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ABSTRACT

This article describes a jointly planned and jointly evaluated course offered through Washington State University General Extension. The purpose of the course was to improve instruction in elementary classrooms through use of competency-based training materials (Minicourses) from the Far West Laboratory for Educational Research and Development. The Minicourse used, entitled "Minicourse I, Effective Questioning: Elementary Level," was designed to improve the questioning and discussion skills of primary and intermediate grade teachers. Each instructional lesson consisted of the following: (a) the teacher reading handbook material; (b) the teacher viewing instructional film and completing handbook quiz; (c) the teacher viewing a model lesson film, identifying target behaviors, and recording these on a form in the handbook; (d) the teacher preparing and conducting a 10-minute microteaching lesson with a small group of pupils from her own class (this is video recorded and replayed twice); and (e) the teacher reviewing the third replay of the reteach lesson with a colleague. Evaluation of the Minicourse program was undertaken by a comparison of pre- and post-course audio recordings of discussions made in the teachers' own classrooms. (JA)

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School District - University Cooperation to Improve In-Service Teacher Education

Cooperative efforts of school districts and university faculty to improve instruction

State University have jointly experimented with the use of various change strategies to facilitate innovation in the schools. Earlier results of these cooperative efforts are described elsewhere. (1) The purpose of this article is to describe a jointly planned and jointly evaluated course offered through the WSU General Extension. The course and the evaluation procedures were conducted with the assistance of a grant under Title III (Systematic Program for Instructional Improvement) of the Elementary and Secondary Education Act of 1965. The purpose of the course was to improve instruction in elementary classrooms through use of competency-based training materials ("Minicourses) from the Far West Laboratory for Educational Research and Development. (2) Of the various "Minicourses available, the one used here is entitled Minicourse 1, Effective Questioning: Elementary Level. It was designed to improve the questioning and discussion skills of primary and intermediate grade teachers. The extensive background of research, development, and testing of Minicourses has been documented by Walter Borg and others. (3) Key studies are summarized in the Teacher's Handbook,

(4) an element of Minicourse which served as the textbook for the WSU course. The objectives of the Minicourse (Table 1) were used to derive the objectives of the WSU course. These objectives were further analyzed into component behaviors which became the target performance standards for the course. The Minicourse introductory lesson and four instructional lessons required about 75-90 minutes on each of fifteen school days distributed over the several weeks of the WSU course. Each instructional lesson consisted of the following activities:

1. The teacher reads the Handbook material which presents the background research and the rationale for the target behaviors of that lesson.

2. Either alone or with the class, the teacher views the instructional film and completes a quiz covering the Handbook and film material.

3. Next, the teacher views a model lesson on film, identifies target behaviors and records these on a form provided in the Handbook. Identifications are verified or corrected during a replay of the same model sequence.

4. The teacher prepares and conducts a ten minute microteaching lesson with a small group of pupils from her own class. This is video recorded and then replayed twice following instructions in the Handbook.

TABLE 1

Minicourse 1 Objectives and Skills

INSTRUCTIONAL SEQUENCE 1	
Objective	To change teacher behavior (teaching techniques and practices) in order to increase pupil readiness to respond to discussion questions.
Skills Covered	Asking question, pausing three to five seconds, then calling on pupil. Dealing with incorrect answers in an accepting, nonpunitive manner. Calling on both volunteers and nonvolunteers in order to keep all pupils alert and to distribute participation.
INSTRUCTIONAL SEQUENCE 2	
Objective	To improve teacher skills so as to decrease the amount of teacher participation and increase the amount of pupil participation.
Skills Covered	Redirecting the same question to several pupils. Framing questions that call for longer pupil responses. 1. Asking for sets or groups of related facts when formulating information-level questions. 2. Avoiding Yes or No replies. Framing questions that require the pupil to use higher cognitive processes.
INSTRUCTIONAL SEQUENCE 3	
Objective	To increase teacher use of probing techniques in order to guide the pupil to more complete and thoughtful responses.
Skills Covered	Prompting. Seeking further clarification and pupil insight. Refocusing the pupil's response.
INSTRUCTIONAL SEQUENCE 4	
Objective	To reduce teacher behavior that interferes with the flow of the discussion.
Skills Covered	Observing the following rules: 1. Teacher should not repeat his own questions. 2. Teacher should not answer his own questions. 3. Teacher should not repeat pupil answers.

5. It is suggested that the third replay of the reteach lesson be reviewed with a colleague. This step was considered optional, but was completed by many participants.

In brief, each lesson consisted of a three-phase sequence: instruction, practice, and feedback.

Initially, Walla Walla central office personnel conducted a general session on the Minicourse at each participating elementary school. This session provided information to help teachers decide whether to sign up for the course and to begin the orientation of those who would enroll. The film introduction to the course provided an overview of the objectives and approach of the course. A total of 45 teachers from four elementary schools were enrolled in the two sections of the course. All participants were registered for one semester credit. The course was taught by a regular faculty member of the WSU Department of Education.

General sessions were conducted in each school to provide teachers background information on questioning strategies and on the Minicourse. Instructional and modal lesson

films were available on schedule at each participating school. Teachers viewed these either individually or in groups. Microteaching was conducted most satisfactorily in a room where equipment could remain set up and ready for operation. Each participant planned the microteach session and conducted it with his or her own pupils, who, by the way, were generally very willing to participate.

The instructor conducted the general sessions and made phone contact with the schools periodically to answer any questions which arose. Generally, the sequence of activities for the Minicourse proceeded as planned and there were few questions. Minor difficulties were encountered in following the sections of the Handbook and in the mechanics of scheduling rooms, equipment, materials and pupils. The course concluded with a general session and evaluation.

Evaluation of Course Participants' Performance

Research studies of the Far West Laboratories have established that when teachers follow the prescribed instructional sequence, the target behaviors are attained at a satisfactory level, and these are retained over a considerable period

of time without appreciable loss (5). Because of this research evidence, major evaluation of the course work of individual participants was based upon a record of the completion of the prescribed sequence of activities. Scheduling charts of the component activities, certification of completion by the building principal and submission of the completed Handbook were used as evidence of completion of the course. All but two of the 45 registrants completed the course. Individual accomplishments were discussed with the instructor during the final class session, and all participants completed a form evaluating their own growth and their attitude toward the experience.

Evaluation of the Minicourse Program

Quite apart from course grades, an evaluation was made of the effectiveness of the Minicourse program. This phase of the evaluation was undertaken by a comparison of pre- and post-course audio recordings of discussions made in the teachers' own classrooms. The Walla Walla District staff agreed to arrange for and obtain recordings from a random sample of teachers expressing an interest in the course.

A total of 54 pre-tapes and post-tapes were obtained; these were coded and scrambled in the Walla Walla District before being sent to Washington State University for scoring. Scorers on the campus had no knowledge of names of teachers, schools, or whether tapes were pre- or post-course samples. Procedures for scoring the tapes were patterned after those used at the Far West Laboratory. Instructions for scoring were obtained from the Laboratory, along with transcripts of classroom discussions from their files. These scripts were scored by the course instructor for occurrence of specific teacher skills covered in Minicourse I and were returned to the Laboratory for checking. In this way, scoring procedures at Washington State University were standardized with those at the Laboratory. A team of scorers at Washington State University was trained until they reached an acceptable level of interrater reliability.

In the process of scoring the 54 tapes, it was discovered that a number of tapes had to be eliminated because of inadequate length, poor recording quality or other nonstandard

conditions. The data reported here are based on a set of matched pre- and post-tapes for thirteen of the forty-three teachers who completed the course. Each tape was scored for occurrence of nine behaviors which were expected to change as a result of teacher participation in Minicourse 1.

Results from Analysis of Pre- and Post-Course Tapes

Results of the analysis of pre- and post-course tapes are presented in Table 2. Participants made the expected changes in their behavior on all but one of the nine measures. To provide an added dimension for evaluation, results from one of the Far West Laboratory field tests (6) are also presented in the Table. Direct comparison can be made on four measures: percentage of teacher talk, length of pupil response, number of one word pupil responses, and percentage of questions that call for higher cognitive pupil responses. Measures stated in terms of the "number of times" a behavior occurred are not directly comparable because of a five minute difference in length of the standard tape sample. Nevertheless, inspection shows changes in the same direction

TABLE 2

Comparison of Pre- and Post-Minicourse Tapes[1]

Behavior Compared	Walla Walla Teachers		Far West Laboratory Field Test Teachers	
	Pre-tape Mean	Post-tape Mean	Pre-tape Mean	Post-tape Mean
1. Percentage of discussion time taken by teacher talk	43.8	24.8	51.6	27.8
2. Number of times teacher used redirection	24.7	38.2	26.7	40.9
3. Number of times teacher used probing	6.7	6.3	8.3*	13.9*
4. Number of times teacher repeated own questions	.3	.1	13.7	4.7
5. Number of times teacher repeated pupil answers	4.1	1.0	30.7	4.4
6. Number of times teacher answered own questions	1.2	.2	4.6	.7
7. Length of pupil responses in words (based on five-minute samples of pre- and post-tapes)	11.6	13.8	5.6	11.8
8. Number of one word pupil responses (based on five-minute samples of pre- and post-tapes)	7.0	5.1	5.8	2.6
9. Percentage of total questions calling for higher cognitive pupil responses	43.3	65.3	37.3	52.0

[1]Unless otherwise noted, the Walla Walla data are based on class discussions approximately 15 minutes in length; the Far West Laboratory data are based on twenty-minute discussions.

*Represents a total of "prompting and further clarification" in Far West Laboratory data.

and of similar magnitude as those in the Far West Laboratory field test.

It is evident that the entry level performance of Walla Walla teachers was farther in the desired direction on all of the measures that are directly comparable, except the number of one word responses in a 5 minutes sample. It is possible that this higher entry level was due to previous change efforts mentioned above. At any rate, gains had to be registered from a more advanced initial level. Nevertheless, Walla Walla post-tape scores exceeded the Laboratory's field test scores on all directly comparable scores but the number of one word responses. One explanation of these differences is that the Walla Walla teachers used the final, polished version of Minicourse 1, whereas the Far West Laboratory teachers used an early developmental version.

A brief examination of each of the nine measures affords some additional appraisal of teachers' attainment of the course objectives.

1. Percentage of discussion time taken by teacher talk showed the largest percentage gain. This measure is perhaps the single most significant one since it reflects the results of many

of the course objectives which are intended to give "air time" to pupils rather than the teacher. The post-tape score is slightly better than that of the Far West Laboratory sample.

2. Redirection occurs when a teacher calls upon different pupils to respond to the same question. If the teacher asks a question, a pupil responds, and then the teacher redirects the same question to three other pupils, this is scored as three occurrences of redirection. Redirection allows pupils to "carry the ball" in discussion. It is a technique which comes through clearly in the Minicourse lessons. The increase in the use of this technique was approximately the same for Walla Walla as the Laboratory sample, although the total scores were lower.

3. One difference in approach to the scoring of the Walla Walla tapes was that instances of prompting and asking for further clarification were tallied together as "probing." The reason for combining them is that both assess the extent to which teacher questions pursue more complete answers from pupils. Probing occurs when the teacher asks a question, the student

responds, and then the teacher asks the same student another question (the "probe") to elicit a more complete, thoughtful response. This was the only measure which did not show movement in the direction of course goals. This objective may be one for which some additional follow-up would be productive. The Coordinators Handbook for the Minicourse contains suggestions for such a program.

4, 5, 6. The so-called "negative behaviors," which tend to increase teacher domination of discussion time, occurred at a low level in the pre-tapes. Even though reductions of these practices were small, the very low scores of Walla Walla teachers are quite in harmony with course objectives. It is worth noting that the common trait of repeating a pupil answer was reduced to one-fourth of its pre-course level.

7, 9. The length of pupil response and the number of one word answers are measures which reflect most directly the pupil growth resulting from the course. The Minicourse recognizes that part of the training of teachers is the training of pupils to respond to the new teacher behaviors. When answers are longer pupils

are likely to be grappling with significant problems at higher levels of Bloom's taxonomy of cognitive objectives (7). Predicted changes did occur in these measures.

9. Percentage of higher cognitive questions was greater for the Walla Walla sample than for the Laboratory sample on both the pre-tape and post-tape. It is difficult to analyze just what influences were at work here. Perhaps previous district programs are reflected. It is gratifying to recognize the potentiality this measure may imply for the quality of discussion in the classrooms of these participants.

Teacher Reaction to the Course

Teacher response to Minicourse I as reflected in the concluding questionnaire, was overwhelmingly favorable. Ninety-seven percent of the forty respondents considered it either an "excellent" (60%) or "good" (37.5%) experience. They considered the most valuable learnings to be the self-evaluation-correction afforded by the microteaching and the practice of questioning strategies. Forty-two percent of the respondents reported using all of the

skills in their classroom at the conclusion of the course. Seventy-three percent reported that they noticed changes in pupil behavior which they could attribute to the Minicourse. Furthermore, the teachers considered the course more valuable than their previous inservice training (83%), extension courses (75%), or on-campus education courses (78%). Seventy-three percent reported that they would be interested in participating in other such Minicourses. Another twenty percent would participate under certain altered conditions, for example, if the course were offered earlier in the year. Such endorsement indicates that this particular use of the Far West Laboratory Minicourse was addressing skills teachers felt to be important.

In summary, the preponderance of indications is that the use of the Far West Laboratory Minicourse, Effective Questioning: Elementary Level in the Washington State University General Extension class did in fact contribute significantly to the improvement of the techniques posed as objectives for the course. Somewhat less directly, and by implication, it contributed to the perfor-

mance of elementary pupils in those classrooms. A competency-based approach to inservice training was found to be effective in skills which can be identified, modeled, and practiced with appropriate feedback. Moreover, this approach was highly acceptable to teachers under the conditions of this course. Having instructional materials readily available and being able to practice skills in the school with one's own pupils were evidently factors which enabled a significant percentage of each building faculty to participate. Rarely does an inservice program receive such enthusiastic response.

The course also identified new approaches for university - school district cooperation. The careful development and research behind these materials enables a high level of mastery of the objectives for a course with a minimum of involvement of campus personnel. At a time of growing interest in field-based instruction, such Minicourses offer a new possibility for off-campus instruction.