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ABSTRACT

This study was designed to determine the effectiveness of three feedback procedures by determining the relationship between the feedback procecures and the development of competence in establishing set by the teacher-trainees as indicated by the group mean gain scores on the "Hernandez-Klingstedt Establishing Set Rating Form." The feedback procedures compared were as follows: (1) verbal and written prompting and cueing provided by peers and the supervising teacher (limited feedback procedure) coupled with viewing of a videotape of the teaching performance; (2) limited feedback procedure coupled with listening to an audiotape of the teaching performance; and (3) the limited feedback procedure itself. An additional purpose was to determine the relationship between the individual mean scores of students exposed to the three feedback procedures with age, sex, marital status, hours in education, total hours in college, and overall college grade-point average. Three groups, consisting of a total of 20 secondary education majors at the University of Texas at El Paso during the spring semester of 1973, were used in this study. It was concluded that there was no significant difference in the effectiveness of the three microteaching feedback procedures. Accordingly, as far as enhancing the attainment of the technical skill is concerned, it seems to make no significant difference which of the three feedback procedures is employed as a part of the instructional sequence. (Author/BD)

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EFFECTIVENESS OF THREE FEEDBACK PROCEDURES IN DEVELOPING SET ESTABLISHING SKILL

Final Report
Prepared for the
University Research Institute
The University of Texas at El Paso

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by

Joe Lars Klingstedt

November, 1974

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CHAPTER I

INTRODUCTION

The technique known as micro-teaching has been adopted by many institutions concerned with the pre- and inservice education of educational personnel. As pointed out by the investigator in a previous study, some procedural problems have arisen.[1]

McDonald and Allen pointed out that a basic problem in preparing teachers was to provide adequate feedback information on the teaching performance.[2] While a large body of psychological literature supports the notion that reinforcement produces learning, McDonald and Allen believe that in a complex learning task such as learning teaching behavior the key to effectiveness may be highly dependent on the kind of feedback provided.[3] They state that the exclusive use of verbal and written prompting and cueing have proven ineffective in producing the learning of desired teaching behavior.[4] Based on the acceptance of these notions, most of the recent research dealing with feedback approaches, especially in the micro-teaching context, has utilized the videotape recorder in an attempt to overcome the weaknesses of the traditional approaches.

Because videotape units are expensive, $600.00 to $3,000.00 and up, the investigator wanted to determine the effectiveness of other feedback

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[1]Joe Lars Klingstedt, "Effectiveness of Three Micro-Teaching Feedback Procedures" (unpublished Ed.D. dissertation, Texas Tech University, 1970), p. 1.

[2]Frederick J. McDonald and Dwight W. Allen, Training Effects of Feedback and Modeling Procedures on Teaching Performance (Stanford, California: School of Education, Stanford University, 1967), p. 1.

[3]McDonald and Allen, p. 13. [4]McDonald and Allen, p. 2.

approaches including the utilization of audiotape as well as videotape.

Statement of the Problem and Its Purposes

The problem of this study was the effectiveness of three microteaching feedback procedures. Effectiveness of the feedback procedures, as used herein, concerns the degree of competence developed in establishing set. The feedback procedures compared were: (1) verbal and written prompting and cueing provided by peers and the supervising teacher, coupled with viewing of a videotape of the teaching performance, (2) verbal and written prompting and cueing provided by peers and the supervising teacher, coupled with listening to an audiotape of the teaching performance, and (3) verbal and written prompting and cueing provided by peers and the supervising teacher.

The first purpose of this study was to determine the effectiveness of the three micro-teaching feedback procedures by determining the relationship between the feedback procedures and the development of competence in establishing set by the students as indicated by the group mean gain scores on the Hernandez-Klingstedt Establishing Set Rating Form.

The second purpose of this study was to determine the relationship between the individual mean gain scores on the Hernandez-Klingstedt Establishing Set Rating Form of students exposed to the three different feedback procedures with each of the following: their age, sex, marital status, hours in education, total hours, and overall college grade-point average.

Hypotheses

In order to achieve the purposes of this study, the following hypotheses

were tested:

1. The verbal and written prompting and cueing provided by peers and the supervising teacher (limited feedback procedure) coupled with viewing of a videotape of the teaching performance (Group A) will be more effective than either the limited feedback procedure coupled with listening to an audiotape of the teaching performance (Group B) or the limited feedback procedure by itself (Group C), and the technique used with Group B will be more effective than the technique used with Group C. The criterion for this was the group mean gain score on the Hernandez-Klingstedt Establishing Set Rating Form.
   A. Group A will make a significantly higher mean gain score than Group B.
   B. Group A will make a significantly higher mean gain score than Group C.
   C. Group B will make a significantly higher mean gain score than Group C.
2. In Group A, there will be no significant relationship between a student's individual mean gain score and each of the following factors:
   A. Age
   B. Sex
   C. Marital status
   D. Hours in education
   E. Total hours
   F. Overall college grade-point average

3. In Group B, there will be no significant relationship between a student's individual mean gain score and each of the following factors:
   A. Age
   B. Sex
   C. Marital status
   D. Hours in education
   E. Total hours
   F. Overall college grade-point average
4. In Group C, there will be no significant relationship between a student's individual mean gain score and each of the following factors:
   A. Age
   B. Sex
   C. Marital status
   D. Hours in education
   E. Total hours
   F. Overall college grade-point average

Definition of Terms

Micro-teaching. Micro-teaching is a controlled sample of real teaching which is scaled down in terms of students and time. As used in this study, teacher-trainees concentrated on the use of a clearly defined teaching skill, establishing set, during carefully prepared lessons on selected topics in a planned series of four-minute encounters with four peers serving as the micro-class. Following the initial presentation, the trainees were critiqued, and then they were given twelve minutes to

revise their lesson plan. After the revision was made, they re-taught the lesson to a different micro-class. The final step in the sequence was the re-critique.

Establishing set. Establishing set is a technical skill of teaching which aims at helping the teacher establish an appropriate mental set for learning in the classroom.

Teacher-trainee. A teacher-trainee was a prospective secondary education teacher who was enrolled in the course "Methodology and Technological Applications for Secondary Education" in the secondary teacher education program at the University of Texas at El Paso.

Technical skills of teaching. The technical skills of teaching are defined as a pattern of specific teaching behaviors which are used in a variety of teaching situations.[5] Among the technical skills which have been identified are: (1) stimulus variation, (2) establishing set, (3) closure, (4) silence and nonverbal cues, (5) reinforcement of student participation, (6) fluency in asking questions, (7) probing questions, (8) higher-order questions, (9) divergent questions, (10) recognizing attending behavior, (11) illustrating and use of examples, (12) lecturing, (13) planned repetition, and (14) completeness of communication.[6]

Supervising teacher. The supervising teacher was the investigator who was in charge of the micro-teaching instruction of the students involved in

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[5]Frederick J. McDonald, Technical Skills of Teaching: General, Stanford Center for Research and Development in Teaching: Second Annual Report (Stanford, California: School of Education, Stanford University, 1968), p. 9.

[6]Dwight W. Allen and Kevin Ryan, Microteaching (Reading, Massachusetts: Addison-Wesley Publishing Company, Inc., 1969), p. 15.

the study.

Micro-lesson. The four-minute presentation of a prepared lesson to a micro-class by the teacher-trainee constituted the micro-lesson.

Micro-class. The micro-class was made up of four of the teacher-trainee's peers who served as learners to whom the micro-lesson was presented.

Teach. The teach is the initial presentation of a micro-lesson to a micro-class by the teacher-trainee.

Critique. The critique is the evaluation immediately following the micro-lesson presentation in which feedback on the effectiveness of the micro-lesson is given to the teacher-trainee.

Re-teach. The re-teach is a revised and improved presentation of the same lesson presented in the teach. This lesson was taught to a different micro-class.

Pre-test. The pre-test consisted of a four-minute videotape of each teacher-trainee presenting a discussion-type lesson to four peers. This videotape was made prior to any instruction in establishing set.

Post-test. The post-test consisted of a four-minute videotape of each teacher-trainee presenting a discussion-type lesson built around the same concept they used for their initial taping to four peers. The teacher-trainees were told to concentrate on the demonstration of skill in establishing set. This videotape was made after all instruction in establishing set was completed.

Hernandez-Klingstedt Establishing Set Rating Form. The Hernandez-Klingstedt Establishing Set Rating Form is a measuring instrument developed at The University of Texas at El Paso to evaluate the degree of competence attained in the skill of establishing set. The instrument consists of six

statements related to various aspects of establishing set on which the rater is to give the ratee numerical ratings ranging from 1 (weak) to 7 (truly exceptional). This instrument was used to evaluate the pre-test and the post-test tapes.

Jury. The jury was a panel of four professional people, selected on the basis of professional qualifications in the areas of teacher education, who evaluated the pre-test and the post-test tapes of the teacher trainees.

Mean gain score. The difference between the score on the pre-test tape and the score on the post-test tape was referred to as the mean gain score. The group mean gain score was the difference between the group mean of the scores on the pre-test tapes and the group mean of the scores on the post-test tapes.

Feedback. Feedback is a source of information used to report to the teacher-trainee on how well he is functioning in the role of the teacher.

Audiotape recorder. The audiotape recorder is a recording and playback machine that provides audio feedback on the recorded teaching performance.

Videotape recorder. The videotape recorder is a recording and playback machine providing video as well as audio feedback on the recorded teaching performance.

Competence in establishing set. The degree of competence attained by the teacher-trainee in establishing set was measured by the individual mean gain score on the Hernandez-Klingstedt Establishing Set Rating Form. The higher the mean gain score, the greater the development of competence in establishing set.

Student Information Form. The student information form is a form

developed especially for the purpose of collecting personal and academic information from the students participating in the study.

Need for the Study

The author's initial research on the effectiveness of various feedback techniques in producing a particular technical skill of teaching pointed out that very little research had been done on how teachers learn to teach. One technique which was mentioned as having played a significant role in modifying teachers' behavior was feedback as a part of a micro-teaching sequence. However, the cost-effectiveness of the various types of procedures used to provide feedback was not clear. It was primarily for this reason that the original study was undertaken.[7]

This need for this study was based primarily on recommendations made in the previously mentioned study by the investigator. Among the most significant were the recommendations that the study be duplicated, and that similar studies be conducted to determine the effectiveness of the three micro-teaching feedback procedures when used in connection with other technical skills of teaching.[8]

Delimitations of the Study

This study was delimited to the testing of twenty secondary education majors enrolled in a secondary methods course (Ed.C. 3312) at the University of Texas at El Paso during the spring semester of 1973.

Training and emphasis on the technical skills of teaching was delimited to that of establishing set.

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[7]Klingstedt, pp. 10-14. [8]Klingstedt, pp. 96-98.

Measurement of the degree of competence acquired in establishing set was delimited to the use of the Hernandez-Klingstedt Establishing Set Rating Form.

The points mentioned in the Statement of the Problem and Its Purposes section of this report further define the delimitations of the study.

Limitations of the Study

One of the limitations of the study was that only one instrument was used to measure the degree of competence acquired in the technical skill of teaching called establishing set.

Another limitation of the study was the size of the jury used to evaluate the pre-and posttest tapes. The jury was purposely kept small to facilitate intensive training and the increase reliability.

Basic Assumptions

The basic assumptions of this study were:

1. The enrollment in the section of Secondary Methods to be used in this study would be large enough to permit the assignment of at least five students to each of the three groups.
2. The difference in environmental factors would be similar enough that minor differences would not affect the outcome of this study. This assumption could be made because the same classroom was used throughout the entire study.
3. Topics selected for the teacher-trainees to teach to their micro-classes would be relevant to the secondary methods course, and these topics would allow the teacher-trainees to exhibit competence in the technical skill being emphasized.
4. The use of the teacher-trainee's peers for the micro-class would be just as satisfactory as the use of high school students. This assumption was based on the reported findings of other investigators who used peers for the micro-class.[9]
5. The statement, in the directional form, of three hypotheses tested in this study (1A, B, C) was justified on the basis of findings reported by Gunther, Meier, and Perlberg.[10]

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[9]Dan Brown, personal letter, October 8, 1969; Bill Fullerton, personal letter, August 9, 1969.

[10]Robert Gunther and Rudolph Pugliesi, "Videotape at a Drama Festival," Audiovisual Instruction, 13 (December, 1968), 1132-1133; John H. Meier and Gerald A. Brudenell, "Interim Progress Report of a Remote Teacher Training Institute for Early Childhood Educators," ERIC, Ed 017 326, P. 2; Arye Perlberg, et. al., "The Use of Portable Video Tape Recorders and Micro-Teaching Techniques to Improve Instruction in Vocational-Technical Programs in Illinois: A Pilot Study," ERIC, Ed 022 029, p. 3.

6. The statement, in the null form, of twelve of the hypotheses tested in this study (2A, B, C, D; 3A, B, C, D; 4A, B, C, D) was justified on the basis of findings reported by Kallenbach.[11]
7. The evaluation form selected was the best instrument available for measuring competence in establishing set. The assumption stated above was justified on the basis of content or face validity which appeared to be established through the extensive use of this instrument at the University of Texas at El Paso. The teacher training program at Stanford University, Arizona State University, and Texas Tech University have also used a similar instrument.

Organization of the Remainder of the Study

The remainder of this study was organized as follows: Chapter II contains the review of research and related literature; Chapter III describes the methods and procedures; Chapter IV contains the presentation and analysis of the data; and Chapter V contains the summary, findings, conclusions, implications, and recommendations.

[11] Warren W. Kallenbach, "The Effectiveness of Video-taped Practice Teaching Sessions In the Preparation of Elementary Intern Teachers," ERIC, Ed 021 776, p. 3.

CHAPTER II

REVIEW OF RESEARCH AND RELATED LITERATURE

Evaluation of teacher effectiveness is, to say the least, a complex problem of utmost concern and importance. In 1963, Gage offered an approach which was designed to reduce the complexity of this problem. He suggested:[12]

> Rather than seek criteria for the overall effectiveness of teachers in the many, varied facets of their roles, we may have better success with criteria of effectiveness in small, specifically defined aspects of the role. Many scientific problems have eventually been solved by being analyzed into smaller problems whose variables were less complex.

At about the same time that Gage made his recommendations relative to what he called "micro-criteria of effectiveness," a group of his colleagues at Stanford were in the process of developing a technique to be used in the education of teachers. This technique ultimately developed into what is now known as micro-teaching.

Most studies to date have indicated that micro-teaching is at least as effective in changing teachers' behaviors, if not more so, than the traditional methods used in teacher education programs. A critical element in the success of the micro-teaching approach is the effectiveness of the feedback procedure utilized.

The purpose of this chapter is to: (1) present a definition of micro-teaching; (2) identify the purposes of micro-teaching; and (3) present a synthesis of attempts to analyze the effects of feedback and modeling variables on the learning of a technical skill of teaching.

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[12] N. L. Gage, "Paradigms for Research on Teaching," in Handbook of Research on Teaching, ed. by N. L. Gage (Chicago: Rand McNally Co., 1963), p. 120.

Definition of Micro-Teaching

Micro-teaching is a scaled down sample of real teaching. It is a procedure by which teachers in training and experienced teachers can gain new information about their teaching and their perception of the teaching act. The micro-lessons constitute a real teaching encounter, not one which is simulated; they are reduced only in terms of students and time.[13] Ideally constructed, the technique allows teachers to apply clearly defined teaching skills to carefully prepared lessons in a planned series of four to ten-minute encounters with a small group of real students, generally with an opportunity to observe the results on videotape. According to the purposes and resources of the user, the definition of micro-teaching will of necessity vary.[14]

Purposes of Micro-Teaching

There are several basic purposes that may be served by micro-teaching. Those most frequently mentioned are: (1) provide an opportunity for pre-service teachers to obtain practice which allows application of methods and ideas under optimum conditions for the trainees without endangering the learning of pupils, (2) develop in students a better understanding of tasks comprising the teaching act, (3) serve as a research vehicle to explore effects of training under controlled conditions, (4) operate in an evaluative sense to aid in the job of rating total performance of the teaching act, (5) promote closer university-public school cooperation,

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[13]Dwight W. Allen, "Micro-Teaching: A New Framework for In-Service Education," The High School Journal, 49 (May, 1966), 356.

[14]Dwight W. Allen and R. J. Clark, Jr., "Micro-Teaching: Its Rationale," The High School Journal, 51 (November, 1967), 75.

and (6) allow experienced teachers means of gaining new information about their teaching in a short length of time.[15] Additional information concerning the history and the applications of micro-teaching can be found in previous material authored by the investigator.[16]

The Effects of Modeling and Feedback Variables

Until recently, experimental analysis of the effects of modeling and feedback variables on the acquisition of desired teaching behavior has been almost nonexistent. This is probably due to the fact that preservation of a teaching performance, either for later use as a perceptual model or for immediate use for feedback purposes, has been limited largely to a symbolic (written) mode, an audiotaped reproduction, or a sometimes inaccurate or at least incomplete memory. However, the appearance of the videotape recorder has changed this situation. McDonald and Allen state that the videotape recorder might just be the technological instrument which will facilitate improved experimentation on teaching behavior. They attribute this, in part, to the fact that televising "trainee" lessons allows the original performance to be completely reinstated. Therefore, in later supervision sessions the "intern" is not forced to respond to supervision on the basis

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[15] Dwight W. Allen, "A New Design for Teacher Intern Program at Stanford University," The Journal of Teacher Education, 17 (Fall, 1966), 296; Dwight W. Allen and Richard E. Gross, "Microteaching: A New Beginning for Beginners," NEA Journal, 54 (December, 1965), 26; Jimmie C. Fortune, et al., "The Stanford Summer Micro-Teaching Clinic, 1965," The Journal of Teacher Education, 18 (Winter, 1967), 389; M. Eugene Gilliom, "Microteaching in the Methods Course: Bridging the Confrontation Gap," Social Education, 33 (February, 1969), 165; Larry K. Sedgwick and Harlyn L. Misfeldt, "Micro-Teaching: New Tool for a New Program," Industrial Arts and Vocational Education, 56 (June, 1967), 34.

[16] Joe Lars Klingstedt, "Effectiveness of Three Micro-Teaching Feedback Procedures," (unpublished Ed.D. dissertation, Texas Tech University, 1970), p. 1.

of what he and the supervisor remember about the complex teaching performance.[17]

The videotape has been used intensively in modeling procedures. Modeling, as a technique used in training teachers, is based on an extensive theoretical base. In a comprehensive treatment of the subject, Bandura and Walters indicated that complex behavior patterns can be acquired through imitation. They state that utilization of face-to-face models speeds up the learning process.[18]

The value of modeling was further supported in a study by Claus which analyzed the effects of cueing procedures in modeling and videotaped playback (i.e. feedback) treatments on the acquisition of a technical skill. The results of the study indicated that in terms of acquiring a complex teaching skill, cued observational learning (modeling) is more effective than feedback, with or without cueing, in bringing about the desired behavior change.[19]

Finally, Salomon and McDonald state very cogently that in all the studies where people changed their behavior as a result of receiving new information about themselves two conditions were met: (1) the receiver of the information knew what behavior was expected of him, and (2) the receiver of the information was ready to modify his behavior to make it

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[17]Frederick J. McDonald and Dwight W. Allen, Training Effects of Feedback and Modeling Procedures on Teaching Performance (Stanford, California: School of Education, Stanford University, 1967), p. ii, 59.

[18]A. Bandura, and R. H. Walters, Social Learning and Personality Development (New York: Holt, Rinehart and Winston, 1963), p. 52.

[19]Karen E. Claus, Effects of Modeling and Feedback Treatments on the Development of Teachers' Questioning Skills, Technical Report No. 6 (Stanford, California: Stanford Center for Research and Development in Teaching, 1969), p. 39.

congruent with the expectations. Only when these two conditions were present did the information provided serve as feedback for the receiver. They concluded that when no model of the desired behavior is presented, reactions to reviewing a videotape of one's performance are largely determined by the viewer's predispositions.[20]

Although all of the above mentioned studies support the value of modeling per se, they don't indicate which type of modeling is most effective. McDonald and Allen state that the rate and level of learning varies as a function of the mode of model presentation. They discuss the comparative value of perceptual (audio-visual) and symbolic (written) modeling procedures and conclude that the perceptual modeling procedures are superior because they allow one to literally create the desired display through editing.[21]

In conclusion, McDonald and Allen state that the most effective variable for describing a desired behavior seems to be modeling in which the behavior is portrayed, and in which the subject views the performance of the model while simultaneously being cued by a supervisor on the significant aspects of the model's behavior.[22]

McDonald and Allen state that among the most difficult problem in designing instructional systems geared to produce a desired teaching behavior has been providing adequate feedback information on the

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[20]Gavriel Salomon and Frederick J. McDonald, Pre- and Posttest Reactions to Self-Viewing One's Teaching Performance on Videotape, Research and Development Memorandum No. 44 (Stanford, California: Stanford Center for Research and Development in Teaching, 1969), p. 2-3.

[21]McDonald and Allen, pp. 4, 145. [22]McDonald and Allen, p. 151.

teaching performance. They indicate that in a complex learning task the effectiveness of the feedback may be highly dependent on the type of feedback provided. For the feedback process to be effective and efficient in producing the learning of teaching behavior, they propose that it should have the following three features: (1) it should reproduce the teaching performance as completely as possible, (2) it should be objective, and (3) it should be immediate and frequent.[23]

The videotape recorder seems to be the vehicle that can assist one in meeting all three points mentioned above. Furthermore, it generally generates a positive feeling on the part of the person who is viewing a tape of himself as a part of the feedback process.[24] Wagner points out three positive aspects of utilizing videotaped feedback in connection with peer teaching [micro-teaching]. He states that the technique allows us to spot areas upon which the student teacher needs to improve, it allows the student teacher to see how his future students will see him, and it facilitates the development of self-confidence in the student teacher's ability to make the classroom experience exciting and worthwhile.[25]

Morse, Kysilka, and Davis indicate that the available evidence fails to support the value of videotaped feedback in the absence of a personal supervisor. While the addition of a supervisor to self-viewing of a videotape for the purpose of providing cue discrimination does improve

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[23]McDonald and Allen, pp. 1, 13, 2.

[24]Joe Lars Klingstedt and Weldon E. Beckner, "Videotaped Micro-teaching," Texas Study of Secondary Education Research Journal, 6 (Spring, 1970-71), 27.

[25]Hilmar Wagner, "Peer Teaching," The Texas Outlook, 52:20-21 (August, 1968), 21.

the effectiveness of the feedback technique, it also increases the cost.[26]

In conclusion, McDonald and Allen state that the single most effective feedback technique appears to be a form of self-viewing (e.g. videotaped replay) accompanied by prompting by a supervisor during the self-viewing.[27]

Summary

Micro-teaching does have much to offer in terms of a new dimension for exploration into improved methods for teacher education programs. Through the technique the complexities of the normal school classroom can be simplified to provide a greater focus on the skill being practiced. In such a setting, many of the anxiety-producing contingencies are removed. Extraneous and interfering variables can be brought under control to a greater extent, and the make-up of the class can be better controlled.

A sizable body of information exists supporting the value of videotaped cued modeling and feedback procedures for the purpose of promoting the acquisition of teaching behavior. Cued perceptual models (e.g. videotaped) proved to be more effective than symbolic (e.g. written transcript) models, and videotaped replay accompanied by supervisor prompting and cueing proved to be the most effective feedback procedure.

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[26]Keven R. Morse, Marcella L. Kysilka, and O. L. Davis, Jr., Effects of Different Types of Supervisory Feedback on Teacher Candidates Development of Refocusing Behaviors, Report Series No. 48 (Austin, Texas: The Research and Development Center for Teacher Education, The University of Texas at Austin, 1970), p. 7.

[27]McDonald and Allen, p. 150.

CHAPTER III

METHODS AND PROCEDURES

The research design included the following: (1) Students Participating in the Study, (2) Instruments Used to Collect the Data, (3) Procedures for Collecting the Data, and (4) Procedures for Treating the Data.

Students Participating in the Study

Twenty secondary education majors enrolled in the secondary methods course (EdC 3312) at the University of Texas at El Paso during the spring semester of 1973 were assigned randomly to three groups. All of these students had completed at least ninety semester hours of college work, but not more than nine hours in education. They all had at least a 2.25 grade-point average in their required English courses (twelve hours), and they had at least a 2.50 overall grade-point average. None of the students had any prior training in micro-teaching or establishing set.

At the beginning of the study, the three groups were equal in size; however, schedule changes and absences during the experiment resulted in a membership of six subjects in one group and seven subjects in each of the other two groups.

Instruments Used to Collect the Data

Two instruments were employed to collect the data used to test the hypotheses of this study.

One of the instruments was the Hernandez-Klingstedt Establishing Set Rating Form. This instrument was designed to measure the degree of competence

attained in the skill of establishing set, and it is described more fully in the "Definition of Terms Used" section of this report. A copy of this form is included as Appendix C.

The other instrument, the Student Information Form, was specifically designed by the investigator to obtain personal and academic information from the students who participated in the study. This form is included as Appendix B.

Procedures for Collecting the Data

Prior to the pre-test taping, all teacher-trainees were asked to prepare a four-minute discussion-type lesson built around a single concept of their choice selected from a list of topics provided by the investigator. They were told that their presentations would be videotaped for diagnostic purposes.

Each teacher-trainee went through the micro-teaching sequence three times. One time was during their regular class period with other class members present, and the other two times were scheduled outside of class at a time convenient to the teacher-trainee.

The teacher-trainees prepared three four-minute lessons on three different topics selected from a list provided by the investigator. All three groups used the same list for their topic selections.

Prior to the post-test taping, all teacher-trainees were told to prepare another four-minute discussion-type lesson built around the same concept and topic they used for their initial taping. They were instructed to concentrate on the demonstration of skill in establishing set. They were told that their presentations would be videotaped for further diagnostic purposes. At no time were they told that they were part of an experimental study. The purpose of this was to avoid the Hawthorne Effect.

As shown in Figure 1 the typical micro-teaching sequence for two students was as follows: (1) teacher-trainee number one presents first teach, supervising teacher observes, and micro-class receives the lesson; (2) teacher-trainee number one is critiqued by the supervising teacher while micro-class A completes their evaluation forms; (3) teacher-trainee number one re-plans his lesson, teacher-trainee number two presents his first teach, supervising teacher observes, and micro-class receives the lesson; (4) teacher-trainee number two is critiqued by the supervising teacher while micro-class A completes their evaluation forms; and (5) micro-class B relieves micro-class A, and the sequence is repeated with teacher-trainee number two re-planning his lesson while teacher-trainee number one is re-teaching and being re-critiqued. For the micro-teaching experience, teaching modules were four minutes and critique modules were eight minutes. The teacher-trainee was allowed twelve minutes to re-plan his lesson before the re-teach.

Minutes	4	8	4	8	4	8	4	8
Participants Teacher-Trainee No. 1	Teach	Critique	Re-Plan lesson		Re-teach	Re-critique	Leave	
Teacher-trainee No. 2	Arrive		Teach	Critique	Re-plan lesson		Re-teach	Re-critique
Supervising Teacher	Observe	Critique	Observe	Critique	Observe	Re-critique	Observe	Re-critique
Micro-class A	View lesson	Complete Rating Form	View lesson	Complete Rating Form	Stand by			
Micro-class B	Arrive				View lesson	Complete Rating Form	View lesson	Complete Rating Form

Fig. 1. Typical micro-teaching sequence for two students*

*Adapted from Larry K. Sedgwick and Harlyn L. Misfeldt, "Micro-Teaching: New Tool for a New Program," Industrial Arts and Vocational Education, 56 (June, 1967), 64.

First hour. During the investigator's first hour with the sections involved in the study, the students completed the Student Information Form, and the videotape equipment was explained and demonstrated. Students were told that for the next few weeks they would be taught by the investigator, and they were informed that a technique referred to as micro-teaching would be used to provide them with real teaching experiences early in their pre-service teacher training. It was explained that a graduate assistant was assisting with teaching this portion of the course because of his experience with micro-teaching and the videotape recorder. The teacher-trainees were told to choose a topic from the selected list and prepare a four-minute discussion-type lesson which they would teach to a micro-class of peers prior to the investigator's second hour with the class. The students were told that these lessons would be videotaped for diagnostic purposes. The schedule for the pre-test taping was completed during this class session.

Second hour. During the second hour, the investigator delivered a lecture demonstration on establishing set, and the use of the rating form was explained. All of the students were given written materials summarizing the main points covered in the lecture. An outline describing the application of micro-teaching to be used in the classes involved in this study was distributed and discussed. Twenty students were assigned randomly to serve as teacher-trainees, and the remaining students were assigned duties as members of the micro-classes. Teacher-trainees were assigned a topic for their in-class presentation, and they selected two topics for their two outside-of-class micro-teaching experiences. Scheduling of teacher-trainees and micro-class members for both the in-class and the outside-of-class sessions was completed during this session.

Each of the three sections was informed of the method of feedback to be employed with their section.

Third hour through the fourteenth hour. During the third through fourteenth hours with the three sections involved in the study, the micro-teaching sequence was completed for all of the teacher-trainees.

Fifteenth hour. During the investigator's fifteenth hour with the sections involved in the study, scheduling for the post-test taping was completed. The teacher-trainees were told to prepare another four-minute discussion-type lesson built around the same concept they used for their initial taping. They were told to concentrate on the demonstration of skill in establishing set. In addition, they were told the tapes of these lessons would be used for further diagnostic purposes.

Dependent variable. The dependent variable was defined as the mean gain score attained by the students in the skill of establishing set. Using the Hernandez-Klingstedt Establishing Set Rating Form, the jury evaluated the pre-test and the post-test tapes. From these evaluations, the individual and the group mean gain scores were computed.

Independent variable. The independent variable was defined as the various methods of feedback employed with the three groups. Feedback for Group A consisted of verbal and written prompting and cueing provided by peers and the supervising teacher coupled with viewing of a videotape of the teaching performance. Feedback for Group B consisted of verbal and written prompting and cueing provided by peers and the supervising teacher coupled with listening to an audiotape of the teaching performance. Feedback for Group C consisted of verbal and written prompting and cueing by itself provided by peers and the supervising teacher.

Control variables. The control variables employed in this study were: (1) age, (2) sex, (3) marital status, (4) hours in education, (5) total hours, and (6) overall college grade-point average. The Student Information Form, which was administered at the beginning of the study, yielded the control variable information.

Equipment. The videotapes were made with a Sonny Model AV-3650 portable videotape recorder. Thirty-minute reels of one half-inch tape were used. The videotape recorder was supplemented with one multi-directional mike, one ten-inch and one twenty-three-inch monitor, and one Sony Camera with a wide angle lens.

The audiotapes were made with a Sony cartridge recorder. Sixty-minute reels of two-track C-sixty tape were used. One multi-directional mike on a stand was employed.

Jury. The jury consisted of four professional educators: (1) Mrs. Barbara Burgess, Laboratory Assistant at the University of Texas at El Paso, (2) Dr. Norma Hernandez, Associate Professor of Curriculum and Instruction at the University of Texas at El Paso, (3) Mr. Tom Schultz, Laboratory Assistant at the University of Texas at El Paso, and (4) Dr. Hilmar Wagner, Associate Professor of Curriculum and Instruction at the University of Texas at El Paso.

Function of the jury. The function of the jury was to view and evaluate the degree of competence in establishing set displayed by the teacher-trainees on the pre-test tapes and the post-test tapes. Each member of the jury completed a copy of the Hernandez-Klingstedt Establishing Set Rating Form for each four-minute teach they viewed. From these forms, composite scores as well as group and individual mean

gain scores were computed.

Training of the jury. The jury was given training in evaluating teacher-trainees in relation to the skill of establishing set. They viewed and evaluated several videotapes of teacher-trainees not involved in this study. This was done to achieve interrater agreement on the Hernandez-Klingstedt Establishing Set Rating Form.

Procedures for Treating the Data

The analysis of covariance statistical technique was used for equating the groups. This technique was specifically designed for use with groups made up of unequal numbers of subjects. Popham states that:[28]

> For the educational research worker, analysis of covariance is an extremely valuable statistical technique, since it allows one to test for mean differences between two or more intact groups while compensating for initial differences between the groups with respect to relevant variables.
>
> Analysis of covariance may be used in the many school research situations when the researcher is unable, for justifiable practical reasons, to manipulate groups so that the samples can be made equal on such important variables as intelligence, prior achievement, etc. Through analysis of covariance, differences between groups with respect to a criterion variable can be studied. At the same time one or more control variables are used to statistically adjust the groups, as though they were equivalent with respect to the control measures.

The analysis of covariance technique was also used to determine if there were any significant differences in the mean gain scores of the three groups. The mean gain scores reflected the degree of skill developed in establishing set by the tnree groups.

The Pearson Correlation Program was used to test the hypotheses of no significant relationship. Analysis of Variance for One-Way Design was

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[28] W. James Popham, Education Statistics (New York: Harper and Row, Publishers, 1967), pp. 230-231.

used to determine interrater agreement. An alpha level of .05 was established as the level of confidence required for statistical significance.

Summary

The three groups used in this study consisted of a total of twenty secondary education majors enrolled in one of their professional education courses.

Two instruments were employed to collect the data used to test the hypotheses of this study. The Hernandez-Klingstedt Establishing Set Rating Form was used to measure the degree of competence attained in the skill of establishing set. The Student Information Form was used to gain information on the control variables.

Prior to receiving any training in the skill of establishing set, all teacher-trainees completed the Student Information Form, and they were all videotaped while they presented a four-minute discussion-type lesson to a micro-class made up of four peers. This initial taping served as the pre-test.

After the pre-test had been completed, all teacher-trainees participated in approximately eleven hours of intensified instruction aimed at developing their skill in establishing set. Following this instruction, all teacher-trainees were videotaped again. This final four-minute videotape served as the post-test.

The dependent variable was defined as the mean gain score attained by the students in the skill of establishing set. The independent variable was the method of feedback, and the control variables were age, sex, marital status, hours in education, total hours, and overall college

grade-point average.

Using the Hernandez-Klingstedt Establishing Set Rating Form, a jury of four professional educators evaluated the pre-test and the post-test tapes. From their evaluations, the group and individual mean gain scores were computed. An analysis of covariance technique was used for two purposes: (1) to determine if there were any significant differences in the mean gain scores of the three groups, and (2) to equate the groups.

A Pearson correlation program was used to test the hypotheses of no significant relationship, and analysis of variance was used to determine interrater agreement.

An alpha level of .05 was established as the level of confidence required for statistical significance.

Figure 2 depicts a summary of the types of data collected and treated in the study. The numbers used in the illustration refer to the hypotheses of the study.

Hypothesis	Type of Data	Group Comparisons		
		Group A	Group B	Group C
1	Comparisons of the mean gain scores	1A	1B	1C
2-4	Comparisons of the invididual mean gain scores with			
	Age	2A	3A	4A
	Sex	2B	3B	4B
	Marital Status	2C	3C	4C
	Hours in Education	2D	3D	4D
	Total Hours	2E	3E	4E
	Overall college grade-point average	2F	3F	4F

Fig. 2. Summary of the types of data collected and treated in the study*

*Adapted from Billy E. Askins, "The Effectiveness of Two Different Uses of An Autoinstructional Program to Teach the Use of the Air Force Fiscal Account Structure and Codes" (unpublished Ed.D. dissertation, North Texas State University, 1967), p. 89.

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

The data gathered to test the hypotheses of this study included the degree of competence attained in the skill of establishing set, age, sex, marital status, hours in education, total hours, and overall college grade-point average of the teacher-trainees.

The data were analyzed to determine the effectiveness of three micro-teaching feedback procedures. The feedback procedures compared were: (1) verbal and written prompting and cueing provided by peers and the supervising teacher, coupled with viewing of a videotape of the teaching performance (Group A); (2) verbal and written prompting and cueing provided by peers and the supervising teacher, coupled with listening to an audiotape of the teaching performance (Group B); and (3) verbal and written prompting and cueing provided by peers and the supervising teacher (Group C). Twenty students participated in the study. Group A contained six students; Group B contained seven students; and Group C contained seven students.

In order to determine the tenability of the hypotheses of the study as stated in Chapter I, statistical analysis of the data collected was made. The data collected from the students were punched on data processing cards, and computations were made at the Computer Center, University of Texas at El Paso, El Paso, Texas. The research hypotheses were restated as null hypotheses and an alpha level of .05 was established as the level of confidence required for statistical significance.

The analysis of the data collected was made in three stages. In the

first stage (before the statistical treatment and analysis of the hypotheses were made), the interrater agreement of the jury members was checked. In the second stage, the test of the hypotheses concerning differences between the mean gain scores of the groups were completed. In the third stage, the correlations of the individual mean gain scores with each of the control variables were determined and analyzed for students in the three groups.

Determining Interrater Agreement

The first stage in the analysis of the data was to check the interrater agreement of the jury members. A comparison of the number of ratings, means, and standard deviations of the jury members' ratings is presented in Table 1.

Table 1 shows that there were forty ratings given by each jury member. The mean rating given by judge 1 was 2.90 (S. D. = 1.22), that of judge 2 was 2.40 (S. D. = .92), that of judge 3 was 2.42 (S. D. = 1.03), and that of judge 4 was 2.95 (S. D. = 1.24). The significance of differences in the ratings of the individual jury members were checked using analysis of variance.

TABLE 1

NUMBER, MEANS, AND STANDARD DEVIATIONS OF JURY RATINGS

Judges	Number of Ratings	Ratings	
		Mean	S.D.
1	40	2.90	1.22
2	40	2.40	.92
3	40	2.42	1.03
4	40	2.95	1.24

Table 2 contains the summary of analysis of variance comparing the mean ratings of the four jury members. The F value required for significance at the .05 level of confidence was 2.68.[29] Because the obtained F value 10.02 was higher than this, the hypothesis of no significant differences in jury members' ratings was rejected. It was determined that differences in the judges' ratings were significant at the .05 level of confidence; therefore, it would seem that there was a lack of interrater agreement. The author attributes this to significantly different levels of experience of the judges, i.e. the two judges who had extensive experience rating students on the skill prior to the training for this study were together on their ratings (means 2.40 and 2.42) and the two judges

[29] N. M. Downie and R. W. Heath, Basic Statistical Methods (2nd ed.; New York: Harper and Row, Publishers, 1965), p. 304.

TABLE 2

SUMMARY OF ANALYSIS OF VARIANCE COMPARING THE MEAN RATINGS OF THE FOUR JURY MEMBERS

Source	Sum of Squares	Degrees of Freedom	Variance Estimate	F Ratio	Level of Significance
Between people		39			
Within people	53.04	120	.04		
Between judges	10.84	3	3.61	10.02	S
Residual	42.20	117	.36		
Total	63.88	159			

who had no experience rating students on the skill prior to the training for this study were together on their ratings (means 2.90 and 2.95).

Test of the Hypotheses Concerning Differences Between the Mean Gain Scores of the Groups

The second stage in the analysis of the data was to test the hypotheses concerning the differences between the mean gain scores of the three groups.

The first hypothesis was "The verbal and written prompting and cueing provided by peers and the supervising teacher (limited feedback procedure) coupled with viewing of a videotape of the teaching performance (Group A) will be more effective than either the limited feedback procedure coupled with listening to an audiotape of the teaching performance (Group B) or the limited feedback procedure by itself (Group C), and the technique used with

Group B will be more effective than the technique used with Group C." The criterion for this was the group mean gain score on the Hernandez-Klingstedt Establishing Set Rating Form. Table 3 contains the group mean gain score analysis of covariance, and Table 4 contains the variable means, standard deviations, and adjusted means.

The technique of analysis of covariance was used to determine whether the mean gain scores for the three groups were significantly different. The covariants used for this test were age, sex (1 = female, 2 = male), marital status (1 = single, 2 = married, 3 = widowed, 4 = divorced), hours in education, total hours, and overall college grade-point average. The means of the covariants were as follows: Group A--age 22.17, sex 1.67, marital status 1.33, hours in education 7.00, total hours 112.33, and overall college grade-point average 2.79. Group B--age 27.43, sex 1.71, marital status 1.29, hours in education 9.00, total hours 99.57, and overall college grade-point average 3.12. Group C--age 23.43, sex 1.43, marital status 1.14, hours in education 6.86, total hours 91.57, and overall college grade-point average 2.59. Prior to the analysis of covariance, the mean gain score for Group A was 1.33 with a standard deviation of .47. The mean gain score for Group B was 1.43 with a standard deviation of .73 and the mean gain score for Group C was 2.14 with a standard deviation of .35. After the means were adjusted by analysis of covariance, the adjusted mean gain score for Group A was 1.24. The adjusted mean gain score for Group B was .62 and the adjusted mean gain score for Group C was .91.

A value of F with 2 degrees of freedom for the greater mean square and 13 degrees of freedom for the lesser mean square must reach 3.80 to be

TABLE 3

GROUP MEAN GAIN SCORE ANALYSIS OF COVARIANCE

Source	SUM-SQUARES (ABOUT)	DF	MEAN-SQUARE	F
Error (Within)	3.01	13	.23	
Treatment Plus Error (Total)	3.90	15		
Difference for Testing Adjusted Treatment Means	.89	2	.45	1.93

F = 1.93--Not Significant

TABLE 4

VARIABLE MEANS, STANDARD DEVIATIONS,
AND ADJUSTED MEANS

Group	Age	Sex	Marital Status	Hours in Education	Total Hours	Overall College Grade-Point Average	Mean Gain	S.D.	Adjusted Mean Gain
A	22.17	1.67	1.33	7.00	112.33	2.79	1.33	.47	1.24
B	27.43	1.71	1.29	9.00	99.57	3.12	1.43	.73	.62
C	23.43	1.43	1.14	6.86	91.57	2.59	2.14	.35	.91

significant at the .05 level[30] As indicated in Table 3, a value of F = 1.93 was obtained; therefore, the research hypothesis was rejected, and the null hypothesis that there will be no significant difference among the mean gain scores of Groups A, B, and C was accepted. The acceptance of this null hypothesis led to the conclusion that there was no significant difference in the effectiveness of the three micro-teaching feedback procedures as measured by the group mean gain scores.

Correlations of the Individual Mean Gain Scores With Each of the Control Variables for Students in the Three Groups

The third stage in the analysis of the data was to determine and analyze the correlations of the individual mean gain scores with each of the control variables for students in the three groups.

Table 5 contains the correlation coefficients and levels of significance between the individual mean gain scores and the control variables (age, sex, marital status, hours in education, total hours, and overall college grade-point average) for students in Group A. To be significant at the .05 level, a value of r with 4 degrees of freedom must reach .81.[31]

Hypothesis 2A was "In Group A, there will be no significant relationship between a student's individual mean gain score and his age." As indicated in Table 5, the correlation between these two factors was r = -.17. This r value with 4 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and

[30] Downie and Heath, p. 302. [31] Downie and Heath, p. 302.

his age was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the age of the students in Group A.

Hypothesis 2B was "In Group A, there will be no significant relationship between a student's individual mean gain score and his sex." As indicated in Table 5, the correlation between these two factors was $r = -.25$. This r value with 4 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his sex was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the sex of the students in Group A.

Hypothesis 2C was "In Group A, there will be no significant relationship between a student's individual mean gain score and his marital status." As indicated in Table 5, the correlation between these two factors was $r = .25$. This r value with 4 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his marital status was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the marital status of the students in Group A.

Hypothesis 2D was "In Group A, there will be no significant relationship between a student's individual mean gain score and his hours in education." As indicated in Table 5, the correlation between these two factors was $r = .08$. This r value with 4 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be

TABLE 5

CORRELATION COEFFICIENTS AND LEVELS OF SIGNIFICANCE BETWEEN THE INDIVIDUAL MEAN GAIN SCORES AND THE CONTROL VARIABLES FOR STUDENTS IN GROUP A

Variable	r	Level of Significance
Age	-.17	NS
Sex	-.25	NS
Marital Status	.25	NS
Hours in Education	.08	NS
Total Hours	-.50	NS
Overall College Grade-Point Average	.62	NS

no significant relationship between a student's individual mean gain score and his hours in education was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the hours in education of the students in Group A.

Hypothesis 2E was "In Group A, there will be no significant relationship between a student's individual mean gain score and his total hours." As indicated in Table 5, the correlation between these two factors was $r = -.50$. This r value with 4 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his total hours was accepted, and it was concluded that there was no significant relationship between the individual mean score and the total

hours of the students in Group A.

Hypothesis 2F was "In Group A, there will be no significant relationship between a student's individual mean gain score and his overall college grade-point average." As indicated in Table 5, the correlation between these two factors was $r = .62$. This r value with 4 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his overall college grade-point average was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the overall college grade-point average of the students in Group A.

In summary, it was found that hypothesis number two was accepted, and there was no significant relationship between the individual mean gain score and the age, sex, marital status, hours in education, total hours, and overall college grade-point average of the students in Group A.

Table 6 contains the correlation coefficients and levels of significance between the individual mean gain scores and the control variables (age, sex, marital status, hours in education, total hours, and overall college grade-point average) for students in Group B. To be significant at the .05 level, a value of r with 5 degrees of freedom must reach .75.[32]

Hypothesis 3A was "In Group B, there will be no significant relationship between a student's individual mean gain score and his age." As indicated in Table 6, the correlation between these two factors was $r = -.28$.

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[32]Downie and Heath, p. 302.

This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his age was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the age of the students in Group B.

Hypothesis 3B was "In Group B, there will be no significant relationship between a student's individual mean gain score and his sex." As indicated in Table 6, the correlation between these two factors was $r = -.06$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his sex was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the sex of the students in Group B.

Hypothesis 3C was "In Group B, there will be no significant relationship between a student's individual mean gain score and his marital status." As indicated in Table 6, the correlation between these two factors was $r = -.37$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his marital status was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the marital status of the students in Group B.

Hypothesis 3D was "In Group B, there will be no significant relationship between a student's individual mean gain score and his hours

TABLE 6

CORRELATION COEFFICIENTS AND LEVELS OF SIGNIFICANCE BETWEEN THE INDIVIDUAL MEAN GAIN SCORES AND THE CONTROL VARIABLES FOR STUDENTS IN GROUP B

Variable	r	Level of Significance
Age	-.28	NS
Sex	-.06	NS
Marital Status	-.37	NS
Hours in Education	.00	NS
Total Hours	-.05	NS
Overall College Grade-Point Average	-.37	NS

in education." As indicated in Table 6, the correlation between these two factors was $r = .00$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his hours in education was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the hours in education of the students in Group B.

Hypothesis 3E was "In Group B, there will be no significant relationship between a student's individual mean gain score and his total hours." As indicated in Table 6, the correlation between these two factors was $r = -.05$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no

significant relationship between a student's individual mean gain score and his total hours was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the total hours of the students in Group B.

Hypothesis 3F was "In Group B, there will be no significant relationship between a student's individual mean gain score and his overall college grade-point average." As indicated in Table 6, the correlation between these two factors was $r = -.37$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his overall college grade-point average was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the overall college grade-point average of the students in Group B.

In summary, it was found that hypothesis number three was accepted, and there was no significant relationship between the mean gain score and the age, sex, marital status, hours in education, total hours, and overall college grade-point average of the students in Group B.

Table 7 contains the correlation coefficients and levels of significance between the individual mean gain scores and the control variables (age, sex, marital status, hours in education, total hours, and overall college grade-point average) for students in Group C. To be significant at the .05 level, a value of r with 6 degrees of freedom must reach .75.[33]

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[33] Downie and Heath, p. 302.

TABLE 7

CORRELATION COEFFICIENTS AND LEVELS OF SIGNIFICANCE BETWEEN THE INDIVIDUAL MEAN GAIN SCORES AND THE CONTROL VARIABLES FOR STUDENTS IN GROUP C

Variable	r	Level of Significance
Age	-.31	NS
Sex	-.35	NS
Marital Status	-.16	NS
Hours in Education	-.11	NS
Total Hours	-.61	NS
Overall College Grade-Point Average	-.52	NS

Hypothesis 4A was "In Group C, there will be no significant relationship between a student's individual mean gain score and his age." As indicated in Table 7, the correlation between these two factors was $r = -.31$. This r value with 5 degrees of freedom was not found to be significant at the .05 level. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his age was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the age of the students in Group C.

Hypothesis 4B was "In Group C, there will be no significant relationship between a student's individual mean gain score and his sex." As indicated in Table 7, the correlation between these two factors was $r = -.35$.

This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his sex was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the sex of the students in Group C.

Hypothesis 4C was "In Group C, there will be no significant relationship between a student's individual mean gain score and his marital status." As indicated in Table 7, the correlation between these two factors was $r = -.16$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his marital status was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the marital status of the students in Group C.

Hypothesis 4D was "In Group C, there will be no significant relationship between a student's individual mean gain score and his hours in education." As indicated in Table 7, the correlation between these two factors was $r = -.11$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his hours in education was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the hours in education of the students in Group C.

Hypothesis 4E was "In Group C, there will be no significant relationship between a student's individual mean gain score and his total hours."

As indicated in Table 7, the correlation between these two factors was $r = -.61$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his total hours was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the total hours of the students in Group C.

Hypothesis 4F was "In Group C, there will be no significant relationship between a student's individual mean gain score and his overall college grade-point average." As indicated in Table 7, the correlation between these two factors was $r = -.52$. This r value with 5 degrees of freedom was not found to be significant. Therefore, the null hypothesis that there will be no significant relationship between a student's individual mean gain score and his overall college grade-point average was accepted, and it was concluded that there was no significant relationship between the individual mean gain score and the overall college grade-point average of the students in Group C.

In summary, it was found that hypothesis number four was accepted, and there was no significant relationship between the individual mean gain score and the age, sex, marital status, hours in education, total hours, and overall college grade-point average of the students in Group C.

Summary

The analysis of data collected in this study was made in three stages. In the first stage, the interrater agreement of the jury members was checked, and differences in the judge's rating were significant.

The second stage in the analysis of the data was to test the

hypotheses concerning the differences between the mean gain scores of the three groups. The technique of analysis of covariance was used to determine whether the mean gain scores for the three groups were significantly different. The covariants used for this test were age, sex, marital status, hours in education, total hours, and overall college grade-point average. A value of $F = 1.93$ was obtained. Because a value of F with 2 degrees of freedom for the greater mean square and 13 degrees of freedom for the lesser mean square must reach 3.80 to be significant at the .05 level, the null hypothesis was accepted. From this information, it was concluded that there was no significant difference in the effectiveness of the three micro-teaching feedback procedures as measured by the group mean gain scores.

In the third stage, the correlations of the individual mean gain scores with each of the control variables were determined and analyzed for students in the three groups. There was no significant relationship between the control variables and the individual mean gain scores of the students in any of the three groups.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary

The problem of this study was the effectiveness of three micro-teaching feedback procedures. Effectiveness of the feedback procedures is related to the degree of competence developed in a specific teaching skill. Establishing set was the specific teaching skill selected for use in this study. The feedback procedures compared were: (1) verbal and written prompting and cueing provided by peers and the supervising teacher, coupled with viewing of a videotape of the teaching performance, (2) verbal and written prompting and cueing provided by peers and the supervising teacher, coupled with listening to an audiotape of the teaching performance, and (3) verbal and written prompting and cueing provided by peers and the supervising teacher.

The purposes of the study were: (1) to determine the effectiveness of the three micro-teaching feedback procedures by determining the relationship between the feedback procedures and the development of competence in establishing set by the students as indicated by the group mean gain scores on the Hernandez-Klingstedt Establishing Set Rating Form, (2) to determine the relationship between the individual mean gain scores on the Hernandez-Klingstedt Establishing Set Rating Form of students exposed to the three different feedback procedures with their age, sex, marital status, hours in education, total hours, and overall college grade-point average.

A review of research and related literature revealed that micro-teaching has much to offer in terms of a new dimension for exploration

into the improved methods for teacher education. Through micro-teaching, the complexities of the normal school classroom can be simplified to provide a greater focus on the skill being practiced. In such a setting, many of the anxiety-producing contingencies are removed. Extraneous and interfering variables can be brought under control to a greater extent. Also, the make-up of the class can be better controlled. For example, a variety of pupils in terms of ability, and other attributes is easily achieved. According to the needs of the intern, the amount of practice can be varied.

The opportunity for immediate feedback on the "teach" and "re-teach" is one of micro-teaching's strongest points. This also helps the intern in terms of self-evaluation.

In terms of utility, the studies examined generally supported the value of videotaped cued modeling and feedback procedures for the purpose of promoting the acquisition of teaching behavior. The literature indicated that cued perceptual models were more effective than symbolic models, and videotaped replay accompanied by supervisor prompting and cueing was the most effective feedback procedure.

The three groups used in this study consisted of a total of twenty secondary education majors enrolled in one of their professional education courses.

Two instruments were employed to collect the data used to test the hypotheses of this study. The Hernandez-Klingstedt Establishing Set Rating Form was used to measure the degree of competence attained in the skill of establishing set. The Student Information Form was used to gain information on the control variables.

Prior to receiving any training in the skill of establishing set, all teacher-trainees completed the Student Information Form, and they were videotaped while they presented a four-minute discussion-type lesson to a micro-class made up of four peers. This initial taping served as the pre-test.

After the pre-test had been completed, all teacher-trainees participated in approximately eight hours of intensified instruction aimed at developing their skill in establishing set. Following this instruction, all teacher-trainees were videotaped again. This final four-minute videotape served as the post-test.

The dependent variable was defined as the mean gain score attained by the students in the skill of establishing set. The independent variable was the method of feedback, and the control variables were age, sex, marital status, hours in education, total hours, and overall college grade-point average.

Using the Hernandez-Klingstedt Establishing Set Rating Form, a jury of four professional educators evaluated the pre-test and the post-test tapes. From their evaluations, the mean gain scores were computed. The analysis of covariance technique was used for two purposes: (1) to determine if there were any significant differences in the mean gain scores of the three groups, and (2) to equate the groups.

A Pearson correlation program was used to test the hypotheses of no significant relationship, and analysis of variance was used to determine interrater agreement.

An alpha level of .05 was established as the level of confidence required for statistical significance.

Findings

In this study, the analysis of data collected was made in three stages. In the first stage, the interrater agreement of the jury members was checked. Analysis of variance yielded an F ratio of 10.01 which was found to be significant at the .05 level of confidence; therefore, there appeared to be a lack of interrater agreement. The investigator attributes this to significantly different levels of experience of the judges.

The second stage in the analysis of the data was to test the hypotheses concerning the differences between the mean gain scores of the three groups. The technique of analysis of covariance was used in order to determine whether the mean gain scores for the three groups were significantly different. The covariants used for this test were age, sex, marital status, hours in education, total hours, and overall college grade-point average. A value of $F = 1.93$ was obtained. Because a value of F with 2 degrees of freedom for the greater mean square and 13 degrees of freedom for the lesser mean square must reach 3.80 to be significant at the .05 level, the null hypothesis was accepted. From this information, it was concluded that there was no significant difference in the effectiveness of the three micro-teaching feedback procedures as measured by the group mean gain scores.

In the third stage, the correlations of the individual mean gain scores with each of the control variables were determined and analyzed for students in the three groups. There was no significant relationship between the control variables and the individual mean gain scores for the students in any of the three groups.

Conclusions

Based upon the findings of this study, the following conclusions were reached:

1. There was no significant difference in the effectiveness of the three micro-teaching feedback procedures as measured by the group mean gain scores.
2. There was no significant relationship between the individual mean gain scores and the age, sex, marital status, hours in education, total hours, and overall college grade-point average of the students in Group A.
3. There was no significant relationship between the individual mean gain scores and the age, sex, marital status, hours in education, total hours, and overall college grade-point average of the students in Group B.
4. There was no significant relationship between the individual mean gain scores and the age, sex, marital status, hours in education, total hours, and overall college grade-point average of the students in Group C.

Implications

Implications drawn from the findings and conclusions of this study are as follows:

1. There may be other methods of feedback just as effective as the use of the videotape recorder in teaching the technical skill of establishing set.
2. There may be factors other than age, sex, marital status, hours in education, total hours, and overall college grade-point average

which can be used to predict the mean gain score in the skill of establishing set.

3. Some type of feedback, in addition to verbal and written feedback by itself, may be needed in order for the teacher trainees to fully appreciate the communication between individuals as it existed in the original encounter.

Recommendations

Based on all aspects of this investigation (review of the literature, statistical results, and experiential aspects), the following recommendations are made:

1. Similar studies should be conducted, with modeling added to the feedback treatment to determine the effectiveness of the procedure when used in connection with other technical skills and strategies of teaching.
2. The individual techniques within a skill need to be clearly defined so as to promote agreement on these individual factors as well as agreement on the overall skill or strategy. The review of the literature suggests that this might be effectively accomplished through the use of modeling techniques.
3. It is recommended that lack of funds for the purchase of a videotape recorder not prohibit a school or institution from using the micro-teaching technique. As was indicated, there may be other methods of feedback that may be just as effective. As has been indicated, it seems to make little difference, in measurable skill attained, which feedback approach is used. However, because of student expressed preference for videotaped feedback, its

contribution to the enhancement of objectivity in supervisory encounters, and considerable evidence supporting it as a part of a total instructional package it is recommended that it be employed when feasible.

4. When using videotaped replay for feedback purposes always provide a supervisor to prompt and cue during the replay.
5. To increase the focus of attention on the skill or strategy being emphasized, as opposed to undue attention on planning the content of new lessons, allow students to retain the basic subject while presenting it to different groups of students for each reteach.
6. In divisions of teacher education programs concerned with teaching methods, it is recommended that the use of feedback procedures be coupled with precued perceptual modeling technique, and that these be considered in proper perspective with other instructional methods.
7. Because of high supervisory time required per student, as well as laboratory practice on the part of the student, a lab section should be added to methods courses employing the microteaching approach. Furthermore, teaching assistants should be trained to assist with the supervisory sequence to reduce the cost while maintaining adequate personnel for cueing and feedback purposes.

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APPENDIX

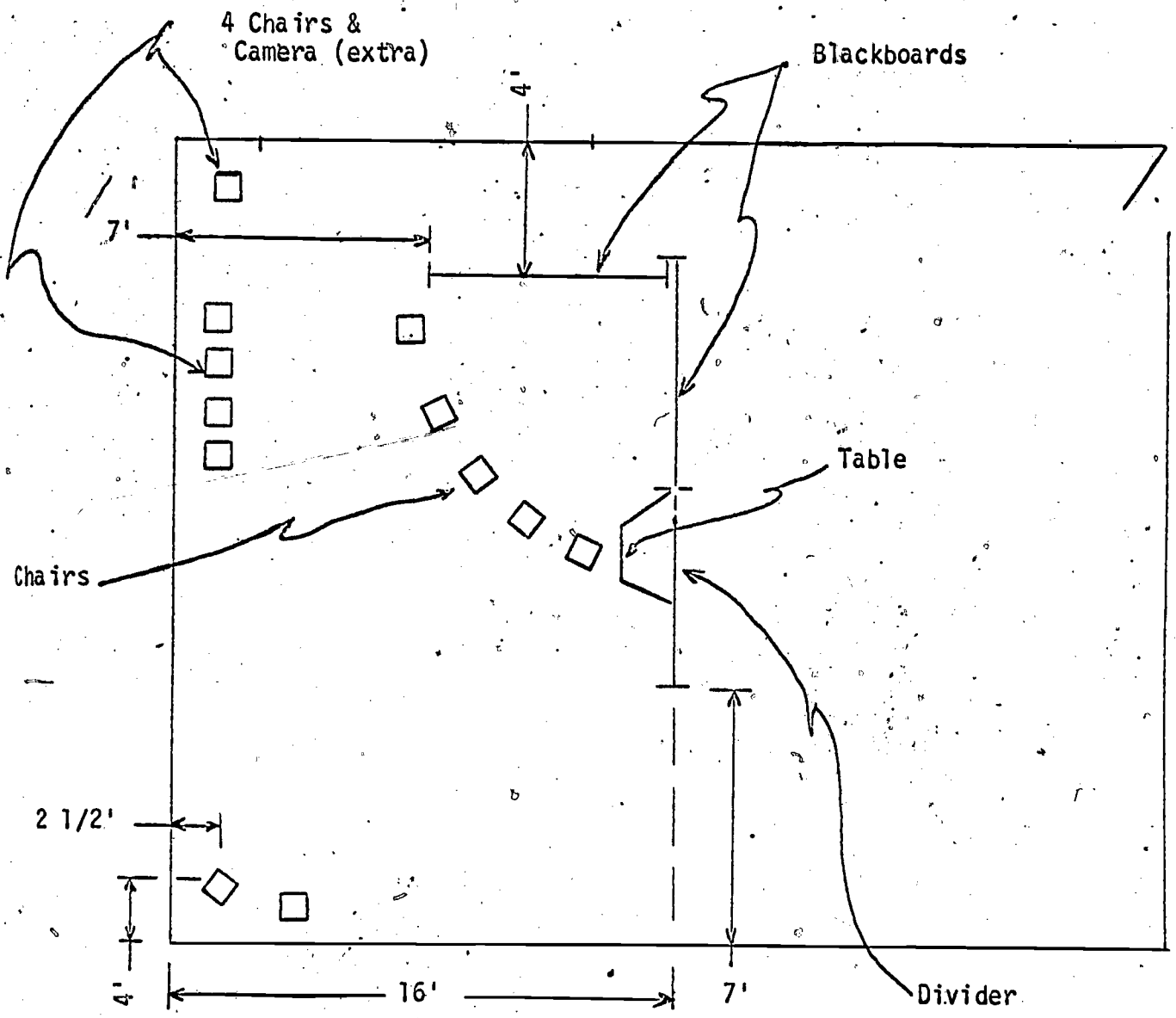
A. Typical Micro-Teaching Classroom Arrangement

B. Student Information Form

C. Hernandez-Klingstedt Establishing Set Rating Form

D. Micro-Teaching Topics

APPENDIX A: TYPICAL MICRO-TEACHING CLASSROOM ARRANGEMENT



ROOM 208
NOT TO SCALE

APPENDIX B:

STUDENT INFORMATION FORM

SEMESTER _____ DATE _____

COURSE:

DEPT. _____ NUMBER _____ SECTION _____
7 11 15

COURSE CODE _____
77

NAME _____
17 LAST FIRST MIDDLE

SOCIAL SECURITY NUMBER _____
37

SEX: MALE _____ FEMALE _____
46 46

DATE OF BIRTH: _____
Month 47 Day Year

TOTAL CREDIT HOURS EARNED: _____
53

GRADE POINT AVERAGE: _____
56

SCHOOL IN WHICH ENROLLED: _____
59

TEACHING FIELDS:

1. _____ _____
64 68 Code

2. _____ _____
70 74 Code

LOCAL ADDRESS: _____

_____

TELEPHONE: _____

NAME_____

STUDENT INFORMATION FORM

(CONTINUED)

MARITAL STATUS (circle one)

1. Single
2. Married
3. Widowed
4. Divorced or Separated

HOURS COMPLETED IN EDUCATION

(do not include hours in which you are presently enrolled)

_____

TRAINING IN MICROTEACHING

(If you have ever received any training in microteaching please describe it below)

TEACHING FIELD CODES

01	BIOLOGICAL SCIENCES	BISC
02	GENERAL BUSINESS	GENB
03	CHEMISTRY	CHEM
04	DRAMA	DRAM
05	ENGLISH	ENGL
06	GEOLOGY	GEOL
07	FRENCH	FREN
08	GERMAN	GERM
09	HEALTH AND PHYSICAL EDUCATION	H PE
10	HISTORY	HIST
11	JOURNALISM	JOUR
12	MATHEMATICS	MATH
13	PHYSICS	PHYS
14	POLITICAL SCIENCE	POSC
15	SECRETARIAL SCIENCE	SESC
16	SPANISH	SPAN
17	SPEECH	SPCH
18	BUSINESS	BUSN
19	SCIENCE	SCI
20	SOCIAL STUDIES	SOST
21	SINGLE TEACHING FIELD: ENGLISH	ENGL
22	MUSIC	MUS
23	PSYCHOLOGY	PSYC
24	LANGUAGE	LANG
25	ART	ART
26	NONE	NONE

APPENDIX C: HERNANDEZ-KLINGSTEDT ESTABLISHING SET RATING FORM

NAME OF EVALUATOR_____

NAME OF TEACHER_____
DATE_____

I.D. NUMBER_____

ESTABLISHING SET -- EVALUATION FORM

	WEAK	BELOW AVERAGE	AVERAGE	STRONG	SUPERIOR	OUTSTANDING	TRULY EXCEPTIONAL
WARM-UP EFFECT							
1. The method for establishing set created interest in understanding the lesson.	1	2	3	4	5	6	7
2. The method for establishing set called attention to the main idea of the lesson.	1	2	3	4	5	6	7
LEARNING TO LEARN EFFECT							
USING STUDENTS' BACKGROUND							
3. The method for establishing set called to mind an idea, a skill, or a feeling that could be associated with the new material.	1	2	3	4	5	6	7
MEMORY							
4. The device used for establishing set will promote recall of the main idea of the lesson.	1	2	3	4	5	6	7
INVOLVEMENT							
5. The method for establishing involved the students in the lesson.	1	2	3	4	5	6	7
CUE DISCRIMINATION							
6. The teacher offered cues or guides to aid in focusing on the main idea of the lesson.	1	2	3	4	5	6	7

APPENDIX D: MICRO-TEACHING TOPICS

1. What are the characteristics of a good question
2. Basic procedures for using instructional media
3. Should teachers use the normal curve to grade students
4. Planning an effective study skills program
5. Comparisons between modular and traditional scheduling
6. How the textbook should be used
7. Classroom management
8. The principles upon which team teaching is built
9. Teaching of concepts
10. What is remedial teaching
11. The use of games in the classroom
12. Necessary components of the daily lesson plan
13. Use of homework
14. How to organize for group dynamics
15. The characteristics of a good assignment
16. How to design an attractive tack-board display
17. How does the classroom teacher provide for transfer
18. How to set up a frequency distribution
19. How to get students to give good reports
20. Programmed learning (theory, uses)
21. The teacher's role in guidance
22. Review of professional journals
23. Individual learning contracts