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The purpose of this project was to develop an effective, efficient, standard method of training aides using programed instruction. A 2-month curriculum which had been established in the Los Angeles County Hospitals in 1962 was refined and objectives were specified in behavioral terms. Programed instruction materials were written for the knowledge aspects of the course, and tests were developed to evaluate the effectiveness of the curriculum and the materials. The November 1967 class of trainees who participated in the demonstration project were compared with trainees of 1963 who had had formal group training bu t no programed instruction and with a group trained in 1961 or before with on-the-job training only. The test results indicated that those who had had formal training attained more knowledge than those with on-the-job training only. There was no significant difference between formal group training without programed instruction and formal group training with programed instruction. However, the latter required 35 percent less instructor time. It is recommended that programed instruction be integrated into formal training programs because it conserves instructor time, provides for flexible scheduling for large or small groups, and aids in standardizing content. Appendixes include a sample test, a curriculum outline, a day-by-day program schedule, and a rating scale. (JK)

PROGRAMMED INSTRUCTION
FOR
AIDES IN PHYSICAL THERAPY

Final Report

by

Lucy V. McDaniel, Ed.D., R.P.T.

S.R.S. Grant RD-1712-M-66-C1
Attending Staff Association of the
Rancho Los Amigos Hospital

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SIGNIFICANT FINDINGS FOR THE REHABILITATION WORKER

One solution to meet the increased demand for physical therapy services is to train and use physical therapy aides. The purpose of this project was to demonstrate an effective, efficient, standard method of training aides using programmed instruction.

Using the extensive preliminary work already done by the physical therapy departments of the Los Angeles County Hospitals, a two-month curriculum was refined and programmed instruction materials were written for four major areas of the course: Bones, Joints and Muscles of the Human Body; Brain and Nerves of the Human Body; Major Systems of the Human Body (circulatory, respiratory and urinary systems); and Selected Neurological Disabilities. Tests were developed to evaluate the effectiveness of the curriculum and of the programmed materials.

Three methods of training were compared: (1) on-the-job training only, (2) formal group training without programmed instruction, and (3) formal group training with programmed instruction.

The test results support the conclusion that those who had formal group training attained more knowledge than those who had on-the-job training only. There was no significant difference in the amount of knowledge attained between formal group training without programmed instruction and formal group training with programmed instruction except that the latter required 35 per cent less total instructor time.

In the judgment of the supervisors, those aides who had formal group training with programmed instruction had more confidence in their work, could do a greater variety of tasks and were more quickly oriented to their departments than those who had on-the-job training only.

The work of this project indirectly relates to patient care. Well-trained aides help extend physical therapy services to more patients by freeing the therapist from the more routine tasks. This means that the physical therapist not only can care for more patients, but also can direct more of his energy toward those aspects of patient care that require his professional knowledge and skills.

The author recommends that programmed instruction be integrated into formal training programs for aides because it brings trainees to a standard level of knowledge, it requires less total instructor time, and since it is a self-instructional method of learning, it provides flexibility in scheduling for large and small physical therapy departments.

ACKNOWLEDGMENTS

We are grateful to all those who have contributed to this investigation with information, suggestions, and testing arrangements. In particular, we are indebted to the Physical Therapy Coordinating Committee of Los Angeles County who gave permission to program the content of their aide training curriculum and to field test the program with their trainees.

Lucy V. McDaniel, Ed.D., R.P.T.

Project Director

PREFACE

The original title of this project was "Programmed Instruction for Non-Professional Aides and Assistants in Physical Therapy." The author prefers "Programmed Instruction for Aides in Physical Therapy" because it more closely describes the content of the report.

Two reasons support this change. First, aides and assistants in physical therapy have more specific meaning to physical therapists now than they did when this project started. Assistants will have greater depth in training than will aides. Second, programs must be written for a certain depth of learning. This training program and the programmed instruction materials were written for the aide level personnel.

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ABSTRACT

One solution to meet the increased demand for physical therapy services is to train and use physical therapy aides. The purpose of this project was to demonstrate an effective, efficient, standard method of training aides using programmed instruction.

A two-month curriculum was refined and programmed instruction materials were written for the knowledge aspects of the course. Tests were developed to evaluate the effectiveness of the curriculum and the programmed materials.

Three methods of training were compared: (1) on-the-job training only, (2) formal group training without programmed instruction, and (3) formal group training with programmed instruction. All subjects were aides working in the physical therapy departments of Los Angeles County Hospitals.

The test results support the conclusion that those who had formal group training attained more knowledge than those who had on-the-job training only. There was no significant difference between formal group training without programmed instruction and formal group training with programmed instruction except that the latter required 35 per cent less instructor time.

The author recommends the integration of programmed instruction into formal training programs for aides because it requires less total instructor time, provides flexible scheduling for large or small groups and the content is standard.

PROGRAMMED INSTRUCTION FOR AIDES IN PHYSICAL THERAPY

INTRODUCTION

Background Information

The need for greater numbers of most health service personnel has been reported by many. Physical therapy plays a major role in rehabilitation and shares the critical personnel shortage with other team members. To provide a satisfactory solution to the problem and help extend the health services, many people recommend training and using non-professional personnel.

In a report submitted by the American Physical Therapy Association to a conference designed to study the utilization of supportive personnel in rehabilitation facilities throughout the nation, a ratio of one physical therapist to 10,000 population was proposed as a desirable ratio to reach. To meet this ratio, the 1965 A.P.T.A. membership will need to double by 1975. The report suggests that using well-trained supportive personnel is a method of extending the physical therapy program.[1]

To meet the increased demand for professional services which the escalation of health care has created, Jacquelin Perry, M.D., suggests maintaining all physical therapy education at the professional level and freely assigning all semiskilled tasks to an assistant group.[2]

Assistants with practical knowledge may supplement the services of professional workers.[3] Until a supportive level is established, physical therapists of necessity must continue to do tasks that do not require professional skills.[4]

Viola Robins, R.P.T., states that experience has shown that services can be extended to twice the number of patients by using well-trained aides. These aides were trained in performing clerical duties, maintaining treatment areas, preparing patients for treatment, and assisting in treatment of patients. The use of aides given the physical therapist time to evaluate more patients, plan treatment programs, and execute only that portion of the program that requires their knowledge and skills.[5]

The past three years have witnessed substantial changes concerning the use and training of supportive personnel. The House of Delegates of

the American Physical Therapy Association has issued policy statements on the training and utilization of two levels of supportive personnel, the aide and the assistant. Now that the use and training of supportive personnel is accepted, members of the physical therapy profession are seeking guidance about how to do the training.

Programmed instruction has shown promise in solving many training problems. Research findings to date support the following principles. Programmed instruction brings participants to a standard level of learning. The learning time varies from student to student but is less than for other methods of learning. In addition, it saves teacher time after the initial program has been developed.

Anticipated advantages of training physical therapy aides by means of programmed instruction are: it would require minimal teaching time to apply the instruction to the local situation; and programmed instruction would be readily available and applicable to large and small physical therapy departments throughout the country.

This project was unique in two ways. First, it was the first formal training of physical therapy aides in the United States except in the military services. Second, it was the first time that the use of programmed instruction was reported for training at the sub-professional level in the medical field.

Purpose

The purpose of this project was to demonstrate an effective, efficient, standard method of training aides and thus extend physical therapy services in rehabilitation. This was done by producing the following materials:

1. Tests on subject matter for evaluation of curriculum and programmed instruction.

2. Units of programmed instruction for suitable subject matter.

3. A two-month curriculum containing selected subject matter and suggested methods of training. This was based on extensive preliminary work already done by the Los Angeles County Physical Therapy Departments.

Review of Relevant Literature

At the time that this project was proposed, in 1964, few texts and references on the use and development of programmed instruction were available. In his 1954 article, "The Science of Learning and the Art of

Teaching," B. F. Skinner discusses reinforcement which is one of the basic elements of programmed instruction.[6] He suggests that in learning, reinforcement should be positive, immediate and frequent. In 1960, Lumsdaine and Glaser edited a book which reprinted all major reports in the field of programmed instruction and presented a comprehensive annotated bibliography.[7] This is the best source for literature prior to 1960.

Fry in his 1963 book, Teaching Machines and Programmed Instruction, for the first time concisely unified known information on the subject.[8] He reviewed the variety of teaching machines available. He set forth principles and techniques of programming, and emphasized the importance of specific behavioral objectives. Finally, he presented steps in programming; and included samples of linear and branching programs.

Robert F. Mager's book, Preparing Objectives for Programmed Instruction, clearly suggests how to write objectives which will describe the desired behavior of the learner.[9] A meaningful objective will include identification of the goal by name, description of the conditions under which the behavior will be expected to occur, and specification of the criteria of acceptable performance.

Another guide to programmed learning was published in 1963 by Lysaught and Williams.[10] They summarized the findings of research to date in the following principles: (1) it can be effective; (2) it can reduce student error; (3) it tends to bring all students to a common level of learning; (4) individual learning time may vary widely. Planning for programming included selecting a unit, appropriate objectives, and a suitable model. How to construct, edit and test the program were described.

Using the programmed format for his book, Programmed Instruction: A Manual of Programming Techniques, Dale M. Brethower covers the concept of behavioral control, reinforcement, and specific programming techniques.[11] In his discussion of error rate, he states that a low error rate and evenly distributed errors are desirable. Uneven distribution of errors indicates that parts of the program are not learned well; the program then needs to be revised. An error rate of about 10 per cent is recommended because this appears to be the level at which an even distribution of errors is achieved.

In addition, two other texts that examine techniques of frame construction and examples of prompting are Good Frames and Bad by Susan M. Markle[12] and A Programed Primer on Programming by Susan M. Markle, Lewis D. Eigen and P. Kenneth Komoki.[13]

Bloom's Taxonomy of Educational Objectives is a basic guide both for curriculum building and for programmed instruction.[14] He presents a

comprehensive classification of objectives. Examples are included of questions which will test different kinds of objectives. Objectives and test items are essential to curriculum revision and the construction and evaluation of programmed instruction.

There is little doubt that programming is an educational method to be taken seriously. In 1964, Schramm summarized thirty-six reports comparing programs with conventional classroom instruction at all levels from primary school to college and adult education.[15] The general summary is that seventeen showed superiority for programmed over conventional instruction, eighteen showed no significant difference, and only one showed a final superiority for the conventional classroom method.

By 1962, publication of programmed instruction applied to the medical field began to appear in professional journals. Seedor reported the development and use of units on Asepsis for Nursing Students.[16] Green used the method with medical students on the subject of Medical Parasitology.[17] A course on Medical Terminology for Medical Secretaries is described in the January 1964 issue of National Society for Programmed Instruction Journal.[18]

Since this project started, many texts have been written on programmed instruction. Most of these have to do with methods used in developing a program.

Taber, Glaser and Schaefer in their 1965 book, Learning and Programmed Instruction, emphasized the need for analyzing subject matter behavior prior to program construction.[19] The authors suggest a general framework for program development. It includes the following steps: identifying what the student is to be able to do when he has finished the program, identifying the entering knowledge of the student, constructing tests to measure attainment of goals, specifying content subtopics and subject matter relationships, arranging subtopics in a logical sequence for learning, and writing criterion frames. The authors also explain frame construction, prompting techniques and frame sequences, and they give guidelines for program editing and processing.

The Center for Programmed Learning for Business at the University of Michigan has published several papers and texts on learning how to program and managing the programmed learning effort. Programmed Learning: A Practicum is a programmed text which presents the complete programming process, from subject matter analysis through field testing and program revision.[20] A type of workbook, it teaches how to write frames by presenting examples and requiring practice. This method of developing a program includes defining behavioral objectives, then writing criterion frames. Next, a minimum number of "teaching frames"

are written to each criterion frame. This technique is explained by David Markle in a paper entitled "Lean Programming."[21] The major point is to include minimum teaching material in the early drafts and let the students' responses in tryouts guide the programmer in revisions for the final draft.

Managing the Instructional Programming Effort by Rummler, Yaney and Schrader concentrates on the management and administrative aspects of programmed learning from initial presentation through implementation and follow-up.[22] Included in the book is a sample of suggestions to supervisors to insure proper administration of the program such as: (1) assuring the trainee that the program is not a test; (2) providing an area away from the work area to take the program; (3) allowing the trainee sufficient time; (4) limiting sessions to two hours; (5) spacing sessions no more than forty-eight hours apart.

Programed Instruction, the Sixty-Sixth Yearbook of the National Society for the Study of Education, gives special stress to the developmental process of programmed instruction and to the practical application of the principles of programming.[23] The first three steps in the development of instructional programs are: (1) specification of the behavioral objectives, (2) analysis of the subject matter in terms of its component discriminations, generalizations, and chains, and (3) sequencing these components for effective learning.

In a chapter on empirical testing of programs, Susan M. Markle suggests three distinct phases of program testing. They are: (1) the developmental testing phase when crude drafts are given to students followed by revisions and more trials; (2) the validation testing phase or the demonstration phase when tests are used to describe how well the program teaches; and (3) the field testing phase or utilization phase designed to find how well the program works under the control of the intended user.

The proceedings of the first and second Rochester Conference on Programmed Instruction in Medical Education were published in 1965 and 1967 respectively.[24, 25] The change in the titles of the texts, from Programmed Instruction in Medical Education to Self-Instruction in Medical Education, indicated a broadening of the application of the programming process to many instructional forms such as films, tapes, simulators and computers.

These books contain mainly reports of the use of programmed instruction. However, one paper by Robert F. Mager, entitled "Criteria for Evaluation," reviews measures currently used in evaluating program effectiveness. To measure behavioral change, he recommends the use of both pre- and post-tests followed by calculation of a gain score or a modified gain score to assess the objectives of instruction. Error rate,

response latency, analysis of criterion frames, and learner comments can all serve to indicate where there are weaknesses in the programs. Mager stresses two points: (1) one should test programs with students rather than colleagues, and (2) one should measure effectiveness in tearms of behavioral outcomes rather than in terms of instructional processes.

Programmed Instruction and the Hospital, published in 1967, was based on the Conference on the Application of Programmed Instruction to the Hospital Field.[26] The hospital field recognizes the need to use modern technology in facing up to the challenges of mass education. The book examines the educational problems the hospital faces, provides current information on the effectiveness of programmed instruction, examines what already has been done in the health field, and where programmed instruction might best be used. In Jerome P. Lysaught's opinion, the basic contributions of programmed instruction are: (1) it is a systematic process of teaching, based on learning theory; (2) it provides an explicit set of arrangements for the transmission of information and the development of skills; and (3) it provides for measurement, evaluation and improvement of the materials.

TEST DEVELOPMENT

The development of tests was a necessary preparatory step to evaluate the effectiveness of the project. Procedures for writing reliable and valid achievement tests are well established. Useful as a guide for developing tests for this project was Adams' book Measurement and Evaluation in Education, Psychology and Guidance.[27] Her explanations of reliability and validity are clear. Methods of calculating coefficients are included with well-selected examples. Her chapter on teacher-made tests describes how to write test items, do an item analysis, revise items and then prepare the test and use it.

Helmstadter's book was particularly valuable for his thorough coverage of reliability and validity.[28]

Wood gave details about how to write tests.[29]

One purpose of the tests was to evaluate programmed instruction by determining the level of knowledge of groups of trainees prior to and after taking programs. For this purpose, moderate reliability would be satisfactory. This could be achieved in relatively short tests.[30] Another purpose was to evaluate the training program by determining the level of knowledge of groups of aides who had the training course and those who

did not have it.

Because no tests were available, item development, test construction, test reliability and validity checks were undertaken.

Item Development

A four option multiple-choice question was chosen as the type of item to be used. It could be stated either as a question with a choice of four possible answers, or as a statement with a choice of four possible endings. Advantages of this type of question are that they are objective, they are reliable, they are easy to score, and they are liked by those taking the test.

The first draft of items was written by instructors in the Physical Therapy Aide Training Course. Each instructor wrote questions which sampled the subject matter of each class he taught. These were questions judged by the instructors to cover information that aides needed to know in order to understand aides' job responsibilities and tasks assigned to them.

Next, the questions were edited. Statements or questions were simplified or clarified as necessary. Options were examined to see that they were as short as possible, were plausible, had no clues to the correct answer, and that one was correct and three were incorrect.

Approximately fifty aides in the Los Angeles County Hospitals' physical therapy departments were tested with these questions. This group being active as physical therapy aides, fulfilled two purposes. First, they provided information for judging the quality of each item, that is, where flaws existed. Second, they provided a cross check that the item content was need-to-know information. If only a few of the aides answered the item correctly, it would be questionable that the information was necessary for an aide to know to carry out his job. If at least 50 per cent answered it correctly, it probably was a need-to-know item.

Approximately fifty questions were given at one time and ten weekly meetings were scheduled to complete this trial of all the test items.

Each item was analyzed for acceptance into the item pool. The following criteria were used. The difficulty must be between 50 and 100 per cent. That is, 50 to 100 per cent of the aides must have answered it correctly. The item must be discriminating. That is, those whose total score was in the upper third almost always answered it correctly and those whose total score was in the lower third almost always missed it. Finally, all options must attract some choices. Items meeting these criteria were accepted after a final edit for simplicity and clarity of style.

Other items were examined further for revision or elimination. A low difficulty and discrimination rating could be caused by cumbersome or ambiguous words and phrases. However, these items might cover information that aides need to know. These questions were revised and rewritten or, on rare occasions, eliminated. Options receiving no choices were rewritten except in those relatively few questions that were easy yet judged important and well written.

All items which had been changed were given to a group of physical therapy aide trainees as a final examination to their course. Items were again analyzed and revised as needed. Some required up to four trials to meet the criteria established. Aide trainees or aides who did not have the test items for at least one year served as the trial groups.

This process produced a pool of 550 items. The subject matter of these items covered a sampling of all topics in the physical therapy aide training course. Each item had difficulty and discrimination ratings in terms of physical therapy aides.

Test Construction

Compiling tests for various purposes was made simple by using the item pool. Our first need was to have two alternate test forms for each of four programs. These were used as pretests and posttests to validate the programs. Eight tests were compiled.

To compile two alternate forms of a test for a program, all items on the subject were selected from the item pool. In order to have tests of equal length, an even number of items were needed. Therefore, the number of items was randomly reduced to twice the size of the desired test length. Next, items were arranged in order of difficulty, then sorted into two stacks so that the two stacks would be nearly equal in difficulty.

If one test had more items on one topic than the other test, items were exchanged. These were items of equal difficulty, preferably in the mid-range of difficulty. Thus, an item from an area of excess coverage in one test was traded for an item of equal difficulty from an area of excess coverage in the other test. Sometimes one of the randomly omitted items could be exchanged for a needed one.

When the content coverage was equalized, tests were checked to determine if they were equally difficult. A mean score for each test was calculated by summing the difficulty of the items and dividing by the number of items. In all cases, the two means thus determined were within a few percentage points of each other.

Items were arranged according to topic with items on similar points

being put together. They were arranged on the page for ease in reading. Directions to the trainees about how to answer the items were written and placed just before the first question on each test. An example of a test is reproduced in Appendix A.

A person's score was the percentage of items he answered correctly. No correction was made for guessing.

Using this method, eight tests were constructed, two for each program.

The program, Bones, Joints and Muscles of the Human Body, covers anatomical terminology. Brain and Nerves of the Human Body presents gross neurological structures and functions. Major Systems of the Human Body includes the structure and functions of the circulatory, respiratory and urinary systems. Selected Neurological Disabilities briefly considers neurological conditions commonly treated in physical therapy departments.

The title and number of items in each test is given below:

Program	Numbers of Items Per Test
Bones, Joints and Muscles	20
Brain and Nerves	15
Selected Neurological Disabilities	16
Major Systems	30

Reliability and Validity

A final reliability and validity check was done in 1968. Four tests (A) were given to all Los Angeles County Hospitals' physical therapy aides in May and the four alternate tests (B) were given in July. Sixty aides took both forms of the test.

The results are shown on Table 1. The means and standard deviations of the two forms of each test are very consistent.

The Kuder-Richardson Formula 21 (r_{KR21}) was chosen as the reliability coefficient to check the internal consistency of each test.[31] These coefficients are shown in the fourth column of Table 1. All were well above the .50 minimum vlaue recommended for checking group level of knowledge.[32]

Validity of the tests was established in three ways. First, face validity was built in by having instructors write questions which they judged aides should be able to answer in order to do their job. Second,

content validity was created by selecting items for each test that sample all areas of the subject matter. Finally, a validity coefficient was estimated by taking the square root of the reliability coefficient.[33] This is shown in the last column of Table 1. These values indicate high validity.

These results confirm adequate reliability and validity for the purposes of this project. The tests can be relied on to reflect group level of knowledge of those who have had programmed instruction and those who have not; those who have had the training course and those who have not.

TABLE 1

TEST EVALUATION

Test		No.	Mean	S.D.	Reliability r_{KR21}	Validity Estimate $\sqrt{r}$
Bones, Joints and Muscles	A	60	76%	19%	.77	.88
	B	60	77%	19%	.80	.89
Brain and Nerves	A	59	70%	21%	.72	.85
	B	59	71%	20%	.70	.84
Selected Neurological Disabilities	A	60	68%	19%	.67	.82
	B	60	73%	20%	.72	.85
Major Systems	A	59	65%	16%	.74	.86
	B	59	66%	16%	.72	.85

Group: Physical Therapy Aides in Eight Los Angeles County Hospitals

A - Test Given May 1968
B - Test Given July 1968

PROGRAM DEVELOPMENT

The process of program development followed these steps: (1) refining the curriculum and writing objectives; (2) outlining the subject matter; (3) writing frames; (4) trying out the program numerous times with students; (5) revising the program as indicated by the tryouts; (6) validating the program with field testing; and (7) publishing the program.

Refining the Curriculum and Writing Objectives

The first formal group training of physical therapy aide trainees in the Los Angeles County Hospitals was established in 1962. Therefore, at the start of this project in 1964, the curriculum of physical therapy aide trainees already had been approximated. The remaining tasks were to refine the curriculum and to specify objectives in behavioral terms, that is, in terms of what the trainees were expected to do.

Tests were used as one method of refining the curriculum. Physical therapists used their expert, empirical judgment in determining what information physical therapy aides need to know. A part of the project included verifying this judgment by testing the knowledge of experienced aides. We used the premise that the material retained by the aides was likely that which they used in their work and therefore would be that which the trainees needed to learn. If only a few of the aides answered an item correctly, it would be questionable that the information was essential in order for an aide to know how to carry out his job.

With this information, objectives were written. Consideration was given to how well the subject matter needed to be learned. For example, the trainees might need to be able to recall certain information or be able to apply concepts to various situations without any clues. For other information, it might suffice that the trainees be able only to recognize the correct answer among distracting answers.

Also written into the objectives were the conditions under which the final behavior was expected to occur.

Outlining the Subject Matter

Course outlines already existed from the original establishment of the training course. However, for programmed instruction the subject matter needed to be defined in greater detail.

To obtain this amount of detail, the programmers became thoroughly acquainted with the material by searching the literature and by questioning experienced medical personnel.

Next, every teaching point needed to be defined with regard to what an aide needs to know and how well he needs to know it. This included choosing words at the appropriate vocabulary level. Stated objectives, test analysis and expert judgment were the guides used in determing these factors.

Then the material needed to be organized into logical sequences for learning. The outlines were given to the members of the Physical Therapy Coordinating Committee of Los Angeles County for their reviewing, editing, revising and ultimate approval.

Writing Frames

In selecting a programming format, the subject matter, the learners and the objectives were considered. For our programs the linear format was chosen. A linear program presents a sequential development of the subject matter through which each trainee proceeds in exactly the same order as the next trainee regardless of his response. Learning medical terminology requires repetitive, overt responses best given with the linear format. The trainees have similar education and experience backgrounds so the order of proceeding through the program can be the same for each trainee.

The detailed, sequential outlines served as the source in writing the program frames. "Criterion frames," which test the trainees' knowledge, were written first. Essentially, criterion frames are statements of each of the objectives in question form. Then, to each criterion frame or teaching point was written a series of increasingly difficult "teaching frames." These are frames which impart information to the trainee to enable him to answer the criterion frame correctly. While the teaching frames are not test frames, they do contain some form of question in order to elicit an appropriate, relevant, overt response from the trainee. The correct response is provided on the back of each frame, or the top of the next frame.

Physical therapists edited the frames before the program was presented to the students.

Because of the concentration required in reading a program, fatigue of the learner was considered when writing the programmed units. Each unit was planned to require approximately one hour of reading time. We believed that the trainees could be scheduled for one to two hours of programming without becoming tired.

Trying and Revising

Early tryouts of the program with students and subsequent revisions

are two of the most distinguishing features of programmed instruction. The program and the programmer who devises it bear the major responsibility for the student's success. If the student makes wrong responses or fails to master the material, the fault is with the program, not the student.

Before the program was completed, parts of the program were tried out with students. Trying out the program is important because it focuses attention on the individual learning process and it insures that a program will work.

Because great numbers of students were needed for the programming trials and because there were limited numbers of physical therapy aide trainees, individuals with backgrounds similar to those of physical therapy aides were used. For these individual trials we used physical therapy aide trainees of Los Angeles County Hospitals who were hired between the times that the formal training course was offered, and nursing aide trainees from Rancho Los Amigos Hospital.

First, individuals were used one at a time. The trainee's written responses to the frames as well as his comments served as guides in revising the frames. Revisions most often included rewording where there was ambiguity, writing additional teaching frames or changing the sequence of the frames. Care was taken not to make the criterion frames easier. Also used as guides in the frame revisions were computed error rates of all responses and of criterion responses in particular. An error rate between 5 and 10 per cent was the goal, although any error on a criterion frame was scrutinized.

Tryouts and revisions of sequences of the program or the whole program were done with as many individuals as was necessary to attain the desired goal. The usual number of individual trials was from four to six.

Next, the revised frames were duplicated and given to a group of eight to twelve trainees. Our guides and goals were the same for this trial as they were for the individual trails. Individual trials help the programmer by pointing out gross errors or misinterpretations in the program. Small group trials point out finer errors and give a broader interpretation of the program's effectiveness with many students among whom there are varying amounts of ability. Usually two small group trials were used with revisions made after each group. At this point the amount of time required to read each unit is approximated, using as an estimate the time required by 80 per cent of the students of the small group trials. The students for these group trials were physical therapy aide trainees from the Los Angeles County Hospitals, nursing aides from Rancho Los Amigos Hospital, and nursing aides from Lynwood Convalescent Hospital and Marlinda Nursing Home in Lynwood, California.

Validating the Program with Field Testing

The teaching effectiveness of the program is assessed in the last tryout of the program, the phase called field testing. The program, revised from the small group trials, was duplicated and field tested with one to two hundred students. For this number of students we used physical therapy aide trainees from the Los Angeles County Hospitals, Dallas County Hospital in Texas and Highland View Hospital in Cleveland, Ohio; physical therapy corpsmen trainees from Brooke Army Hospital, Fort Sam Houston, San Antonio, Texas; nursing aide trainees from the Los Angeles County Hospitals; occupational therapy aides from Rancho Los Amigos Hospital; and vocational nursing students from these southern California schools; Banning High School Adult Evening School, Cerritos College, East Los Angeles College, Long Beach City College, Los Angeles Harbor College, Los Angeles Trade-Technical College and Riverside City College.

The target group, the physical therapy aide trainees in the Los Angeles County Hospitals for whom we were programming, was compared with the overall field test group on the factors of age and number of years of formal schooling. The findings are shown below:

	Age (Mean)	Years of Schooling (Mean)
Target Group	27	12.0
Overall Group	26	11.5

At this point, validated, equivalent tests, developed independently of the program, were administered, one before and one after reading the program. The tests were used to determine the program's teaching effectiveness. The gain in knowledge that the trainees derived from the program is reported as the gain score which is the difference between the scores of the pretest and posttest. Individual error rates are also computed by dividing the number of incorrect responses that each trainee makes in the program by the total possible number of responses. The mean of the individual error rates is reported as the error rate of the program.

Traditionally, a score of seventy is the lowest passing grade on a test. Trainees scoring 70 per cent or higher on the pretest were not included in the validation statistics because these students were judged as already knowing the subject.

During the period of the grant, four programs were validated. Table 2 gives the number of trainees used in field testing, the mean pretest score, the mean posttest score, the gain score, and the mean error rate of each program.

TABLE 2

FIELD TEST RESULTS

Program	N	Pretest Score (Mean)	Posttest Score (Mean)	Gain Score (Mean)	Error Rate (Mean)
Bones, Joints and Muscles	136	40	73	33	5.0%
Brain and Nerves	102	54	75	21	5.5%
Major Systems	165	52	73	21	4.0%
Selected Neurological Disabilities	125	58	72	14	4.0%

The criteria selected for program validation were a gain score of at least twenty and an error rate of less than 10 per cent. All programs but one, Selected Neurological Disabilities, met these criteria. Because the gain score of this program fell short of our standard, our plans are to revise the program and field test it again in 1969 with Orthopedic and Medical Disabilities.

Publishing the Program

The program is printed in book form and also made into a filmstrip (Tutorfilm) for use with AutoTutor teaching machines. Ten Mark II AutoTutor teaching machines were purchased with grant funds.

A plate booklet or a set of plates are published for each program. The plates contain drawings and charts which the student refers to and completes as he reads the program. Some programs have summary sheets which are written in a fill-in-the-blank format. The student also completes the summary sheets as he reads the program. At the end of the program, the student may keep the plates and summary sheets which serve as reference information.

Table 3 gives a brief description of each program, the number of one-hour units that comprise each program and the production status.

TABLE 3

PRODUCTION STATUS

Program	Number of One-Hour Units	Production Dates
Bones, Joints and Muscles of the Human Body A 738-frame survey of the anatomy of the musculo-skeletal system.	8	Book form in 1965.* Second printing in 1967.* AutoTutor filmstrip in 1966.*
Brain and Nerves of the Human Body A 280-frame program of the anatomy and physiology of the nervous system.	4	Book form in October 1968. AutoTutor filmstrip in December 1968.
Major Systems of the Human Body A 648-frame survey of the circulatory, respiratory and urinary systems.	9	Book form in January 1969. AutoTutur filmstrip in March 1969.
Selected Disabilities A description of 18 neurological, orthopedic, and medical conditions commonly treated in physical therapy departments.	20	Book and AutoTutor filmstrip in Fall 1969.

Programmed Instructional Materials for Physical Therapy Aides, 1967

* Published by the Attending Staff Association of Rancho Los Amigos Hospital, Inc., 12826 Hawthorn Street, Downey, California 90242

DEMONSTRATION MODEL

The demonstration model is a two-month course designed for the training of physical therapy aides. It includes lectures, programmed instruction, demonstrations and practice, and on-the-job training. The Los Angeles County Physical Therapy Coordinating Committee developed the aide training course by a job analysis of the physical therapy aide's responsibilities in order to identify the skills required of him. The information he needed to know and understand in order to carry out his job was specified. Units of instruction were described and time requirements estimated. Instructors were assigned topics for which they developed lesson plans.

The first course was held in 1962. It has been given for six years. Revisions were made according to the suggestions for improvement made by instructors and trainees. As units of programmed instruction were written, they were placed on the schedule. The departments have been well satisfied with the effectiveness of the course.

The Los Angeles County Physical Therapy Coordinating Committee has permitted the author to reprint the latest revision. It is included as Appendix B, as the demonstration model.

Description of Model

The objectives of the training course are on the first page of the course description. They are stated in terms of the knowledge, understanding, skills and attitudes expected of the trainees on completion of the course.

The subject units listed on the second page with their time allotments summarize content and emphasis. On the following pages are unit descriptions which include objectives, the teaching methods used to reach these objectives, and the value of each unit. Time allotments for subtopics are also shown. The final pages show total time scheduled over a period of two months.

Integration of Programmed Instruction

Certain characteristics of programmed instruction must be considered when integrating it into the training schedule.

Programmed instruction requires concentration and application by the trainee and thus is fatiguing. The time required to read a program varies greatly from one person to another with the slowest reader often taking more than twice as much time as the fastest one.

Procedures in the process of change are not practical for programming. They may change before the program is completed. Therefore, specific current practices are not included in the programs.

Because of these characteristics, several rules for scheduling programmed instruction into the curriculum were established. These rules are enumerated below.

To prevent mental fatigue:

1. Schedule only one one-hour unit at a time.

2. Alternate programmed instruction with an activity class or on-the-job practice.

3. Schedule only two to three hours of programmed instruction per day.

To accommodate for varied learning rates:

1. Schedule the amount of time that 75 to 80 per cent of the trainees will need in order to read a unit of programmed instruction.

2. Schedule make-up time for the 20 to 25 per cent who need extra time to finish the program.

To present current and institutional applications:

1. Include review-application sessions of about one-half to one hour for each three or four hours of programmed instruction.

The Instructor's Role

The success of a program depends on its wise use by the instructor. It is a tool that can improve the effectiveness of trainee learning. A trainee may not be interested in the subject unless the instructor points out its importance to the trainee's job. Charts, models, pamphlets and illustrations displayed in the classroom help arouse interest. In other ingenious ways the good teacher can develop interest.

The program does assure the instructor that the trainee will have specified basic information. He can then plan his efforts toward applying this information to concrete, specific situations. He can supplement that information with the latest findings about the subject. It is important to know how acquired principles and skills apply and relate to the local work

situation.

Used in this integrated manner, programs can be effective. A program may fail if the instructor thinks it will take his place and do the job for him.

The author recommends that the trainee be required to write all his responses when reading a program. In spite of the fact that writing responses takes more time than simply thinking the responses without writing, studies indicate that the information is retained better over a long period of time if the responses are written.[34, 35, 36]

When the programs were tried out during their development, trainees requested reference information. The programmed texts are relatively poor references because of their presentation formats. Summaries, plates and plate booklets, collected and organized into notebooks, can serve as reference information.

There are two other possibilities for implementing a course similar to this model. First, use of the programs could be spread over a longer period of time, using more on-the-job practice. Second, if the situation permits, the programs can be used as homework. In this way each trainee could take as much time as he needed. This would solve the problem of coping with individual reading time differences.

EVALUATION OF AIDE TRAINING PROGRAM

During the grant period (May 1965 - May 1968) test items and tests were developed and validated. Programmed instruction was developed, field tested and integrated into the physical therapy aide program. By November 1967, nearly 50 per cent of the classroom time of the curriculum was programmed. To evaluate the effectiveness of this demonstration project, the November 1967 class of trainees was used as the demonstration model. It was compared with those who had formal group training without programmed instruction and those who had on-the-job training only.

Trainees of 1963 were chosen as one of the groups with which to compare the demonstration model. Although group training for all aides in Los Angeles County Hospitals' physical therapy departments started in 1962, some duplication of instruction occurred. This was eliminated by 1963. This group well represents formal group training with no programmed instruction.

Those aides trained in 1961 or before had on-the-job training only. These aides formed the third comparison group.

A total of sixty-three aides from all Los Angeles County Hospitals' physical therapy departments formed these three groups. The groups allowed comparison of three training approaches: on-the-job training, formal group training with no programmed instruction and formal group training with programmed instruction.

Several sources of information were available to compare the three training approaches and thus evaluate the demonstration model. Directors of physical therapy departments from seven hospitals provided such records as job analyses and training schedules, personnel changes and evaluations. With these records comparisons could be made between training programs and the aides so trained. Knowledge tests would show aides' retention of instruction received with each training method.

Of the physical therapists who supervised aides in and before 1961, sixteen remained. They served as judges of the abilities of aides who had training prior to 1962 and those who had training in 1967.

First, curriculum practices were documented for the comparative groups. Instructor time then was calculated. Trainees were evaluated by tests and ratings. Relative supervisory time was judged as no documents of exact supervisory time were available.

The Curriculum

Standardization of curriculum according to content, time and teaching methods was a goal of the project. Training schedules gave some information. Schedules and lesson plans for 1963 and 1967 documented these two years. When such schedules were not available, directors of physical therapy departments provided additional information.

To obtain information about training of aides in 1961 and before, directors of physical therapy departments in seven county hospitals were sent questionnaires. The following information was requested about their training of aides prior to 1962.

1. A list of topics taught or a copy of training schedule.

2. The time spent per topic and the frequency of training sessions.

3. The method of training used.

Roughly four methods of instruction were identified in the three com-

parison groups. With the first method (A) the aide was taught individually by the instructor who explained and demonstrated what to do for a particular patient. This was called on-the-job practice. A second method (B) was used with a group of two or more trainees. A skill was explained, demonstrated, then trainees practiced the skill with a partner. A third method (C) was the lecture, usable for groups when teaching background knowledge. The final method (D) was programmed instruction in the form of texts presenting selected background knowledge which could be read by the trainee individually or in a classroom. Enrichment and application discussions followed this method. One or all of these methods were used in training aides.

A comparison of content, time allotments, and instructional methods are shown on Table 4. This table shows major changes that occurred in the curriculum from 1961 to 1967. In 1961, small departments taught skills. This was done individually, on-the-job and usually as needed. One aide learned one job, another learned a second. The large departments were able to teach two or three aides at a time. So to some extent, large departments used the lecture to present background information of the tasks that the aides learned. They also provided the aides with practice of skills needed, most of it specific to a particular job. Great variety prevailed.

A big change occurred by 1963 with the use of formal group training, the reduction of variety in content, time, and method. The content of the training program had been established by department directors specifying subjects to be taught. Time to be spent on each was specified. Time spent on background knowledge subjects increased. All aides learned all the skills that any would need to know. Lecture, demonstration and practice in groups could be used to their greatest advantage. Lesson plans documented content, teaching aides, equipment needed, references, and work groups.

The change that occurred between 1963 and 1967 was the addition of a method which further standardized content. Programmed instruction replaced many hours of lectures. All students learn the same information from a program to approximately the same level of recall. However, the amount of time allotted to the various subjects during this period for the most part remained unchanged.

The goal of standardization was achieved.

TABLE 4

STANDARDIZATION

TIME, CONTENT, METHOD

	1961		1963	1967
	Small Dept.	Large Dept.	Small and Large Depts.	Small and Large Depts.
Content and Time				
1. The Human Body		14 hrs.	36 hrs	30 hrs.
2. Selected Disabilities		?	10 hrs.	17 hrs.
3. Patient Management	?	9+ ? hrs.	14 hrs.	12 hrs.
4. Selected Procedures	?	25+ ? hrs.	31 hrs.	32 hrs.
5. Hospital Role	?	11+ ? hrs.	6 hrs.	10 hrs.
TOTAL	?	59+ ? hrs.	97 hrs.	101 hrs.
Instructional Methods	A	A, B, some C	A, B, C	A, B, C, D
Documents	List of topics taught as needed	Scheduled topics	Schedules, Lesson Plans	Schedules, Lesson Plans and Programs

? Subjects listed, but time allotted not known.

Instructional Methods:

A. On-the job practice
B. Explain, demonstrate and practice skill
C. Lecture
D. Programmed Instruction

Instructor Time

An anticipated value of formal group training and of programmed instruction was the reduction of total hours spent by various instructors in preparing for and conducting classes. Group training would save this instructor time by eliminating repetition of training from trainee to trainee and from department to department. Once a program was written, it would reduce the time required to prepare for that subject.

A survey questionnaire to the directors of the seven physical therapy departments revealed that records of teaching time for 1961 did not exist in some cases and were incomplete in other cases. No accurate estimate could be made of instructor time. Some small hospitals spent relatively little time with new aides. Large hospitals trained several aides at once with time specified, but much instruction time not recorded.

It is accurate to say that changing from on-the-job training to group training reduced total instruction time. With on-the-job training, instruction was given one to four times a year to individual aides in seven departments. With group training, instruction was given once or twice a year to a group of aides. The amount of time cannot be calculated because records were incomplete.

However, time spent in group training with and without programmed instruction is recorded accurately on the training schedules of the Aide Training Program.

Total instructor time was calculated to include preparation time as well as classroom time. Classroom time was tabulated from the training schedules of 1963 and 1967. This included lectures given, demonstrations, and supervision of trainee practice. Preparation time for lectures and demonstrations was determined by multiplying classroom time by three. When programmed instruction was given, someone was available to answer questions, so actual time was recorded. No preparation time was given for programmed instruction or review, assuming that review preparation might be done while monitoring the programmed material.

Instructor time obtained from training schedules is shown on Table 5. The amount of time saved between 1961 and 1963 is not known. Total instructor time was reduced about 35 per cent from 1963 to 1967, a sizable saving.

TABLE 5

INSTRUCTOR TIME
(In Hours)

Year	Lecture, Demonstration & Practice	Preparation	Programmed Instruction	Review of Programmed Instruction	Total
1961	?	?	0	0	?
1963	97	291	0	0	388
1967	52	156	39	10	257

Trainee Knowledge

Effectiveness of training can be judged best by the performance of trainees. Written tests give objective evidence of knowledge and understanding attained.

Therefore, all aides in Los Angeles County Hospitals' physical therapy departments were given a knowledge test in May 1968. Nearly complete participation was achieved as seventy of seventy-two aides were tested.

Three comparative training groups were identified. Twenty aides formed a group that had on-the-job training only, and had been employed more than one year. Most were employed in 1961 and earlier. The second group, who had the formal group training without any programmed instruction, had eight members (1962-63). The third group of eleven (1967) had four programmed courses: Bones, Joints and Muscles of the Human Body; Brain and Nerves of the Human Body; Selected Neurological Disabilities; and Major Systems of the Human Body. Test results from these groups were compared with other data collected to evaluate the three different training approaches.

In addition, test results of two other groups that had varying amounts of programmed instruction provided more detailed information about the effectiveness of this training method. One of these groups with ten members had one programmed course, Bones, Joints and Muscles of the Human Body. Another group, with fourteen members, had three programs, Bones, Joints and Muscles of the Human Body, Brain and Nerves of the Human Body and Selected Neurological Disabilities.

Seven aides did not qualify for any of these groups and were omitted from the study. Four had varying amounts of programmed instruction in early individual program trial stages. Two had not had the course and had been employed less than six months. One did not complete the course because of illness. This left a total of sixty-three aides assigned to five groups whose test results were analyzed.

A test of eighty-one multiple-choice questions was given to the sixth-three aides in May 1968. The posttests of the four programs mentioned above comprised the test, making an analysis of each knowledge area possible.

Results

The mean score and standard deviation for each group is shown on Table 6. Analysis of variance showed no difference between the five means. However, a t-ratio between on-the-job training and formal group training (A & B) was significant. Also, a t-ratio showed that the difference between on-the-job training and formal group training with programmed instruction (A & E) was highly significant.

These figures support the conclusion that those who had formal group training attained more knowledge than those who had on-the-job training. There is no significant difference between those not having programmed instruction and those having varying amounts of programmed instruction.

TABLE 6

RESULTS OF TESTS OF LOS ANGELES COUNTY PHYSICAL THERAPY AIDES

May 1968

Groups	N	Mean	Standard Deviation
A. On-the-job Training	20	66	12.5
B. Formal Group Training Without Programmed Instruction (1962-63)	8	72	14.8
C. Formal Group Training With One Program (1964-65)	10	70	9.2
D. Formal Group Training With Three Programs (1966)	14	70	10.3
E. Formal Group Training With Four Programs (1967)	11	75	14.0
TOTAL	63	70	

F = 1.04 not significant

t between A and E = 3.32 - significant at less than the 1% level

t between A and B - 2.06 - significant at the 5% level

t between other means not significant

Trainee Performance

The performance of trainees can be rated by those supervising their work. This can supplement other methods of evaluating training effectiveness. The year 1961 again represented individual (on-the-job) training and 1967 the demonstration model training.

Within the departments in the Los Angeles County, sixteen supervising therapists and directors of physical therapy departments remained who had experience with aides in both groups. Five were from small departments, eleven from large departments. They were used as judges of the difference between the two groups of aides.

Items to be rated were developed from comments made during oral critiques of the training course. Items were stated as positive qualities. Some concerned trainee attitudes, some described job capabilities and others reflected supervisory time requirements.

Supervisors rated each item using a simple, five-point scale comparing trainees of 1961 to those of 1967.

Items and grades are shown on a sample rating scale in Appendix C.

As differences in small departments well might be different than those in the large departments, their ratings and the total ratings were each analyzed.

Because some of the judges helped to plan and carry out the first group training program, and because judgments are subjective, the following criteria for significance were established:

1. Fifty per cent of the grades must be extreme grades (grades one or five).

2. Eighty per cent of the grades must be in the same direction (1961, grades four and five; or 1967, grades one and two).

3. The balance of the grades must be "no difference" (grade three).

If an item met the above criteria for the total ratings, it was analyzed by chi square to determine the statistical significance of the difference in the number of supervisors choosing each of the three grades. Less than 5 per cent was the required level of significance.

Attitudinal items are shown in Table 7 which indicate whether or not ratings by group met the criteria. All items rated 1967 trainees better than

1961 trainees. Only item three, "Confidence in Carrying Out His Duties," met the criteria in all three groups. However, the raters from small departments agreed that their aides who had the course were more willing to accept responsibilities than those who did not.

TABLE 7

ATTITUDINAL ITEMS
(1967 Trainees Rated Better Than 1961 Trainees)

Item	Small Dept. Ratings	Large Dept. Ratings	Total Ratings
1. Willingness to Work With Patients	No	No	No
2. Willingness to Assist the Physical Therapist	No	No	No
3. Confidence in Carrying Out Duties	Yes	Yes	Yes*
4. Willingness to Carry Out Duties	No	No	No
5. Willingness to Accept Responsibilities	Yes	No	No

No = Item did not have necessary percentage of ratings to meet criteria.
Yes = Item did have necessary percentage of ratings to meet criteria.
* Chi square significance - <1%

Job performance items, and whether or not ratings by groups met the criteria is shown in the Table 8. Again ratings favored 1967 trainees over 1961 trainees. Item two, "Variety of Skills Well Done," met all criteria with all groups. Item three, "Variety of Patients With Whom Aide Can Work," met all the criteria in the ratings of small departments and total ratings, but the differences were not statistically significant.

Thus, most raters agreed that aides with group training were more versatile in their job skills. Small departments agreed that their aides were more versatile in the types of patients with whom they could work

with.

TABLE 8

JOB PERFORMANCE
(1967 Trainees Rated Better Than 1961 Trainees)

Item	Small Dept. Ratings	Large Dept. Ratings	Total Ratings
1. Number of Patients Treated	No	No	No
2. Variety of Skills Can Do Well	Yes	Yes	Yes**
3. Variety of Patients With Whom Can Work	Yes	No	Yes*

No = Item did not have necessary percentage of ratings to meet criteria.
Yes = Item did have necessary percentage of ratings to meet criteria.
* Chi square significance - 1%
** Chi square significance - >5%

Differences in time required to supervise aides is important in judging the effectiveness of the two training approaches. As no records were available for objective data, supervisors were asked to judge three items according to the relative time required to give individual instruction, to orient, and to check for follow-through on job assignments.

Table 9, shows which items met the criteria according to size of department. Although most raters judged that all items took less time in 1967 than in 1961, only "Orienting Aide to the Section" met all criteria. The small departments differed from the large departments in judging that "Time spent in checking for follow-through" was less also.

TABLE 9

SUPERVISORY TIME
(1967 Trainees Rated Better Than 1961 Trainees)

Item	Small Dept. Ratings	Large Dept. Ratings	Total Ratings
1. Instructing Aide About New Patient	No	No	No
2. Orienting Aide to Department	Yes	Yes	Yes*
3. Checking Aide for Follow-through	Yes	No	No

No = Item did not have necessary percentage of ratings to meet criteria.
Yes = Item did have necessary percentage of ratings to meet criteria.
* Chi square significance - between 5 and 1%

In summary, in the judgment of the supervisors and directors of departments those aides trained with the demonstration model (1967) were better in the following ways than those individually trained (1961):

1. They had more confidence in carrying out their duties.

2. They could do a greater variety of tasks well.

3. They could be oriented to their department more quickly.

In addition, small departments noted these advantages in their aides:

1. They were more willing to accept responsibility.

2. They could work with a greater variety of patients.

On other items rated, the two training approaches did equally well.

Summary

The relationship of curriculum changes to changes in instructor time, trainee abilities and supervisory time, will contribute to the overall evaluation of this demonstration project using 1967 as the model year. These

changes are summarized on Table 10.

Some significant changes occurred between 1961 and 1963 when there was a major shift from individual on-the-job training to formal group training. At this time, instructor time decreased an unknown amount of time, while trainee knowledge improved a statistically significant amount. Other significant changes occurred between 1963 and 1967 when the programmed instruction was integrated into the training. Instructor time decreased 35 per cent, while trainee knowledge acquired was essentially the same for both methods.

Some changes are based on information about differences between 1961 and 1967 only. In comparing individual training (1961) with group training utilizing programmed instruction (1967), we find that a difference in trainee attitude was an increased confidence in carrying out his duties. His change in skill was an increase in the variety of tasks he could do well. Also he took less time to be oriented to his work. Otherwise his attitudes were as good and his work as effective as those of the aides trained in 1961.

Briefly, the variety in amount of time and content of the curriculum was reduced when group teaching methods and programmed instruction were integrated into the training program in the demonstration project. Trainees functioned as well or better on their jobs with reduced instruction time and supervisory time required.

This evaluation demonstrates that group training with programmed instruction for physical therapy aides is as effective as other methods, and is more efficient.

TABLE 10

OVERALL CHANGES

	1961 to 1963	1963 to 1967
Curriculum Changes		
Hours	Small depts. increased Large depts. slightly increased?	Stable (97-101 hrs.)
Content	Increased coverage knowledge content added to skills.	Knowledge and skills further defined.
Method	Group methods replaced much individual training.	Programmed instruction replaced many lectures
Instructor Time Changes	Decreased?	Decreased 35%
Trainee Changes		
Knowledge	Improved 6% (stat. sig.)	Improved 3% (insig.)
	1961 to 1967	
Attitudes	Improved confidence. No other changes.	
Job Skills	Increased variety of skills well done. No other changes.	
Supervisory Time Changes	Decreased orientation time. No other changes.	

REFERENCES

1. Chabala, Lillian E., Selection, Training and Utilization of Supportive Personnel in Rehabilitation Facilities. Velda Rose Towers, Arkansas Rehabilitation Research and Training Center and Association of Rehabilitation Centers, Inc., Hot Springs, Arkansas, September 1966, pp. 57-62.

2. Perry, Jacquelin, M.D., Responsibilities in patient care: the need for nonprofessional assistants in physical therapy. Phys. Ther., 46:250-255, March 1966.

3. U. S. Department of Health, Education and Welfare, The Nation and its Older People. Report of the White House Conference on Aging, 1961. Washington, D.C., April 1961, pp. 159-162.

4. Killen, M. Barbara, Supportive personnel in physical therapy. Phys. Ther., 47:483-490, June 1967.

5. Robins, Viola, Training and use of nonprofessional personnel in hospital facilities. Phys. Ther., 46:256-8, March 1966.

6. Skinner, B. F., The science of learning and the art of teaching. Harvard Educational Review, 24:86-97, 1954.

7. Lumsdaine, A. A., and Robert Glaser, ed., Teaching Machines and Programmed Learning: A Source Book. Department of Audiovisual Instruction, N.E.A., Washington, D.C., 1960.

8. Fry, Edward, Teaching Machines and Programmed Instruction. McGraw-Hill Book Co., Inc., New York, 1963.

9. Mager, Robert F., Preparing Objectives for Programmed Instruction. Fearon Publishers, San Francisco, 1961.

10. Lysaught, Jerome P., and Clarence M. Williams, A Guide to Programmed Instruction. John Wiley & Sons, Inc., New York, 1963.

11. Brethower, Dale M., Programed Instruction: A Manual of Programing Techniques. Educational Methods, Inc., Chicago, 1963.

12. Markle, Susan Meyer, Good Frames and Bad: A Grammar of Frame Writing. John Wiley & Sons, Inc., New York, 1964.

13. Markle, Susan M., L. D. Eigen, and P. K. Komoski, A Programed Primer on Programing, Vol. I and II. Center for Programed Instruction, New York, 1960.

14. Bloom, Benjamin S., ed., Taxonomy of Educational Objectives. David McKay Co., Inc., New York, 1961.

15. Schramm, W., Learning and technology of instruction. In Hilgard, Ernest R. and Gordon H. Bower, Theories of Learning, Third Edition. Appleton-Century-Crofts, New York, 1966.

16. Seedor M. M., Can nursing be taught with teaching machines? Amer. J. Nurs., 182:117-20, 1963.

17. Green, E. J., R. J. Weiss, and P. O. Nice, The experimental use of a programmed text in a medical school course. J. Med. Educ., 37: 767-75, 1962.

18. Smith, Genevieve L., Medical terminology. National Society for Programmed Instruction Journal, 3:12-13, January 1964.

19. Taber, Julian I., Robert Glaser, and Halmuth H. Schaefer, Learning and Programmed Instruction. Addison-Wesley, Reading, Massachusetts, 1965.

20. Brethower, Dale M., David G. Markle, Geary A. Rummler, Albert W. Schrader, and Donald E. P. Smith, Programmed Learning: A Practicum. Ann Arbor Publishers, Ann Arbor, Michigan, 1965.

21. Markle, David G., Turning test frames into teaching frames: a strategy. Read before the Annual Convention of National Society for Programmed Instruction, 1967.

22. Rummler, Geary A., Joseph P. Yaney, and Albert W. Schrader, ed., Managing the Instructional Programming Effort. University of Michigan, Ann Arbor, Michigan, 1967.

23. Lange, Phil C., ed., Programmed Instruction, the Sixty-Sixth Yearbook of the Society for the Study of Education, Part II. University of Chicago Press, Chicago, Illinois, 1967.

24. Lysaught, Jerome P., ed., Programmed Instruction in Medical Education, Proceedings of the First Rochester Conference. The Rochester Clearinghouse, Rochester, New York, 1965.

25. Lysaught, Jerome P., and Hilliard Jason, ed., Self-Instruction in Medical Education, Proceedings of the Second Rochester Conference. The Rochester Clearinghouse, Rochester, New York, 1967.

26. Programmed Instruction and the Hospital. Hospital Research and Educational Trust, Chicago, Illinois, 1967.

27. Adams, Georgia Sachs, Measurement and Evaluation in Education, Psychology, and Guidance. Holt, Rinehart and Winston, New York, 1964.

28. Helmstadter, G. C., Principles of Psychological Measurement. Appleton-Century-Crofts, New York, 1964.

29. Wood, Dorothy Adkins, Test Construction, Development and Interpretation of Achievement Tests. Charles E. Merrill Books, Inc., Ohio, 1961.

30. Adams, op. cit., p. 323.

31. Ibid., p. 87.

32. Ibid., p. 96.

33. Ibid., p. 108.

34. Kristy, Jean, Overt versus covert responses in learning with programmed instruction. Paper given at the Annual Conference of the American Physical Therapy Association, Chicago, July 1968.

35. Krumboltz, John D., and Ronald G. Weisman, The effect of overt versus covert responding to programed instruction on immediate and delayed retention. J. Educ. Psychol., 53:89-92, April 1962.

36. Goldbeck, R. A., The effect of response mode and learning material difficulty on automated instruction. Technical Report No. 1. American Institute for Research, Santa Barbara, California, September 1960.

APPENDIX A

BONES, JOINTS AND MUSCLES OF THE HUMAN BODY

TEST B

Instructions: The following statements have four possible endings. Select the ending which best completes the statement. Write the corresponding letter in the blank at the left of the statement. Only one of the four endings is correct for each statement.

___ 1. Providing the body framework and protecting delicate parts are <u>two</u> purposes of:

a. bones
b. muscles
c. tendons
d. ligaments

___ 2. Of the words listed below, the one which does <u>not</u> have the same meaning as the others is:

a. tuberosity
b. trochanter
c. prominence
d. depression

___ 3. The trunk motion which is performed by the abdominal muscles is:

a. flexion
b. extension
c. abduction
d. depression

___ 4. The elbow flexor muscle is named the:

a. trapezius
b. triceps
c. biceps
d. deltoid

___ 5. The bones which form the elbow joint are the:

a. ulna and carpals
b. humerus and radius
c. humerus, radius, and ulna
d. radius and ulna

___ 6. The muscles which bend our fingers are the finger:

a. flexors
b. extensors
c. abductors
d. adductors

___ 7. The long bone which forms part of the shoulder joint is the:

a. humerus
b. radius
c. ulna
d. metacarpal

___ 8. The thumb motion which allows us to perform fine motions is:

a. flexion
b. adduction
c. opposition
d. abduction

___ 9. The bones which form the shoulder joint are:

a. humerus, scapula, and clavicle
b. humerus, radius, and ulna
c. femur, tibia, and fibula
d. carpals, metacarpals, and phalanges

___ 10. When the forearms are turned so that the palms face up, they are in a position of:

a. pronation
b. internal rotation
c. external rotation
d. supination

___ 11. The motion listed below which is <u>not</u> a wrist motion is:

a. extension
b. abduction
c. ulnar deviation
d. radial deviation

___ 12. The bones which form the elbow joint are the:

a. humerus, ulna, and carpals
b. femur, tibia, and fibula
c. carpals, metacarpals, and phalanges
d. humerus, radius, and ulna

___ 13. The gluteus maximus muscle is a hip:

a. flexor
b. extensor
c. abductor
d. internal rotator

___ 14. The bone of the foot which forms a part of the ankle joint is a:

a. tarsal
b. metatarsal
c. phalanx
d. carpal

___ 15. The motion of hip extension is done by the:

a. gluteus medius
b. iliopsoas
c. gluteus maximus
d. gastrocnemius

___ 16. The number of motions at the knee joint is:

a. 2
b. 4
c. 6
d. 8

___ 17. The muscles which evert the ankle are the:

a. gastrocnemius
b. peroneals
c. hamstrings
d. quadriceps

___ 18. When the gluteus medius moves the thigh out to the side, the motion is hip:

a. adduction
b. flexion
c. abduction
d. extension

___ 19. The muscle which extends the knee is the:

a. gluteus maximus
b. hamstrings
c. gastrocnemius
d. quadriceps

___ 20. [illegible]ame for the thigh bone is:

a. tibia
b. femur
c. ilium
d. pelvis

APPENDIX B

ATTENDANT TRAINING PROGRAM

FOR

PHYSICAL THERAPY DEPARTMENTS

IN

LOS ANGELES COUNTY HOSPITALS

LOS ANGELES COUNTY CIVIL SERVICE COMMISSION

EMPLOYEE DEVELOPMENT DIVISION

1963

Revised: August 1968

ATTENDANT TRAINING PROGRAM
FOR
PHYSICAL THERAPY DEPARTMENTS
IN
LOS ANGELES COUNTY HOSPITALS

OBJECTIVES

1. The trainee will master the fundamentals of patient management.
2. He will master a variety of selected physical therapy procedures.
3. He will know and understand the characteristics and problems of selected disabilities.
4. He will know and understand the structure and function of various systems of the human body.
5. He will develop a positive attitude toward his role in the physical therapy department and the hospital.

Revised: August 1968

ATTENDANT TRAINING PROGRAM

PHYSICAL THERAPY DEPARTMENTS

LOS ANGELES COUNTY HOSPITALS

CONTENT	HOURS
I. THE HUMAN BODY	
A. Major Bones, Joint, and Muscles	8 1/2
B. Introduction to Brain and Nerves	4 1/2
C. Major Systems of the Body	9 1/2
D. Human Relations and Reactions	5
II. INTRODUCTION TO SELECTED DISABILITIES	
A. Medical Conditions	4
B. Orthopedic Conditions	6 1/2
C. Neurological Conditions	10
D. Geriatrics	1
III. FUNDAMENTALS OF PATIENT MANAGEMENT	
A. Basic Nursing Procedures	12
B. Preparation of Patient	7 1/2
C. Applied Body Mechanics	6
IV. SELECTED PROCEDURES	
A. Hydrotherapy Equipment	6
B. Electrotherapy Equipment	10
C. Exercise Equipment and Basic Routines	9
D. Ambulation and Assistive Equipment	6
V. BACKGROUND FOR HOSPITAL ROLE	8
VI. ON-THE-JOB PRACTICE IN HOME HOSPITAL	201 1/2
Administrative Time	3
TOTAL HOURS	320

Revised: August 1968

ATTENDANT TRAINING PROGRAM
PHYSICAL THERAPY DEPARTMENTS
LOS ANGELES COUNTY HOSPITALS

I. THE HUMAN BODY
(Total: 27 1/2 Hours)

A. Major Bones, Joints and Muscles	B. Introduction to Brain and Nerves	C. Major Systems of the Body	D. Human Relations and Reactions
In this unit the trainee will learn the names and locations of important bones and muscle groups and the joint motions which they perform. The subject will be presented by programmed instruction, reviewed by discussion and demonstrated with patients. This knowledge will help him understand instructions and the purpose of his work assignments.	In this unit the trainee will learn the gross structure and function of the nervous system. This unit will be presented by programmed instruction, reviewed by discussion and demonstrated with models and patients. This will provide background for understanding the problems and treatment of patients with disease or injury to this system.	The trainee will learn the gross structure, function and signs of changes of the circulatory, respiratory and urinary systems of the body. The material will be presented by programmed instruction and demonstrated with patients. This will provide a background for understanding the problems and treatments of patients with disease or injury to these systems.	The trainee will learn the basic emotional needs of himself and others and the reactions of individuals to disease. This subject will be presented in a series of lectures. This will aid the trainee in his everyday work relationships with the staff and patients.
Content: Hours	Content: Hours	Content: Hours	Content: Hours
1. Introduction - Gross structures of musculoskeletal system 1 1/2	1. Introduction - Gross structure and function of nervous system 1	1. Circulatory System 2	1. Human Relations - Basic Needs 1
2. Head, Neck and Trunk 1	2. Brain 1	2. Respiratory System 1 1/2	2. Patient Reaction to Disability 2
3. Upper Extremity 2 1/2	3. Spinal Cord 1/2	3. Urinary System 3 1/2	3. Employee-Patient Relationships 2
4. Lower Extremity 2	4. Peripheral Nerves 1	4. Temperature, Pulse and Respiration 1	Total: 5
Review 1 1/2	Review 1	Review 1 1/2	
Total: 8 1/2	Total: 4 1/2	Total: 9 1/2	

ATTENDANT TRAINING PROGRAM
PHYSICAL THERAPY DEPARTMENTS
LOS ANGELES COUNTY HOSPITALS

II. INTRODUCTION TO SELECTED DISABILITIES (Total: 21 1/2 Hours)	III. FUNDAMENTALS OF PATIENT MANAGEMENT (Total: 25 Hours)		
Selected Disabilities	A. Basic Nursing Procedures	B. Applied Body Mechanics	C. Preparation of Patients
The trainee will learn the gross causes, symptoms, and conventional treatment of disabilities commonly treated in physical therapy departments. The material will be presented by programmed instruction, reviewed by discussion and demonstrated with patients. This will help the trainee understand the problems of patients with whom he will be working and improve his confidence in working with them.	The techniques of performing basic nursing procedures will be learned in this unit. These techniques will be presented by lecture-demonstration and followed by trainee practice. This will make the trainee capable of handling some nursing problems that arise in his work.	The trainee will learn the basic principles of body mechanics, their application in transferring patients safely, and the use and care of wheelchairs and guerneys. The material will be presented by programmed instruction and lecture-demonstration and followed by trainee practice. These skills will enable the trainee to avoid those injuries associated with poor body mechanics and will enable him to carry out this phase of his job with confidence.	The trainee will learn the techniques of dressing and positioning patients for treatment, and techniques of applying supportive devices. The unit will be presented by both programmed instruction and lecture-demonstration and followed by trainee practice. This will provide the trainee with some primary skills and understanding of his job.
Content: Hours	Content: Hours	Content: Hours	Content: Hours
1. Medical Conditions 3 1/2	1. Admission of Patient 1	1. Body Mechanics 1	1. Dressing, Undressing, and Positioning Patients 3 1/2
Review 1/2	2. Personal Care 1	2. Lifting and Transferring Patients 4	2. Applying Supportive Devices 4
2. Orthopedic Conditions 5 1/2	3. Bed Making 2	3. Maintenance of Equipment (Wheelchairs) 1	Total: 7 1/2
Review 1	4. Bathing 1	Total: 6	
3. Neurological Conditions 8 1/2	5. Feeding 1		
Review 1 1/2	6. Temperature, Pulse and Respiration 2		
4. Geriatrics 1	7. Bowel and Bladder Care 3		
Total: 21 1/2	8. Discharging Patient 1		
	Total: 12		

ATTENDANT TRAINING PROGRAM

PHYSICAL THERAPY DEPARTMENTS

LOS ANGELES COUNTY HOSPITALS

IV. SELECTED PROCEDURES
(Total: 31 Hours)

A. Hydrotherapy Equipment	B. Electrotherapy Equipment	C. Exercise Equipment and Basic Routines	D. Ambulation and Assistive Equipment
In this unit the trainee will learn the types, effects, use and care of hydrotherapy equipment and the safe application of selected phases of hydrotherapy. The subject will be presented by lecture-demonstration and followed by trainee practice. This material will help the trainee understand the purpose of hydrotherapy and his role and responsibility in its application.	The types, effects, use and care of electrotherapy equipment and the safe application of selected phases of electrotherapy will be learned in this unit. The material will be presented by both programmed instruction and lecture-demonstration and followed by trainee practice. This unit will provide the trainee with an understanding of the purposes of electrotherapy and his role and responsibility in its application.	The trainee will learn the effects of exercise on the human body, the use and care of exercise equipment and the safe application of selected phases of exercise treatment. The unit will be presented by lecture-demonstration and followed by trainee practice. Knowledge of this subject will provide the trainee with an understanding of the purposes of various types of exercise and of his role and responsibility in the exercise program.	In this unit the trainee will learn the safe use and care of assistive equipment and its application to patients during ambulation. Both programmed instruction and lecture-demonstration, followed by trainee practice, will be used to present the material. These skills will enable the trainee to safely assist patient practice and carry out specific instructions given by the physical therapist.
Content: Hours	Content: Hours	Content: Hours	Content: Hours
1. Introduction - types, effects, precautions 1	1. Equipment: types, effects, precautions, care 5	1. Introduction - effects of exercise, types of exercise, precautions 1	1. Standing boards 1
2. Whirlpool hubbard tank, pool 2 1/2	Ultraviolet 1	2. Range of Motion 4	2. Assisting Patients - Types of Gait 2
3. Hot packs, paraffin bath 2 1/2	Infrared 1	3. Resistive Exercise Apparatus 4	3. Walkers, Canes, and Crutches 2
Total: 6	Electrical Stimulation 1	Total: 9	4. Safety 1
	Shortwave 1		Total: 6
	Ultrasound 1		
	2. Prepare and position patient for treatment. Apply infrared and spot quartz 4		
	3. General Care of Equipment 1		
	Total: 10		

ATTENDANT TRAINING PROGRAM

PHYSICAL THERAPY DEPARTMENTS

LOS ANGELES COUNTY HOSPITALS

V. BACKGROUND FOR HOSPITAL ROLE (Total: 8 Hours)

Orientation and Ethical Behavior

The trainee will learn the history and purpose of physical therapy, the ethical behavior expected of hospital personnel and the organization of his hospital including an introduction to the use of and respect for medical records. These subjects will be presented by a series of lectures. Knowledge of the subjects will help the trainee understand the functions of the various departments and the importance of his role on the medical team.

Content:	Hours
1. Orientation to Your Job	3
2. Ethical Behavior	2
3. The County System	2
4. Introduction to Medical Records	1
Total:	8

VI. ON-THE-JOB PRACTICE IN HOME HOSPITAL (Total: 201 1/2 Hours)

On-The-Job Practice

In this unit the trainee will apply the newly learned skills to the treatment in the physical therapy departments of his home hospital. This will be accomplished by supervised on-the-job practice. In this way, the trainee will gain skill, confidence and further understanding in specifically assigned tasks as a physical therapy attendant.

	Hours
1st month	53 1/2
2nd month	148
Total:	201 1/2

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ATTENDANT TRAINING PROGRAM FOR PHYSICAL THERAPY DEPARTMENTS
LOS ANGELES COUNTY HOSPITALS

FIRST WEEK

* Programmed Instruction

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00	Hospital Role: Introduction History	*Make-up time On-the-job practice	*Make-up time On-the-job practice	*Make-up time On-the-job practice	*Applied Body Mechanics Pivot Transfer
9:00	Administration: Pre-evaluation				On-the-job practice
10:00	Hospital Role: Ethical Behavior				
11:00	*Bones, Joints, Muscles Introduction	Bones, Joints, Muscles Review	Bones, Joints, Muscles Review	Bones, Joints, Muscles Review	
12:30	Hospital Role: Tour	*Bones, Joints, Muscles Shoulder	*Bones, Joint, Muscles Hip	*Applied Body Mechanics Introduction	*Brain and Nerves Introduction
1:30	Human Relations: Basic Needs	Patient Preparation Supportive Devices, Neck and Trunk	Basic Routines ROM of Upper Extremity	Basic Routines ROM of Lower Extremity	Applied Body Mechanics Lifting Transfer
2:30	Exercise Equipment: Introduction	*Bones, Joints, Muscles Elbow			
3:30	*Bones, Joint, Muscles Head, Neck & Trunk	*Bones, Joint, Muscles Wrist and Hand	*Bones, Joint, Muscles Knee Ankle and Foot	*Applied Body Mechanics Wheelchairs	*Brain and Nerves The Brain

ATTENDANT TRAINING PROGRAM FOR PHYSICAL THERAPY DEPARTMENTS
LOS ANGELES COUNTY HOSPITALS

SECOND WEEK

* Programmed Instruction

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00	*Brain and Nerves Spinal Cord	*Make-up time On-the-job practice	*Selected Disabilities Brain Injuries	*Selected Disabilities Spinal Cord Diseases	*Selected Disabilities Poliomyelities Neuronitis
9:00	On-the-job practice		*Make-up time On-the-job practice	*Make-up-time On-the-job practice	On-the-job practice
10:00					
11:00		Brain and Nerves Review			
12:30	*Brain and Nerves Peripheral Nerves	*Selected Disabilities C.V.A.	Selected Disabilities Review	Selected Disabilities Review	*Selected Disabilities Neuritis and Vertebral Discs
1:30	Patient Preparation Supportive Devices, Upper Extremities	Basic Routines Slings and Springs	Applied Body Mechanics Wheelchair Transfer	Patient Preparation Supportive Devices, Lower Extremities	Exercise Equipment Resistive Exercise
2:30	Human Relations Patient Reaction to Disability	Ambulation Equipment Standing Board	Exercise Equipment Resistive Exercise	Human Relations Employee-Patient Relationships	
3:30		*Selected Disabilities Brain Diseases	*Selected Disabilities Spinal Cord Injuries		*Selected Disabilities Peripheral Nerves Injuries

ATTENDANT TRAINING PROGRAM FOR PHYSICAL THERAPY DEPARTMENTS
LOS ANGELES COUNTY HOSPITALS

THIRD WEEK

* Programmed Instruction

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00	*Make-up time On-the-job practice	*Selected Disabilities Fractures On-the-job practice	*Selected Disabilities Arthritis *Make-up time On-the-job practice	*Major Systems Respiratory System On-the-job practice	*Major Systems Respiratory System On-the-job practice
9:00					
10:00					
11:00	Selected Disabilities Review	*Selected Disabilities Deformities of the Spine			
12:30	*Selected Disabilities Amputees		Selected Disabilities Review Orthopedic Disabilities	*Selected Disabilities Cardiac	*Selected Disabilities Diabetes
1:30	Ambulation Equipment Canes, Crutches Walkers	Ambulation gaits	Ambulation Safety	Hydrotherapy Introduction	Hydrotherapy Whirlpool Hot packs
2:30			*Major Systems Circulatory System	Preparation of Patient Positioning Introduction	
3:30	*Selected Disabilities Fractures	*Selected Disabilities Arthritis		*Major Systems Respiratory System	Major Systems Temperature, Pulse, Respiration

ATTENDANT TRAINING PROGRAM FOR PHYSICAL THERAPY DEPARTMENTS
LOS ANGELES COUNTY HOSPITALS

FOURTH WEEK

* Programmed Instruction

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00	*Make-up time On-the-job practice	*Selected Disabilities T.B.	*Selected Disabilities Geriatrics	*Major Systems Bladder Program	*Electrotherapy Equipment Ultrasound
9:00		On-the-job practice	*Make-up-time On-the-job practice	*Make-up-time On-the-job practice	*Make-up time On-the-job practice
10:00					
11:00					
12:30	Major Systems Review	*Electrotherapy Equip- ment Infrared	Selected Disabilities Review Medical *Electrotherapy Equip. Ultraviolet	Major Systems Review	Electrotherapy Practice
1:30	Preparation of Patient Positioning Prone Side	Hydrotherapy Equip- ment Hubbard Tank Pool	Electrotherapy Equip. Practice	Hydrotherapy Equip- ment Paraffin	
2:30				Hospital Role Medical Records	Hospital Role County System
3:30	Major Systems Urinary System	*Major Systems Urinary System	*Major Systems Urinary System	*Electrotherapy Equip. Diathermy	

DOCUMENT RESUME

ED 029 110 VT 007 963

By-McDaniel, Lucy V.

Programmed Instruction for Aides in Physical Therapy. Final Report.

Rancho Los Amigos Hospital, Inc., Downey, Calif.
Spons Agency-Social and Rehabilitation Service (DHEW), Washington, D.C.
Pub Date Oct 68
Grant-RD-1712-M-66-C1
Note-59p.
EDRS Price MF-$0.50 HC-$3.05
Descriptors-Achievement Tests, Curriculum, Curriculum Development, *Health Occupations Education, *Methods Research, Physical Therapy, *Physical Therapy Aides, Program Development, *Programed Instruction, Program Evaluation, *Teaching Methods, Test Construction

The purpose of this project was to develop an effective, efficient, standard method of training aides using programed instruction. A 2-month curriculum which had been established in the Los Angeles County Hospitals in 1962 was refined and objectives were specified in behavioral terms. Programed instruction materials were written for the knowledge aspects of the course, and tests were developed to evaluate the effectiveness of the curriculum and the materials. The November 1967 class of trainees who participated in the demonstration project were compared with trainees of 1963 who had had formal group training bu t no programed instruction and with a group trained in 1961 or before with on-the-job training only. The test results indicated that those who had had formal training attained more knowledge than those with on-the-job training only. There was no significant difference between formal group training without programed instruction and formal group training with programed instruction. However, the latter required 35 percent less instructor time. It is recommended that programed instruction be integrated into formal training programs because it conserves instructor time, provides for flexible scheduling for large or small groups, and aids in standardizing content. Appendixes include a sample test, a curriculum outline, a day-by-day program schedule, and a rating scale. (JK)

ATTENDANT TRAINING PROGRAM FOR PHYSICAL THERAPY DEPARTMENTS
LOS ANGELES COUNTY HOSPITALS

FIFTH WEEK

* Programmed Instruction

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:00 to 9:00	*Electrotherapy Equipment Stimulation	Make-up time	Electrotherapy Equipment Practice	Electrotherapy Equipment Care of Equipment	Hospital Role Medical Records
9:00 to 4:30	On-the-job practice →		SIXTH WEEK		→
8:00 to 9:00	Nursing Procedures Admission of Patient	On-the-job practice	Nursing Procedures Personal Care	On-the-job practice	8:00 - 10:00 Nursing Procedures Bed Making
9:00 to 4:40	On-the-job practice →		SEVENTH WEEK		→
8:00 to 9:00	Nursing Procedures Bathing	On-the-job practice	Nursing Procedures Feeding	On-the-job practice	Nursing Procedures Temperature, Pulse, Respiration
9:00 to 4:40	On-the-job practice →		EIGHTH WEEK		→
8:00 to 9:00	8:00 - 10:00 Nursing Procedures Bowel and Bladder Care	On-the-job practice	Nursing Procedures Discharging Patient	On-the-job practice	Administration Post Evaluation
9:00 to 4:30	10:00 - 4:30 On-the-job practice →				2:30 - 4:30 Administration Certificates

APPENDIX C

AIDE RATING SCALE

Compare the performance of your attendants now with the performance of your attendants prior to the County Training Program in 1962 by answering the following questions.

A. Is their attitude different? To answer, place a number in front of each listed attitude using this key:

1. Much better in 1967.
2. Slightly better in 1967.
3. No difference between 1967 and 1961.
4. Slightly better in 1961.
5. Much better in 1961.

___ Willingness to work with the patients.
___ Willingness to assist the physical therapist.
___ Confidence in carrying out their duties.
___ Willingness to carry out their duties.
___ Willingness to accept their responsibilities.

B. Is their versatility different? To answer, place a number in front of items listed below using this key:

1. Much more in 1967.
2. Slightly more in 1967.
3. Same for 1961 and 1967.
4. Slightly more in 1961.
5. Much more in 1961.

___ Number of patients treated by each aide per day.
___ Variety of skills aide is able to do well.
___ Variety of patients aide is able to work with.

C. Is time spent supervising attendants different? To answer, place a number in front of each item using the following key for supervisor's time required:

1. Much more in 1961.
2. Slightly more in 1961.
3. Same in 1967 and 1961.
4. Slightly more in 1967.
5. Much more in 1967.

___ Instructing aide about a new patient.
___ Orienting aide to section.
___ Checking for follow-through on job assignment.