

THE EFFECT OF PRETESTING ON MASTERY
OF COURSE MATERIAL

A THESIS

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We hereby recommend that the thesis prepared under
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CHAPTER I

INTRODUCTION

In the past, occupational therapist educators have concentrated on improving the image of occupational therapy as a profession. The Essentials of an Accredited Educational Program for the Occupational Therapist, revised by the American Occupational Therapy Association in 1972 and adopted by the American Medical Association in 1973, has shifted the focus of attention of occupational therapist educators to the improvement of the curriculum. The increasing number of advanced educational programs in occupational therapy and the increased demand for qualified registered therapists to teach in undergraduate and graduate programs has made occupational therapists more aware of teaching as a new specialty within the profession.

Jantzen (1974) considered academic occupational therapy as a career specialty in the profession, grounded in the basic bodies of knowledge required of clinical specialties, but requiring additional knowledge for competent performance in the academic setting. She also proposed that the educational component is both a necessary and essential part of the total field of endeavor and that competent performance as a university faculty member requires both

clinical knowledge and additional knowledge and skills specific to that career role.

The planning and subsequent presentation of course material to occupational therapy students and the method of testing or measuring a student's acquisition of knowledge requires great care. While this author was involved in the dual role of graduate student and teaching assistant, interest was aroused as to the possible uses of pretesting as an educational tool at the college level.

The use of testing at the college level may be viewed by both faculty and students as primarily a means of assigning a grade at the end of a course of instruction. This is considered to be a poor procedure. Using testing as a method of evaluating course material and preparing students for a course introduces the question of whether the technique of pretesting can be used to induce the student to master course material. The student's reaction to and opinion of pretesting are also important.

Statement of the Problem

This study attempted to determine if a series of pretests would induce the student to master course material as well as induce the student to participate in unassigned, course-related activities outside of class. The subjects for this study were enrolled in two sections of a course

Introduction to Occupational Therapy, at Texas Woman's University in the Spring semester, 1974.

Limitations of the Study

The subjects were not a random sample since they were in a predetermined group. The subjects were not matched for level of ability and were not screened for previous background in medically related or science courses.

The experimental group initially consisted of sixteen occupational therapy students; however, it was reduced to fourteen when two students withdrew from the university. The control group consisted of nineteen occupational therapy students.

The pretests were constructed for this particular class and were not based on previously standardized data. The pretests may have given the student the opportunity to practice test taking rather than inducing him to master the course material or encouraging him to be involved in unassigned experiences.

Since the lecture method was used, it was impossible to insure identical presentation of course material to both groups. Due to the scheduling of school holidays, the length of time between pre- and posttesting was not always the same and may have affected validity of this study.

Significance of the Study

Since an increasing number of occupational therapists are becoming interested in academic teaching as a specialty within occupational therapy, there is a growing need for information relating to teaching and to evaluating methods. Jantzen (1974) stated that there is a need to orient the occupational therapist to educational terminology. Measurement and evaluation in the clinical setting, as they relate to patient care, are not new to the therapist. However the use of evaluation in the student clinical programs has only recently undergone revision. After conducting a pilot study in 1972, the American Occupational Therapy Association replaced the Report of Performance in Student Affiliation (RPSA) with the Field Work Performance Report. In the new evaluation form, there is less emphasis on comparing a student to other students. Instead, the student is compared with himself. When given a certain number of opportunities to display a behavior, the number of successes are noted. The occupational therapist who supervises and teaches students in clinical and academic environments needs information about student testing, its uses or consequences, and the part it plays in learning.

Hypothesis

The purpose of this study was to test the null hypothesis that there would be no difference between the unit tests and final exam scores of students who had taken a pretest prior to each unit and those students who had not taken such pretests.

It was also proposed that there would be no difference between the two groups of subjects in the amount of participation in unassigned, course-related activities.

Definitions

For the purpose of this study, a pretest will be defined as a test given to a student prior to the presentation of course material.

Broudy (1964) stated that the level of mastery learning is judged by the strength of the skill or knowledge of a particular subject. For the purpose of this study, mastery learning will have occurred when the student attains the behavioral objectives for the course (see Appendix A).

CHAPTER II

REVIEW OF LITERATURE

A review of the literature will include a brief history of testing and the traditional uses of testing and pretesting. The effects of testing and pretesting will also be surveyed.

History of Testing

Among the first types of tests were oral and physical performance tests. Oral questioning dates back to the beginning of language (Stanley, 1964). The Spartans, who were devoted to physical culture, had an elaborately graduated series of performance tests through which every boy had to pass in demonstrating his mastery of certain required skills. In the fifth century B.C. in Athens, a more intellectual kind of testing was refined by Socrates to extend and to enrich the learning of his pupils. This was a combination of teaching and testing where the teacher worked with a single pupil or small group. Under these conditions, testing was a normal part of the give and take of teaching and seldom was regarded as a function separate from teaching (Chauncey and Dobbin, 1963; Stanley, 1964).

As increasing numbers of young people sought educations, schooling became more formal. The special problems created by group instruction were recognized as early as the eighteenth century. At that time, educators and psychologists understood that even though teachers instructed pupils in groups, they had to understand them as individuals and to plan their learning accordingly (Chauncey and Dobbin, 1963; Stanley, 1964).

The first step toward scientific measurement in American education was taken by Mann in the 1840s. Mann was responsible for requiring all students to answer the same questions on an exam, for he believed that the written exam was superior to the oral exam. In colonial America, the oral exam was used as a method of judging the adequacy of learning and teaching (Tiegs, 1939; Chauncey and Dobbin, 1963; Stanley, 1964). In support of written exams, Mann stated they were impartial and just and eliminated favoritism. He believed that the exam should be used for appraisal of the students (Tiegs, 1939).

By 1864, the English schoolmaster, Fisher, proposed the widespread use of objective and standardized measures of academic attainment. He devised a scale whereby he assigned values from one to five for student performances on writing and math proficiency exams. His proposal was not widely accepted (Tiegs, 1939; Stanley, 1964).

An American educator, White, supported increased use of written tests and believed they were more impartial since all students would take the same tests. The results would be more tangible and reliable and would more accurately compare progress in pupils as well as reveal defects in teaching. White also believed that school instruction and study were no better than the tests by which they were measured (Stanley, 1964).

Rice, in 1897, applied a standardized test to an educational problem. He may be considered the real inventor of the comparative test. He studied the use of a spelling test under uniform conditions and set forth the value of what are now called norms (Chauncey and Dobbin, 1963; Stanley, 1964).

In the early 1900s, tests were developed to measure mental ability of pupils in order to separate out those who would be unable to profit from regular school. The French psychologist Binet was involved in such a project and stated that no test nor technique measured mental ability directly. He set up sample tasks for the child and then observed what happened. Binet established rough averages of performance among children at successive age levels. Binet's work marked the beginning of modern educational testing (Chauncey and Dobbin, 1963).

The father of the educational testing movement was Thorndike, who, in 1904, published the first textbook on educational measurement. Thorndike and other pioneers in this movement used standardized achievement tests which were based on principles of scientific measurement of human abilities developed in the psychological laboratories (Chauncey and Dobbin, 1963; Stanley, 1964).

The widespread use of objective tests and systematic achievement testing was seen in the 1920s. At that time, testing was used mainly for course improvement and administrative regulation. The faith of the 1920s in a "standard" curriculum was partially replaced, in the 1930s, by a belief that the best learning experience would result from teacher-pupil planning in each classroom. Tests were designed to be given for judgments about individuals, as in selecting students for advanced training, assigning marks, and diagnosing individual competencies and deficiencies (Cronbach, 1963; Stanley, 1964). In 1935, educators warned that it was important that the limitations of measuring instruments be recognized. Educational measurement had overemphasized the testing of limited areas of knowledge and skills, excluding other important educational objectives. Educators attempted to develop procedures to measure the attainment of such objectives as critical thinking, social sensitivity, aesthetic appreciation, and personal and social adjustment. This

was designed to lead to more adequate assessment of many personal factors including higher mental processes, such as application and analysis, and broad areas of nonintellectual skills and behaviors such as interests and attitudes (Stanley, 1964).

World Wars I and II stimulated further test development not only because of the demands of military classification but also because war unified many research efforts. College entrance examinations were further revised and extensively used. Since World War II, measurement experts have worked to increase the precision and usefulness of their instruments and to improve educational psychological measurement theory (Stanley, 1964).

Uses of Testing

The uses made of evaluation depend on the broader contexts of values, goals, and purposes of the administrator. In education, some form of measurement is inevitable and is usually considered inherent in the teaching process (Stanley, 1964).

An early use of testing was in the comparison of test results with test norms or group averages. In the late 1930s, the emphasis was shifted toward the use of test results in the analysis of teaching difficulties and in determining how children experiencing learning difficulties

could be helped. Uses of testing included estimating citizenship and achievement, and a newer viewpoint emphasized the improvement of learning as a principle function of measurement (Tiegs, 1939).

In the 1950s, Cook (1951) suggested that overall educational planning, educational placement, guidance and counseling, and improvement of the learning situation were related to the functions of measurement. Included in improving the learning situation were, (1) establishing learning situations appropriate to needs, abilities and potentials of the individual student, (2) diagnosing and alleviating learning difficulties, and (3) motivating and directing the learning experience and developing and maintaining skills and abilities. Cook also stated that, in professional schools and colleges, measurement had an excluding and eliminating function.

One of the main purposes of evaluation, which includes testing and measurement, is to improve learning and instruction. Evaluation is especially useful when certain principles are followed. Gronlund (1971) listed five principles of evaluation: (1) Determine and clarify what is to be evaluated. (2) The evaluation technique should be selected in terms of the purpose to be served. (3) Comprehensive evaluation requires a variety of evaluation techniques and may include testing. (4) Proper use of evaluation techniques

requires an awareness of their limitations and strengths.

(5) Evaluation is a means to an end, not an end in itself.

Cronbach (1954) listed the following as purposes of evaluation: to help the learner to realize how he should change or develop his behavior, to help the learner attain satisfaction when he is doing as he should, to help the teacher judge how adequate his teaching methods are and assist in making administrative judgments.

The review of literature indicates a shift in the understanding of the potential in the uses of testing from primarily comparison of achievement to the analysis of teaching, placement, guidance and counseling, and improving learning and instruction.

Uses of Pretesting

Using testing as a first phase of teaching in addition to the final action may assist in determining student readiness for specific course material, predicting student success, and determining whether course objectives are appropriate (Cook, 1951; Davis, 1951). Questions at the beginning of a unit may be used to encourage the student to look for specific facts or concepts and serve as a study guide (Berman, 1967).

Gronlund (1971) has suggested that pretests, which may be used to determine if a pupil has the minimum

background necessary to proceed with a course or unit, have a low level of difficulty. Pretests, which are to inform the student of the skills he will have to achieve in order to meet the course requirements, will cover material and concepts to be taught and will have a higher level of difficulty.

Effects of Testing and Pretesting

Neff (1972) noted that teachers persist in using tests as a negative kind of feedback in spite of some evidence that positive reinforcement may enhance learning while negative reinforcement may cause unlearning. Neff also believed that too many teachers depend upon the student's fear of failure for motivation. The fact that an exam is eminent may create a need in the student to prepare for that exam, as well as determine what the student may study (Cook, 1951; Kleuthe, 1968).

Gronlund (1971) stated that tests, ratings, and other evaluation procedures provide immediate, attainable goals for the student and provide knowledge of learning progress. These are believed to be two important ways evaluation processes may facilitate pupil motivation.

According to Bigge (1971), motivation is frequently believed to be achieved by manipulating the organism's past or present environment so that tension within the organism is either created or increased. Bigge wrote that when a

person develops a state of tension resulting from an unsatisfied need, it can be said that he is motivated. The person's aim, then, may become the reduction of the state of tension. If the scheduling of a test or exposure to a pretest creates a need to study or seek information, then one could say the student is motivated or induced to act. Motivation may then be considered to play an important role in learning.

Bigge (1971) identified two basic types of motivation, intrinsic and extrinsic. Intrinsic motivation is that tendency to activity which arises from within the individual. The student who studies because he enjoys the subject matter is influenced by intrinsic motivation. The student who studies a subject only because he will be tested over the material is said to be influenced by extrinsic motivators, since the motivator lies outside the organism. An incentive to act can be a result of extrinsic motivation. If testing is used skillfully as an extrinsic motivator, it may help promote intrinsic motivation or incentive by arousing the student's interest in a subject or by creating a need in the student.

Fitch, Drueker, and Norton (1951) found that frequent testing of achievement in the college lecture classroom may motivate outside endeavor. In their study, optional discussion sessions were scheduled in addition to the required

lecture session. Students who received more frequent tests tended to take advantage of optional sessions.

Sax and Reade (1964) studied the effect of varying difficulty levels of examinations on student's academic achievement in an education course. Results indicated that students who took exams labeled as difficult and who were initially in the upper half of their class obtained higher scores than equally bright students who took exams labeled as easier. Sax and Reade believed that hard exams may motivate brighter pupils to greater achievement than do easier examinations and suggested that difficult exams could be used during the semester to motivate students, to be followed by an easier final exam for grading purposes.

Marso (1969) questioned the Sax and Reade study because their examinations were more difficult than commonly used in a typical classroom. Marso's data supported the hypothesis that college students who experience less difficult unit examinations achieve better on a course final examination. He proposed that, by experiencing relatively easy unit examinations, the students received more reinforcement for their study efforts and consequently developed a more intense "set to study."

Knight (1973) proposed that a student's motivation and consequently his classroom performance could be affected by reinforcement contingencies, such as requiring 100 percent

mastery on weekly quizzes. If a student failed to demonstrate complete mastery, he was required to retake the same quizzes until he did so. Knight's program utilized two principles of learning which had been previously shown to have a positive effect on the student's ability recall information:

- (1) The retention of material is much greater when trials are distributed rather than massed, as in a few exams.
- (2) The student performs better when he knows how he is performing from one trial to the next. Knight's results supported his hypothesis, and he suggested that the motivational level of the student was related to performance.

Campeau (1968) found that under the stress of test-like conditions on conceptual learning tasks, the performance of high-anxious subjects was disrupted to a significantly greater degree than that of low-anxious subjects. However, Campeau noted that the direction of the difference was reversed when the subjects were able to see whether or not they were improving from trial to trial.

Carlson and Ryan's (1969) study supported Campeau's findings. They further proposed that, although test anxiety may act as a motivational force on test performance, if the difficulty of the task was increased, the individual with high-test anxiety does not do as well as one with low-test anxiety.

Studies by Ware (1968) and Flook and Robinson (1972) investigated the effects of pretest information on the student's later performance and did not support the hypothesis that later performance would improve. This was believed to be partially due to the length of time between the pre- and posttest and the types of questions on the pretest. If the pretest questions demanded retention of factual material, the retaining of the pretest information may be more likely than if the pretest questions demanded application of abstract principles to a concrete situation. The student's self-concept and motivational level were also considered to be variables.

In a study by Means and Means (1971), subjects were administered a pretest which, they were told, was an aptitude test that had been previously used to predict achievement in the course. Results indicated that high grade-point-average students performed better when told they had done poorly on the pretest. However, low grade-point-average students performed better when told their test scores indicated they had a high aptitude for success in the course.

In a study designed to investigate the effect of prequestions on memory, Peeck (1970) found that the experimental subjects had a higher degree of retention seven days after the initial testing than the control group. This study indicated that prequestions could favorably affect retention

of material pertaining specifically to the prequestions but not to information excluded from the prequestions.

A review of the literature on the effects of testing indicates that testing is believed by some to be used only as negative feedback or punishment despite evidence that positive reinforcement may enhance learning (Neff, 1972). Testing is believed to create a need in the student, as well as provide attainable goals, and thus induce or motivate the student to action (Gronlund, 1971; Bigge, 1971; Neff, 1972). There appears to be some disagreement about the effect of the level of test difficulty. The student's anxiety level was considered a variable related to student needs to reduce the tension or student needs to achieve (Campeau, 1968; Carlson and Ryan, 1969). The effects of pre-testing on short-term and long-term retention appear to be dependent on the level of skills required on the tests as well as the length of time between pre- and posttesting. In some studies, it appeared that the pretests contained questions used on the posttests, and students were not allowed to keep the pretests for study guides (Ware, 1968; Flook and Robinson, 1972).

CHAPTER III

METHODOLOGY

Procedure

The subjects for this study were students enrolled in two sections of a course entitled Introduction to Occupational Therapy. Although the course was not restricted to occupational therapy majors, only occupational therapy students were used as subjects for this study. This was a predetermined group and not a random sample. The students were not told that they were subjects for a study.

Only one group received a pretest prior to each unit of material presented (see Appendix B). The students were informed that the pretest was not for grading purposes but that it was a teaching tool. Although the pretests were not tried with a pilot group, the questions were based on the experimenter's experience with a similar class the previous semester. Material on the pretests covered some information presented to the class in the previous unit as well as new information, since the purpose of the pretest was to motivate low-achievement students and sustain high-achievement students. Each successive pretest included less familiar information and more new information. The questions on the

pretests required the same type of skills needed to meet the course behavioral objectives (see Appendix A).

While the pretest gave the student opportunity for practicing skills, such as dividing medical terms into prefix, root, and suffix, or "translating" a paragraph written in medical terms into laymen terms, it provided only a minimal sample of actual medical terms with which to practice.

The investigator attempted to construct pretests with successively higher levels of difficulty. Analysis of item difficulty was conducted after each pretest. Unknown to the subjects, the number of errors were recorded but only for the purpose of item difficulty analysis. The pretests were returned, with incorrect answers underlined, to the students at the class session immediately following the one in which the pretest had been administered. The students were encouraged to correct the pretests on their own.

Three pretests were given during the semester. Each pretest was followed by a posttest or unit test after the course material was covered. The control group received the same posttest as the experimental group. Both groups were also encouraged to purchase a textbook, Brady's Programmed Orientation to Medical Terminology (1970), and answer the questions in the text on their own, outside of class.

The data collected and analyzed were the student grades on unit tests and final exam. Class means for each exam were compared using the t-test to determine if there was a significant difference. Using the t-value table, if the value exceeded the figure corresponding to that given for the .05 level of significance, then the differences between the means would be considered significant and not due to chance (Turney and Robb, 1971).

One week before the final exam the students in both groups answered a questionnaire anonymously. The questions pertained to unassigned course-related activities, such as reading articles or watching medically-related TV shows, the students may have done (see Appendix C). The chi-square method was used to analyze the student responses on the questionnaires. A table of probability was used to determine if the obtained chi-square value was significant or due to chance. A probability level of .05 was accepted as significant (Chase, 1967).

Immediately after the final exam the experimental group anonymously answered questions pertaining to their study methods and their opinion of the worth of the pretest as a learning tool (see Appendix C). This questionnaire was administered after the final exam so that the students in the experimental group would be less likely to relate it to the first questionnaire. It was also believed that the students

would be more willing to answer the questionnaire after, rather than just prior to, the final exam. Information from this questionnaire was examined and will be presented in descriptive form.

CHAPTER IV

ANALYSIS OF DATA

The means and standard deviations for each group on each unit test and the final exam were determined. See Appendix D for raw scores. The significance of the difference between the means was determined by using the t-test. Although the unit test and final exam means were higher in the experimental group, analysis of the data indicated the differences did not reach the .05 level of significance. The null hypothesis that there would be no difference between the unit tests and final exam scores of the students who had taken a pretest prior to each unit of course material and those students who had not taken pretests was accepted.

TABLE 1
COMPARISON OF POSTTEST SCORES FOR EXPERIMENTAL
AND CONTROL GROUPS

Test No.	Group	N	\bar{X}	S	St. Error	<u>t</u> -Value	p
1	E	16	61.52	4.34	1.08	.3988	.70
	C	19	60.78	6.56	1.51		
2	E	14	62.50	4.82	1.29	1.5870	.20
	C	19	59.24	6.98	1.60		
3	E	14	79.68	4.57	1.22	1.7715	.10
	C	19	75.90	7.64	1.75		

(t=2.042 (df 30, $p < .05$)

As the level of item difficulty on the pretest increased, the t -values increased, indicating that the pretests may have had an effect on the mastery of course material.

TABLE 2
COMPARISON OF PRETEST LEVEL OF ITEM
DIFFICULTY AND POSTTEST t -VALUE

Test	Pretest Mean Item Difficulty	Posttest t -Value
1	.64	.3988 ($p < .70$)
2	.34	1.5870 ($p < .20$)
3	.34	1.7715 ($p < .10$)

In comparing the difference between the answers of the experimental and control groups to the items on the questionnaire administered prior to the final exam, the chi-square test did not yield values significant at the .05 level. The null hypothesis that there would be no difference between the two groups of subjects in the amount of participation in unassigned, course-related activities was accepted.

The two items on the questionnaire that reached the highest level of probability ($p < .20$) indicated that 57 percent of the students in the control group tended to answer questions in the programmed textbook. Seventy-nine percent of

the students in the experimental group and 68 percent of the students in the control group watched medically-related TV shows.

Table 3 depicts the chi-square values for each item on the questionnaire administered prior to the final exam.

TABLE 3
CHI-SQUARE VALUES FOR PRE-FINAL
EXAM QUESTIONNAIRE

Question	Chi-Square Values
1. Answered questions in programmed text.	2.4143 (df 1, $p < .20$)
2. Read medical articles in newspaper or magazine4666 (df 1, $p < .50$)
3. Watched regularly scheduled medically-related TV shows.5587 (df 1, $p < .50$)
4. Watched special medically-related TV shows.5250 (df 1, $p < .50$)
5. Watched more medically-related TV shows this semester	1.8897 (df 2, $p < .20$)
6. The purpose of testing is (a) only for a grade, (b) a learning experience, or (c) a learning and grading tool.	2.4902 (df 2, $p < .30$)

Further analysis of each part of item six on the pre-final exam questionnaire indicated that more students in the experimental group (100%) than in the control group (77%) tended to view testing as a learning tool rather than just a

grading tool. All students in both groups indicated "yes" when asked if testing was a learning and grading tool.

Student responses to the post-exam questionnaire which was administered to the experimental group were as follows: In response to question 1, all of the students indicated they corrected their pretests.

In response to question 2, all of the students indicated they found the pretests helpful. Some of the reasons given were, (1) The pretest served as study guides. (2) The pretests indicated what might be expected on the exams. (3) The pretests indicated what type of mistakes the students were making as well as indicated how much they knew. (4) The pretests gave the students a chance to see how the medical terms were actually used.

Only two students indicated on question 3 that the pretests frustrated them. Reasons given were that they didn't know the new information or were unable to remember previously learned material. These same two students indicated, however, that the pretests were helpful to them.

All students indicated on question 4 that they would recommend the use of the pretests with future classes taking Introduction to Occupational Therapy. All but one student gave reasons for recommending pretest usage. Eight students (57%) stated that the pretest was a good study or learning aid and gave them a chance to see how the terms

were used. Four students (29%) stated the pretests helped them prepare for the exams. One student (7%) believed the pretest aided the teacher in determining what information had not been clearly transferred to the students.

CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate the effect of pretesting on the mastery of course material. The uses and effects of testing on student performance noted in the literature was reviewed on the assumption that occupational therapists need more information pertaining to the effects of testing in the academic setting.

The null hypothesis that there would be no difference between the unit tests and final exam scores of students who had taken a pretest prior to each of three units and those students who had not was accepted. The null hypothesis that there would be no difference between the two groups of subjects in the amount of participation in unassigned course-related activities was accepted. The data indicated that the experimental group's mean scores were higher than those of the control group. The magnitude of the difference increased with each successive test. One hundred percent of the experimental group and only 77 percent of the control group participated in unassigned, course-related activities.

Conclusion

Although the data were not statistically significant, there was a trend indicating that with successive exposure to pretests the difference between the class means became more marked. It was the opinion of one hundred percent of the students in the experimental group that the pretests were useful. Pretesting may be considered a useful tool in the mastery of course material; however, further investigation is indicated.

Recommendations

Future studies should utilize random samples of a larger student population. Matching the students according to ability level and previous exposure to medical or science-related courses should also be considered. More frequent pretesting might be considered since with each successive pretest the posttest mean score differences were increasingly large.

APPENDIX A

BEHAVIORAL OBJECTIVES

AND

COURSE CONTENT

BEHAVIORAL OBJECTIVES

OT 1212: Introduction to Occupational Therapy

Catalog Description: Introduction to the disease processes involved in patient treatment by occupational therapists. Two lecture hours per week. Credit: 2 hours.

Purpose: To acquaint the student with the medical terms frequently used by occupational therapists.

Behavioral Objectives: Given a clinical description of a disease or patient condition, the student will be able to analyze the medical terms by breaking apart each word into its component parts and define each part using common terms. (90% accuracy--A, 80% accuracy--B, 70% accuracy--C)

1. Given a list of words, the student will separate the words into prefix, word root, and suffix and define each part using common words.

2. Given a case report written in medical terms, the student will "translate" into layman terms using common words.

3. Given a description of a condition, the student will write the appropriate medical terms with correct spelling.

COURSE CONTENT

1. Introduction--to course content, word construction and importance of correct spelling.	3%
2. Terms associated with position, body movement, planes and body surfaces, deviations of	6%
3. Terms associated with psychosocial dysfunction	19%
4. Medical terms for body parts and systems	7%
5. Terms associated with physical dysfunction	39%
6. Medical abbreviations and case studies	7%
Review and Tests	19%

APPENDIX B

PRETEST QUESTIONS
AND POSTTESTS

PRETEST I

Name _____

OT 1212: Pretest: Medical terms pertaining to psychosocial dysfunction.

Separate each of the following words into a prefix, word root, and suffix by drawing a vertical line between each of the parts. Not all words will have all three parts. EXAMPLE: psycho/path/ology, ab/normal.

- | | |
|-------------------|-------------------------|
| 1. claustrophobia | 6. disorientation |
| 2. addiction | 7. echopraxia |
| 3. encephalitis | 8. electroencephalogram |
| 4. conversion | 9. psychosis |
| 5. psychosis | 10. hypnosis |

Match the common word on the right to the medical term on the left by putting the appropriate letter in the blank provided.

- | | |
|--------------------|-----------------|
| 11. _____ psycho- | a. pain |
| 12. _____ -pathy | b. inflammation |
| 13. _____ cephalo- | c. excessive |
| 14. _____ -itis | d. beginning |
| 15. _____ -phobia | e. mind |
| 16. _____ hyper- | f. divided |
| 17. _____ genesis | g. after |
| 18. _____ -algia | h. head |
| 19. _____ post- | i. disease |
| | j. condition |
| | k. fear |

In the blank, write the medical word for each common word or phrase listed below. EXAMPLE: mind, one who studies

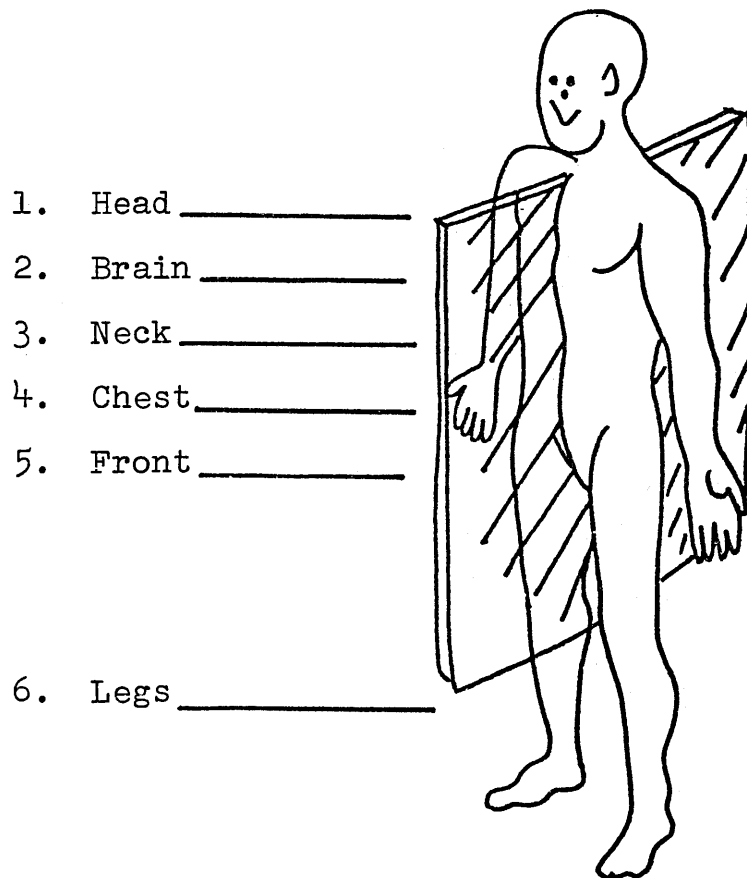
psychologist

20. nervous condition _____
21. mind disease _____
22. away from average _____

POSTTEST I

Name _____

FILL IN THE BLANKS WITH THE APPROPRIATE MEDICAL TERMS.



7. The plane that divides the body into right and left halves is the _____ plane.

8. The _____ plane divides the body into front or
9. _____ and back (10.) _____ halves.

When you lay on your stomach you are in the (11.) _____ position.

The act of turning hand palm up is called (12.) _____

MATCH THE COMMON WORK IN THE COLUMN ON THE RIGHT TO THE APPROPRIATE MEDICAL TERM ON THE LEFT BY PUTTING A LETTER IN THE BLANKS PROVIDED.

13. _____cephalo

14. _____optic

15. _____caput

16. _____hypo

17. _____en

18. _____dys

19. _____ad

20. _____psych

21. _____syn

22. _____hyper

23. _____acro

24. _____derma

25. _____genesis

26. _____neuro

27. _____megalo

a. skin

b. in

c. sleep

d. head

e. eye

f. toward

g. enlarged

h. excessive

i. nerves

j. brain

k. together

l. extreme

m. less

n. beginning

o. mind

p. difficult

q. after

r. life

28. _____con

29. _____-itis

30. _____-osis

31. _____-ology

32. _____-oid

33. _____-pathy

34. _____-emia

35. _____-iatric

36. _____meter

37. _____an-

a. resembling

b. condition

c. study of

d. disease

e. measure

f. without

g. a process

h. inflammation

i. treatment

j. blood

k. with

DIVIDE EACH OF THE FOLLOWING WORDS INTO ITS COMPONENT PARTS
AND WRITE THE COMMON WORD OR WORDS FOR EACH PART.

EXAMPLE: hypo/chondr/iasis--under+cartilage+condition

38. psychogenesis_____
39. anopsia_____
40. psychiatrist_____
41. schizophrenia_____
42. paranoid_____
43. psychopharmacology_____
44. tachycardia_____
45. photophobia_____
46. psychosomatic_____
47. pyromania_____
48. hebephrenia_____
49. symbiosis_____
50. acrophobia_____
51. neurodermatitis_____
52. hyperhydrosis_____

IN THE BLANKS PROVIDED WRITE THE MEDICAL TERM FOR EACH UNDER-
LINED COMMON WORD.

A temporary (53)_____ brain inflammation
(54)_____ may be characterized by
excessive pain (55)_____. Without
beginning (56)_____ of the
cerebellum is an example of a with birth (57)_____
cranial without average (58)_____.

Children with water brain (58)_____ frequently
have low tone (6)_____ muscles.

Mind without (neg.) vision (61)_____ is an
example of a hysterical neurosis, conversion type, and is of
mind beginning (62)_____ origin. Another
mind body (63)_____ illness is
nerve skin inflammation (64)_____.

Together fingers (65)_____ and small head
(66)_____ are sometimes associated with
some of the mental retardation together courses (67)_____.

Carbon monoxide intoxication will cause negative oxygen blood
(68)_____.

PRETEST II

REWRITE THE FOLLOWING PARAGRAPH, USING MEDICAL TERMS.

Upon admission to the hospital the patient had no fever, however, was spitting up blood, having difficulty breathing and was somewhat blue. He was reported to have a poor appetite and complained of not feeling very well.

POSTTEST II

Name _____

MATCH THE COMMON WORD ON THE RIGHT TO THE APPROPRIATE MEDICAL TERM ON THE LEFT BY PUTTING THE CORRECT LETTER IN THE BLANK PROVIDED.

- | | |
|-------------------|-------------------------------|
| 1. _____aden- | |
| 2. _____-centesis | |
| 3. _____-ectasis | a. chest lining |
| 4. _____trache- | b. white |
| 5. _____thorac- | c. dilation |
| 6. _____-costo- | d. windpipe |
| 7. _____-lysis | e. rib |
| 8. _____leuko- | f. vein |
| 9. _____ptysis | g. gland |
| 10. _____pnea | h. puncture |
| 11. _____pulm- | i. breath |
| 12. _____pleur- | j. break |
| 13. _____-clasis | k. chest |
| 14. _____-lith | l. saliva |
| | m. gradual decline, loosening |
| | n. lung |
| | o. blue |
| | p. calculus |
| | q. surrounding |

FOR EACH UNDERLINED MEDICAL TERM (1) DIVIDE THE WORD AND (2) DEFINE EACH PART, USING COMMON WORDS. TWO POINTS FOR EACH WORD.

- 15-24. A baby born with erythroblastosis fetalis may be anemic, appear jaundiced and have cardiomegaly and hepatomegaly.
- -
 -

- d.
- e.

25-30. Leukemia may result from lymphadenopathy or it may be myelogenous.

- a.
- b.
- c.

31-38. Symptoms of anemia include leukodermatosis, hypoglossalgia and dyspepsia.

- a.
- b.
- c.
- d.

FOR EACH OF THE FOLLOWING ITEMS CIRCLE THE ONE BEST ANSWER.

39. The blood producing system is the
a. hematopyeloetic system.
b. hematopyoetic system.
c. hematopoietic system.

40. Fragmentation of the blood cells is called
a. erythrocentesis.
b. erythroclasis.
c. erythroectasis.

41. A disease of the white matter in the spinal cord is
a. leukomyelopathy.
b. leukomyopathy.
c. leukomyelodystrophy.

42. Inflammation of the lymph gland is called
a. lymphangitis.
b. lymphadenitis.
c. lymphenditis.

43. Removal of an entire lung is called
a. phlebotomy.
b. pleuraectomy.
c. pneumectomy.

44. A flowing or discharge from the lung is
a. pleurorrhagia.
b. pleurorrhoea.
c. pleurorrhaphy.

45. A condition of where the lung falls or drops is called
a. pnemmonosis.
b. pneumoptosis.
c. pneumopyitis.
46. Inflammation of the valve between the stomach and the intestines is
a. gastritis.
b. pyelitis.
c. pyloritis.
47. The presence of blood in the sputum is
a. hemoptysis.
b. hemopoiesis.
c. hemophilia.
48. The presence of air and fluid in the chest cavity is
a. pulmo hydrothorax.
b. pneumohypothorax.
c. pneumohydrothorax.
49. An incision of the uterus is made through the abdomen and is called
a. gastrohysterotomy.
b. gastrohysterectomy.
c. gastrohystero-centesis.
50. The surgical formation of an opening into the esophagus is
a. esophagoscopy.
b. esophagostomy.
c. esophagostenosis

REWRITE THE FOLLOWING SENTENCES, REPLACING THE COMMON WORDS WITH MEDICAL TERMS.

- 51-53. The clinical manifestations of pernicious anemia are syncope, weakness, difficulty breathing, and white skin.
- 54-57. Blood in the saliva must be differentiated from blood that is "thrown-up" which arises from the stomach and intestinal tract instead of the lung tract.

REWRITE THE FOLLOWING SENTENCES, USING COMPLETE SENTENCES.
REPLACE COMMON TERMS WITH MEDICAL TERMS.

58-63. Infected gums with pus flowing, inflammation of tissues surrounding the tooth and decay were treated by removal of part of the gums and tooth repair.

64-69. Due to advanced lung disease, which included a cancerous tumor and inflammation of the chest lining, a removal of one lobe of the lung was necessary. After surgical care consisted of lung puncture for drainage.

PRETEST III

TRANSLATE THE FOLLOWING PARAGRAPH INTO COMMON WORDS.

Pathology and pathogenesis of hepatic cirrhosis includes hepatomegaly, fatty infiltration, and tissue necrosis. Secondary problems include renal dysfunction which is characterized by pathological changes resembling those of chronic diffuse glomerulonephritis. A macrocytic or normocytic anemia with normal or elevated mean corpuscular hemoglobin values, lymphopenia, and thrombocytopenia is also found in some cases. Occasionally, a folic acid deficiency leads to megaloblastic anemia. Hypersplenism may also play a role in producing anemia.

POSTTEST III

Name _____

MATCH THE COMMON WORD ON THE RIGHT TO THE MEDICAL TERM ON THE LEFT BY PUTTING THE APPROPRIATE LETTER IN THE BLANK PROVIDED.

- | | |
|-------------------|-----------------|
| 1. _____-lysis | a. pus |
| 2. _____chole- | b. saliva |
| 3. _____pyelo- | c. extreme |
| 4. _____cyt- | d. before |
| 5. _____ante- | e. bile |
| 6. _____-rrhea | f. decline |
| 7. _____retro- | g. bladder |
| 8. _____hypo- | h. burst forth |
| 9. _____acro- | i. large |
| 10. _____megalo- | j. backward |
| 11. _____-ectasis | k. dilation |
| 12. _____costo- | l. fall forward |
| 13. _____ptysis | m. rib |
| | n. cell |
| | o. under |
| | p. flow |
| | q. pelvis |

IN THE FOLLOWING TRUE OR FALSE QUESTIONS, CIRCLE THE "T" IF TRUE AND THE "F" IF FALSE. IF THE ITEM IS FALSE, WRITE THE CORRECT COMMON WORD(S) IN THE BLANKS PROVIDED.

14. T F Pyuria means pus + urine _____
15. T F Cholangiorrhapy means xray of bile ducts (vessels)

16. T F Hapatorrhea means liver + suture _____
17. T F Bronchogenic carcinoma means benign tumor originating in the bronchi _____

18. T F Pericardiocentesis means surgical puncture of the membrane surrounding the heart_____
19. T F Tenomyotomy means tendon + marrow + incision

20. T F Myelodysplasia means spinal cord + poor + formation _____
21. T F Erythrodontia means red tooth_____

CIRCLE THE ONE BEST ANSWER IN THE QUESTIONS BELOW.

22. Reduction of red blood cells is called
a. erythrocytolysis.
b. erythrocytosis.
c. erythrocytemia.
23. Removal of an entire lung is a
a. pleuraectomy.
b. pneumonectomy.
c. phlebectomy.
24. Inflammation of valve between the stomach and duodenum.
a. pyloritis
b. pyelitis
c. pyoitis
25. Presence of blood in the sputum is
a. hemoptosis.
b. hemopoiesis.
c. hemoptysis.
26. Surgical formation of opening into the esophagus is
a. esophagostenosis.
b. esophagoscopy.
c. esophagostomy.
27. Establishment of an opening for drainage of bile ducts into the stomach
a. hepatocholangiogastrostomy
b. hepatocholangioenterostomy
c. hepatochalgiogastrostomy
28. A biliary concentration or stone in the liver is
a. hepatolysis.
b. hepatoptosis.
c. hepatolith.

29. Repair of the pelvis of the kidney is called
a. pyelopathy.
b. pyeloplasty.
c. pyoplasty.
30. Hypertrophy of the kidney may also be called
a. nephromegaly.
b. nephromalacia.
c. nephrotrophy.
31. A term indicating presence of pus in the kidney is
a. nephropathic.
b. nephroptosis.
c. nephropyosis.

IN THE BLANKS PROVIDED, WRITE THE MEANING OF THE MEDICAL TERMS,
USING COMMON WORDS.

32. encephalopathy_____
33. photophobia_____
34. intracranial_____
35. psychosomatic_____
36. suppurative pancreatitis_____
37. cholelithectomy_____
38. choleangiohepatoma_____
39. renal pyelogram_____
40. gastrophlebitis_____

WRITE THE MEDICAL TERM FOR EACH OF THE FOLLOWING:

41. nerve inflammation_____
42. water on the brain_____
43. mind condition_____
44. air in chest cavity_____
45. stomach hernia_____

46. falling or prolapse of bladder_____
47. within the head-blood tumor_____
48. swelling in area surrounding vessels_____

IN THE SPACE PROVIDED WRITE, IN COMMON WORDS, THE MEANING OF EACH UNDERLINED WORD.

49. Agenesis of hepatic tissue or hematopoietic organs would be examples of congenital anomalies.
- 1.
 - 2.
 - 3.
 - 4.
 - 5.
50. A child born four weeks post mature by a gastrohysterotomy was noted to have transient tachypnea and cardiac arrhythmia followed by apnea and cyanosis.
- 1.
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.
 - 7.
51. After sudden onset of left hemiparesis a right carotid angiogram indicated occlusion of the carotid artery. Treatment included a thrombectomy.
- 1.
 - 2.
 - 3.
52. Psychoanopsia and neurodermatitis are psychophysiological illnesses.
- 1.
 - 2.
 - 3.
53. The chief complaint was dysphagia due to esophageal stenosis. Esophagoscopy revealed an esophagocele which was corrected by an esophagoplasty.
- 1.
 - 2.
 - 3.
 - 4.
 - 5.

54. Symptoms of hepatic cirrhosis include dyspepsia, esophageal and gastric varicosities, splenomegaly, and jaundice.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

55. REWRITE THE FOLLOWING PARAGRAPH, USING MEDICAL TERMS AND COMPLETE SENTENCES.

Symptoms of (sugar or honey running through) that may affect the occupational therapy program are retina inflammation, weakness, open sores, reduced reflexes, much urine, sugar in the urine, excessive sugar in the blood and reduced sensation.

APPENDIX C

QUESTIONNAIRES

QUESTIONNAIRE ADMINISTERED TO BOTH GROUPS PRIOR TO FINAL EXAM

Your Name is not Necessary

Please answer the following questions:

Did you do any of the following unassigned, course-related activities outside of class? Circle "YES" if you did, or "NO" if you did not.

1. I answered the questions in the programmed textbook. YES NO
2. I read medical articles in newspapers and/or magazines such as Time, Good Housekeeping, Reader's Digest, etc. YES NO
3. I watched medically related TV shows such as Marcus Welby, MASH, Emergency, Bold Ones, etc. YES NO
4. I watched special medically related TV shows such as those covering burns, mental retardation, drug addiction, childbirth, etc. YES NO

If yes, name some of the Special TV shows you watched

5. Have you made it a point to watch more medically related TV shows this semester than you did last semester? YES NO
6. The purpose of testing in general is
 - a. only so the teacher can assign a grade. YES NO
 - b. a learning experience for the student. YES NO
 - c. a learning and grading tool YES NO
 - d. other _____

THANK YOU

QUESTIONNAIRE ADMINISTERED TO EXPERIMENTAL GROUP AFTER FINAL EXAM.

Your Name is not Necessary

Answer the following questions by circling "YES" if you agree or "NO" if you disagree.

1. Did you correct your pretests? YES NO
2. Did you find the pretest helpful? YES NO
If no, why? _____

If yes, why? _____

3. Did the pretest frustrate you? YES NO
Why? _____

4. Would you recommend that similar pretests be used with future classes taking OT 1212: Introduction to Occupational Therapy? YES NO
Why? _____

APPENDIX D

RAW SCORES

RAW SCORES IN RANK ORDER

Unit Test 1

<u>Experimental Group</u>	<u>Control Group</u>
67.50	67.50
66.25	66.75
66.00	65.50
65.50	65.00
65.50	65.00
65.00	64.75
64.00	64.50
64.00	63.00
61.50	62.50
61.25	62.50
58.50	62.25
57.50	61.72
56.25	60.75
56.00	60.25
55.00	60.00
54.50	60.00
	55.50
	47.25
	40.00
N=16	N=19
$\bar{X}=61.52$	$\bar{X}=60.78$
s= 4.34	s= 6.56

$t=0.3988$ (df 33, $p<.70$) NSD

Unit Test 2

<u>Experimental Group</u>	<u>Control Group</u>
69.00	67.50
68.00	66.50
67.50	65.50
67.00	65.50
66.50	65.00
64.00	65.00
64.00	64.50
63.00	64.00
62.00	60.50
60.50	60.00
58.00	59.50
55.50	57.50
55.50	57.50
54.50	57.00
	56.00
N=14	53.00
$\bar{X}=62.50$	52.00
s= 4.82	50.00
	39.00
	N=19
	$\bar{X}=59.24$
	s= 6.98

$t=1.5870$ (df 31, $p<.20$) NSD

Test 3 (Final Exam)

<u>Experimental Group</u>	<u>Control Group</u>
86.50	84.50
85.00	84.00
84.00	84.00
84.00	82.50
82.00	81.00
82.00	80.50
81.50	79.50
80.00	79.50
79.00	78.50
77.00	77.00
76.00	77.00
74.50	77.00
72.50	75.00
71.50	74.50
	74.00
N=14	73.00
\bar{X} =79.68	63.50
s= 4.57	60.00
	57.00
	N=19
	\bar{X} =85.90
	s= 7.64

$t=1.7715$ (df 31, $p<.10$) NSD

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