin lesions of the disease.
50. Blood tests for syphilis can be negative in some stages of the disease.

APPENDIX E

NUMBER AND PERCENTAGE OF SUBJECTS IN CONTROL AND EXPERIMENTAL GROUPS
BY AGE, SEX, AND STUDENT STATUS IN FALL, WINTER,
AND SPRING QUARTERS

	Fall				Winter				Spring			
	I* .A+	B++	II* A	B	I A	B	II A	B	I A	B	II A	B
<u>Age:</u>												
20-23 years	12	75	15	88	5	62	6	67	8	89	3	37
24-29 years	1	6	1	6	2	25	3	33	1	11	1	13
30-50 years	3	19	1	6	1	13	-	--	-	--	4	50
<u>Sex:</u>												
Male	1	6	1	6	-	--	1	11	2	22	1	13
Female	15	94	16	94	8	100	8	89	7	78	7	87
<u>Student Status:</u>												
Generic	16	100	17	100	8	100	9	100	9	100	2	25
Registered Nurse	--	--	--	--	-	--	-	--	-	--	6	75
Totals	16		17		8		9		9		8	

- * Subjects in Control (lecture) Group
 ** Subjects in Experimental (discussion) Group
 + Number of Subjects
 ++ Percentage of Subjects

APPENDIX F

TEXAS WOMAN'S UNIVERSITY

Human Research Committee

Name of Investigator: Mary Jo Dunmer Center: DallasAddress: 403 W. Main Street
Johnson City
Tennessee 37601Dear Ms. Dunmer:
Your study entitled A Comparison of Lecture and Discussion Methods of Instruction

has been reviewed by a committee of the Human Research Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education and Welfare regulations require that written consents must be obtained from all human subjects in your studies. These forms must be kept on file by you.

Furthermore, should your project change, another review by the Committee is required, according to DHEW regulations.

Sincerely,

Leola M. Lane
Chairman, Human Research
Review Committee
at Dallas.

TEXAS WOMAN'S UNIVERSITY

DENTON, TEXAS 76204



THE GRADUATE SCHOOL
P.O. Box 22479, TWU STATION

November 30, 1978

Miss Mary Jo Dummer
403 W. Main Street
Johnson City, Tennessee 37601

Dear Miss Dummer:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,

A handwritten signature in cursive script that reads 'Phyllis Bridges'.

Phyllis Bridges
Dean of the Graduate School

PB:dd

cc Dr. Jean Stair
Dr. Anne Gudmundsen
Graduate Office

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS 76204

DALLAS CENTER
1810 INWOOD ROAD
DALLAS, TEXAS 75235

HOUSTON CENTER
1130 M. D. ANDERSON BLVD.
HOUSTON, TEXAS 77025

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE East Tennessee State University

GRANTS TO Mary Jo Dummer

a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

A Comparison of lecture and discussion methods of instruction.

The conditions mutually agreed upon are as follows:

1. The agency (may) ~~(may not)~~ be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) ~~(may not)~~ be identified in the final report.
3. The agency ~~(wants)~~ (does not want) a conference with the student when the report is completed.
4. The agency is (willing) ~~(unwilling)~~ to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: October 30, 1978

Wynelle B. Bopert
Signature of Agency Personnel

Mary Jo Dummer
Signature of Student

Jean Stair R.N. C.M.
Signature of Faculty Advisor

* Fill out and sign three copies to be distributed as follows: Original-Student;
First copy - agency; Second copy - TWU College of Nursing.

EAST TENNESSEE STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

PROJECT TITLE: A Comparison of Discussion and Lecture Methods of Instruction

PRINCIPAL INVESTIGATOR: Mary Jo Dummer, Nursing Department

The Institutional Review Board has reviewed the above named project on (date) 10-28 with respect to the rights and safety of human subjects, including matters of informed consent and protection of subject confidentiality, and finds the project acceptable to the Board.

Frederick D. Dummer Chairman

M. J. Dummer

APPENDIX G

TEXAS WOMAN'S UNIVERSITY

(Form B - Oral presentation to subject)Consent to Act as a Subject for Research and Investigation:

I have received an oral description of this study, including a fair explanation of the procedures and their purpose, any associated discomforts or risks, and a description of the possible benefits. An offer has been made to me to answer all questions about the study. I understand that my name will not be used in any release of the data and that I am free to withdraw at any time.

Signature_____
Date_____
Witness_____
Date

Certification by Person Explaining the Study:

This is to certify that I have fully informed and explained to the above named person a description of the listed elements of informed consent.

Signature_____
Date_____
Position_____
Witness_____
Date

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