DESCRIPTORS- *EDUCATIONAL PROGRAMS, *INSERVICE TEACHER
EDUCATION, *INSTRUCTION, *MICROTEACHING, *PROGRAM
DESCRIPTIONS, SKILL DEVELOPMENT, TEACHER EDUCATION, TEACHING
SKILLS, BEHAVIOR DEVELOPMENT, INTERNSHIP PROGRAMS, TEACHER
INTERNS, STANFORD TEACHER COMPETENCE APPRAISAL GUIDE,
STANFORD UNIVERSITY, STANFORD TEACHER EDUCATION PROGRAM,
CALIFORNIA,

    DESCRIBED IS THE USE OF MICRO-TEACHING IN THE STANFORD
TEACHER EDUCATION PROGRAM. SECTION 1 BRIEFLY INTRODUCES AND
PROVIDES A SCHEDULE FOR THE 1967 MICRO-TEACHING CLINIC.
SECTIONS 2 AND 3 PROVIDE DESCRIPTIONS OF THE 1965 AND 1966
SUMMER MICRO-TEACHING CLINICS RESPECTIVELY. INCLUDED ARE
DISCUSSIONS OF (1) BACKGROUND INFORMATION ON MICRO-TEACHING,
(2) PRELIMINARY PLANNING, FACILITIES, AND PERSONNEL
UTILIZATION, (3) THE STRUCTURE AND FORMAT OF THE CLINICS, AND
(4) THE EVALUATIVE DATA OBTAINED DURING EACH YEAR. SECTION 4
DISCUSSES (1) MICRO-TEACHING AS A NEW APPROACH FOR INSERVICE
TEACHER EDUCATION, (2) THE TECHNICAL SKILLS OF TEACHING, AND
(3) DEVELOPING SPECIFIC TEACHING SKILLS THROUGH
MICRO-TEACHING. TABLES OF DATA FOR THE 1965 AND 1966 CLINICS
ARE APPENDED. (RS)

STANFORD TEACHER EDUCATION PROGRAM

MICRO - TEACHING:

A DESCRIPTION

Stanford University

1967

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PREFACE

Microteaching is a teacher education technique developed by the School of Education at Stanford University and first applied as a combined training and diagnostic tool in Stanford's teacher intern program in the summer of 1963. Essentially constructed, but real teaching, the technique allows teachers to apply clearly defined teaching skills to carefully prepared lessons in a planned series of five to ten-minute encounters with a small group of real students, often with an opportunity to observe the results on videotape. Its distinction lies in the opportunity it provides teachers for immediate and individual diagnostic evaluation of teacher performance by colleagues, supervisors and participating students and for measuring progress in specific teaching techniques. As an adjunct to either pre-service teaching experience in the school or in-service programs of teacher improvement, micro-teaching, we feel, adds relevance to training procedures that have heretofore had the limited merit of theoretical discussions followed with trial by fire.

Building on its initial effectiveness, we have continued to evaluate and upgrade the microteaching program each year. We continue to build new patterns for its use and to identify and amend its shortcomings. As a vehicle for research on the teaching-learning process and teacher behavior, the microteaching program has given us new insight into these phenomena and suggested areas of further study.

We offer this collection of documents not as a conceptual framework for a micro-teaching program, but as a record of our working experience as the program enters its fifth year. We do feel this experience should encourage those concerned with improving the quality of instruction to consider the further investigation of micro-teaching as a new approach to controlled practice in teaching.

Dwight W. Allen

Associate Professor of Education
Stanford University, Stanford, California

September 1967

SECTION I

Introduction to the 1967 Edition,

1967 Micro-Teaching Schedule

INTRODUCTION TO THE 1967 EDITION

This edition goes to the collater as the 1967 summer session is in progress. The reader will get the basic picture of the 1967 clinic by first reading the description of the 1966 clinic by Cooper and Stroud, and then looking at the micro-teaching schedule for 1967 which is on the following page. Major changes are the inclusion of a 40-minute 20-pupil diagnostic lesson at both the beginning and end of the summer, the use of an experimental clinical training session during the first two weeks of microteaching, the addition of a new communication skill, and the attempt to use a "preteach" and a "reteach" during the micro-class.

Answers are being systematically sought to the following questions this summer:

(1) What additional or different information does one get by examining a 40-minute, 20 pupil diagnostic lesson as compared to that gained from a 5 minute 4 pupil diagnostic?

(2) What effect does the order of skills practiced have on the attainment of the skills? (asked in relation to reinforcement and silence)

(3) What modeling procedures produce the most powerful change in intern behavior - symbolic (written), perceptual (videotape), or reinforcement (each is his own model)?

(4) Does a 24 hour planning interval between a teach and a reteach give greater behavior change than a brief 15-minute planning interval.

(5) Does the use of a reteach or a preteach (trying an excerpt of the next day's lesson with a comparable group of students) enhance the intern's ability to use the skill being practiced?

Richard J. Clark
Coordinator of Supervision

August, 1967

MICRO-TEACHING SCHEDULE - SUMMER, 1967

Week of June 26	July 3	July 10	July 17	July 24	July 31	August 7
M T W Th F S	M T W Th F S	M T W Th F	M T W Th F	M T W Th F	M T W Th F S	M T W
d D D r s rs rs	rs rs P	p p cc cc	Plan unit sc sc sc sv sv	sv sv l l l l		d D D

Symbols and Explanation:

d = 5 minute diagnostic lesson taught to 4 pupils
D = 40 minute diagnostic lesson taught to 25 pupils

r = reinforcement
s = silence and non verbal cues
p = probing

      each Intern will have approximately 2 hours of clinical training and practice in each of these skills.

cc = completeness of communication - each Intern will teach and reteach one lesson

sc = set and closure
sv = stimulus variation
l = inquiry

      these represent a package of skills for effective presentations

Note: Individual lessons are typically 5 minutes long and are planned and taught by the Intern, critiqued with a supervisor, then replanned and retaught to a new group of pupils

      Mirco-class lessons are about 20 minutes long, are planned and taught as parts of a 12 lesson unit by a team of supervised interns to a constant group of students.

You will receive training in using each of the skills. Through July 11 this training will be given entirely within the micro-teaching clinic. The following training lectures are anticipated.

July 12-completeness of communication, July 17-completeness of communication in retrospect, July 19-set and closure
July 25-stimulus variation
July 31 - inquiry

SECTION II

Micro-Teaching, Summer 1966,

Appendix A - Materials

Appendix B - Tables

Appendix C - Description of Micro-Teaching

Micro-Teaching 1966 Summer Schedule

THE STANFORD SUMMER MICRO - TEACHING CLINIC, 1966.

by

James M. Cooper
and

Thomas Stroud

Stanford University
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MICRO-TEACHING SUMMER 1966

Micro-teaching is a scaled-down teaching encounter which has been developed at Stanford University to serve 3 purposes: (1) as preliminary experience and practice in teaching, (2) as a research vehicle to explore training effects under controlled conditions, and (3) as an in-service training instrument for experienced teachers. In micro-teaching the trainees are exposed to variables in classroom teaching without being overwhelmed by the complexity of the situation. They are required to teach brief lessons (5 to 25 minutes) in their teaching subject, to a small group of pupils (up to 5). These brief lessons allow opportunity for intense supervision, video-tape recording for immediate feedback, and the collection and utilization of student feedback. The research to be reported in this article was done in the fourth micro-teaching summer clinic which was held as a pre-internship training program for the Stanford Secondary Teacher Education Program for 1966.

As in past micro-teaching clinics the focus was on instructing the interns in the use of certain technical skills of teaching, and allowing the interns the opportunity of practicing these skills in the micro-teaching clinic under the close supervision of a trained supervisor.

Planning and Objective of Micro-Teaching, Summer, 1966

Prior to the 1966 micro-teaching clinic a series of seminars was held to discuss, refine, and reformulate the structure and objectives of the program. The Stanford Teacher Education Program staff headed by Drs. Allen, Bush, and McDonald developed the following teaching skills for the summer clinic:

1. Reinforcement

2. Varying the Stimulus

3. Presentation Skill - Set Induction

4. Presentation Skill - Lecturing and use of A-V

5. Illustrating and Use of Examples

6 Presentation Skill - Closure

7. Student-Initiated Questions

Also included were two experimental training studies. During the 3rd week an experiment was conducted on higher order questioning techniques. In the 7th week an experiment dealing with techniques of discipline and control was conducted. The results of these experiments will not be reported here as they were conducted under the auspices of the Stanford Research and Development Center in Teaching.

The Micro-teaching clinic was held in eight classrooms located on Stanford's Inner Quad. All of these eight classrooms contained video-tape units, and all lessons taught were video-taped. These video-tape units are portable recording instruments which make possible a visual and audio tape of the teaching performance. These tapes are available for immediate replay by trained technicians and are used as stimulus objects during the supervisory conferences. Each of the eight class-rooms were standardly equipped with regard to blackboards, audio-visual equipment, and desks.

The micro-teaching students were recruited from local high schools and were trained for a period of 3 hours in the use of the Stanford Teacher Competence Appraisal Guide. In addition, the students received one-half hour's training in the specific evaluative instruments of each technical skill the day they were to be taught by interns using that skill. These students were paid for their participation during the summer. Teams of four students of the same grade level with mixed ability composition (grades 8 - 11) were assigned to each of the micro-teaching rooms.

They were rotated after each lesson so the reteach sequence would be taught to a different, but comparable team.

The Stanford supervisors were doctoral students selected for their teaching competence in their respective subject matter fields. Each supervisor was assigned a group of interns (4 to 9 interns each) in his area of teaching competency. This supervisor served a variety of functions. Among these were: (l) resource person, (2) advisor, (3) interpreter of student feedback, (4) rater, and (5) general morale booster. The supervisors also received several hours instruction in the use of the Stanford Teacher Competence Appraisal Guide. There was no opportunity however for training in the instruments evaluating the technical skills. However, they did attend the lectures given to the interns describing each of the skills.

The Stanford Teacher Competence Appraisal Guide consists of a thirteen item, seven-interval, forced choice scale biased toward superior ratings to eliminate J-curve effects. This appraisal guide is now in the third year of usage and has been subjected to much statistical study. The guide is the evolution of some seven years of Stanford experimentation with and revision of teaching competence scales. The scale as such consists of thirteen, semi-independent items constructed from the results of a factor analysis on a guide composed of twenty-four items. In several studies the guide has had adequate reliability over items and has been connected with student test performance in an analysis of covariance test.[1]

In previous summers we have depended on the Stanford Teacher Competence Appraisal Guide to evaluate the interns' competence in the specific technical skills of teaching. However, there was a dissatisfaction with the Appraisal Guide for

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[1]Allen, Dwight W., and Fortune, Jimmie C., An Analysis of Micro-Teaching: A New Procedure in Teacher Education, Stanford Univ., Stanford, Calif.,1965.

this purpose. The main reason being that the Appraisal Guide was designed to measure overall teacher competency. None of the items on the Appraisal Guide are specifically designed for any of the technical skills that were the focus of the micro-teaching clinic. It was very difficult to tell, for example, which items on the Appraisal Guide specifically measured the skill of reinforcement techniques. A decision was made at the beginning of the summer to construct evaluative instruments which were designed to measure progress in each of the technical skills that were included in the micro-teaching clinic. Because of the pressing demands of limited time, these instruments were not validated nor was reliability established prior to their use.

Description of Structure and Format

There was also another structural change in the micro-teaching clinic this year. In previous years the interns would teach a lesson for five minutes, critique the lesson with their supervisor making use of the video-tape units, and immediately reteach the lesson over again to a new group of students. In last year's clinic we discovered almost no behavior change from the teach to the reteach as measured by the students' ratings. An hypothesis was tested this year that the reason for the lack of improvement between the teach and reteach was because there was not sufficient time between the teach and reteach to allow the intern to make sufficient behavior changes. This year the format was as follows: (1) teach for 5 minutes, (2) critique for 10 minutes, (3) break for 15 minutes so that the intern could plan the changes to be made in the reteach lesson (during this break another intern went through a 5-minute teach and 10 minute critique), (4) reteach to a different group of students for 5 minutes, (5) critique for 10 minutes. The total teaching time was

10 minutes and the total time allotted for the critique was 20 minutes. The results

of our hypothesis will be discussed later in each skill's analysis and in the Summary.

On the first day of the micro-teaching clinic each of the 145 interns taught a

five minute diagnostic lesson. The purpose of this first diagnostic lesson was to get

an evaluation of the interns' beginning performance, and to expose the interns to

the Stanford video-tape and supervisory system. The evaluation ratings of the

interns' performance were made by both a micro-teaching student team and a Stanford

supervisor on the Stanford Teacher Competence Appraisal Guide. The Appraisal Guide

was used here because we wanted to obtain an overall teaching performance evaluation

rather than an evaluation of one particular skill.

The first two weeks following the diagnostic lesson the interns taught four

teach-reteach cycles. The first two cycles focused on the skill of Reinforcing

students in order to obtain increased class participation. The second two cycles

focused on the technical skill of Varying the Stimulus Situation.

At the end of the first two weeks there was a seven day break. During this

break the interns participated in a training study experiment on higher order question-

ing. Also during this break the interns were organized into team teaching groups

in their subject matter areas in preparation for micro-teaching during the 4th, 5th,

6th, and 7th weeks of the clinic. During weeks 5 and 6 the interns taught individual

lessons of the teach-reteach nature as well as the micro-class type of lesson.

The micro-class type of lesson presented a different format. During weeks

4-7 the interns were organized into team teaching groups. In each group there

were between 2 - 4 interns. Each group prepared a twelve day teaching unit under

the direction of an assigned supervisor. The prepared unit was taught to the same

student team for the entire twelve days. The teaching load was distributed equally

among the interns in the form of 20-25 minute lessons with supervisory conferences of similar length following.

Statistical Design and Analysis

1. Five-Minute Lessons

As described above, the teach-reteach format, where the intern teaches a five-minute lesson and, twenty-five minutes later, reteaches the lesson to another class, was used in weeks 1, 2, 5 and 6. The statistical design and analysis of the ratings of these lessons, as recorded by the students and supervisors on the technical skills instruments, was carried out with the purpose of detecting improvements in the interns' performances from the teach to the reteach, and from the first teach-reteach cycle to the second cycle of the same skill. Analyses were carried out using separately the supervisors' ratings and the mean ratings of the students in the class, averaged over all items of the instrument.

In order to eliminate from the estimated changes in performance any existing rating bias in the students, interns were paired off so that if one intern taught class A and retaught the lesson to class B, the other intern in the pair would teach class B and reteach class A. Thus improvement in the interns' performances was estimated, in an unbiased way, by increases in the combined ratings of the intern-pairs. Although this method does not allow assessment of indivdidual interns, statistical inferences about the group will have more validity than if the effects of rater bias had not been eliminated. The rater-bias effect was shown to be significant in the Appraisal Guide ratings of the first diagnostic lesson (see Appendix Table 15), hence, it would also be expected to be significant in the ratings of the technical skills.

Table 1 gives the analysis of the ratings for the skill Reinforcement (Week 1).

N is the number of intern-pairs for which both teach and reteach ratings were available for both interns. If X represents the average gain of two paired interns (interpreting loss as a negative gain), then $\overline{X} = \sum X/N$, $s = \sum (X-\overline{X})^2 / (N-1)$, and $t = \sqrt{N}\,\overline{X} / s$. The next column gives the level at which t is significant (2-tailed test). The levels considered are .10, .05, .01 and .001, so that "NS" represents a value not significant at the .10 level. The quantity $\sqrt{2}s$ is also listed, as it gives an estimate of the standard deviation of the gains of <u>individual interns</u>, after rater-bias effects have been eliminated. The average gain of individual interns is given by $\overline{X}$. Table 1 shows, for both student ratings and supervisor ratings, all gains to be significant except from the first lesson reteach to the second lesson teach.

The analysis of the ratings for Varying the Stimulus (Week 2) is given in Table 2 (Appendix). We note here that the gain from first lesson teach to first lesson reteach, as rated by students, was not significant. However, the overall gain from first lesson teach to second lesson reteach was more strongly significant (.001) than the gain within the second lesson (.01). It is also to be noted that the supervisor ratings show a significant <u>loss</u> from the first lesson reteach to the second lesson teach.

Illustrating and Use of Examples (Week 5) and Student-Initiated Questions (Week 6) each had only one teach-reteach cycle. The analyses are given in Tables 3 and 4 respectively. We note that the gains in performance were not significant. No supervisors were present for Student-Initiated Questions. Instead, the interns rated themselves and also collected the students' ratings. We note that student ratings were obtained for only 27 intern pairs. It is conjectured that this was because the interns kept the forms for the sake of the comments written on them.

2. Micro-Classes

Because there was no teach-reteach cycle in the micro-classes (Weeks 4

through 7), and because sufficient flexibility in the teaching pattern was present to

permit interns to occasionally teach two micro-class lessons in one week (and none

at all some other week), it was not possible to analyze gains in performance of

individual interns (or even of intern-pairs). Tables 5, 6, 7 and 8 give the means

and standard deviations of the ratings. For student ratings, the averages of the

ratings given by the four students in the class were used. It is for this reason that

the student ratings have lower standard deviations than the supervisor ratings.

These quantities are given, item by item, for both the Appraisal Guide and the

technical skills instruments. Since items 12 and 13 of the Appraisal Guide were

not used consistently by the raters, only the results of the first 11 items are tabulated.

During Week 7 no specific skill was emphasized, and only the Appraisal Guide was

used.

As mentioned in the preceding paragraph, the Stanford Teacher Competence

Appraisal Guide was used in rating the micro-classes (Weeks 4, 5 and 6), as were

also the technical skills instruments. One reason for this was to provide data on

the basis of which one could decide whether the technical skills instruments do, in

fact, measure variables which are not measured by the Appraisal Guide. The null

hypothesis was formulated that the interns' performances on the technical skills

instrument for a given skill could be fully predicted, except for errors of measure-

ment, by a multiple linear regression on his scores for the same lesson as measured

by the Appraisal Guide.

A method of testing this hypothesis, based on Wilks' Λ-statistic, is described

by Rao[1], pp. 467-472. The method, essentially, performs a multiple regression of the technical skills instrument scores based on the Appraisal Guide scores. An observation vector for this regression consists of the itemized Appraisal Guide scores of particular lesson by a particular rater, together with the itemized technical skills instrument scores of the same lesson by the same rater. The fact that some of these sets of scores are ratings of the same lesson by different raters is not used at this point. Then a one-way multivariate analysis of variance is performed on the regression residuals of the technical skills instrument scores. If these residuals vary significantly from intern to intern, it is concluded that the technical skills instrument scores carry information not contained in the Appraisal Guide scores. Actually, the multiple regression coefficients never need be computed, since the $\wedge$-statistic is based only on determinants of the sums-of-products matrices.

Since this analysis requires several ratings of the same performance, only the individual student ratings were used. Ratings were used only where both the Appraisal Guide and technical skills instrument ratings of the same performance by the same rater were available and identifiable. If an intern taught twice in one week, only the ratings from one lesson were used.

The analysis of the results is presented in Table 9. Wilks' $\wedge$ is followed by m, where $m = t - \frac{1}{2}(p + q + 1)$. Here p is the number of items on the technical skills instruments, q is one less than the number of interns (cf. "D.F. between" Tables 10, 11 and 12), and t is the total number of degrees of freedom (one less than the total number of ratings obtained). The fifth column is $-m \ln \wedge$, whose distribution under

[1]Rao, C.R. (1965), Linear Statistical Inference and Its Applications, Wiley, New York.

the null hypothesis is approximately chi-square with pq degrees of freedom. Because of the high degrees of freedom, significance was judged on the basis of the normal approximation to the chi-dquare, as stated in Arkin and Colton,[2], p.121. The critical value for significance at the .001 level (one-tailed test) is 3.09. This value was exceeded on all three skills, confirming very strongly the informative value of the technical skills instruments.

When the computation for the above analysis was performed, the sums-of-products matrices were printed out, making possible the estimation of reliability coefficients for the technical skills instruments, and for the Appraisal Guide as used in measuring these technical skills. We do not reproduce the matrices here, but we do present the Components of Variance Analysis, which we now describe.

We use the same mathematical model that is used in test theory[3]. Letting X be a rating (observed score) of an intern's performance, we assume $X = T + E$, where T is the true score or performance and E represents measurement errors, incorporating all subjective tendencies of the rater. T will be the same for any performance, regardless of the rater; whereas E will vary from rater to rater. In this model the T's and E's are treated as though they had been sampled independently from large, normally distributed populations. Of course the X's for a given performance will be dependent, because of the common term T. This model coincides exactly with the one-way classification of the Random-Effects Model of Analysis of Variance, also known as Components of Variance, which is treated

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[2] Arkin, H. and Colton, R.R. (1950), Tables for Statisticians, College Outline Series, Barnes & Noble, New York.

[3] Gulliksen, Harold (1950), Theory of Mental Tests, Wiley, New York.

by Graybill[4] . Tables 10, 11 and 12 give the degrees of freedom and mean squares

in the analyses of the between-intern and within-intern components for Weeks 4, 5

and 6. The significant F-ratios indicate that the ratings do, in fact, measure

actual differences between interns. If MS_B and MS_W represent the mean squares

between and within, respectively, then the variance of the true scores σ_T^2 is estimated

by $(MS_B - MS_W) / n$ and the error variance σ_E^2 is estimated by MS_W, where the effec-

tive number of raters per inten, n, is given by Graybill as $n = \dfrac{N^2 - \Sigma n_i^2}{N(A - 1)}$, where n_i

is the number of raters on the ith intern, A is the number of interns, and N is the

total number of ratings used. As mentioned above, the ratings used here were those

used in the calculation of Wilks' Λ. The reliability coefficient of the population is

defined by $r_{xx} = \sigma_T^2 / \sigma_X^2 = \sigma_T^2 / (\sigma_T^2 + \sigma_E^2)$. Thus the reliability coefficients

were estimated by substituting into this formula the estimates of σ_T^2 and σ_E^2 . The

reliability coefficients may appear low; it must be borne in mind that the subjective

element in the rating process is appreciable, so that frequently two raters rating

the same performance will differ more than one rater rating two different interns;

this will be especially true if the group of interns is fairly homogeneous.

In order to assess the progress of the interns through the micro-class portion

of the program, a two sample t-test was performed on weeks 4 and 7, as rated by

the Appraisal Guide. Table 13 was constructed on the basis of the data in Tables

5 and 8, showing the mean gain from week 4 to week 7, the pooled variance of

weeks 4 and 7, and the Students' t-statistic. Since the sample sizes for weeks 4

and 7 were almost equal, the pooled variance s_p^2 was obtained by averaging the

squared standard deviations for weeks 4 and 7. To obtain t, the mean gain was

multiplied by the factor $\sqrt{\dfrac{1}{s_p^2(1 / N_1 + 1 / N_2)}} = \sqrt{\dfrac{53}{s_p^2}}$ taking $N_1 = N_2 = 106$.

[4]Graybill, F.A. (1961) <u>Introduction to Linear Statistical Models</u>, McGraw-Hill, New York

Under the assumption of equal variances for weeks 4 and 7, significance for the t-ration was calculated on the basis of 210 degrees of freedom. It can be deduced from the data in Tables 5 and 8 that this assumption fails to hold in four cases (marked with asterisks in Table 13). However, because the sample sizes are almost equal, dropping the assumption of equal variances is equivalent (assuming approximate normality) to merely a small drop in degrees of freedom, which does not change the significance level for any of these 4 items.

Table 13 shows a general increase in scores from Week 4 to Week 7 as rated by the students, and a general decrease as rated by the supervisors. These trends are confirmed by a survey of the micro-class data for Weeks 5 and 6. Although the reason for this phenomenon is not evident, the ratings were taken three weeks apart, and it is possible that the rating patterns of either the students or the supervisors did not remain constant over this period of time.

3. Diagnostic Scores

Means and standard deviations of the initial and final diagnostic scores, as rated by students and supervisors, is presented item-by-item, in Table 14. The mean gains are also presented; and, for the total of the first 11 Appraisal Guide items, both the mean and standard deviation of the gains appears. The gain for each intern is simply his final score minus his initial score. The null hypothesis that the mean gain is zero is tested and rejected at a very high level of significance (beyond the .00001 level).

The above analysis was carried out ignoring the effects of rater bias. A one-way analysis of variance (Tables 15 and 16) shows, however, that the effect of rater bias is significant, i.e., that one rater (superivor or class of students) will have a constant tendency to rate above or below another rater. The analysis is

carried out item by item for students (class averages) and for supervisors on the initial diagnostic scores (Table 15) and the final diagnostic scores (Table 16).

Description of Content

1. Reinforcement

During the one hour instruction session on this skill the interns were introduced to the power of reinforcement through the use of examples. Experimental evidence and anecdotes were presented regarding reinforcement. The interns were also told of the experiment done with the previous year's interns regarding the use of reinforcement to increase student participation. Thus success of this experiment is what prompted the incorporation of reinforcement as a technical skill for this summer's micro-teaching.

The interns were instructed to reinforce their students responses in the micro-teaching classes. This reinforcement was divided into several categories:

1. Positive non-verbal reinforcement

    a. nods and smiles

    b. teacher moves toward pupil

    c. teacher keeps eyes on pupil

    d. teacher writes the pupil's response on the blackboard

2. Positive verbal reinforcement

    Following a pupil response the teacher should use words and phrases such as "Good", "Fine", "Excellent", "Correct", etc., or otherwise verbally indicating pleasure at the pupil's response.

The interns were also alerted to teacher actions and responses which act as negative reinforcement and tend to decrease pupil participation. For example:

a. scowls or frowns

b. moves away from pupil

c. eyes not on pupil

d. responses such as "No", "Wrong", and "That's not it."

e. expressions of annoyance or impatience

At the end of the instruction period the interns were told to plan 5 minute lessons of their own choosing, and to concentrate on incorporating the ideas of positive reinforcement into their lessons in order to obtain increased participation.

Results of Reinforcement Training

In order to measure the results of the reinforcement training a special evaluative instrument was drawn up. See Appendix. As has been previously mentioned the interns had four opportunities (two teach-reteach cycles) to practice the skill of reinforcement. Number 1 refers to the first teach, number 2 to the first reteach, number 3 to the second teach, and number 4 to the second reteach. Improvement between lessons 1 and 2 was significant to the $p < .001$ level, but improvement was not significant between lessons 2 and 3, as measured by both students' and supervisor ratings. Between lessons 3 and 4 there was improvement significant to the .05 level for student ratings, and .001 for the supervisor ratings. Between lessons 1 and 4 there was a gain in level of performance significant to the .001 level for both students' and supervisor ratings.

One hypothesis for the lack of significant improvement between lessons 2 and 3 is that a time period of two days elapsed between these lessons, and the effects of one day's practice was not sustained during this two day layoff.

Another hypothesis is that these two lessons, 2 and 3, were different in

content, and in lesson 2 this was the second time the intern had received the benefit of a critiquing session on lesson 1, but had not received a prior critiquing for lesson 3, because that lesson content had not been taught before. For the statistical analysis of the data see Appendix B , page 1 .

2. Varying the Stimulus

For an edited transcription of the one hour instruction session presented to the interns on the skill of varying the stimulus see Appendix A , page 2 . As with all the other technical skills a special evaluative instrument was constructed to measure the characteristics unique to Varying the Stimulus. See Appendix A , page 7 , for this instrument and for an edited transcription of the instruction given to the interns.

The students' ratings showed no significant gain between lessons 1 and 2, or 2 and 3. For lessons 3 and 4 there was a positive improvement significant to the .01 level. Between lessons 1 and 4 there was an improvement significant to the .001 level.

Supervisory ratings showed a positive improvement significant to the .001 level for lessons 1 and 2, 3 and 4, and 1 and 4. For lessons 2 and 3 there was a regression in performance level significant to the .05 level.

Conclusions

1. For the first time during the clinic a strong discrepancy appeared between the students' ratings and that of the supervisors. This phenomena will appear again in later skills. An interesting conclusion that we have drawn is that the students' ratings are more reliable than supervisors' ratings. Our reasoning is something

like this: A supervisor will critique an intern's lesson during the teach cycle and point out certain aspects, which if changed, he believes will improve the lesson. On the reteach the intern incorporates the change into the lesson, and the supervisor then judges the lesson to be superior to the earlier one because the intern performed the suggested changes. On the other hand, two independent groups of students judged the first teach and reteach lessons to be of about the same performance level. Because of this reasoning we have for the last three years of microteaching used student ratings as being the more accurate measure of change in performance. An alternative hypothesis is that the students may not be able to distinguish improvement changes either through a lack of training, sophistication, or some other reason. However, because this descrepant phenomenon occurs mostly on the first lesson teach-reteach (1 and 2) and not on other comparisons, we tend to believe the fault in measurement lies with the supervisors and not with the students.

2. Following this line of reasoning, that the supervisors tended to overate the first reteach lesson (2), then a comparison of 2 and 3 should show a drop in ratings since 3 was the second teach, and the supervisors had no vested interest in terms of having already made suggestions for improvement. And, in fact, a comparison of 2 and 3 shows a drop in the t ratio to -2.19, as compared to 1 and 2 t ratio of + 7..80 (significant to the .001 level). The t ratio of lessons 2 and 3 (-2.19) was also significant (.05 level). See Appendix B, page 2 for the statistical data.

3. Presentation Skill - Set

An edited transcription of the presentation to the interns regarding the technical skill of Set Induction may be found in Appendix A, page 8. It should be

noted that the micro-teaching lesson for this skill was of 20-25 minute duration rather than the 5 minute teach-reteach cycle. There was no reteach cycle for the longer micro-class lessons. In addition to the specific evaluative instrument used for the skill of Set Induction, Appendix A, page 12 , each of the lessons was also rated on the Stanford Teacher Competence Appraisal Guide, Appendix A , page 29 , by both students and supervisor. Because of the longer length of the lesson the Appraisal Guide was well-suited to its use in this situation. Another reason for using both the technical skill instrument and the Appraisal Guide was to get some sort of comparison of the two instruments. We wished to determine if the specific technical skill instrument measured anything different from the Appraisal Guide. This question was answered in the affirative to the .001 level of significance for this skill as well as the other two technical skills measured in the Micro-class context (Lecturing and Use of A-V, and Closure). See Statistical Design and Analysis for further discussion.

4. <u>Lecturing and Use of A-V</u>.

An hour lecture was presented to the interns dealing with the presentation skill of Lecturing and the use of Audio-Visual media to supplement the lecture (Appendix A, page 13). The interns then practiced this skill in the 20 minute Micro-class, and were rated on both the specific instrument designed for lecturing and the Appraisal Guide. (See Statistical Design and Analysis for further discussion)

5. <u>Illustrating and Use of Examples</u>

Again, as with the other skills, the interns were given a one hour presentation on the technique of using examples to illustrate certain points or concepts. See Appendix A, page 19 , for a copy of the instruction given to the interns. Also

see Appendix A, page 22 , for the evaluative instrument for this skill. The interns practiced this skill in the 5 minute teach-reteach cycle rather than the 20-25 minute micro-class. There was only one teach-reteach cycle for this skill, as opposed to the two cycles given for Reinforcement and Varying the Stimulus.

Conclusions

Once again the discrepancy between student ratings and supervisor ratings appeared for a first lesson teach-reteach comparison. There was no significant differences in student ratings of 1 as compared with 2. However, supervisory ratings between 1 and 2 showed an improvement significant to the .001 level. See Appendix B, page 3 .

6. Presentation Skill - Closure

For this particular skill only a brief amout of time - 15 minutes - was spent on presenting it to the interns. This shortness of time was mainly a function of the demands of the schedule rather than an indication of the worth of the particular skill. A description of what was told to the interns may be found in Appendix A, page 23 . This skill was practiced within the 20 minute micro-class context. The evaluative instrument for the skill of Closure can be found in Appendix A , page 24 . (See Statistical Design and Analysis for further discussion)

7. Student Initiated Questions

Previous to the meeting of this instruction period the interns were given two sheets of paper with a description of a discrepant event. The interns were to hypo-thesize solutions to this event before the meeting of the instruction group. See Appendix A , page 25 .

The instructor then proceeded to elicit responses from the interns as to why the students didn't ask questions. The instructor told the group of interns that he had some information that they didn't have about the problem. The approach was an inductive one.

The interns were then asked to construct or think of a discrepant event in their subject area to present the students in micro-teaching the next two days. An evaluative instrument was devised to test the interns' application of this technique.

One point should be noted. During the teach-reteach cycle there was no supervisor present in the room with the intern and the students. The students commented on the lesson as usual, gave their evaluations to the intern, and the intern proceeded to observe the video-tape by himself. The purpose for the ab-sence of the supervisor was to begin to develop the process of self-critiquing. The interns were instructed to fill out a questionnaire, see page 28 in the Appendix, part of which was to be completed prior to the first teach, part between the teach and reteach, and the last question after the reteach. The interns were then to meet with their supervisors later in the day or the next day to observe the video-tape together. The supervisor was able to see what the intern's objectives were, how successfully they were carried out, what changes had been planned for the reteach, and how successful the intern thought he had been. There were generally favorable reactions on the part of supervisors and interns to this attempt at self-critiquing.

An analysis of the students' ratings showed no significant improvement be-tween lessons 1 and 2. There was no second teach-reteach cycle. See Appendix B , page 3 .

8. <u>A Comparison of the Pre and Post-Diagnostic Lessons.</u>

The best measure of the interns' total progress during the course of the summer Micro-teaching Clinic is given by a comparison of the 1st diagnostic lesson, given the first day of the clinic and the 2nd diagnostic lesson, given the last day of the clinic. Both of these lessons were of 5 minute duration and both were rated on the Appraisal Guide. The results showed that for both students and supervisors the mean increase in the ratings was highly significant - far beyond the .00001 level. For an item-by-item analysis see Table 14.

It must be remembered that one set of ratings was taken at the beginning of the summer, while the other set of ratings was taken at the end of the summer. We have no evidence which tells us how much the raters' criteria and judgment changed during the course of the summer. However, we have no evidence that their criteria did change, or, if it did, in what direction the change occurred.

<u>Summary</u>

The 1966 micro-teaching experience again proved to be a very valuable one for the interns in the Stanford Teacher Education Program. The best evidence for this are the significant gains shown from the first diagnostic to the final diagnostic of the summer.

1. Once again the difference between supervisor and student ratings on reteach lessons was demonstrated. Our conclusions from previous micro-teaching clinics were sustained again - that student ratings are probably a more accurate measure of behavior change than the supervisor ratings.

2. Only one significant change occurred between lessons 1 and 2 (Reinforcement skill) but in both cases when there were lessons 3 and 4 for a technical skill, significant improvement occurred. This suggests that perhaps one teach-reteach cycle is not enough to obtain significant behavior change,

2. (Cont'd)

and that an additional teach-reteach cycle for each skill might be necessary in order to achieve significant improvement.

3. Although the validity and reliability for the specific evaluative technical skills instruments have not been established, they probably offer more face validity for measuring teaching behavior change on the particular skill than does the more global Stanford Teacher Competence Appraisal Guide. More development of these instruments should prove profitable for future micro-teaching training clinics. Training in the use of the Appraisal Guide and the specific technical skills instruments is strongly recommended for both supervisors and students.

4. Last year's micro-teaching clinic showed few significant changes between the teach and reteach lessons as measured by students' ratings. It was hypothesized that this was due to the fact that interns were required to reteach immediately upon the completion of the critique session with the supervisor. It was thought that if the interns had a fifteen-minute break between the teach and reteach lessons they would have more time to replan their lessons in order to improve on the reteach. The results were mixed. Improvement was made between lessons 3 and 4 (teach-reteach) when there were two teach-reteach cycles (Reinforcement and Varying the Stimulus) and between lessons 1 and 2 for Reinforcement. No improvement was noted between lessons 1 and 2 for Varying the Stimulus, Illustrating and Use of Examples, and Student-Initiated Questions. This should not be taken to mean that the fifteen minute preparation was ineffective, however. Another possible explanation for the lack of improvement in lessons 1 and 2 has already been noted above under #2. The fifteen minute preparation time should be and will be further investigated in the Micro-Teaching Clinic, 1967.

5. The video-tape recorder plays an important role in the supervisory process in micro-teaching. The staff at Stanford is convinced that the most inefficient use of the video-tape is to replay the entire lesson and just sit and watch it. The supervisor needs to point out the specific things (not more than one or two) on which he wants the intern to focus. He needs to replay small segments to emphasize or clarify certain points. In other words, a training course should be required of the supervisors in order to make the most effective use of the video-tape in the supervisory process.

6. The main purpose of the Stanford Micro-teaching Clinic was to train our intern teachers in some of the techniques related to teaching. Because of our emphasis on training it was very difficult to maintain strict experimental conditions. The results reported in this paper reflect an attempt to control as many variables as was possible given the priority of training during the micro-teaching clinic.

APPENDIX A

1. Evaluation Sheet - Reinforcement

2. Lecture - Varying the Stimulus

3. Evaluation Sheet - Vary the Stimulus

4. Lecture - Set Induction

5. Evaluation Sheet - Set Induction

6. Lecture - Lecturing and Use of A-V

7. Evaluation Sheet - Lecturing and Use of A-V aids

8. Lecture - Illustrating and Use of Examples

9. Evaluation Sheet - Illustrating and Use of Examples

10. Lecture - Closure

11. Evaluation Sheet - Closure

12. Lecture - Student - Initiated Questions

13. Evaluation Sheet - Student-Initiated Questions

14. Appraisal Guide

TEACHER _____ SUBJECT AREA_____

OBSERVER_____

TEACH_____RETEACH_____

REINFORCEMENT SKILL

	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL
POSITIVE TEACHER COMMENTS							
1. When a student answered a question correctly or asked a good question, the teacher rewarded him by such words as "Fine", "Excellent", "Good", "Terrific", etc.	1	2	3	4	5	6	7
POSITIVE TEACHER GESTURES							
2. The teacher encourages the students' comments and answers by nonverbal cues such as smiling, nodding his head, writing the student's answer on the blackboard, etc.	1	2	3	4	5	6	7
NEGATIVE TEACHER COMMENTS							
3. The teacher rarely or never discouraged students by use of such comments as "No!" "Wrong!" "That's not it," "Of course not!", or otherwise verbally expressing negative feeling.	1	2	3	4	5	6	7
NEGATIVE TEACHER GESTURES							
4. The teacher rarely or never discouraged students by use of such nonverbal actions as frowning, scowling, expressions of annoyance, impatience, etc.	1	2	3	4	5	6	7
ENTHUSIASM							
5. The teacher's response to the students' questions and comments was enthusiastic.	1	2	3	4	5	6	7

COMMENTS: _____

_____

_____

_____

_____

Lecture to Interns

on

Varying The Stimulus Situation

The idea we are trying to get across to you is a simple one - we want you to think not only about the preparation of instructional materials, but also about how you will present that material. We think that the presentation of most material can be enhanced through the use of certain techniques which we will talk about today.

The experiment which was devised to train people in varying the stimulus situation came out of a body of theory concerned with the effects of change and habituation. The work that has been done points to the fact that changes, any deviation from the standard, seems to result in higher attention levels. With this in mind we asked interns to try out certain techniques which might help to sensitize them to this teaching behavior and, more important, they should serve to keep student attention levels at a high level.

I will give you the instructions that we gave the interns who participated in the experiment and in this way you will get acquainted with the techniques we would like you to practice.

The training you are to receive is designed to make you, as teacher, more aware of the attention producing behaviors that you, as stimulus object, can control. During your training you will be staged, like an actor, in certain behaviors. This micro-teaching experience is designed toward one goal -- giving you practice in varying the stimulus situation. The relatively simple behaviors you will be asked to perform are a very small sample of the kinds of things you can do in the classroom. In no way are you to feel limited to the kinds of behaviors we will be training. In fact, we hope to stimulate you into thinking about the problem and devising stimulus variations which suit you and your individual teaching style.

Our goal for this training is to emphasize six (6) behaviors or behavior patterns which we would like you to practice and incorporate into your micro-lessons. We feel the intensive practice given today will help you transfer this training to your own classroom presentations.

TRAINING BEHAVIORS

Movement: Our interest here is in producing visual and aural sensory adjustments on the part of the pupil toward you as a stimulus object. We can generalize from theories about attention and state that a high number of these sensory adjustments, per unit time, will help the teacher keep the students attending to the message of the lesson. The teacher behavior required is that of moving throughout the lesson in a pattern which insures:

a) That on numerous occasions the teacher is perceived in both the left and right sides of the classroom.

b) That on numerous occasions the teacher is perceived in both the front and back of the teaching space.

c) That occasionally the teacher moves among and/or behind the students.

Gestures: The goal here is to get you to be more expressive and dynamic in your presentations to a class. Hand, head, and body movements are an important part of communication. The oral message alone is not as effective in conveying meaning as an oral message combined with gestural cues. One can think of the effective communications of Marcel Marceau and Harpo Marx as one end of a continuum and the relatively dry and lifeless communication of Ed Sullivan as the other end of the continuum. Maximum communicative effectiveness probably lies somewhere in between.

<u>Focusing</u>: The task of the teacher will be to attempt to control exactly, through a highly structured behavior, the direction of student attention. This behavior can be produced either through verbal statements, through specific gestural behaviors or by some combination of both. Some examples follow:

a) Verbal Focusing: "<u>Look</u> at this diagram!" "<u>Listen</u> closely to this!" "Now, here's something <u>really</u> important!" "Watch what happens when I connect these two points!"

b) Gestural Focusing: Teacher points to object. Teacher bangs blackboard for emphasis.

c) Combinations of Verbal and Gestural Focusing: "<u>Look</u> at this diagram (Teacher points to diagram)!"

<u>Interaction Styles</u>: The teacher will try to <u>vary</u> the pattern of the lesson presentation by switching to different interaction styles. Three styles are identified below:

a) Teacher-Group: The teacher is lecturing or demonstrating to <u>all</u> students, asks questions to the group at large and is non-specific in the presentation.

b) Teacher-Student: Here the teacher tries to make a point with or for <u>one</u> student or asks a particular student a question.

c) Student-Student: The teacher can take a student's response and direct it to another student for comment or clarification. Another technique is for a teacher to have one student explain something to another student. The goal here is to have the teacher withdraw briefly from the lesson by allowing student-student interactions to occur.

The deliberate patterning of these interaction styles serves to vary the context within which content is presented. This should result in a higher level of attention than would occur if only a single style were utilized (i.e., lecturing).

Pausing: The effectiveness of silence as an attention demanding behavior is well known by public speakers and little used by teachers. There is no reason to rush to fill silent spaces with talk or activity. In fact, there are some interesting events that occur when pauses are deliberately inserted into the lesson. First, it breaks informational segments into easily processed units. Second, it captures attention by reducing the stimuli present (remember, attention is maintained at a high level when stimulus change occurs, not just when stimulus intensity is increased). Third, it probably causes the students to "strain" for cues and direction since the situation lacks structure. Finally, a distinct pause prepares the students for the next unit of teacher behavior.

Shifting Sensory Channels: By shifting the primary sensory receptors (e.g., ears to eyes) being used by the student, a necessary set of adjustments must be made by him to receive the teacher's message. This is not a shift in reception through the same sensory channel as we discussed in the section on movement. In this case the emphasis is on the adjustments that must be made by switching the primary receptors. This should insure a higher level of attention. The behaviors the teacher must produce are those that shift the primary mode of information transfer.

Usually the teacher is conveying oral messages; these might be supplemented by visual messages through the use of blackboards, pictures, objects, etc. Tactile attention is demanded when the teacher passes around some object or asks students to adjust or manipulate some apparatus. In your micro-teaching you are asked to give

attention to the simplest kinds of sensory shifting. This is oral-visual shifting with the use of the blackboard.

When using the blackboard or any other visual media, try to rely on the visual image to convey meaning without providing any oral cues -- that is, if word "X" goes on the board, don't pronounce that this is "X". Make the student shift from listening to watching during the lesson you present. Try to incorporate this technique into your micro-lesson.

SUMMARY

You have been asked to incorporate into your lesson the following behaviors:

1) Movements

2) Gestures

3) Focusing Behaviors

4) Changes in Interaction Style

5) Pausing

6) Shifting Sensory Channels

The practice you will gain, with the aid of a supervisor, will help you gain confidence in using these behaviors and hopefully stimulate you to try your own techniques in your classroom.

(This presentation was followed by a 5-minute tape of a negative model and then a 5-minute tape of a positive model.)

TEACHER _____ SUBJECT AREA _____

OBSERVER _____

TEACH _____ RETEACH _____

STANFORD UNIVERSITY
SCHOOL OF EDUCATION
SECONDARY TEACHER EDUCATION PROGRAM

July 1967

VARIATION OF STIMULUS SITUATION	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL

TEACHER MOVEMENTS

1. At various times during the lesson, the teacher was noted in the left, right, forward, and back of the teaching space.

    1 2 3 4 5 6 7

TEACHER GESTURES

2. The teacher used gestures (hand, body, and head) to help convey extra meaning in the presentation of the lesson

    1 2 3 4 5 6 7

FOCUSING

3. When the teacher wanted to emphasize a point, it was clearly stressed through the use of gestures (e.g., pointing, banging on the board, etc.) or through the use of verbal expressions (e.g. "Listen closely," "Watch this," etc.) or by combining both gestural and verbal acts.

    1 2 3 4 5 6 7

INTERACTIONS

4. The teacher varied the kind of participation required of the students. That is, students could be directly called on, group questions were asked, student-student interchange could occur. Students could role-play, go to the board, etc. The teacher is to mix these various techniques.

    1 2 3 4 5 6 7

PAUSING

5. The teacher gave the students time to think or get ready for new ideas by using silence. That is, all teacher activity ceased for short time periods.

    1 2 3 4 5 6 7

ORAL-VISUAL SWITCHING

6. The teacher uses visual material (words on blackboard, objects, pictures, etc.(in such a way that the student must look to get the information. That is, the teacher doesn't say what the object or word is but refers to it in the lesson making the student look, not listen to what is going on

    1 2 3 4 5 6 7

DEFINITION OF THE PROBLEM:

Observers have noted that intern-teachers usually do not spend much time preparing a class for an activity. They frequently say, "Read this story tonight for homework," or "Watch this demonstration carefully" and expect that there will be a classful of rapt and eager eyes and minds anxious to learn as much as possible. The purpose of the week's micro-teaching activity is to get the interns to think about and practice giving a class as much preparation as possible for an oncoming activity. The goal is for the micro-teaching class to understand what is going to take place, what is the goal of the activity, and to have as much help as possible in being able to perform what is expected of them.

MICRO-TEACHING: FOURTH WEEK ACTIVITY--SET TRAINING

In the micro-teaching lesson for next week, you should use five or ten minutes of the 25 minutes you have available to introduce an activity: a lecture, reading assignment, book report, committee presentation, movie, filmstrip, or what have you. Then you will proceed to teach the activity.

The problem which faces you and which faces every teacher at least twice each classroom period, is that of finding those introductory remarks (or procedures) which will produce the maximum payoff in learning. That is, what introduction to an activity can you devise which will produce the maximum payoff in learning. That is, what introduction to an activity can you devise which will produce the maximum in subsequent learning?

Throughout this material, we shall not be content to use the simple and useful word, "Introduction." Instead, in the service of precision and as a result of educational training, we shall use more jargoned expressions such as "pre-instructional procedures" or "instructional sets." Both refer to words or activities which precede the actual business of instruction.

EXAMPLES OF RESEARCH ON INSTRUCTIONAL SET:

The concept of pre-instructional procedure or set comes from research on learning and the theory which has directed and developed from that research. This research appears to indicate that the activities which precede a learning task have an influence upon the outcome of that task, and that some instructional sets promote learning better than others. If some instructional sets are superior to others, then each teacher is faced with the need to find those types of sets which will be most useful for his purposes and to modify these sets to fit the specific classroom situation.

In our own experience we have many examples of prior instructions influencing our responses in a new situation. If we have been told that a newly met person is a brilliant scientist, a slob, a straight arrow, or a contrite convict, we will notice and respond to different words and signals during the conversation and what we "learn" during the conversation will depend, partly, upon our prior instruction. Similarly, if we are told that tomorrow's test is hard or easy, essay or objective, we will study differently according to the instructions.

Let us suppose that you wish the class to read Chapter 3 in their textbook as homework, and Chapter 3 is about Andrew Jackson and the changes which took place under the reign of "Andrew I." The "problem" which faces you is, what remarks or activities will produce the greatest learning for the next day. You could say, I suppose, "Now class, for tomorrow I want all of you to read Chapter 3 in the text." Such a weak set would probably produce the usual response, and the next day you'll discover that half of the class has not read the assignment and the remainder claim that they studied but are unable to answer your discussion questions.

To improve your set, you might try: "For tomorrow, I want you to read Chapter 3 in the text and come to class prepared for a discussion." This last sentence is an improvement because it gives the student more information about his goal, that of preparation for a discussion. But despite the obviousness of the addition, the student may need a good deal more help before he is able to prepare himself for the next day's discussion. What will you discuss? What points should he consider as he reads? What should he focus on while he reads? How should he use his past information? Should he learn facts or principles? Should he compare, contrast, both or neither?

A sufficient set, then, is one which gives the student adequate preparation so that while he goes through the activity he is able to come as close to the goals as you wish.

PRE-INSTRUCTIONAL PROCEDURES (cont'd)

ACTIVITIES FOR WHICH SET IS APPROPRIATE:

1. At the start of a unit

2. Before a discussion

3. Before question-answer recitation

4. Giving a homework assignment

5. Before hearing a panel discussion

6. Before student reports

7. When assigning student reports

8. Before a filmstrip

9. Before a discussion following a filmstrip

10. Before a homework assignment based upon the discussion following a filmstrip

11. Before a discussion based upon the homework in item 10

EXAMPLES OF NOVEL SETS:

Each of these sets was designed to increase attention to the task, and the amount of responding they were to make to the task. In a few cases, facilitative acts were meant to occur.

1. As you read this chapter about the Civil War, think about how you would have gone about stopping the war if:

> you had a million dollars
> intelligence
> a cloak of invisibility.

2. Starting a lesson on tone in poetry by comparing a Joan Baez record with Goldfinger with the Rolling Stones.

3. As you read the Turn of the Screw, try to decide if this is a ghost story or one written by a neurotic who distorts reality.

4. Before we read the story, The Lottery, I want to finish giving grades. I've decided to fail three students, and have placed three sips among these thirty slips in this hat which indicate that you fail. Now we will pass the hat...

PRE-INSTRUCTIONAL PROCEDURES (cont'd)

5. Teacher announces that all Jewish children must leave school at noon because such children are not allowed to attend school in the future. Then teacher leaves room. After the dust settles, the class begins to study the topic on Freedom of Religion.

6. Giving models of good book reports before the class writes their book reports. (Such sets act as facilitating sets. Indeed, such sets are usually quite effective in obtaining desired responses).

7. Using the three hats which Lear wore as facilitating sets to understand the three roles which he had, and the three stages of his change.

8. In order to facilitate the teaching of order and categorizing behavior, the class were given 35 record jackets and asked to sort them into four categories--each student could make any category he wished.

9. We are going to take a trip to Rome, but don't want anyone to discover that we are really Americans. How should we dress, act, etc? What small things do you think might give us away? Now read...

10. Developing times when individual class members have been confused over making decisions, and then used as facilitating set for the study of Hamlet. Or--the conflict and betrayal between parents and children as set for Lear.

11. Analogy: debate is like an argument with parents--each side trying every trick to win.

12. Understanding executive, legislative, and judicial branches of government by working through analogies to family, school, and the city.

13. Studying history from 1700 to 1900 by giving a set for developing "rules of history."

14. A "startle" set: a piece of wood overhangs on a desk. The part on the desk is covered with a piece of paper. The teacher gives a sharp blow to the part of the wood outside the desk, and (because of the air pressure) the paper is undisturbed and the wood snaps.

15. In any historical situation, setting up the problem which any nation faced (but not identifying the nation) and then asking the class to come up with responses to the nation's problem. Then they read.

16. Making up a set of questions on the constitution, giving this test to member of the community, as a set for study of government.

17. Giving assignment of creating a character as a set for noticing character in the reading of short stories.

TEACHER_____SUBJECT AREA_____
OBSERVER_____
TEACH_____RETEACH_____

	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL

PRE-INSTRUCTIONAL PROCEDURES (SET)

INTEREST

1. The teacher's method of introducing the lesson was in itself interesting.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

2. The teacher's method of introducing the lesson helped you become interested in the main part of the lesson.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

COGNITIVE LINK

3. The relationship or connection between the introduction and the body of the lesson was clear.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

UNDERSTANDING

4. The teacher gave the students some guides or cues in the introduction which were helpful in understanding the lesson.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

MEMORY

5. The teacher's introduction will help you remember the material presented in the body of the lesson.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

COMMENTS: _____

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Lecturing and Use of A-V

A <u>formal</u> <u>lecture</u> refers to a verbal presentation of subject matter content formally organized and unsupported by other learning media, extending over a period of time of not less than 15 or 20 minutes. An <u>informal</u> <u>lecture</u> refers to a presentation involving audio-visual media and student interruption for questions and clarification. We might define an informal lecture as the teacher being the presenter of 90% of the information and the student 10%.

Given these definitions there are two main questions that the teacher needs to consider: 1. When is it effective to lecture? 2. How can you lecture effectively? Let us look at the first question.

<u>Why or when to use lecturing</u>. 1. The teacher may have information which is not accessible to the students. For example, an expert in some subject matter field, a scholar, one who has traveled widely, etc., will often have information which the student does not have. 2. A second reason for lecturing is to reinforce written work. Before or after students study a topic you may want to reinforce their learning by lecturing on some of the same material so that you have, in effect, a repetition of main points. However, you must be sure not to lecture on everything the student learns. You need only to lecture on those things which you wish to emphasize. 3. A third reason for lecturing is to create a change of pace or, as we have discussed, to vary the stimulus situation. In this way we can switch from the question-answer presentation to that of a lecture. Any method used exclusively usually results in a loss of attention and bored students. 4. Economy is an important reason for lecturing. Through a lecture, you can synthesize many sources, although far too often this is not the case with a lecture. If a lecture is well done it will have synthesized several sources, so that all students can get a universal coverage of

the subject matter. 5. The lecture can also inform learners of the expected outcomes of learning. For example: We are going to take up a particular unit in which we are going to concentrate on ...and ... will be expected of the students.

The second major question that we need to answer is how to lecture effectively. The first assumption is that the listening audience, the students, must be verbal enough to respond to the lecture. You can only communicate to students who employ the language which is used by the speaker. For the teacher, this means that he needs to consider the vocabulary which he uses in his lecture. In the formal lecture, the verbally adept students have a high potential for compressing ideas or synthesizing points of view. But those who are not verbally adept lack these characteristics which are features required to absorb the points of the lecture. In other words, if we note that slow learners are not verbal, then in most cases a lecture to them may be very wasteful and destructive to morale. The slow learner cannot respond to the concentrated medium of a formal lecture. Other oral media may be preferable for this group of students -- such as the discussion or informal lecturing techniques.

Another very important consideration to remember is that if we are going to use a lecturing technique the students need to be prepared for this formal lecturing technique. One of the skills that many students do not have is the skill of listening. The teacher should provide opportunities for the students to listen in practice sessions, teaching them how to listen for main ideas.

Another consideration should be that of note-taking. Robert Gagne argues that research shows that note-taking serves no useful purpose. On the other hand, there is some evidence that note-taking helps to assimulate ideas. Students need to be taught how to take notes effectively if note-taking is not going to be an obstruction to their learning. They need to be shown how to listen for the main ideas and put

them in note form. Early in the lecture a teacher may ask a question such as:
"What do you think the main idea is so far?" This is an attempt to involve the
students in the lecture or in the learning process rather than have them as passive
observers.

What are some of the other attributes of a good lecture? A good lecturer must
have audience appeal -- warmth, friendliness, and confidence. He must speak in
a voice which is clear and easily understood. He should have very good control of
the English language -- syntax, word selection, enunciation, pronunciation, the
use of meaningful figures, etc. Because of a lack of these characteristics there
may be individuals for whom the lecture is not the best means of presentation.
Furthermore, lecturing may be completely alien to the personality and style of
certain teachers. A beginning teacher must take these things into consideration in
deciding if lecturing should play a major part in his teaching style.

Let us turn our attention now to the lecture itself.

1. Planning

Planning is usually the first criterion of the well developed lecture. You may
find planning a very painful experience. Your objectives have to be sharply defined,
the way you develop your main points must also be sharply defined, and the support-
ing evidence well organized to make the lecture effective. You want to avoid un-
necessary repetition or misplaced emphasis. Although the technique of repetition
can be very effective to highlight important points. A good lecture needs to be
clear and well organized. Notice how a newscaster organizes his presentation,
enhances it with interesting sidelights and human interest stories. Most newscasters
are good models of organization.

2. Pacing

We have, of course, already discussed pacing under the technical skill of varying the stimulus. This skill also applies to delivery techniques, using different visual materials, lowering or changing the pitch of the voice. All of these things are part of the total idea of pacing. Remember that one of the objectives of the teacher is to pace the students into the lecture rather than overwhelm them.

If you watch newscasters you will see them using a rapid cadence of words, slowing down and speeding up. In other words, they are varying the stimulus that they give to their audience. Main ideas should be repeated and highlighted so that students will pick up cues that these are important concepts or ideas pertaining to the lecture.

As we design the presentation of a lecture (this is also related to pacing) there are some guidelines that should be considered. One model is often called the ten-thirty-ten principle. Assume that you are going to make a fifty-minute lecture. You should probably spend about ten minutes telling the student what you are going to tell them. This is incorporated into the idea of set induction which we have already studied earlier this summer. Thirty minutes should be spent in telling the students the material and the last ten minutes should be taken in reviewing, explaining what you have already told them. This brings in the concept of closure which we are going to study next week.

For secondary school teachers, the informal lecture method is probably far superior to the formal lecture method. The teacher needs to use visuals to enhance his presentation. Participation should be encouraged. If students do not understand points they should be encouraged to raise their hands and ask questions of the teacher. Often times he will want to supplement the informal lecture with written hand-outs,

film strips or overheads. The main point is that the use of audio-visual aid should complement rather than be a substitute for the presentation. We want to be sure that the use of an audio-visual method makes the presentation more effective than it would be in the regular mode of instruction of a formal lecture.

STANFORD UNIVERSITY
SCHOOL OF EDUCATION
SECONDARY TEACHER EDUCATION PROGRAM

July 18, 1966

LECTURE AND USE OF A-V AIDS

	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL
A-V EFFECTIVENESS							
1. The A-V aid the teacher used helped clarify and emphasize the main ideas of the lecture.	1	2	3	4	5	6	7
CHANGING STIMULUS SITUATION							
2. Throughout the lecture the teacher varied the stimulus situation, e.g. used gestures, pausing techniques, focused students' attention on important points, and moved about during the lecture.	1	2	3	4	5	6	7
CLARITY							
3. The teacher explained ideas and/or presented material in language that was understandable to the student.	1	2	3	4	5	6	7
INSTRUCTIONAL MODE							
4. The lecture method used by the teacher was the best means of attaining the instructional goals.	1	2	3	4	5	6	7
ORGANIZATION							
5. The teacher allotted adequate time for and clearly explained:							
a. the purposes of the lecture (SET)	1	2	3	4	5	6	7
b. the main content of the lecture	1	2	3	4	5	6	7
and c. summarized the main points which were presented in the lecture.	1	2	3	4	5	6	7

INTERN_____   LECTURING PLAN AND EVALUATION
SUBJECT_____
SUPERVISOR_____.

Complete prior to teaching

 1. State briefly your instructional objectives for the day and the main ideas you intend that the students learn.

  _____

  _____

  _____

  _____

 2. State briefly the audio-visual aid you intend to use and your rationale for selecting this particular technique.

  _____

  _____

  _____

  _____

  _____

Complete after teaching

 1. Do you think that the students understood the main ideas which you presented? Did they learn what you had intended?

 Yes_____ Why?_____

 _____

 Yes --_____ Why?_____

 _____

 2. What other alternative audio-visual aids might you have used to make the lecture more effective?

  _____

  _____

  _____

  _____

  _____

 Please feel free to use the other side for additional comments.

Illustrating and Use of Examples

I. Introduction

1. The word "example," comes from the word, "sample," which means a portion of a whole which shows the quality and character of the whole.

2. The use of examples is basic to teaching. Why? Because the use of examples is basic to good, sound, clear thinking. Whenever you are in a discussion or an argument with someone, and the person makes a statement that seems a little ambiguous, controversial, or you just don't understand what he means, wouldn't your first reaction be to ask him to give you an example to clarify, verify, or substantiate what he is trying to say?

3. Would you accept the idea that a person who can't give an example of what he is talking about probably does not have a very clear idea of what he is saying?

II. Use of Examples in Teaching

1. How do you use examples in your teaching? There are two basic approaches with which I am sure you are familiar.

A. The Deductive Approach.

  1. You state the idea or principle.

  2. You give examples which illustrate, clarify, or substantiate your idea.

  3. You go back to the main idea by relating the examples to the principle.

B. The Inductive Approach

  1. You start with examples.

  2. You make an inference or you come to a conclusion upon the basis of those examples.

2. A common understanding is that the inductive approach means student participation and that the deductive approach means that the teacher lectures. It is

important to realize that you can get a great deal of student participation in either

the deductive or inductive approach. For example, when you state the principle

or define the idea in the deductive approach, it is easy to ask the students to give

you the examples which would illustrate the main idea. Conversely, you could

lecture and still use the inductive approach. For example, the teacher could give

all the examples and make the appropriate inferences without asking the students

to participate in the lesson at all.

3. Some Guidelines for the Effective Use of Example:

A. Start with the simplest examples that will achieve your goal. Work

from the simple examples to the more complex examples.

B. Start with examples relevant to your students' experience and knowledge.

C. It is important to remember that the point of using examples is to

illustrate, clarify or substantiate an idea. Therefore, if you use the

deductive approach, and you start with the idea and then get the examples,

it is important to then relate the examples to the specific idea which you

are trying to teach to your students. If you use the inductive approach,

you start with the examples and then you make the inference to the

principle, then you have to get more examples which illustrate and

clarify the point. The principle is always to relate your examples to

the point you are trying to teach.

4. The Teacher's Evaluation of His Teaching:

A sure way that the teacher has of checking to see whether he has taught what

he wanted to teach is to ask his students to give his examples of the idea which he

was trying to teach.

III. **Summary** Guidelines for the Effective Use of Examples:

    A. Start with simple examples and work to the more complex examples.

    B. Start with examples relevant to students' experience and knowledge.

    C. Relate the examples to the principle or idea being taught.

    D. Check to see whether you have accomplished the objective of your lesson

       by asking students to give you examples which illustrate the point you

       were trying to make.

STANFORD UNIVERSITY, SCHOOL OF EDUCATION

SECONDARY TEACHER EDUCATION PROGRAM

July, 1966

TEACHER_____SUBJECT FIELD _____

OBSERVER_____

TEACH____RETEACH____

ILLUSTRATING AND USE OF EXAMPLES	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL
1. The teacher, in his explanations, started with simple examples and followed with more complex examples, if appropriate, to illustrate his point.	1	2	3	4	5	6	7
2. The teacher used examples which were relevant to the students' past knowledge and experiences.	1	2	3	4	5	6	7
3. The teacher directly related or connected the specific examples with the main ideas or points of the lesson.	1	2	3	4	5	6	7
4. The teacher checked to see if the students understood the main points of the lesson by asking the students to give examples illustrating these points.	1	2	3	4	5	6	7

COMMENTS:_____

_____

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_____

TRAINING IN TEACHING SKILLS: CLOSURE

Closure is attained when the major purposes and principles of a lesson, or portion of a lesson, are judged to have been learned so that new knowledge can be related to past knowledge.

Closure is complementary to set induction. It is more than a quick summary of the ground covered in a lesson. In addition to pulling together the major points and acting as a cognitive link between past knowledge and the new knowledge, closure provides the pupil with a needed feeling of achievement. Closure is not limited to the completion of a lesson. It is also needed at specific points within the lesson so that pupils may know where they are and where they are going. If the planned lesson is not completed, closure can still be attained by drawing attention to what has been accomplished up to the point where the lesson must end.

A. Drawing attention to the completion of the lesson or part of the lesson

1. Provide consolidation of concepts and elements which were covered before moving to subsequent learning.
2. Relate lesson back to the original organizing principle.
3. Review major points using an outline.
4. Summarize discussion including the major points which were covered by the teacher and class.
5. Develop all the elements of the lesson into a new unity.
6. Review major points throughout the lesson.

B. Making connections between previously known material, currently presented material, and future learning.

1. Review sequence which has been followed in moving from known to new material.
2. Apply what has been learned to similar examples and cases.
3. Extend material covered to new situations.

C. Allowing students opportunity to demonstrate what they have learned.

1. Provide for pupil practice of new learning.
2. Provide for pupil summary.

D. Developing unsuspected closure.

1. Help students to take what has been presented and to develop this material into a new, and unsuspected, systhesis.

TEACHER_____ SUBJECT_____

OBSERVER_____

TEACH_____ RETEACH_____

STANFORD UNIVERSITY
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CLOSURE

	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL
1. The teacher provided consolidation of concepts and ideas which were covered before moving to subsequent learning.	1	2	3	4	5	6	7
2. The teacher reviewed the major points and ideas throughout the lesson.	1	2	3	4	5	6	7
3. The teacher made connections between previously known material, currently presented material, and future learning.	1	2	3	4	5	6	7
4. The teacher allowed students the opportunity to demonstrate what they have learned, e.g., provide for pupil summary or provide for pupil practice of new learning.	1	2	3	4	5	6	7
5. The teacher, or students, summarized the class discussion including the major points which were covered by the teacher and class.	1	2	3	4	5	6	7

COMMENTS:_____

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_____

The following are potential situations which you are to consider. For you own use, think through answers to the stated problems before coming to class on Wednesday, July 27.

I. Student Initiated Questions:

Scene 1: Classroom - Reading and discussion on a topic has just been completed.

Teacher	Students
1. "Anyone have questions?"	1. Blank stares
2. "Everybody understands this material?"	2. Nods of assent
3. "How about you, John --- anything need clearing up?"	3. "Not for me -- I understand."
4. "Are you sure there aren't any questions?"	4. Smiles and nods of heads.

Scene 2: Teacher's home - grading quiz papers late at night on the "understood" topic. Results:

Total points possible:	25
High	18
Average	12
John	7

Problem: If they didn't understand the material before the quiz, why didn't they ask questions? (Give at least three possible hypothesis.)

Problem: How can a teacher get students to initiate questions? (Suggest at least three possible alternatives.)

II. Self-Evaluation

In the fall, you will begin to teach approximately forty hours per month. Your supervisors will be available for six or more hours to help you evaluate your performance. Some students will let you know how well they think you're doing. Most of the time, you will have to be the judge and jury as you plan each day's activity based on the effectiveness of the previous day. How well can you objectively evaluate your own teaching so that you will be helped to change what ought to be changed and to keep what ought to be kept? A second focus of this week's skill is to begin the explanation of this question.

Problem: You have completed forty minutes of lecture-discussion (in a fifty minute class) and want to evaluate your teaching (as contrasted with the students' learning). How might you go about such an evaluation. (suggest at least two ways)?

Problem: Student-centered activity has gone on for two-thirds of the class period and you want to evaluate your role as contrasted with the students'. What might you do? (Suggest at least two possibilities.)

Problem: The bell has just rung and you have dismissed your class. How can you evaluate your effectiveness as a teacher in order to decide on an approach for the next day? (Think of the criteria you might apply and what effect such an appraisal would have on your planning.)

STANFORD UNIVERSITY
SCHOOL OF EDUCATION
SECONDARY TEACHER EDUCATION PROGRAM

July 1966

TEACHER_____SUBJECT_____
OBSERVER_____
TEACH_____RETEACH_____

STUDENT-INITIATED QUESTIONS

	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL
1. The teacher's introduction clarified the purpose of the lesson.	1	2	3	4	5	6	7
2. The discrepant event described by the teacher was interesting and aroused the students' curiousity.	1	2	3	4	5	6	7
3. The students had ample opportunity to ask questions.	1	2	3	4	5	6	7
4. The teacher allowed the students time to explore an idea before going on to another students' questions.	1	2	3	4	5	6	7
5. During the summary of the lesson the teacher applied questions asked by the students to demonstrate correct and incorrect approaches to solving the problem.	1	2	3	4	5	6	7

COMMENTS :_____

_____

_____

_____

STANFORD UNIVERSITY
SCHOOL OF EDUCATION
SECONDARY TEACHER EDUCATION PROGRAM

July 27, 1966

TO: Interns
FROM: Joe Beard
RE: Student Initiated Questions

INSTRUCTIONS: Complete questions 1 and 2 prior to your first teach
                Complete questions 3 and 4 prior to your reteach
                Complete question 5 after your reteach

        TAKE THIS SHEET WITH YOU TO YOUR SUPERVISORY CONFERENCE THAT
        YOU SCHEDULE WITH YOUR SUPERVISOR.

1. What is the purpose of your lesson? _____

_____

_____

_____

2. How do you intend to accomplish your purpose? _____

_____

_____

_____

3. How successful was the lesson? (Cite positive and negative examples, if
    appropriate) _____

_____

_____

_____

4. What changes do you intend to make for the reteach lesson? _____

_____

_____

_____

_____

5. How effective were the changes which you made from the first teach? _____

_____

_____

_____

APPENDIX B

Tables

Table 1 - Reinforcement

Table 2 - Varying the Stimulus

Table 3 - Illustrating and Use of Examples

Table 4 - Student Initiated Questions

Table 5 - Set Induction - Means and S.D.'s

Table 6 - Lecturing and Use of A-V - Means and S.D.'s

Table 7 - Closure - Means and S.D.'s

Table 8 - Week 7 ratings - no particular technical skill practiced

Table 9 - Test That Technical Skills Instruments Measure Variables

       Not Measured by Appraisal Guide

Table 10 - Set Induction - Componenets of Variance

Table 11 - Lecturing and Use of A-V - Components of Variance

Table 12 - Closure - Components of Variance

Table 13 - Comparison of Weeks 4 and 7 (Micro-Classes)

Table 14a - Diagnostic Scores - Means and S.D.'s (Student Ratings)

Table 14b - Diagnostic Scores - Means and S.D.'s (Supervisor Ratings)

Table 15 - Initial Diagnostic Lesson - ANOVA for Rater Effects

Table 16 - Final Diagnostic Lesson - ANOVA for Rater Effects

FIVE-MINUTE LESSONS: Analysis of Gains Between Two Lessons

The variable Y represents the average gain of two paired interns (see Statistical Design and Analysis). The basic score, on which the gain is measured, is the average over all items of the technical skills instrument.

TABLE 1

REINFORCEMENT (Week 1)

Student Ratings (class averages)

Lessons Compared	N	$\overline{X}$	s	t	SIG	$\sqrt{2}s$
1, 2	65	.276	.580	3.84	.001	.820
2,3	59	-.023	.450	-0.39	NS	.637
3,4	63	.095	.377	2.02	.05	.534
1,4	60	.333	.591	4.36	.001	.836

Supervisor Ratings

Lessons Compared	N	$\overline{X}$	s	t	SIG	$\sqrt{2}s$
1,2	61	.612	.497	9.61	.001	.702
2,3	49	-.100	.637	-1.10	NS	.900
3,4	55	.400	.432	6.87	.001	.611
1,4	56	.918	.779	8.82	.001	1.102

TABLE 2

VARYING THE STUMULUS (Week 2)

Student Ratings (class averages)

Lessons Compared	N	$\bar{X}$	s	t	SIG	$\sqrt{2}s$
1,2	65	.056	.330	1.37	NS	.467
2,3	55	-.010	.342	-0.22	NS	.483
3,4	54	.128	.342	2.74	.01	.484
1,4	54	.165	.326	3.73	.001	.461

Supervisor Ratings

Lessons Compared	N	$\bar{X}$	s	t	SIG	$\sqrt{2}s$
1,2	63	.361	.368	7.80	.001	.520
2,3	54	-.168	.564	-2.19	.05	.798
3,4	54	.458	.419	8.05	.001	.592
1,4	54	.623	.577	7.95	.001	.815

TABLE 3

ILLUSTRATING AND USE OF EXAMPLES (Week 5)

Student Ratings (class averages)

Lessons Compared	N	$\overline{X}$	s	t	SIG	$\sqrt{2}s$
1,2	45	.038	.388	0.66	NS	.549

Supervisor Ratings

Lessons Compared	N	$\overline{X}$	s	t	SIG	$\sqrt{2}s$
1,2	45	.442	.482	6.14	.001	.682

TABLE 4

STUDENT - INITIATED QUESTIONS

Student Ratings (class averages)

Lessons Compared	N	$\overline{X}$	s	t	SIG	$\sqrt{2}s$
1,2	27	.057	.568	0.51	NS	.803

MICRO-CLASSES: Means and Standard Deviations of Ratings

TABLE 5

SET INDUCTION (Week 4)

ITEM	Students (class averages) 107 interns rated		Supervisors 105 interns rated	
	MEAN	STD. DEV.	MEAN	STD. DEV.
Appraisal Guide				
1	3.92	0.54	3.96	1.08
2	3.97	0.55	4.44	0.99
3	4.05	0.63	4.40	1.21
4	4.09	0.63	4.53	1.05
5	4.19	0.68	4.43	1.07
6	3.93	0.69	3.96	1.14
7	4.12	0.66	4.16	1.23
8	3.95	0.62	3.86	1.20
9	4.06	0.75	4.05	1.11
10	3.95	0.61	3.88	1.07
11	4.07	0.58	4.12	1.02
Average 1 -11	4.03	0.53	4.16	0.88
Technical Skills Inst				
1	3.97	0.71	3.98	1.17
2	3.99	0.70	4.08	1.24
3	4.10	0.64	4.30	1.18
4	3.90	0.68	4.13	1.21
5	3.83	0.67	4.03	1.37
Average 1 - 5	3.96	0.61	4.10	1.05

TABLE 6

LECTURING AND USE OF A-V (Week 5)

ITEM	Students (class averages) 105 interns rated		Supervisors 103 interns rated	
	MEAN	STD. DEV.	MEAN	STD. DEV.
Appraisal Guide				
1	4.00	0.52	3.97	0.91
2	4.00	0.46	4.28	0.94
3	4.17	0.56	4.16	1.01
4	4.12	0.52	4.29	0.91
5	4.20	0.70	4.24	1.15
6	3.85	0.50	4.07	0.96
7	4.18	0.60	4.15	0.99
8	3.99	0.62	3.99	1.09
9	4.00	0.74	4.17	1.06
10	3.96	0.62	3.82	1.05
11	4.09	0.54	4.27	0.98
Average 1 - 11	4.05	0.49	4.13	0.80
Technical Skills Inst				
1	4.10	0.93	4.08	1.34
2	4.07	0.60	4.17	1.13
3	4.24	0.59	4.26	1.03
4	4.06	0.65	4.08	1.03
5	3.94	0.59	4.02	1.14
6	4.18	0.60	4.11	1.00
7	3.99	0.62	3.83	1.18
Average 1 - 7	4.08	0.56	4.08	0.89

TABLE 7

CLOSURE (Week 6)

ITEM	Students (class averages) 95 interns rated		Supervisors 94 interns rated	
	MEAN	STD. DEV.	MEAN	STD. DEV.
Appraisal Guide				
1	4.09	0.47	3.90	0.93
2	4.10	0.44	4.09	0.88
3	4.21	0.57	4.06	1.02
4	4.17	0.54	4.20	0.84
5	4.26	0.58	4.31	1.12
6	3.93	0.51	3.84	0.92
7	4.18	0.65	4.06	1.02
8	4.03	0.58	3.82	1.03
9	4.11	0.80	3.98	1.03
10	3.94	0.56	3.64	0.98
11	4.14	0.52	4.04	0.87
Average 1 - 11	4.11	0.48	4.00	0.76
Technical Skills Inst				
1	4.09	0.59	3.89	0.92
2	4.22	0.64	3.86	1.05
3	4.28	0.63	4.03	1.01
4	4.26	0.74	3.87	1.09
5	4.15	0.63	3.73	0.90
Average 1 - 5	4.20	0.55	3.88	0.78

TABLE 8

<u>WEEK 7</u>

(No particular Technical Skill Practiced This Week)

ITEM	Students (class averages) 106 interns rated		Supervisors 107 interns rated	
	MEAN	STD. DEV.	MEAN	STD. DEV.
Appraisal Guide				
1	4.20	0.54	3.77	0.94
2	4.22	0.58	3.97	0.92
3	4.29	0.60	3.90	0.89
4	4.24	0.63	4.08	0.97
5	4.28	0.64	4.04	1.12
6	4.02	0.51	3.71	0.76
7	4.38	0.65	3.74	0.92
8	4.21	0.70	3.69	0.99
9	4.39	0.89	4.13	1.16
10	4.13	0.63	3.64	0.92
11	4.23	0.61	3.97	0.99
Average 1 - 11	4.23	0.55	3.88	0.78

MICRO-CLASSES: <u>Test That Technical Skills Instruments Measure Variables</u>

<u>Not Measured by Appraisal Guide</u>

TABLE 9

Skill	Λ	m	pq	-m lnΛ	Std. Normal Equivalent of -m lnΛ	SIG
Set Induction	.1437	294	440	570	4.11	.001
Lecture & A-V	.0773	289	616	740	3.39	.001
Closure	.0947	278.5	415	656	7.43	.001

MICRO-CLASSES: Components of Variance (based on ratings by individual students)

TABLE 10

SET INDUCTION

(Week 4; 89 Interns; D.F.= 88 between, 253 within)

ITEM	Mean Square Between Interns	Mean Square Within	F	Est. Time Variance	Est. Total Variance	Est. Reliability
Appraisal Guide						
1	1.087	.503	2.16	.152	.655	.232
2	1.065	.527	2.02	.140	.667	.210
3	1.500	.608	2.47	.232	.840	.276
4	1.415	.603	2.35	.212	.815	.260
5	1.542	.729	2.12	.212	.941	.225
6	1.495	.716	2.09	.203	.919	.221
7	1.689	.774	2.18	.238	1.012	.235
8	1.275	.708	1.80	.148	.856	.173
9	2.036	.754	2.70	.334	1.088	.307
10	1.532	.681	2.25	.222	.903	.246
11	1.210	.516	2.34	.181	.697	.260
Technical Skills Inst						
1	1.922	.734	2.62	.309	1.043	.296
2	1.800	.713	2.52	.283	.996	.284
3	1.513	.779	1.94	.191	.970	.197
4	1.706	.719	2.37	.257	.976	.263
5	1.604	.963	1.666	.167	1.130	.148

Effective number of ratings per intern n = 3.84

An F value of 1.51 is significant at .01 level; 1.67 is significant at .001

TABLE 11

LECTURING AND USE OF A-V

(Week 5; 89 Interns; D.F. = 88 between, 249 within)

ITEM	Mean Square Between Interns	Mean Square Within	F	Est. Time Variance	Est. o al Variance	Est. Reliability
Appraisal Guide						
1	0.991	.614	1.62	.099	.713	.139
2	0.818	.466	1.75	.093	.559	.166
3	1.083	.704	1.54	.100	.804	.124
4	1.057	.566	1.87	.129	.695	.186
5	1.806	.712	2.54	.288	1.000	.288
6	1.032	.717	1.44	.083	.800	.104
7	1.409	.801	1.76	.160	.961	.167
8	1.437	.630	2.28	.212	.842	.252
9	2.067	.697	2.96	.360	1.057	.340
10	1.495	.656	2.28	.221	.877	.252
11	1.142	.606	1.88	.141	.747	.189
Technical Skills Inst						
1	3.156	1.102	2.86	.541	1.643	.329
2	1.420	.668	2.13	.198	.866	.229
3	1.333	.652	2.02	.179	.831	.215
4	1.583	1.005	1.57	.152	1.157	.131
5	1.341	.666	2.00	.178	.844	.211
6	1.356	.612	2.25	.196	.808	.242
7	1.444	.919	1.57	.138	1.057	.131

Effective number of ratings per intern   n = 3.80

An F value of 1.34 is significant at .05 level; 1.51 is significant at .01; 1.67 is significant at .001.

B-10

TABLE 12

CLOSURE

Week 6; 84 Interns; D.F. = 83 between, 240 within)

ITEM	Mean Square Between Interns	Mean Square Within	F	Est. Time Variance	Est. Total Variance	Est. Reliability
Appraisal Guide						
1	0.943	.372	2.54	.148	.520	.285
2	0.789	.455	1.73	.087	.542	.161
3	1.306	.538	2.43	.199	.737	.270
4	1.137	.423	2.69	.185	.608	.304
5	1.400	.604	2.32	.206	.810	.254
6	1.034	.566	1.83	.121	.687	.176
7	1.831	.659	2.78	.304	.963	.316
8	1.290	.624	2.07	.173	.797	.217
9	2.590	.639	4.05	.506	1.145	.442
10	1.350	.642	2.10	.184	.826	.223
11	1.078	.538	2.00	.140	.678	.207
Technical Skills Inst						
1	1.326	.456	2.90	.225	.681	.330
2	1.546	.588	2.52	.248	.836	.297
3	1.490	.641	2.32	.220	.861	.256
4	2.069	.637	3.24	.371	1.008	.368
5	1.650	.636	2.59	.263	.899	.292

Effective number of ratings per intern n = 3.86.

An F value of 1.68 is significant at .001 level.

MICRO-CLASSES: Comparison of Weeks 4 and 7

TABLE 13

Appraisal Guide Item	Students (class averages)				Supervisors			
	Mean Gain	Pooled Variance	t	SIG.	Mean Gain	Pooled Variance	t	SIG.
1	.28	.2916	3.77	.001	-.19	1.025	-1.37	NS
2	.25	.3194	3.23	.01	-.47	0.913	-3.58	.001
3	.24	.3784	2.84	.01	-.50	1.128	-3.43*	.001
4	.15	.3969	1.73	.10	-.45	1.022	-3.24	.01
5	.09	.4360	0.99	NS	-.39	1.200	-2.59	.05
6	.09	.3681	1.20*	NS	-.25	0.939	-1.88*	.10
7	.26	.4290	2.89	.01	-.42	1.180	-2.81*	.01
8	.26	.4372	2.86	.01	-.17	1.210	-1.12	NS
9	.33	.6773	2.92	.01	+.08	1.289	+0.51	NS
10	.18	.3845	2.11	.05	-.24	0.996	-1.75	.10
11	.30	.3542	3.67	.001	-.15	1.010	-1.09	NS
Average	.20	.2917	2.70	.01	-.28	0.691	-2.45	.05

* Assumption of equal variances not valid for these items but this does
  not alter the significance level (See Statistical Design and Analysis).

DIAGNOSTIC SCORES: <u>Means and Standard Deviations</u>

TABLE 14a

<u>STUDENT RATINGS (class averages)</u>

Appraisal Guide Item	Initial Lesson		Final Lesson		Gain (Initial to Final)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1	3.63	0.68	4.20	0.57	0.57	
2	3.56	0.58	4.37	0.67	0.81	
3	3.75	0.61	4.45	0.66	0.70	
4	3.60	0.52	4.45	0.73	0.85	
5	3.59	0.57	4.38	0.69	0.79	
6	3.67	0.61	4.37	0.69	0.70	
7	3.78	0.61	4.50	0.72	0.72	
8	3.65	0.65	4.39	0.73	0.73	
9	3.72	0.76	4.39	0.79	0.67	
10	3.39	0.77	4.40	0.72	1.01	
11	3.68	0.59	4.30	0.73	0.62	
Total	40.01	5.33	48.20	6.73	7.94	8.00

Number of Items Rated   (146)   (126)   (124)

Test of significance of gain (total score):

$t = \sqrt{124}$ (7.94) / 8.00 = 11.0, significant beyond .00001 level.

TABLE 14b

SUPERVISOR RATINGS

Appraisal Guide Item	Initial Lesson		Final Lesson		Gain (Initial to Final)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1	2.88	1.14	3.87	1.00	0.99	
2	2.95	1.16	4.13	0.90	1.18	
3	3.21	1.19	4.13	1.00	0.92	
4	3.23	1.23	4.17	1.01	0.94	
5	3.07	1.25	4.23	1.10	1.16	
6	3.02	1.12	3.95	1.01	0.93	
7	3.01	1.29	4.07	0.96	1.06	
8	2.76	1.35	3.99	1.09	1.23	
9	3.14	1.23	4.17	1.04	1.04	
10	2.77	1.16	3.57	0.96	0.80	
11	3.19	1.24	4.01	0.88	0.82	
Total	33.23	11.22	44.28	9.08	11.66	12.06

Number of
Items Rated   (146)   (92)   (91)

t..t of significance of gain (total score):

$t = \sqrt{91} \ (11.66) \ / \ 12.06 = 9.22$, significant beyond .00001 level.

DIAGNOSTIC SCORES: <u>Analysis of Variance for Rater Effects</u>

TABLE 15

<u>INITIAL DIAGNOSTIC LESSON</u>

Appraisal Guide Item	Students (class averages)				Supervisors			
	Mean Square Between Raters (11 DF)	Mean Square Within Raters (134 DF)	F Ratio	SIG.	Mean Square Between Raters (20 DF)	Mean Square Within Raters (125 DF)	F Ratio	SIG
1	0.781	0.443	1.76	.10	5.04	0.70	7.2	.001
2	1.085	0.269	4.04	.001	5.19	0.72	7.1	.001
3	0.802	0.331	2.42	.01	5.90	0.70	8.4	.001
4	0.860	0.217	3.96	.001	5.79	0.82	7.1	.001
5	0.759	0.284	2.67	.01	6.73	0.73	9.2	.001
6	1.490	0.274	5.44	.001	5.35	0.59	9.1	.001
7	1.060	0.312	3.39	.001	7.10	0.78	9.1	.001
8	1.094	0.371	2.95	.01	7.39	0.92	8.0	.001
9	1.480	0.499	2.97	.01	4.56	1.04	4.4	.001
10	0.664	0.580	1.14	NS	3.65	0.98	3.7	.001
11	0.870	0.307	2.83	.01	6.01	0.82	7.3	.001
Total	95.2	22.9	4.16	.001	620.9	46.7	13.3	.001

Note: A "rater" above refers to a class of students (averaged) or to a supervisor.

TABLE 16

FINAL DIAGNOSTIC LESSON

Appraisal Guide Item	Students (class averages)				Supervisors			
	Mean Square Between Raters (7 DF)	Mean Square Within Raters (118 DF)	F Ratio		Mean Square Between Raters (16 DF)	Mean Square Within Raters (75 DF)	F Ratio	SIG
1	2.323	0.201	11.6	.001	3.30	0.50	6.6	.001
2	3.366	0.271	12.4	.001	2.42	0.48	5.0	.001
3	3.236	0.264	12.3	.001	3.59	0.44	8.2	.001
4	3.355	0.365	9.2	.001	3.36	0.53	6.3	.001
5	4.138	0.265	15.6	.001	4.17	0.58	7.2	.001
6	3.301	0.315	10.5	.001	2.33	0.74	3.1	.001
7	2.832	0.385	7.4	.001	3.21	0.43	7.5	.001
8	4.462	0.304	14.7	.001	4.52	0.49	9.2	.001
9	4.297	0.407	10.6	.001	3.47	0.58	6.0	.001
10	2.632	0.401	6.6	.001	2.12	0.68	3.1	.001
11	2.920	0.337	8.7	.001	2.34	0.45	5.2	.001
Total	385.0	25.1	15.3	.001	328.3	30.0	10.9	.001

APPENDIX C

1. Description of Micro-Teaching

STANFORD UNIVERSITY
SCHOOL OF EDUCATION
SECONDARY TEACHER EDUCATION PROGRAM

June 19, 1966

DESCRIPTION OF MICRO-TEACHING

5 minute Individual Lessons

1. You will prepare and teach a 5 minute lesson in your subject area to a group of 4 junior or senior high school students (the exact age group will be indicated on the schedule you receive Tuesday afternoon, June 21st). In addition to the students, your supervisor and a T-V operator will be in the room. Each lesson will be video-tape recorded.

2. The students will critique the lesson and then leave the room. You and your supervisor will look at the students' comments and then look at the videotape of your lesson. Your supervisor will critique the lesson and make some suggestions as to how the lesson could be improved.

3. After the critique you will leave the room for 15 minutes and prepare to teach the same lesson again, incorporating some suggestions made by your supervisor, to a different group of students. There are no rooms specifically available, so you may use any room that is vacant, or go outside to the benches in the inner quad.

4. After 15 minutes you will return to the room and reteach the 5 minute lesson. Again, the students and supervisor will critique the lesson, and you will see the videotape recording of the "reteach" lesson.

20-25 minute Micro-Class Lessons

1. The micro-classes will be team taught by groups of 4 interns in the same subject area. These 4 interns, with their supervisor, will plan a 12 day unit in their subject field. They will plan the objectives of the unit, what activities will take place, and how they will evaluate the high school students. Each micro-class will keep the same group of students for the entire 12 days.

2. Every intern will teach the micro-class once a week. One day of the week 2 interns will share the 20-25 minute time period, while on the other two days of the week the other 2 interns will each teach for the full 20-25 minutes. (More details will be provided later in the summer.)

3. All interns will attend their micro-class even if they aren't teaching that day. They will critique the intern who taught that day, along with the students and the supervisor.

4. The lesson will be videotaped and played back for discussion. Because of the length of the lesson there will be no reteach cycle.

Micro-teaching: a definition

Micro-teaching is a scaled-down teaching encounter in which the intern teaches for short periods of time, 5-20 minutes, to a group of four students, on some topic in his teaching subject.

SECTION III

The Stanford Summer Micro-Teaching Clinic 1965

Appendix A - Tables

THE STANFORD SUMMER MICRO-TEACHING CLINIC, 1965

Jimmie C. Fortune
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Stanford University
Stanford, California

THE STANFORD SUMMER MICRO-TEACHING CLINIC, 1965

Definition

Micro-teaching is a scaled-down teaching encounter which has been developed at Stanford University to serve two purposes, (1) as preliminary experience and practice in teaching and (2) as a research vehicle to explore training effects under controlled conditions. In micro-teaching the trainees are exposed to the variables in classroom teaching without being overwhelmed by the complexity of the situation. They are required to teach brief lessons (5 to 10 minutes) in their teaching subject, to a small group of pupils (up to 5). These brief lessons allow opportunity for intense supervision, video-tape recording for immediate feedback, and the collection and utilization of student feedback. The research to be reported in this article was done in the third micro-teaching summer clinic held as a pre-internship training program for the Stanford Secondary Teacher Education Program for 1965.

From demonstration teaching emerged the idea that interns might gain valuable experience if the students were actual learners and if the interns were attempting to control the content of their teaching specialty. Thus, the micro-teaching structure was put to an empirical test in an experimental clinic held in the summer, 1963. This clinic served as a vehicle of comparison between the micro-teaching and the teacher aide programs held concurrently that summer. The following summer, 1964, a second clinic was held and the data resulting from the two clinics was reported by Allen and Fortune in a previous article presented to AERA in February, 1965.

Findings of Previous Clinic Experimentation

The two principal sources of evaluation were pupils' and supervisors' judgments, recorded on the Micro-teaching Appraisal Guide, consisting of eight items, each on a five-point scale. The correlation of pupils' and supervisory ratings was .81 on the post-tests for the total group. Test, re-test reliability was .89 and split-half reliability was .84.

The findings during this period of experimentation were as follows:

1. Candidates trained through micro-teaching techniques over an eight-week period and spending less than ten hours a week in training performed at a higher level of teaching competence than a similar group of candidates receiving separate instruction and theory with an associated teacher aide experience--involving a time requirement of between 20 and 25 hours per week.

2. Performance in the micro-teaching situation predicted subsequent classroom performance.

3. Over an eight-week period, there is a significant increase in the accuracy of the candidate's self-perception of his teaching performance through identification of weaknesses as well as strengths.

4. Candidates receiving student appraisal of their effectiveness improved significantly more in their teaching performance than candidates not having access to such feedback.

5. Ratings of video transcriptions of teaching encounters are correlated with live rating of the same encounters.

6. Trainees' acceptance of the value of micro-teaching is high.

7. Students' ratings of teaching performance are more stable than any other--
including those of supervisors.

8. Three skills subjected to experimental treatment in micro-teaching produced
significant changes in the performance of intern teachers.

Planning and Objectives of Micro-teaching, Summer, 1965

Prior to the 1965 micro-teaching clinic a series of seminars was held to discuss, refine, and reformulate the structure and objectives of the program. The Stanford Teacher Education Program staff headed by Drs. Allen, Bush and McDonald developed the following conceptual framework of teaching skills for the summer clinic:

Technical Skills of Teaching

1. Initiating Behaviors:

    (a) task direction

    (b) set

    (c) behavioral objectives

    (d) diagnosis of learning

2. Presenting (communication)

    (a) discussion

    (b) lecture

    (c) questioning techniques

    (d) pacing

    (e) frame of reference

    (f) distinguishing between concepts and illustrations

3. Consolidation (of the lesson)

   (a) redundancy

   (b) reviewing

   (c) closure

4. Monitoring

   (a) control and participation

   (b) attending behavior

   (c) discipline

   (d) rewards and punishments

5. Evaluation

   (a) combining grades

   (b) diagnosis

In addition to the micro-teaching experiences the interns were also enrolled in courses in educational psychology, curriculum and instruction, secondary education, and academic subject areas.

Time Table

In order to use the available staff efficiently and to provide pre-internship training for the class of 140 trainees majoring in eight different subject matter areas, a time table of micro-teaching experiences was formulated. This time table attempted to incorporate the technical skills of teaching described above into a pedagogically sound framework. This framework not only included a schedule of classroom training, but also opportunity for further experimental investigation and development of the micro-teaching concept.

1st Week:		Lecturing techniques and presenting skills
2nd Week:		Pre-instructional procedures
3rd Week:		Controlling techniques and procedures
4th Week:		Mid-term examinations break
5th Week:		Discussion skills
6th Week:	Micro Class	Consolidation skills
7th Week:		Evaluation skills

Included were two experimental designs. During the 2nd week an experiment investigating methods of training teachers in task direction skills was performed. During the 7th week a dual purpose experiment investigating explaining behaviors, and performance reliability in respect to student appraisal of teaching was conducted.

The Micro-teaching clinic was held in eight classrooms located on Stanford's Inner Quad. Of these eight classrooms, four of them contained video-tape units. Each of the eight classrooms were standardly equipped with regard to blackboards, audio-visual equipment, and desks.

The Micro-teaching students were recruited from local high schools and were trained for a period of six hours in the use of the Stanford Teacher Competence Appraisal Guide. These students were paid for their participation during the summer. Teams of four students of the same grade level with mixed ability composition (grades 8-11) were assigned to each of the Micro-teaching rooms. They were rotated after each lesson so the reteach sequence would be taught to a different, but comparable team.

The Stanford supervisors were doctoral students selected for their teaching competence in their respective subject matter fields. Each Stanford supervisor was

assigned a group of interns (4 to 9 interns each) in his area of teaching competency. This supervisor served a variety of functions. Among these were: (1) resource person, (2) advisor, (3) interpreter of student feedback, (4) rater, and (5) general morale booster.

These video-tape units are portable recording instruments which make possible a visual and audio tape of the teaching performance. These tapes are available for immediate replay by trained technicians and are used as stimulus objects during the supervisory conferences.

Description of Structure and Format

On the first day of the Micro-teaching clinic each of the 140 interns taught a five minute diagnostic lesson. The purposes of this first diagnostic lesson was to get an evaluation of the interns' beginning performance, and to expose the interns to the Stanford video-tape and supervisory system. The evaluation ratings of the interns' performance were made by both a Micro-teaching student team and a Stanford supervisor on the Stanford Teacher Competence Appraisal Guide.

After the diagnostic lesson was taught the interns were scheduled to micro-teach two teach-reteach cycles a week for three weeks. Prior to the first cycle each week the interns received one hour of instruction in a teaching skill to be emphasized during that week. Two five minute lessons were scheduled to be taught in a teach-reteach cycle. Each cycle, although independent of video-recording, allowed for one teach-reteach cycle to be video-taped each week. This cycle consisted of: (1) a five minute lesson taught to a new team of students and observed by a Stanford supervisor;

(2) a five minute supervisory conference; (3) another five minute lesson taught to a new team of students and observed by the assigned supervisors; and (4) followed by another supervisory conference.

At the end of the first three weeks there was a one week break. During this 4th week the interns were given a week of rest from Micro-teaching and some instruction for classroom discipline techniques. Also during this 4th week the interns were organized into team teaching groups in their subject matter areas in preparation for micro-teaching during the 5th, 6th, and 7th weeks.

Concurrently the staff was engaged in ironing out administrative details for the coordination of the three remaining summer training programs: (1) the final micro-teaching for the 5th, 6th, and 7th weeks; (2) the Tutor program which consisted of each intern tutoring a local high school student for a three week period; and (3) an observation program providing opportunities for the interns to visit local summer high school classrooms.

The 5th, 6th, and 7th weeks of Micro-teaching presented a different format than the first three weeks. During these last three weeks the interns were organized into team teaching groups. In each group there were between 2 to 5 interns. Each group prepared a twelve day teaching unit under the direction of an assigned supervisor. The prepared unit was taught to the same student team for the entire twelve days. At the end of this period the students were evaluated by the interns. The teaching load was distributed equally among the interns in the form of 20-25 minute lessons with supervisory conferences of similar length following.

Description of Content

First Week

The skills emphasized during the first week were directed toward the acquisition of communication skills through lecturing. The instruction consisted of examples and techniques of lecturing including content organization and use of visual aids.

Second Week

This week's micro-teaching sessions were directed toward the proper initiation of filmstrips, homework assignments, discussion sessions, movies, reading assignments, etc. The instruction contained examples of initiating behavior and guidelines for orientation, set, and task direction.

Third Week

The concern of the third week was the skill of handling minor disciplinary disturbances with minimal classroom interference. A student role-playing program built around the identification of cues to inattention and possible disciplinary problems, and supplemented by descriptions of alternative teacher actions was used to achieve this goal.

Micro-class; 5th, 6th, and 7th Weeks

The purpose of the twelve day micro-class was to give the interns an opportunity to plan and teach a unit in their subject areas. They had the opportunity to teach their unit to one class of micro-teaching students for the entire twelve days. In this manner the interns were able to devise evaluative instruments to see how well the students had

learned the materials presented to them. This also gave the interns the opportunity to teach longer lessons than they had in the first three weeks. The length of the lessons taught during these twelve day micro-classes were 20-25 minutes, with a 20 minute discussion of the lesson by the supervisor and the interns in that particular team teaching group. The format for these discussions were Appraisal Guide forms critiquing the lesson filled out by the micro-class students, the intern who taught the lesson, the other interns in the team teaching group, and the Stanford supervisor. Every other day of this twelve day period the 20 minute lesson was video-taped and used by the supervisor and interns for reviewing strong and weak points of the lesson.

Criterion Instrument

Throughout the six weeks of micro-teaching two types of criterion instruments were used. The Stanford Teacher Competence Appraisal Guide and individual reports of the skills emphasized each week were filled out by both the student teams and the supervisors. The individual reports appeared in the form of questionnaires asking for data related to the skill being demonstrated by the intern. The Stanford Teacher Competence Appraisal Guide consists of a thirteen item, seven-interval, forced-choice scale biased toward superior ratings to eliminate J-curve effects. This appraisal guide is now in the second year of usage and has been subjected to much statistical study. The guide as such is the evolution of some seven years of Stanford experimentation with and revision of teaching competence scales. The scale as such consists of thirteen, semi-independent items constructed from the results of a factor analysis on a guide composed of twenty-four items. In several studies the guide has had adequate

reliability over items and has been connected with student test performance in an analysis of covariance test.[1]

Analysis of Data

The statistical analysis of the summer micro-teaching data was made upon the thirteen items of the Stanford Teacher Competence Appraisal Guide. These thirteen items are:

1. Clarity of Aims

2. Appropriateness of Aims

3. Organization of the Lesson

4. Selection of Content

5. Selection of Materials

6. Beginning the Lesson

7. Clarity of Presentation

8. Pacing of the Lesson

9. Pupil Participation and Attention

10. Ending the Lesson

11. Teacher-Pupil Rapport

12. Variety of Evaluative Procedures

13. Use of Evaluation to Improve Teaching

The scores for these items were obtained from micro-teaching student ratings and Stanford supervisor ratings. The statistical analysis included both an overall analysis of the 1st diagnostic and the final diagnostic, and a sequential analysis evaluating

[1]Allen, Dwight W. and Fortune, Jimmie C., An Analysis of Micro-Teaching: A New Procedure in Teacher Education, Stanford University, Stanford, California, 1965.

weekly results. With the exception of the two experimental designs included during the 2nd and 7th weeks of the clinic, pretest-post-test analysis of variance and one-way analysis of covariance with the first diagnostic ratings as the covariant provided the statistical instruments of analysis. Tables I and II record the means obtained over the clinical period.

Overall change was measured by a series of one-way analysis of variance on diagnostic ratings comparing pre-test and post-test means. Both diagnostic tests were of the same five minute format. The post-test diagnostic showed some regression effects from the 6th week ratings. These effects can be explained by the five minute format of the diagnostic in comparison to the twenty minute format of the 6th week. A hypothesis to be tested in later micro-teaching study is that this change of format generated some neglect in preparation which resulted in a lower quality of teaching.

A comparison of the first diagnostic lesson with the last diagnostic lesson based on the students' ratings showed an increase in nine Appraisal Guide items significant to the .01 level. The items which did not show change were item 1, item 6, and item 12. In the case of item 1 the lack of change has not been rationalized. Item 6 probably failed to change due to the change of rapport between the interns and the micro-teaching students resulting from the exchange of pleasantries prior to the beginning of the micro-teaching lessons. Items 12 and 13 are almost totally unobservable in the shortened lesson format and are usually left unrated by the observers.

Similar changes between the first diagnostic lesson and the last diagnostic occurred on the Stanford supervisors' ratings. Items 1 through 12 showed an increase

in ratings significant to the .01 level. The results of the students' and supervisors' ratings on the two diagnostic lessons are given in Tables III and IV.

Individual item change are reported for each week. There are several points of expected regression such as for the teach sequence of Week Three where the students were asked to role-play acts of misbehavior rather than react naturally as students. Regardless of these periods of regression the weekly change reports indicate positive effects of training on specific items.

W K ONE - Lecturing techniques and presenting skills

Both the teach and reteach of Week One were tested against the first diagnostic lesson and improvement on the students' ratings of both the teach and reteach lessons were significant at the .01 level on items 2, 3, 4, 5, 7, 8, 9, 10, 11, 12 and at the .05 level on items 1 and 6. Similar correlations were found for supervisors. An analysis of Week One may be found in Table V.

WEEK TWO

During Week Two an experiment to investigate the teaching of initiating behaviors was carried out. This experiment consisted of four methods of teaching set and task direction behaviors. The interns were randomly sorted into four groups of approximately thirty each and each group received instruction under a different format. The analysis of the data consisted of an analysis of covariance on each appraisal guide article using the previous week's reteach scores as a covariant. Student ratings made up the criteria data. The results were inconclusive.

<u>WEEKS TWO AND THREE</u> - Pre-instructional procedures and controlling techniques
and procedures

Intern progress was analyzed for Weeks Two and Three simultaneously with Week One student ratings forming the base line of analysis. For Week Two items 1, 2, 3, 6, 7 and 8 showed no change from Week One, while items 4, 5, and 12 showed some regression effect. Items 9, 10, and 11 showed improvement over the first week. Because of disciplinary role-playing by the students during Week Three the students' ratings showed a marked regression from Week One's ratings. These findings are summarized in Table VI.

The supervisors' ratings indicated similar trends; however, larger and more consistent item ratings are reported the second week, and the regression effects of the third week appear less severe with more tendency for recovery.

<u>WEEKS FIVE AND SIX</u> - Discussion skills and consolidation skills

Week Five and Week Six were compared with Week Three as a baseline in the same manner that Weeks Two and Three were compared with Week One. Week Five showed improvement in all 13 items significant at the .01 level. Week Six showed improvement in items 4, 5, 6, 7, 10, and 13 significant at the .01 level. There was no change in items 1, 2, 3, 8, 9, 11, 12. These results are summarized in Table VII. The supervisors' ratings showed a somewhat different pattern for Week Six than did the students' ratings. The supervisors' scores were smaller but still significant $(p < .01)$ F-ratios were found for the thirteen items. The mean changes, however, were somewhat different for the two weeks. See Table VII.

Conclusions

The Micro-teaching clinic produced significant behavior changes in teacher education candidates, an objective measure of valuable experience over the period of preinternship. From a questionnaire designed to evaluate student acceptance of micro-teaching, Table IX was completed. This table indicates that less than 15% of the interns reported that the experience was of little or no value. In every week (except the Saturday experimental sessions) micro-teaching was felt to be either very or extremely valuable by more than 60% of the interns returning the questionnaires.

From the analysis of the 1965 summer micro-teaching clinic data the following general conclusions can be drawn:

1. Nine of the first twelve appraisal guide items showed significant ($p < .01$) mean gain over the course of the six week clinic. This mean gain is indicative of substantial intern improvement in the items showing change.

2. Throughout the clinic the major teaching strategy involved the uses of student and supervisory feedback to achieve intern teaching change. This strategy again proved successful since 70% interns reported the usefulness of supervisory feedback and 24% reported the usefulness of student feedback.

3. The 1965 micro-teaching data and results tend to replicate earlier findings in the 1963 and 1964 clinics previously reported to AERA, February, 1965. These results affirmed the effectiveness of those teaching skills reported in 1965 which were previously identified and studied in the earlier clinics.

4. Training in the use of the Stanford Teacher Competence Appraisal Guide seems to help stabilize the ratings as is seen in the similarity of ratings made by different groups of students on the teach-reteach cycles of the first three weeks.

TABLE I

Student Means and Standard Deviations — Items	First Diagnostic Rating		1st Week Rating — Teach		1st Week Rating — Reteach		2nd Week Rating — Teach		2nd Week Rating — Reteach		3rd Week Rating — Teach		3rd Week Rating — Reteach		Micro-Class* 5th Week Rating — 1st Teach		5th Week Rating — 2nd T.		6th Week Rating — 1st Teach		6th Week Rating — 2nd T.		First Diagnostic	
	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t
1. Clarity of Aims	3.63	0.72	3.85	0.65	3.81	0.55	3.84	0.55	3.71	0.77	3.59	0.67	3.72	0.69	3.85	0.59	3.97	1.08	3.70	0.54	3.88	1.06	3.74	0.4
2. Appropriateness of Aims	3.45	0.71	3.72	0.63	3.61	0.53	3.77	0.58	3.69	0.77	3.56	0.63	3.68	0.69	3.92	0.56	4.02	1.02	3.92	0.56	3.75	1.08	3.22	0.4
3. Organization of the Lesson	3.50	0.74	3.90	0.63	3.94	0.52	3.81	0.59	3.84	0.79	3.59	0.70	3.67	0.66	3.99	0.58	4.16	1.07	4.06	0.53	4.08	1.04	3.9	0.7
4. Selection of Content	3.44	0.64	3.75	0.56	3.74	0.57	3.70	0.62	3.62	0.75	3.53	0.62	3.64		3.90	0.54	3.82	0.99	4.51	0.54	3.95	1.07	3.77	0.6
5. Selection of Materials	3.42	0.75	3.74	0.74	4.04	0.73	3.85	0.62	3.75		3.62		3.71	0.73	4.08	0.66	4.14	1.21	4.07	0.62	4.24	1.22	3.77	0.6
6. Beginning the Lesson	3.64	0.61	3.76	0.51	3.56	0.48	3.75	0.54	3.71	0.75	3.11	0.75	3.16	0.71	3.63	0.54	3.79	0.99	3.76	0.54	3.89	1.06	3.63	0.5
7. Clarity of Presentation	3.56	0.69	3.56	0.63	3.97	0.63	4.07	0.59	3.92	0.80	3.64	0.73	3.64	0.73	4.18	0.59	4.21	1.01	4.34	0.57	4.11			
8. Pacing of the Lesson	3.42	0.73	3.69	0.57	3.73	0.65	3.73	0.61	3.68	0.82	3.42	0.75	3.51	0.70	3.89	0.57	3.91	1.04	3.82	0.57	3.88	1.14	3.76	0.6
9. Pupil Participation and Attention	3.48	0.72	3.76	0.71	3.80	0.69	3.96	0.73	3.91	0.90	3.23	0.92	3.3	0.84	4.16	0.67	4.19	1.23	4.30	0.67	4.30	1.31	3.46	0.6
10. Ending the Lesson	3.18	0.83	3.57	0.75	3.56	0.74	3.64	0.69	3.54	0.33	3.10	0.83	3.26	0.81	3.76	0.68	3.69	1.24	3.72	0.62	3.79	1.21	3.46	0.6
11. Teacher-Pupil Rapport	3.45	0.73	3.76	0.72	3.76	0.60	3.94	0.70	3.85	0.94	3.60	0.91	3.61	0.91	3.99	0.61	4.15	1.11	4.05	0.62	4.16	1.21	2.91	0.4
12. Variety of Evaluation Procedures	3.40	0.70	3.51	0.77	3.51	0.62	3.32	0.75	3.27	0.94	2.83	1.25	2.79	1.27	3.51	0.93	3.58	1.71	3.66	0.85	3.58	1.66	3.11	0.5
13. Use of evaluation to improve teaching	NOT OBSERVABLE		NOT OBSERVABLE		NOT OBSERVABLE		2.33	1.67	2.54	1.58	NOT OBSERVABLE		NOT OBSERVABLE		2.81	1.44	2.50	1.47	2.73	1.45	2.73	2.84		

*First and second teaches in the micro-class are not a teach-reteach cycle but only the resultant of teachers in a small team getting to teach twice in the same week.

**Note on second teach sample size decreases greatly.

Supervisor Diagnostic Rating Means and Standard Deviations N=130

Micro-Class

Items	Supervisor Diagnostic Rating		1st Week Rating — teach		1st Week Rating — reteach		2nd Week Rating — teach		2nd Week Rating — reteach		3rd Week Rating — teach		3rd Week Rating — reteach		5th Week Rating — 1 teach		5th Week Rating — 2 teach		6th Week Rating — 1 teach		6th Week Rating — 2 teach		Fin Dia.
	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m	t	m
1. Clarity of Aims	2.74	1.02	3.20	1.09	3.45	0.97	3.43	0.96	3.68	1.00	3.14	1.06	3.39	0.94	3.66	0.94	3.78	1.72	3.72	0.88	3.94	1.76	3.57
2. Appropriateness of Aims	2.86	0.90	3.44	1.06	3.73	0.86	3.72	0.86	3.87	1.02	3.42	1.12	3.56	1.12	4.04	0.96	4.03	1.77	4.07	0.89	4.13	1.78	3.99
3. Organization of the Lesson	2.80	1.03	3.26	1.03	3.54	0.91	3.53	0.92	3.73	1.06	2.95	1.20	3.31	1.12	3.76	1.01	3.81	1.85	3.90	0.92	4.10	1.83	3.77
4. Selection of Content	2.96	0.95	3.46	1.10	3.70	1.02	3.69	1.02	3.88	1.10	3.35	1.02	3.48	1.07	3.86	0.95	3.92	1.75	4.06	0.93	3.99	1.86	3.99
5. Selection of Materials	2.73	1.05	3.53	1.21	3.8?	1.12	3.81	1.13	3.54	1.44	3.17	1.35	3.8?	1.42	3.96	1.16	4.05	2.14	4.10	1.10	3.76	2.20	3.72
6. Beginning the Lesson	3.00	0.83	3.17	1.01	3.50	0.92	3.49	0.93	3.65	1.11	3.01	0.98	3.24	1.06	3.72	1.00	3.59	1.85	3.69	1.02	3.68	2.04	3.73
7. Clarity of Presentation	2.81	1.02	3.10	1.11	3.58	1.10	3.57	1.10	3.69	1.11	2.95	1.18	3.25	1.14	3.70	1.02	3.84	1.89	3.72	0.97	3.97	1.93	3.88
8. Pacing of the Lesson	2.57	1.00	2.91	1.17	3.23	1.10	3.23	1.10	3.53	1.15	2.89	1.16	3.17	1.12	3.44	1.01	3.43	1.86	3.67	0.98	3.68	1.96	3.68
9. Pupil Participation and Attention	2.77	1.01	3.08	1.19	3.35	1.12	3.36	1.11	3.86	1.23	2.85	1.22	2.88	1.28	4.06	1.09	4.27	2.00	4.12	1.07	3.97	2.13	3.95
10. Ending the Lesson	2.18	1.23	2.64	1.25	3.15	1.20	3.13	1.20	3.23	1.23	2.48	1.23	2.66	1.52	3.38	1.30	3.49	1.18	3.49	2.38	3.39	2.36	3.29
11. Teacher-Pupil Rapport	2.53	1.39	2.81	1.41	3.21	1.34	3.23	1.32	3.56	1.39	3.10	1.32	3.69	1.34	3.91	1.16	4.11	2.03	4.01	1.06	4.10	2.10	3.88
12. Variety of Evaluative Procedures	1.23	1.44	1.54	1.60	1.95	1.69	1.94	1.67	1.96	1.82	1.64	1.64	1.76	1.75	2.61	1.46	2.55	1.54	2.68	3.06	2.84		2.05
13. Use of Evaluation to Improve Teaching	NOT OBSERVABLE		NOT OBSERVABLE		NOT OBSERVABLE		NOT OBSERVABLE		NOT OBSERVABLE		1.42	1.49	1.73		2.75	1.37	1.39	1.52	2.77				NOT OBSERVABLE

N=130 except in second teach

*First and second Teaches in the Micro-Class are not a teach-reteach cycle, but only the result of teachers in a small team getting to teach twice in the same week.

**Note on Second Teach Sample size decreases greatly.

TABLE III

First Diagnostic vs. Last Diagnostic

Item (Appraisal Guide)	F. Ratio	Significance	Largest Mean
1	2.07	NS	-------------
2	14.69**	.01	Post-test
3	30.45**	.01	Post-test
4	20.18**	.01	Post-test
5	19.79**	.01	Post-test
6	0.01	NS	-------------
7	54.27**	.01	Post-test
8	17.19**	.01	Post-test
9	23.59**	.01	Post-test
10	10.28**	.01	Post-test
11	34.72**	.01	Post-test
12	0.93	NS	-------------

$*F(1, 269) \geq 3.88 \quad p < .05$
$**F(1, 269) \geq 6.75 \quad p < .01$

TABLE IV

Supervisors Rating

Item (Appraisal Guide)	F. Ratio	Significance	Largest Mean
1	45.90**	.01	Post-test
2	13..80**	.01	Post-test
3	70.00**	.01	Post-test
4	87.47**	.01	Post-test
5	48.91**	.01	Post-test
6	55.85**	.01	Post-test
7	79.64**	.01	Post-test
8	89.92**	.01	Post-test
9	103.71**	.01	Post-test
10	60.47**	.01	Post-test
11	89.99**	.01	Post-test
12	18.69**	.01	Post-test

$*F_{(1, 267)} \geq 3.88 \ p < .05$

$**F_{(1, 267)} \geq 6.75 \ p < .01$

TABLE V

Week One: Students

* Item	F. Ratio	Significance	Largest Mean
1	4.31	.05	Teach-Reteach
2	7.04	.01	Teach-Reteach
3	20.16	.01	Teach-Reteach
4	9.66	.01	Teach-Reteach
5	30.31	.01	Teach-Reteach
6	3.02	.05	Teach-Reteach
7	23.62	.01	Teach-Reteach
8	8.58	.01	Teach-Reteach
9	8.47	.01	Teach-Reteach
10	11.64	.01	Teach-Reteach
11	9.20	.01	Teach-Reteach
12	8.93	.01	Teach-Reteach

*Note both teach and reteach were tested against diagnostic

$$*F(2, 418) \geq 3.01 \quad p < .05$$
$$**F(2, 418) \geq 4.65 \quad p < .01$$

TABLE VI

Students Scores: First, Second, Third Week

Item	F. Ratio	Significance	Second Week Change	Third Week Change
1	3.02	.05	no change	regression and some recovery
2	1.49	NS	no change	no change
3	5.42	.01	no change	regression and little recovery
4	2.76	.05	regression on reteach	regression and little recovery
5	6.82	.01	regression on both	regression and little recovery
	32.61	.01	no change	marked regression
7	10.07	.01	no change	marked regression
8	4.80	.01	no change	marked regression
9	19.75	.01	improvement	marked regression
10	11.58	.01	improvement on teach	marked regression
11	3.92	.01	improvement	regression
12	15.01	.01	regression	marked regression

$$F_{(5, 813)} \geq 2.3 \quad (p < .05)$$
$$F_{(5, 813)} \geq 3. \quad (p < .01)$$

TABLE VII

Students Scores
  Fifth and Sixth Weeks: Third Week as a Baseline

Item	F. Ratio	Significance	Fifth Week Change	Sixth Week Change
1	4.74	.01	improvement	no change
2	9.84	.01	improvement	no change
3	15.83	.01	improvement	no change
4	12.46	.01	improvement	improvement
5	13.01	.01	improvement	improvement
6	35.31	.01	improvement	improvement
7	28.35	.01	improvement	improvement
8	13.90	.01	improvement	no change
9	46.15	.01	improvement	no change
10	23.08	.01	improvement	improvement
11	16.36	.01	improvement	no change
12	29.46	.01	improvement	no change
13	14.68	.01	improvement	improvement

$F(2, 286) \geq 3.03$ $(p < .05)$
$F(2, 286) \geq 4.70$ $(p < .01)$

TABLE VIII

Supervisor Scores

Item	Fifth Week Change	Sixth Week Change
1	improvement	no change
2	improvement	no change
3	improvement	improvement
4	improvement	no change
5	improvement	no change
6	improvement	improvement
7	improvement	improvement
8	improvement	improvement
9	improvement	regression
10	improvement	no change
11	improvement	no change
12	improvement	regression
13	improvement	regression

TABLE IX

Results of 1965 Micro-Teaching Experiment

Item	Report	%Ext. val.	%Very val.	%Av. val.	%Lt. val.	%no val.
1st wk.	96	12.4	50.0	23.9	8.5	5.2
2nd wk.	104	17.5	38.6	37.5	5.4	1.0
3rd wk.	108	12.9	38.9	32.4	11.1	4.2
5th wk.	91	24.2	36.3	21.2	14.2	5.1
6th wk.	91	26.2	34.3	26.3	8.2	5.0
Sat.	96	19.6	24.0	28.0	18.0	10.4

SECTION IV

Micro-Teaching - A New Framework for In-Service Education

The Technical Skills of Teaching

Developing Specific Teaching Skills Through Micro-Teaching

MICRO-TEACHING: A NEW FRAMEWORK FOR IN-SERVICE EDUCATION

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Stanford University

A young science teacher entered her micro-teaching class carrying a live snake. The purpose of her lesson was to identify characteristics common to snakes and not to other animals. As a result of her dramatic entrance, involvement was immediate and sustained throughout the five-minute lesson. At the end of the lesson, no one could doubt that this was real, not laboratory teaching.

The teacher was evaluated and rated by the students and supervisors in accordance with the Stanford Appraisal Guide. Her ratings were generally quite high, with the exception of "pacing the lesson." Immediate feedback indicated that this otherwise effective teacher talked too fast and covered too much information through the lecturing technique. It was suggested that she limit the information to three or four major characteristics which distinguish snakes from other types of animals, and refocus in order to provide for student summary and more effective closure.

With immediate information as to suggested improvement, the teacher then re-taught the same lesson dealing with snakes. On subsequent re-teach, the teacher, students, and supervisors felt the lesson indicated definite improvement. All agreed that the material was probed in greater depth, and the material was more lucid in organization.

This teaching situation occurred as part of a seminar series for in-service training of supervisors at the Campbell Union High School District in California. The purpose of the series was to change teacher perceptions of their own teaching behavior, and to provide training for specific teaching skills. Teachers and supervisors were given only a cursory amount of training and initial application, yet supervisors were able to get differences in teaching behavior. The training seminars demonstrated that micro-teaching can be of real value to experienced personnel.

The micro-teaching structure is a scaled-down teaching encounter in class size and class time which has been developed in the Stanford University Secondary Teacher Education Program. Class size is limited to one to five students and class time from five to twenty minute lessons. Micro-teaching may be used with or without video-tape.

While micro-teaching was first developed for preliminary experience and practice in teaching and as a research vehicle to explore training effects under controlled conditions, the concept can be of service to experienced teachers as a means of gaining new information about their teaching in a relatively short time, and as a means of changing teacher perceptions of their own teaching behavior. Relistic approximations to classroom conditions allow predictions of subsequent classroom teaching to be made with a high degree of accuracy, for the students are reacting and evaluating as real students, not role-playing. This constitutes a _real_ teaching encounter, not one which is simulated; only it is reduced in terms of students and time.

Micro-teaching may therefore serve a dual purpose; it may be utilized in a diagnostic sense to ascertain specific problems in presenting curriculum, and it may be used in an evaluative sense to rate total performance through the use of immediate student feedback. Previous experiments have shown that student ratings of teacher performance are more stable than other types of evaluation.

Experienced teachers may gain new insights through adaptation of the micro-teaching model. Under the present framework, if a teacher wishes to try a new approach in a particular lesson, he must wait until the following year to test alternatives to that lesson. In micro-teaching, the teacher can experiment with several alternatives with a limited number of students each time, with the opportunity for immediate evaluation and additional trials. Following this limited application, the plan can then be presented to the classroom. In this way, teachers may experiment with new methods and new content without the risk of defeating student learning and with much more satisfactory timing.

The micro-teaching clinic is an effective stimulus for the improvement of teacher performance after a performance plateau is reached in early tenure. The most effective teachers attain a high level of performance early in their careers. Unfortunately they rarely have the stimulus to further increase their competence. Providing them with an opportunity to try new ideas easily and without risk to student learning can be an important asset to professional development.

The following uses of micro-teaching are among those appropriate for in-service situations:

1. The teach-reteach pattern.

By using a teach-reteach model, a teacher can use the experience of teaching a lesson to an initial group of students to make changes which can be immediately incorporated and taught to a different group of students for comparative evaluation. The scaled-down nature of the micro lesson

makes such repetitions feasible and economical. By using the teach-reteach
pattern, specific teaching skills can better be evaluated; content can be
tested with one teacher practicing a new lesson while the rest of the depart-
ment uses this lesson as a basis for critique and suggested alternatives.
On the reteach, the experienced teacher can test new ideas and methods
determined by student reaction and departmental suggestions thereby improving
both the quality of content and mode of presentation.

2. Micro-teaching as a trial framework for team presentations.

Groups of teachers can experiment together with new techniques in content or
mode of presentation. Several teachers from a given department could teach
while the rest of the department uses their presentation for purposes of
evaluation. Perhaps several departments might expand this experiment as
a means for developing interdisciplinary curriculums.

3. Micro-teaching as a site for trial of instructional level.

It is often difficult to predict the instructional level of materials. Even the
most experienced teacher can make serious misjudgments about student ex-
perience or maturity required to learn a given set of materials. In some
instances this will require the alteration of the lesson materials. In other
circumstances the lesson can be taught at another level as indicated. In
Jefferson County, Colorado, a lesson was developed for fifth and sixth-grade
students in science. In a trial of this lesson in a micro-teaching situation, it
was discovered that second-grade students caught on to this lesson faster than
did older students. Micro-teaching provides good opportunity for such quick
comparisons. Obviously, there remained many questions as to why and under
what circumstances the results would have differed. These questions could
also be tested quickly in the micro-teaching structure where immediate feed-
back is available and the conditions could be altered easily as desired.

4. Micro-teaching for pre-employment prediction.

Micro-teaching can serve as a framework for selection or rating experienced
teachers seeking employment. An evaluation committee could rate the teacher
under "live" conditions instead of relying solely on recommendations or grade-
point average. This concept can be extended to include evaluation of current
employees for possible promotion. Under the present system, teachers are
observed once or twice a year, given a rating form or written recommendation
which signifies the teacher's competence. With the use of micro-teaching,
teachers can be observed frequently for brief durations of time, under con-
trolled conditions. With micro-teaching as a source of evaluative evidence,
new criteria for employment performance can be developed. For example,
it might be more noteworthy to judge how much a potential teacher will be

able to improve as a result of inservice supervision than to assess current performance. Also as we learn to differentiate teaching roles, micro-teaching situations can be devised to provide practice and evaluation of specific competences.

A recent experiment for pre-employment prediction was carried out jointly by Stanford University and the Fremont Union High School District in California. Teachers seeking employment with the Fremont District taught a micro-lesson. Two methods for selection were then used; Fremont selected teachers using traditional means, while Stanford University predicted teaching success based solely on micro-teaching evaluations. The results of this experiment will be available in the fall after Stanford and Fremont correlate their selections and predictions. Those teachers chosen by Fremont will be checked against their ratings in micro-teaching, and both predictions will be evaluated by teaching success during the year. It is not anticipated that micro-teaching can replace other employment screening entirely, but the present experiment can provide evidence as to possible directions for further exploration.

5. Micro-teaching to train supervisors.

By focusing on specific techniques desired for experienced teachers, supervisors can identify the necessary variables in training teachers to improve their teaching behavior. The beginning teacher, for example, is observed usually one full class period followed by a teacher conference. The new teacher receives a list of suggested changes, but the supervisor has no way to test the results of the conference since there is typically no effort to evaluate the application of supervisory suggestions until months later, with different conditions in student reaction, materials, or grade level. No one ever _knows_ the results of supervision.

With micro-teaching, a beginning teacher is observed for a brief lesson followed by a conference followed by another observation. During the conference, the trainee must absorb both the students' and the supervisor's suggestions for improvement. During the re-teach, the supervisor can immediately evaluate progress and understanding on the part of the teacher. All instruction and evaluation occurs within a relatively short period. Experiments have indicated that a teacher should not be given more than one or two specific points to concern himself with during any one supervisory sequence.

There are many facets of supervision that can be studied, using the micro model: testing and looking at alternatives for supervision; varying the time and length of visits; letting teachers select the time for supervision; experimenting with the concept that the quality of supervision improves with a reduction in the number of conference suggestions; experimenting with or without video-tape; studying and enumerating the skills of teaching (identifying specific training protocols); using new materials; distinguishing between behavioral objectives and pious hopes; improving the ability to diagnose and state behavioral objectives; and developing instructional techniques.

6. Micro-teaching for continuing the supervision and evaluation of beginning teachers.

This model lends itself to intensive supervision, immediate critique, and opportunities to repeat the practice session if necessary. Micro-teaching simplifies the complexities of teaching by isolating specific variables in the total teaching act which can be identified and therefore manipulated. It also provides greater control over practice in a wide range of teaching situations, in a variety of pupil types and class compositions and in the possible variation in amount of practice according to individual needs. Micro-teaching increases the economy of supervision by increasing the amount of practice possible within a limited period of time, requiring fewer facilities and pupils. It also anticipated new alternatives in evaluation by providing good records of teaching performance at periodic intervals under standard conditions and permitting several judges to evaluate and re-evaluate a single performance.

The micro-teaching model can be adapted to different grade, ability, and interest levels. This is especially important at the junior and senior high school level. Individual adaptations would vary from school to school, depending upon local needs.

Initiating and maintaining a micro-teaching clinic serving local needs takes few facilities and funds.

Micro-teaching can facilitate curriculum planning. If the committee is working during the summer, then the micro-classes should be utilized during the summer. Students could be hired and paid out of regular district funds as part of the cost of curriculum development. This would provide pre-class trials of materials with the opportunity for trying and testing many alternatives.

If the curriculum committee is working on planning development during the regular school year, then microteaching should be used a few days before a teacher would normally be teaching the lesson. This would be particularly useful for evaluation in team-teaching situations. Teachers could use their own students for evaluation purposes, but on each occasion, teachers should select different students from their classes for trial runs. This provides the necessary random sampling and does not unduly affect the learning of any one student. Great variety is possible with only a few students.

During the summer of 1965, Stanford University has continued experimenting with the micro-teaching model as a method for training beginning teachers. For 140 pre-service teachers, the total number of students required was 42. Ten different student teams composed of four students each were used (with two reserves) and this combination gave great variety for each teacher.

The micro-teaching model can be used as a part of teacher workshops. The model can be adapted at any time during the workshops; on Saturdays, during the summer, or during the regular school year. Students could be selected on a voluntary basis or hired. The important thing to remember is that adaptation of micro-teaching does not take many students or complex logistics.

A recent interview with experienced personnel from Jefferson County, Colorado, indicated that micro-teaching during summer workshops for in-service teachers is particularly valuable. New ideas and methods were tested within the micro-framework. The model was also successfully used on parents' night as a means of explaining to parents new ideas and curriculum to be presented during the summer.

During the summer, the problem is to select a representative student population for which the materials are ultimately being developed. Experiments to date have shown that there is no difficulty employing the students; they are eager to participate. Funds can be drawn from the curriculum planning budget. Proportionately, the amount of financial resources needed is not high.

Training of micro-teaching students is minimal, since training is limited to teaching the students how to use the evaluation instruments. Two types of instruments have been used in Stanford's experimentation; a general rating form (the Stanford Teacher Competence Appraisal Guide), and specific forms developed to reflect specific skills. The latter instruments are designed by the staff responsible for the training so that the desired responses are accounted for selectively.

The structure of the micro-teaching clinic will depend on the focus and purposes of the experimentation; that is, the structure will be difference if the focus is on staff training rather than on materials. If the focus is on staff training, then the students should use narrow and specifically designed rating instruments to measure staff variables. If the focus is on materials, evaluative instruments would have to reflect the training focus.

The micro-teaching clinic can be structured so that it focuses upon teaching competences where the students' point of view is most relevant. This would include student reaction to beginning the lesson (establishing set), establishing appropriate frames of reference, increasing student participation, using questions effectively, recognizing and obtaining attending behavior, control of participation, providing feedback, setting a model, employing reinforcement, effectively giving directions, and ending the lesson (achieving closure).

Micro-teaching successfully facilitates maximum flexibility in learning how to use new curriculum, in learning how to evaluate curriculum and performance, and as a selection and prediction device. Micro-teaching lends itself

well to experimentation with practice and evaluation of several techniques: the teach-reteach pattern offers the opportunity for immediate student reaction and feedback; team presentations can be tested on a limited scale before postulation to the class; the model can be adapted at different grade levels; a micro-teaching situation can provide information for determining the level where a lesson might be most appropriately taught; pre-employment and employment predictions and ratings can be evaluated from several points of view; training techniques can be developed for supervisors; continued supervision and evaluation of beginning teachers can be increased.

Micro-teaching offers the opportunity for new insights and perceptions of teaching behavior in presentation and evaluation techniques. The model can be adapted to local needs in testing both immediate and long-range goals in curriculum planning. Micro-teaching holds a kaleidioscope of opportunities for rethinking the basis of inservice education.

TECHNICAL SKILLS OF TEACHING

1. ESTABLISHING SET

The term set refers to the establishment of cognitive rapport between pupils
and teacher to obtain immediate involvement in the lesson. Experience indicates
a direct relationship between the effectiveness in establishing set and effective-
ness in the total lesson. If the teacher succeeds in creating a positive set,
the likelihood of pupil involvement in the lesson will be enhanced. For example,
one technique for inducing positive set is through the use of analogies that
have characteristics similar to the concept, principle, or central theme of the
lesson. By training teachers in set induction procedures and having them apply
these procedures in micro-teaching sessions, their subsequent classroom teaching
can be significantly improved.

2. ESTABLISHING APPROPRIATE FRAMES OF REFERENCE

A student's understanding of the material of a lesson can be increased if it
is organized and taught from several appropriate points of view. A single frame
of reference provides a structure through which the student can gain an under-
standing of the materials. The use of several frames of reference deepens and
broadens the general field of understanding more completely than is possible
with only one. For example, the Emancipation Proclamation becomes more meaningful
to the student when it is understood from the frames of reference of the Northern
white abolitionist, the Southern white, the Negro slave in the seceded South, the
free Negro, the European clothing manufacturer, the political leaders of England,
and as an example of the reserve powers of the American President, than if it is
simply discussed as the document issued by Lincoln which freed the slaves.
Teachers can be trained to become more powerful teachers as they are taught to

identify many possible frames of reference that might be used in instruction, to make judicious selection from among them, and then to present them effectively.

3. ACHIEVING CLOSURE

Closure is complementary to set induction. Closure is attained when the major purposes, principles, and constructs of a lesson, or portion of a lesson, are judged to have learned so that the student can relate new knowledge to past knowledge. It is more than a quick summary of the ground covered in a lesson. In addition to pulling together the major points and acting as a cognitive link between past knowledge and new knowledge, closure provides the pupil with a needed feeling of achievement. Closure is not limited to the completion of a lesson. It is also needed at specific points within the lesson so that pupils may know where they are and where they are going.

4. RECOGNIZING AND OBTAINING ATTENDING BEHAVIOR

Teachers can be trained to become more sensitive to the classroom behavior of pupils. The successful experienced teacher, through visual cues, quickly notes indications of interest or boredom, comprehension or bewilderment. Facial expressions, directions of the eyes, the tilt of the head, and bodily posture offer commonly recurrent cues which make it possible for the skilled teacher to evaluate his classroom performance according to the pupil's reactions. He can then change his "pace," vary the activity, introduce new instructional strategies as necessary, and improve the quality of his teaching. Unlike his more experienced counterpart, t beginning teacher has difficulty perceiving and interpreting these visual cues. Through 16mm motion picture films and 35mm still picture protocols of classrooms, and video-tape recordings in micro-teaching sessions, supervisors are able to sensitize teachers to visual cues of pupils' attending and non-attending behavior.

5. PROVIDING FEEDBACK

The feedback process in the training of teachers may be simply states as providing "knowledge of results." Teachers often ignore the availability of information accessible during the lesson. Questioning, visual cues, informal examination of performance, are immediate sources of feedback. Teachers can be taught appropriate techniques to elicit feedback from students to modify their lesson accordingly. Teachers unconsciously tap a variety of feedback sources but unless they are sensitized, they tend to rely unevenly on a limited number of students as "indicators" and to rely on a restricted range of feedback cues.

6. EMPLOYING REWARDS AND PUNISHMENTS (REINFORCEMENT)

Reinforcing desired pupil behavior through the use of reward and punishment is an integral part of the teacher's role as director of classroom learning. Substantial psychological evidence confirms the value of reinforcement in the learning process. The acquisition of knowledge of specific techniques of reward and punishment and the development of skill in using them appropriately in specific situations is most important in training a beginning teacher. Experience indicates that teachers can acquire skill through micro-teaching practice in reinforcement of pupil learning.

7. CONTROL OF PARTICIPATION

Micro-teaching sessions enable teachers to analyze the kinds of pupil-teacher interaction which characterize their teaching. Control of pupils' participation is one important variable in the successful learning for the pupils. Micro-teaching sessions provide an opportunity for teachers to practice different techniques for encouraging or discouraging classroom interaction and to gain insight into the casual relationship between a series of teacher-pupil interactions When a teacher develops the skill to analyze and to control the use of his accepting and rejecting remarks, his positive and negative reactions, his patterns

of reward and punishment, he has taken a major step toward effective teaching.

8. REDUNDANCY AND REPETITION

The purpose of this skill is to clarify and reinforce major ideas, key words principles, and concepts in a lecture or discussion. The use of redundance and repetition is a powerful technique in focusing and highlighting important points, and describing them from a different point of view. Improper use of this skill can cause confusion and poor learning among the students, while proper use can direct their attention to points which the teacher wishes to emphasize. There are two main varieties of repetition:(1) Literal repetition - using simple, massed, distributed, and accumulative repetition; and (2) Figures of speech - metaphors, analogies, verbal emphasis, focusing, gestures, and visual highlighting.

9. ILLUSTRATING AND USE OF EXAMPLES

The use of examples is basic to teaching for good, sound, clear teaching. Examples are necessary to clarify, verify, or substantiate concepts. Both inductive and deductive uses of examples can be used effectively by the teacher. Effective use of examples includes: (1) starting with simple examples and progressing to more complex ones; (2) starting with examples relevant to students' experience and knowledge; (3) relating the examples to the principles or ideas being taught; (4) checking to see if the objectives of the lesson have been achieved by asking students to give examples which illustrate the main point.

10. ASKING QUESTIONS

Prior to the development of probing and higher order questioning techniques comes the skill of asking questions, period. Too often beginning teachers lecture and tell students rather than asking questions which can elicit the answers from the students themselves. Training techniques have been developed by which teachers can see model videotapes of teachers demonstrating this skill, and by

practicing in a micro-teaching situation increase the number of questions.

which they ask of students. Having achieved this goal the emphasis can be

placed on higher order questioning techniques.

11. THE USE OF HIGHER ORDER QUESTIONS

Higher order questions are defined as questions which cannot be answered

from memory or simple sensory description. They call for finding a rule or

principles rather than defining one. The critical requirements for a "good"

classroom question is that it prompts students to use ideas rather than just

remember them. Although some teachers intuitively ask questions of high quality,

far too many over-emphasize those that require only the simplest cognitive activity

on the part of the students. Procedures have been designed to sensitize begin-

ning teachers to the effects of questioning on their students and which provide

practice in forming and using higher order questions.

12. THE USE OF PROBING QUESTIONS

Probing requires that teachers ask questions that require pupils to go beyond

superficial "first-answer" questions. This can be done in five ways: (1) asking

pupils for more information and/or more meaning; (2) requiring the pupil to

rationally justify his response; (3) refocusing the pupil's or class's attention

on a related issue; (4) prompting the pupil or giving him hints; and (5) bringing

other students into the discussion by getting them to respond to the first

student's answer.

13. TEACHER SILENCE AND NON-VERBAL CUES

Many teachers are frightened by silence or pauses in classroom discussion.

They usually hasten to fill silence gaps by talking. What many teachers do not

realize is that teacher silence is a powerful tool in the classroom. Teacher

pausing can be used after: (1) Introductory statements to pressure the students

into thinking about the teacher's statement; (2) questions to the students to

give them time to think about a proper answer; (3) questions from the students
to direct the question to another student with a look or gesture; (4) student
response to elicit a continuing response.

14. STUDENT-INITIATED QUESTIONS

This skill is based upon techniques which produce a discrepant event that
provokes students to ask questions of the teacher. These questions can be asked
in a twenty-question type of game which keeps student motivation and interest
at a high level.

15. COMPLETENESS OF COMMUNICATION

Although the importance and need for clear communication is blatant, it
is not often the guiding principles in actual communication. Sensitivity train-
ing on the importance, and the difficulty, of being understood is the focus of
this skill. Several classroom games have been devised which dramatically demon-
strate to teachers that what they consider to be clear instructions are often
not clear at all to the students. Sensitivity training in the skill of communi-
cating with others will produce teachers who are more responsive to possible
miscommunication.

INTEGRATIVE SKILLS

The following are classified as integrative skills because they consist of combinations of other skills. Mastery of the separate skills is not enough to produce the overall desired behavior. For this reason new skills are listed which consist largely of combinations of other skills in a different context.

16. VARYING THE STIULUS SITUATION

Psychological experiments have shown that deviations from standard, habitual teacher behavior result in higher pupil attention levels. Teachers should be sensitized to their habit patterns and made aware of attention producing behavior that they, as the stimulus object, can control. The behaviors include teacher movement, gestures, focusing pupil attention, varying the interaction styles, pausing, and shifting sensory channels.

17. LECTURING

Training in some of the successful techniques of lecturing based upon a communications model is the focus for this skill. Delivery techniques, use of audio-visual materials, set induction, pacing, closure, redundancy and repetition, and other skills related to lecturing are included.

18. PRE-CUEING

Pupils are often called on in class to answer questions. Frequently the student does not know the answer and either wastes class time talking in circles, or else admits ignorance. If the teacher could cue the student 5 or 10 minutes ahead or when he wants to answer the student could prepare himself, thus making a significant contribution to the class. The alerting or cueing of students is a teacher technique which can be used to good purpose in the classroom.

DEVELOPING SPECIFIC TEACHING SKILLS THROUGH MICRO-TEACHING

by

James M. Cooper

Researchers have produced hundreds of thousands of pages analyzing teaching, yet we still know relatively little about it. One major reason for this is quite clear -- teaching is an extremely complex process dealing with many variables -- teachers' and pupils' personality characteristics, intelligence, motivation, teaching skills, etc. -- so that lifetimes can be spent researching small aspects of the above variables.

One approach toward analyzing teaching is to look at it in terms of pupil and teacher behaviors. If we observe a teacher over long periods of time we will note that he uses certain skills or techniques many different times. If skills and behaviors which teachers perform often in the classroom can be identified, different training protocols or established procedures and techniques can be developed in order to produce proficiency in their use. In other words, much of the complex act of teaching can be broken down into simpler, more easily trainable skills and techniques. If we were to make a tally count of the kinds of skills or techniques or activities that a teacher uses in the classroom, we would probably find that the teacher would do some activities or skills much more often than others. We would probably also find that certain behaviors of the teacher tended to act as stimuli which in turn produced certain pupil behaviors.

Research has already indicated some of these teacher behaviors which tend to produce desired pupil behaviors. For example, if teachers reinforce students both verbally and non-verbally when they participate in classroom discussions,

irrespective of the correctness of their responses, students will participate more often in classroom discussions. If teachers wish to get students to participate more often in class they should discover what is reinforcing for particular students and then reinforce the students when they do participate in class. It would seem that the more techniques a teacher has at his disposal for reinforcing students the better his chances for getting good pupil participation.

A training technique instituted at Stanford University for developing specific teaching skills is the process known as micro-teaching. It exposes the trainees to variables in classroom teaching while reducing the complexity of the situation. The teacher attempting to develop a new teaching skill is not confronted with preparing a lesson plan of forty-five minutes in length, nor does he have to worry about the management of a group of thirty students. Teaching a small class, usually four students, for a short period of time, five to twenty minutes, allows the teacher trainee to focus his attention on mastering a specific technique.

What are the most important ideas to be considered in developing teaching skills through micro-teaching?

1. Specific skills in teaching must be developed. Skills must be defined and decisions made as to which skills would be the most useful for teacher trainees to have in their repertoire. In the 1966 micro-teaching clinic at Stanford the following skills were decided upon.

   a. Reinforcement Techniques.

   b. Varying the Stimulus Situation in order to keep pupil attention level high.

c. A package of 3 presentation skills:

    (1) Set Induction -- the establishment of cognitive rapport between pupils and teacher to obtain immediate involvement in the lesson.

    (2) Lecturing Techniques and Use of A.V.

    (3) Achieving Closure -- this skill is complementary to Set Induction. Closure is attained when the major purposes and concepts of a lesson, or portion of a lesson, are judged to have been learned so that the student can relate new knowledge to past knowledge.

d. Illustrating and Use of Examples -- this skill included the concept of using simple examples and progressing to more complex ones in order to explain concepts and principles.

e. Student Initiated Questions -- this skill focused on getting students to initiate questions by presenting them with incongruity facts.

There was no assumption made that these skills represented the most important ones a teacher should have, but it was felt that each was substantial and should be a part of the teacher's repertoires. Skills will differ according to subject field, grade level, and a host of other variables. While there are obviously some skills which are common to Peace Corps workers teaching English as a second language and mathematics teachers in suburban high schools, it is important to realize that there are also some crucial skills unique to each area. There is no one set of technical skills which is better than another set. The selection and development of technical skills of teaching depends upon the objectives of the teacher education program.

There is a great need for research in this area of selecting and defining skills in order to avoid wasting time and energy working on skills which are of

of little use to the teacher. In other words, what skills will produce the greatest payoff for the teacher in the classroom? Very few answers to this question are known. Research is also needed to guide the selection of the behavioral components of each skill. There are many ways of reinforcing students for participation. Which techniques should the training emphasize? At the present time we are operating on common sense, hunches, and intuition. This is not good enough for a long-range development of teaching skills; it is only a stop gap measure until empirical proof is gathered.

2. Training protocols must be established in order to develop the teaching skills. The behavioral components of any teaching skill expected of the trainees can be described to them in a lecture situation. A more powerful training procedure, in my opinion, would be to show various models demonstrating particular teaching skills. Suppose, for example, that the skill to be taught to the teacher trainees was that of "Varying the Stimulus Situation." Several ten or fifteen-minute films or videotape recordings could be made of experienced teachers demonstrating the skill. The teacher trainees could then try to identify particular behaviors on the part of the model teachers which they believed demonstrated the skill of "Varying the Stimulus Situation." A discussion could follow in which a list might be drawn up of the model teacher's behaviors. The instructor could then pass out the criteria of the skill as he defined them and compare them to the list which was compiled. Another showing of the model tapes with the trainees viewing them in light of the instructor's criteria might follow. The trainees should then have the opportunity to practice the skill of "Varying the Stimulus Situation" soon thereafter in a micro-teaching situation.

3. <u>Teach-Reteach Concept.</u> One of the main advantages of micro-teaching is its provision for reteaching the same lesson almost immediately in an attempt to improve one's performance. Because the lessons are of short duration and are taught to few students, they can be re-taught to a different group of students, incorporating supervisory suggestions for improvement. The basic model is one of a Teach, Critique, Reteach, and Critique again cycle. This model employs cybernetic principles of immediate feedback and immediate opportunity to incorporate that feedback into the teaching act.

4. <u>Video-tape Recordings.</u> The use of video-taping is not an essential part of micro-teaching, but it is certainly a most beneficial addition. There are two major uses for video-tape recordings in developing specific teaching skills for micro-teaching. First is the use of video-tapes to show model teachers demonstrating specific skills. An experiment at Stanford University has demonstrated the power of T.V. recordings of model teachers in obtaining desired behavior change on the part of the trainees.[1] The opportunity to compare their performances with that of a model teacher's enabled trainees to adapt their performance to better demonstrate the specific skill.

Second is the use of video-tapes as part of the supervisory process. It is so much easier to obtain behavior change if the supervisor and the trainee agree as to what the trainee's behavior was in the first place. The video-tape recording enables them to reach agreement by providing a common frame of reference in the supervisory conference. The lesson is recreated on the T.V. monitor instead of in their individual minds. It has also been my finding that the trainee

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[1]Orme, M., McDonald, F.J., and Allen, D.W. "The Effects of Modeling and Feedback Variables on the Acquisition of Complex Teaching Strategy," School of Education, Stanford University, 1966.

is less apt to take constructive criticism personally when it is directed at his image on the monitor rather than at his person. Use of the T.V. takes some of the sting out of the supervisor's suggestions by depersonalizing the criticism and which makes the trainee less defensive.

Another advantage of video-tape recordings is that they help the trainee to supervise himself, i.e., to analyze his own performance in terms of its strengths and weaknesses. A trainee should be encouraged to diagnose his own difficulties and plan alternative actions. On these occasions the supervisor should not be present during the lesson. Instead, the trainee should write out his aims and how he intends to accomplish them before the lesson. After reviewing the video-tape of the lesson he should state how successful he thought the lesson was, using positive and negative examples. He should also state what changes he intends to make for the reteach lesson. Following the reteach and second critique session he should state how effective he thought the changes were.

Later that day the trainee should meet with his supervisor to view the lessons again and compare his written analysis with that of his supervisor. In this manner the trainees can learn to diagnose their own strengths and weaknesses. This self-analysis is important if the trainee is to continue to develop professionally after his initial training period. The use of video-tapes permit self-analysis in a way that is impossible without this accurate recording of the lesson.

5. The Development of Specific Evaluative Instruments. In the first three micro-teaching clinics conducted at Stanford a general teacher competence appraisal guide was used to evaluate a trainee's competence in specific technical

skills of teaching. This instrument proved to be unsatisfactory because it was designed to measure overall teaching competency. None of the items on the appraisal guide were specifically designed for any of the technical skills that were the focus of the micro-teaching clinic. It was very difficult to tell, for instance, which items on the appraisal guide specifically measured the skill of "Reinforcement Techniques." Last summer we constructed evaluative instruments to measure progress in each of the technical skills that were included in the micro-teaching clinic. However, because of the pressing demands of limited time, these instruments were not validated nor was reliability established prior to their use.

The development of instruments designed to specifically measure the skills which are the foci of training in micro-teaching is definitely needed in order to correctly assess the effects of training in various skills. The reliability of the instruments must also be established in order to have faith in the analysis of the data designed to measure the effects of training. Only by a systematic measurement of the skills and the training protocols can programs be properly evaluated and the micro-teaching process up-graded.

Another advantage of having evaluative instruments for specific skills is their usefulness in the critiquing sessions. Since the object of working on discrete teaching skills is to develop competence in these skills which comprise much of the teaching act, it makes little sense to give the trainees feedback based, not upon these skills, but rather on some sort of global non-behavioral type rating. The appraisal instruments, in other words, should reflect the specific skill which the trainee is attempting to master.

Summary

Breaking down the complex teaching act into simpler, more easily trainable skills offers much promise for teacher education. Micro-teaching provides a useful and constructive setting for the development of such specific teaching skills. As has been emphasized in this article, there is much that we do not know about training teachers through this method, just as there is much we don't know about training teachers in a more conventional manner. I would hope that every institution that attempts the development of specific teaching skills through micro-teaching will also set up experimental controls to test hypotheses regarding the skills and the training protocols. We need more reliable knowledge about this method of training teachers, and we can only gain this knowledge if each institution using this technique will add its findings to the general fund of knowledge.