Teaching and Evaluating Generic Teaching Skills

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Introduction

In an effort to identify the competencies which are needed by public school teachers, the Council on Teacher Education, a policy recommending body appointed by the Florida State Board of Education, undertook a thorough analysis of the competencies which had been identified by various teacher education researchers and practitioners. In 1975 a list of 52 major competencies was submitted to a broad sample of 4500 teachers in Florida in order to obtain their ratings of the importance of these competencies to their day-to-day teaching. This survey resulted in the idenfication of 23 essential competencies for teachers.

The essential competencies range from basic skills in reading and mathematics to complex human relations skills. Given this broad range, the Council on Teacher Education made the decision to ask the Florida Research and Development Program to fund validation studies which would demonstrate that these competencies could and are being learned by teachers.

The project reported here is the result of a contract with the R & D Program to document the feasibility of effectively teaching eight of the essential skills. The specific competencies which were taught are the "technical" skills which are listed below:

1. Diagnose the entry knowledge and/or skill of students for a given set of instructional objectives using diagnostic tests, teacher observations, and student records.

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2. Identify long-range goals for a given subject area.

3. Construct and sequence related short-range objectives for a given subject area.

4. Select, adapt, and/or develop instructional materials for a given set of instructional objectives and student learning needs.

5. Select/develop and sequence related learning activities appropriate for a given set of instructional objectives and student learning needs.

6. Establish rapport with students in the classroom by using verbal and/or visual motivational devices.

7. Present directions for carrying out an instructional activity.

8. Construct or assemble a classroom test to measure student performance according to criteria based upon objectives.

The investigators deliberately chose to validate instruction on the entire cluster of technical skills, as opposed to only one or two, because these skills are sequentially related to the preparation for, delivery of, and evaluation of instruction. They compose in a broad and comprehensive way, the skills which are generally referred to as the systematic approach to instruction.

Therefore, the eight essential skills were viewed as an integrated, systematically related set of skills. When applied in the context of designing instruction for the classroom they should result in demonstrable learning outcomes. The purpose of the project was to determine if teachers could be provided effective instruction on these competencies, and that evidence of this effectiveness could be demonstrated through the production and evaluation of documented instructional packages.

In this report, a description will be provided of the instructional setting and the participants in the study, the specific skills taught to the participants, the assessment of the effectiveness of the instruction, and an estimate of the time and costs which would be required to replicate the instruction.

PROCEDURES FOR THE VALIDATION SURVEY

Participants

Nineteen teachers participated in the evaluation of the feasibility of teaching the eight technical skills of teaching. The teachers' backgrounds varied in terms of their amount of training, teaching experience, and content specialities. Table 1 provides a summary description of the group by current degree held, years of teaching experience, and grade level and content taught in their current position. The data indicate that the majority were classroom teachers with bachelor degrees with less than 10 years teaching experience. They represented a wide range of content areas in their teaching.

Instructional Setting

The instruction on the technical skills was provided to the teachers through their enrollment at Florida State University in IDD 537, The Design of Modular Instruction, during the Summer Quarter, 1976. The course was offered as a 5 quarter-hour graduate course which required no prerequisites. It was scheduled on the FSU campus for a five-hour block of time each week for the nine-week term. All participants registered for the course on a grade (A-F) basis rather than on a pass-fail plan.

Instructional Objectives

The eight technical teaching competencies which were developed by the Florida Department of Education (DOE) served as the baseline for selecting specific instructional objectives and materials for the course. The text, The Systematic Design of Instruction, by Walter Dick and Lou M. Carey (1978), was used because of the close relationship between the objectives for the book and the Department of Education objectives. Table 2 illustrates the relationship between the DOE technical skills and the instructional skills included in The Systematic Design of Instruction. The DOE technical skills objectives are

presented in the left column and the corresponding objectives from the Dick Carey text are presented in the right column.

Instructional Materials

The text used to present the concepts, ideas, and examples of the DOE technical skills was The Systematic Design of Instruction by Walter Dick and Lou Carey (1978).

Chapters I and II provide an introduction to the systems approach and an overview of a particular systematic model for designing instruction. Chapters III through XI each address one component of the instruction design model. The final chapter identifies a number of additional areas in which the systems approach is being applied in education. Each of the chapters in the text was written in a manner that reflects the systematic design principles which are taught in the book.

The text was used as a self-instructional, self-paced guide to learning the eight technical skills identified by the Department of Education. It includes all the information and procedures needed to learn these skills. In addition, the text served as an example of the kind of instruction participants were learning to develop in that it is intended for individualized use and includes all of the "events of instruction" as defined by Gagne in Essentials of Learning for Instruction, (1977).

Instructional Support Materials

A course guide was provided to each student which included the following items:

1. An overview of course procedures.
2. Assessment criteria for the course.
3. A description of each course assignment:
   a. Topics covered in each assignment.
   b. A list of behaviorally stated objectives for each assignment.
   c. References to The Systematic Design of Instruction identifying the chapters to study for specified objectives.

Table 1

A Description of Participants in the Technical Skills Course

Current University Degree

Degree	Bachelors	Masters	Doctorate
Number of Participants	12	6	1

Years of Teaching Experience

Years of Experience	0-5	6-10	11+
Number of Participants	9	9	1

Grade Levels Taught

Grade Levels	Elementary	Secondary	University	None
Number of Participants	8	4	5	2

Current Position

Current Position	Classroom Teacher	University Faculty	Coordinator Media Center	Librarian	Student
Number of Participants	10	2	1	2	4

Content Areas Represented

Cataloging	Instructional Media	Music
Chemistry	Language Arts	Psychology
Communications	Math	Religion
Elementary Ed.	Mental Retardation	Sociology

Table 2

A Comparison of the DOE and Dick and Carey Objectives

DOE Objectives	Dick and Carey Objectives
7. Diagnose the entry knowledge and/or skills of students for a given set of instructional objectives using diagnostic tests, teacher observations and student records.	4. To describe both entry behaviors and general characteristics of target students and discuss the implications of these behaviors and characteristics for a given set of instructional materials. 12. To summarize learning data on specified objectives which are gathered through a formative evaluation study of a given set of instructional materials. 13. To use summarized learning data to identify weaknesses in instructional materials and suggest revisions in the material to improve intended students performance.
8. Identify long-range goals for a given subject area. 9. Construct and sequence related short-range objectives for a given subject area.	1. To identify and write a terminal objective which meets the criteria for initiating the design of effective instructional materials. 2. To identify, describe and apply the information processing, hierarchial and combination methods of instructional analysis to identify and sequence the subobjectives for any terminal objective. 3. To describe the relationship which exists among subobjectives and discuss the implications of this relationship for a set of instructional materials. 5. To construct properly written instructional objectives which include the conditions of performance, the performance, and the critieria for evaluating performance.
10. Select, adapt and/or develop instructional materials for a given set of instructional objectives and student learning needs. 11. Select/develop and sequence related learning activities appropriate for a given set of instructional objectives and student learning needs. 12. Establish rapport with students in the classroom by using verbal and/or visual motivational devices. 13. Present directions for carrying out an instructional activity.	8. To identify and describe the major components of an instructional strategy which includes preinstructional activities, information presentation, student participation, testing activities and follow-through activities. 9. To develop an instructional strategy and construct a set of instructional materials according to that strategy.
14. Construct or assemble a classroom test to measure student performance according to criteria based upon objectives.	6. To describe the characteristics of a criterion-referenced test and to construct criterion-referenced items to match given instructional objectives. 7. To describe the purposes of entry behaviors tests, pretests, and posttests and to construct each type of test for a given set of instructional objectives. 10. To describe the purpose for and stages of formative evaluation for instructional materials and to describe the assessment instruments and procedures used at each stage in a formative evaluation study to collect data on the effectiveness of materials. 11. To construct the necessary instruments and procedures to carry out a formative evaluation study on a given set of instructional materials.

d. Notes on specifics or background information participants may need to complete the assignment.

The guide was sufficiently specific that students could, on their own, review each of the eight assignments, prepare the required instructional materials, and essentially complete the course without coming to class. While this would not be a recommended procedure, one student, because of scheduling conflicts, did just this. The procedures using in administering the course will be described in detail in the next section.

Tests and Questionnaires

A number of test instruments were developed for use in this course. Sets of criterion-referenced test items that match the course objectives as specified in the Course Guide were used for the pretest, progress test and posttest. These tests include items at both the information (knowledge) level and at the application (performance) level.

Comprehension tests. The criterion-referenced comprehension test items were derived from the 13 course objectives. There was a written pretest/posttest with a corresponding answersheet. There were also three separate progress tests and corresponding answersheets which assessed participants' mastery as they moved through the course. Test item numbers on the pretest/posttest and on the progress tests correspond directly to course objectives (1 through 13).

Application tests. There were two levels of application tests. The first assessment comes early in the design of the instruction in the form of the Design Evaluation. To complete this test, participants specified the instructional goals for the materials they were developing, the corresponding subskills needed to achieve the goal, the behavioral objectives for each specified subskill, and sufficient test items to assess each behavioral objective.

The major application assessment took place at the end of the course. Each student was required to turn in the following: (a) instructional materials, (b) assessment instruments, and (c) a documentation report on their design process, evaluation process, a summary of the effectiveness of their materials, and strategies for the revision of the instructional materials to make them more effective for intended students.

Biographical data. An instrument was developed to gather biographical data about participants to facilitate administration of the course. The information was useful for contacting participants during the course and for grouping participants for class interaction so those within a group had similar backgrounds, content areas, or grade levels. This form also provided the demographic data which was used to describe the participants in the initial portion of this article.

Attitude survey. An attitude survey instrument was constructed to identify participants' reactions to the course. Opinions were sought about the Course Guide, the text, the tests, and materials development procedure, and the class activities.

Instructional Procedures

The class was scheduled to meet each Monday afternoon for nine weeks. At the introductory session, the students were provided a complete description of the procedures which would be followed in the course and the types of materials they would be producing. They were also given a pretest covering the major course objectives.

The strategy for teaching instruction design used in this study was to have the students study and be tested at the knowledge level on the entire model before beginning to develop their own materials. Therefore, during the second, third and fourth meetings of the class, students were tested each week over

approximately one-third of the text materials, and then discussions were conducted which addressed questions raised by the students.

The next phase of the course was focused on the students' design of their instructional materials according to the systems approach model. Each student wrote out an instructional goal, analyzed the subskills necessary to achieve the goal, identified the entry skills needed by target learners, and developed performance objectives and corresponding criterion-referenced test items. This design information was critiqued by the students in small groups during the fifth class session. It was then reviewed by the instructor and returned to students during the sixth class meeting. The sixth session was used as a time for participants to discuss the revised design plans in small groups and to consider the instructional strategy which each student planned to use.

The students were now ready to begin writing their instructional materials, and to formatively evaluate them with learners from their target population. Class sessions seven and eight consisted of consultations between the instructor and individual students to answer their specific questions when necessary. Students worked at their own rate in writing, testing and documenting their materials.

The instructional materials which were developed by the students had to meet the following criteria:

1. The content should be in an area in which the student already had considerable expertise.

2. The materials should consist of approximately one-half to one hour of instruction depending on the age of the target learners.

3. There should be between 8 and 20 learners involved in the small group evaluation of the materials.

4. The participant should write the majority of the information contained in the instructional materials, but other, already existing materials could also be incorporated in the materials.

The final phase of the course for the students was the documentation of the entire process which they had used to develop their materials. This report contained all the information on the design of their instruction as well as a description of the formative evaluation process and the revision of their materials. The report and the instructional materials were the primary bases upon which the success of the students in meeting the technical skills objectives was determined.

During the ninth week of the course the students submitted their reports on their developmental activities. The posttest on their comprehension of the objectives was given during the last class meeting as well as the attitude survey. In addition to questions about specific course components, the survey form included questions on the amount of time spent by the students on various aspects of the course and the costs they had incurred in developing their materials.

It should be noted from this description of course procedures that this was not a lecture/discussion course. Students were free to learn at their own pace (as long as they maintained the minimal pace required to finish the course during one quarter).

The role assumed by the instructor during the trial of the materials was as instructor/consultant. All the concepts and information required to complete the assignments appeared in the Course Guide and in The Systematic Design of Instruction. Participants' class time was spent taking quizzes over materials read outside of class, analyzing their quiz results, discussing questions raised by other participants, interacting in small groups, or consulting individually with the instructor.

The instructor did not serve as a content expert for the participants. Rather the role of reactant to the technical skills process was more appropriate

since the instructor could not be an expert in all the areas defined as project topics by participants. The participants were responsible for obtaining content expert reaction from sources other than the instructor. The expertise of the instructor was in the knowledge and application of the systems model for identifying, designing and evaluating instruction.

Time Requirements for Course Activities

Participants were asked to estimate the amount of time they had spent on the various components of the course. These components include: (a) reading the text and studying for progress tests during the first three weeks of the course; (b) designing instruction; (c) writing, producing, testing and analyzing materials; (d) analyzing and documenting their development procedures and the effectiveness of their instruction based on student performance; and (e) studying for the posttest or final exam. The time estimates of participants were summarized and are illustrated in Figure 1.

Participants spent an average of 82.3 hours working on course components outside of classroom time.

ASSESSMENT OUTCOMES

There were several instruments used to evaluate the progress and performance of participants during the course. Instruments include a pretest, three progress tests, a posttest, a product or materials evaluation, and an attitude questionnaire.

Participants' Performance on Cognitive Tests

The 13 objectives from the Dick and Carey materials have been categorized into the eight Department of Education objectives. Performance in the course will be reported in terms of the Department of Education objectives.

Figure 1
Participants' Estimates of Time Spent on Major Course Components

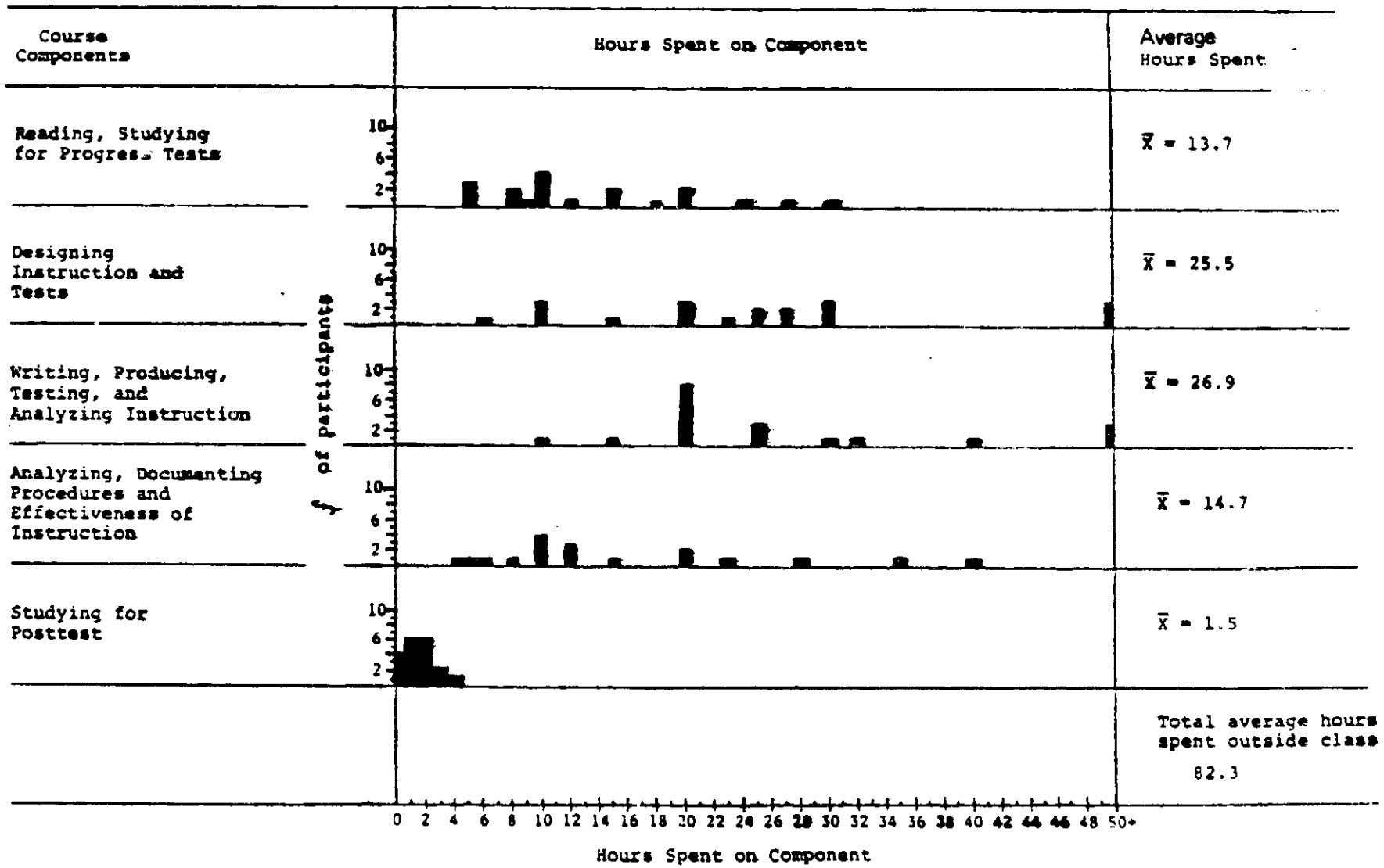

Table 3

The Average Score for Participants on Each Objective for the Pretest, Progress Tests, Posttest and Materials Development

Technical Skills	Pretest	Progress tests	Posttest	Materials development
1. Diagnose student performance.	28	87	92	92
2. Identify long range goals.	16	89	94	88
3. Construct sequence objectives for a given subject area.	17	90	93	88
4. Select/adapt or develop instructional materials for given objectives and pupil needs.	—	—	—	78
5. Select/adapt or develop related learning activities for given objectives and pupil needs.	—	—	—	79
6. Establish rapport with students using motivational devices.	2	95	78	100
7. Present directions for carrying out an instructional activity.	3	95	80	100
8. Construct/assemble classroom tests (criterion-referenced tests.)	12	94	98	97
Average Percent	13	91	89	90

Average Percent Achieved

The Dick and Carey objectives that comprise each DOE objective may be reviewed in Table 2.

Table 3 contains the average percent score of participants on each of the eight technical skills objectives for the pretest, progress test, posttest and materials development project. The group achieved considerable skills growth between the time they entered the course (pretest) and the time they completed each of the following assessments. The average total score achieved by the group for the pretest was 13 percent compared to 91 percent achieved on the progress tests, 89 percent achieved on the posttest, and 90 percent achieved on the materials development project.

Participants' Performance in Materials Development

Participants applied the skills learned in the course to the design, development, testing, and evaluation of a set of instructional materials. These materials packages included: (a) the instructional materials; (b) the criterion-referenced tests which included pretests, embedded tests and posttest; and (c) a documentation report which included a description of the rationale for the module, the design and development procedures, an instructional analysis chart, a description of the formative evaluation procedures, a description of the sample group used to field test the materials, data summaries on the effectiveness of the materials, and a description of revisions that should be made in the materials or tests to make them more effective.

Participants were also assessed on the gains in pupil achievement they were able to obtain with the materials they developed in the course. For each participant, the pretest scores and posttest scores were compared for their small group evaluations, and pupil gain scores were computed. These data are summarized in Table 4. All participants obtained pupil achievement growth with their materials (column V) however, some were more successful with pupil

achievement growth than others. Column VI contains the range of pupils' scores on the posttest for each participant. The optimum one could hope for would be a 0 range or 100 percent for the lowest scoring pupil and 100 percent for the highest scoring pupil. One participant obtained these high results, while another participant had one pupil who mastered 0 percent of the objectives on the posttest and the highest achieving pupil only obtained 57 percent of the objectives. Thus, several types of data were used by participants to evaluate both the effectiveness of their instruction, their instructional procedures, and the appropriateness of the target group they had selected to try their materials.

Participants' Attitudes About Course Administration, Materials, Instruction and Procedures

An attitude questionnaire was distributed at the end of the course, and participants were asked to answer questions with both multiple-choice and free-form responses. Questions included on the attitude questionnaire addressed: (a) the Course Guide, (b) the text, (c) the tests, (d) materials development activities, (e) in-class activities, and (f) general comments about the course. Participants' responses on this form can be used along with participant performance to evaluate the success of the course.

Generally, all the components of the course were well received by a large majority of the group. The participants believe the course is important and that they gained many useful skills during the course.

Most participants believe that the development and evalution of instructional materials requires a lot of work, but that the skills they develop during the process will have long-term benefits for them.

REPLICATION COSTS AND TIME

If the instruction provided in the validation study were to be replicated in another location, a number of factors would need to be taken into consideration.

Table 4

Learning Outcomes of Participants Instructional Packages

I Participant	II Content Area	III Pretest	IV Posttest	V Gain	VI Range or Posttest
1	Psychology	18%	55%	37%	21-86
2	Identify letters	30%	79%	49%	60-100
3	Physical science	3%	24%	21%	0-57
4	Photography	34%	86%	52%	75-100
5	Foreign Language	28%	87%	59%	50-100
6	Cataloging	23%	91%	68%	60-100
7	Punctuation	47%	84%	37%	62-100
8	Metric System	35%	94%	59%	70-100
9	Photography	73%	91%	18%	62-100
10	Music	31%	100%	69%	100-100
11	Behavioral Objectives		Incomplete data reported		
12	Communications	35%	80%	45%	54-100
13	Mathematics	40%	78%	38%	45-100
14	Communications	27%	99%	72%	95-100
15	Banking		No data reported		
16	Psychology	18%	55%	37%	21-86

These factors include space, time, instructional materials, instructor, cost and administrative arrangements.

No special meeting facilities or equipment are required for the instruction. However, students are required to provide multiple copies of their materials for their small group evaluation with target students. Therefore, access to some type of inexpensive duplicating equipment would be helpful.

The average time spent by students in the instruction was 85 hours. Thus, the instruction could be provided during an intensive three-week period during which participants were expected to spend about six hours per day in self-paced instruction. In the validation study, the students had nine weeks to complete the instruction. Alternative plans could be developed to spread the instruction over 16 weeks or even an academic year--depending upon the time available for teachers to participate in the course.

All of the materials which would be required to implement instruction on the technical skills of teaching are included in the appendices of this report with the exception of the test book, The Systematic Design of Instruction.

While the instructor for the course, as administered in the validation study was not required to lecture on the topics in the course, it was necessary to be knowledgeable about the various processes which are involved in the model and to be able to assist students with specific problems as they arose. Persons with training or experience in the systematic design of instruction should be able to serve as an instructor with these materials.

A process for training additional instructors is presently under investigation. Successful students in the course are serving as instructional assistants to the instructor. After one or two of these experiences, it is anticipated that the person could then serve as an instructor for other students.

The problems of cost and administrative arrangements are closely related. Major factors to be considered are the necessity of bringing in an instructor versus the use of an available staff person. Also to be considered is the desirability of offering academic credit for the instruction.

There appear to be five ways for teachers to obtain instruction in the identified technical skills. They include:

1. As a graduate or special student in a university.
2. As a participant in an institute offered by the Continuing Education Office of a university.
3. As a student in a regular continuing education class which is offered through the Continuing Education Office at an university.
4. As a student in a special interest course offered through a college of education.
5. As a participant in a regular in-service course offered and managed by a local Teacher Education Center.

For each of these five modes of offering instruction, there are various factors to consider when determining the costs of administration, instruction, and assessment. These factors include tuition or fees, graduate credit, scheduling and the pace of the instruction, location of instruction, and participant selection and screening. The factors associated with the various modes of instruction are presented in Table 5.

Another approach that is not shown in Table 5 is that of training one or more individuals within a district to provide this instruction to teachers through the local Teacher Education Center. There are various ways this training might be arranged, but they are beyond the scope of this report. The costs of replication reported here as alternative E represent costs to a local TEC that is located within a university community.

Table 5

Factors Associated with Various Modes of Delivery
of the Technical Skills Instruction

Instructional Modes	Factors				
	Costs	Credit for Participants	Calendar and Pace of Instruction	Participant Selection	Location of Instruction
A. Regular graduate course	$22.00/grad. hour or $110.00/student	1. 5 hrs. University credit 2. Arranged in-service credit through TEC	Set by regular university calendar for 1 quarter	Set by univ. admissions policy for regular and special grad. students.	University campus facilities
B. Institute offered through Continuing Education (Univ)	-$22.00/grad. hr. or $110.00/student -$220.00 for 20 students	SAME AS ABOVE	Set by agreement between Office of Continuing Education, instructor, and TEC	Selected by TEC and approved by Off. of Continuing Education	Location specified by TEC
C. Regular course through Continuing Education	SAME AS ABOVE	SAME AS ABOVE	Set by regular university calendar for 1 quarter	Selected by TEC and Approved by Office Continuing Education	SAME AS ABOVE
D. Special interest course through a College of Education	SAME AS ABOVE	SAME AS ABOVE	SAME AS ABOVE	Set by university admissions policy for regular and special graduate students	University campus facilities
E. Inservice course through a TEC using consultants	1. Ph.D. Consultant=$150/day or 2625. 2. MS consultant= $100/day or $1750 3. Bachelors consultant=$75/day or $1312.50	In-service credit by local district only unless otherwise arranged	Set by TEC and consultant	Set by TEC and consultant	Set by TEC and consultant

* Consultant fees based on 17.5 working days or 105 actual hours of administration, instruction, and assessment activities. (Cost does not include travel.)

SUMMARY

The purpose of this study was to identify instructional materials, conduct instruction, document procedures, and validate the effectiveness of instruction that would lead to mastery of the eight "technical" competencies included in the 23 essential competencies identified by the Department of Education.

The instructional materials selected to teach the eight technical skills, The Systematic Design of Instruction by Walter Dick and Lou Carey, proved to be effective. The text presented the concepts, examples and practice exercises necessary for participants to independently study all eight of the complex technical skills. Indicators of the success of this text in helping participants achieve mastery in the eight technical skills were: (a) the pretest-progress test growth of participants at the beginning of the term when the text was their sole source of information, (b) the ability of participants to successfully apply the technical skills in the production and analysis of their own instructional materials, and (c) the attitudes of participants concerning their ability to use the text both as a study guide for exams and as a reference during their materials development activities.

The course guide was developed and used to lead participants through the instructional materials and activities. It provided specific performance objectives for the course, hints on procedures for successful completion of the objectives, and a calendar of events which included due dates for course activities and assignments. In this case, the course guide and calendar were written to match the objectives and activities with a nine-week university calendar.

The course guide could be changed to fit any number of course time constraints, i.e., a short four-five week intensive workshop, a nine-week course, a semester course, or a year of related in-service activities. Even with a new

calendar, the text would remain the same as would the performance objectives and test for the course.

Participants found the course guide very helpful in leading them through the text and relating the text to specific course objectives. It tended to cause them to believe that the course was systematically organized. In addition, the Course Guide enhanced the "individualized" nature of the course. Those who wanted to work ahead did so, and those who lagged behind for some reason always had the guidance they needed to catch up.

The instructional procedures used during the course were for the most part successful. Students reported that they approved of course organization (progress tests first, class discussion sessions, development activities, and then a posttest). In fact, they believed they were so well prepared for the posttest that they spent an average of only one and one-half hours studying for the final examination. The activity that received the most criticism from participants was "small group interaction to assess their instructional design evaluations." Though some reported this activity to be of little or no help, others reported that feedback from peers was very beneficial. These mixed reviews on small group interaction indicate that this activity should be studied and either revised or clearly made optional as an instructional procedure. All other instructional procedures were reviewed as beneficial by participants.

The materials and procedures employed during this study were effective in enabling eighty-five percent of the participants to reach mastery on all eight of the technical skills objectives. Fifteen percent of the group did not achieve mastery, but this was due to their inability to complete the objectives in the time alloted for the study. These individuals, however, did master all the objectives on the cognitive tests, and their development activities to date

indicate that they will successfully master the objectives (through completion of their instructional development project) in the near future.

One motivating factor that was present during this study should be discussed. All the participants were enrolled in the course for graduate credit which could be applied toward an advanced degree. This may have provided additional motivation for participants beyond learning for learning sake. Many hours of hard work are required for participants to study the concepts and to develop the skills involved in the eight technical skills. Whether the degree of motivation and dedication observed during this study could be realized through an in-service "points toward recertification" plan such as that found in Teacher Education Centers is yet to be seen.

This validation study has demonstrated that teachers can be taught to use the eight technical skills in the context of designing, developing and evaluating instruction. The average student spent approximately 85 hours learning about and demonstrating these skills. On the average, approximately 90 percent of the teachers achieved each of the technical skills. However, as was expected, there was a wide range in the performance of the students who used the materials which were developed by the teachers. Past experience has shown that additional use of these skills by teachers results in significant time savings in the design of the instruction and improved performance by students.

The cost was $100.00 per student plus a small amount for duplicating their materials. The role of the instructor was one of consultant and manager rather than lecturer. It was shown that the instruction could be replicated in a number of settings and using a variety of administrative arrangements.

References

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