THE EFFECTIVENESS OF
MICRO-TEACHING AND VIDEO-TAPES
IN TRAINING PROSPECTIVE ELEMENTARY TEACHERS IN
SPECIFIC TECHNICAL SKILLS OF TEACHING

DISSERTATION
Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

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* * * * * *

The Ohio State University
1969

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ACKNOWLEDGMENTS

The writer wishes to express his sincere gratitude and deep indebtedness to Lowry W. Harding, his adviser, for the encouragement, support, and advice which he offered so willingly during the writing of this dissertation. A special note of appreciation and respect is extended to Alexander Frazier and Charles B. Huelsman, Jr. for serving on the author's reading committee.

A special thanks is expressed to W. Clyde Taylor, William C. Schwarzbek, and Annie Laurie Keyes for serving on the panel to rate the video-tapes in this study.

An expression of gratitude is given to Lloyd B. Smith for his assistance in the statistical analysis of data in this investigation.
DEDICATION

This study is dedicated to my wife, Patsy, and to my children, Kevin and Gayle, for their understanding and encouragement.
VITA

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CHAPTER I

INTRODUCTION

BACKGROUND OF THE PROBLEM

One of the major problems facing education today is that of obtaining enough qualified teachers to keep pace with the expanding school population. The problem is one of quantity, but also one of quality. Not only are more teachers needed, but teachers are needed who have the best possible preparation for the job. Both supervisors of student teachers and teachers of methodology have been constantly concerned with how to improve the preservice education of elementary teachers. New technical knowledge and rapid changes in the educational structure of our nation's schools have placed additional demands upon colleges and universities for more effective programs of preservice teacher education.

In recent years there has been an increased emphasis in preservice teacher education on technical skills involved in teaching. Micro-teaching is becoming an accepted technique for training prospective teachers in the use of these technical skills of teaching.
Micro-teaching is a way of scaling down teaching to gain more control over the teaching situation. Micro-teaching was conceived of and first put into practice at Stanford University in the summer of 1963. The micro-teaching experiences introduced the prospective teachers to the complexity of the teaching act.

The technique evolved from a practice in teacher education known as the demonstration lesson. One type of a demonstration lesson was a practice lesson taught by the preservice education student, usually to peers in the methods classes.

At Stanford University, secondary school-age students were hired for the micro-teaching sessions. The lesson was taught and then critiqued by the micro-class members, the supervisors, the student teacher who taught the lesson, and other student teachers. It was recognized that this feedback would be useful only if acted upon and this micro-teaching cycle was developed: teach, critique, replan, reteach, and critique. The original group of three to five students was replaced by a new group of students for the second, or reteaching session.

Video-taping was added as a means of improving feedback and retaining a record of progress in teaching ability. Video-taping is not an essential part of micro-teaching, but it enhances the technique and makes it a more powerful instructional tool.
Reducing the complexity of the teaching act to concentrate on its various components is a customary practice in many preservice education programs. Micro-teaching has provided a means for refining this procedure. One result of the work with micro-teaching has been the development of a list of technical skills of teaching, now numbering about twenty. Each of these skills would make a substantial contribution to the teacher's repertoire.

Many people in teacher education see a need for prospective elementary teachers to develop familiarity with a broad range of teaching skills. As student teachers become more familiar with technical skills of teaching, it is assumed that a broader range of alternative teacher behavior is developed.

Few research studies have been focused upon the problem of applying micro-teaching techniques and videotaping to preservice education programs for prospective elementary teachers. Consequently, there are many unanswered questions. Prominent among them are the following: (1) Are the teaching skills learned through the aid of micro-teaching applied in the classroom situation when the prospective teacher does his student teaching? and (2) Is micro-teaching an effective technique for preparing prospective elementary student teachers for the complexity of teaching?
STATEMENT OF THE PROBLEM

The purpose of this study is to investigate the effectiveness of the micro-teaching technique as a means of instructing prospective elementary teachers in selected technical skills of teaching.

OBJECTIVES OF THE STUDY

1. To determine if technical skills of teaching, learned through micro-teaching sessions prior to the student teaching experience, are applied in the classroom setting.

2. To determine if micro-teaching is of value in pre-service education programs for elementary teachers, and if it should be included in methods courses prior to student teaching.

HYPOTHESES TO BE TESTED IN THE STUDY

1. There will be a greater degree of competency in selected technical skills of teaching for those student teachers who participated in micro-teaching sessions.

2. Prospective elementary teachers who participated in the micro-teaching/video-tape program will regard this experience as being a meaningful part of the total teacher education program, and as being helpful
in preparing them for the complexity of participating in the student teaching program.

RELATED RESEARCH

Micro-teaching was conceived of and first put into practice at Stanford University in the summer of 1963. The technique was used in the preservice education program for about one hundred fifty liberal arts majors seeking secondary teaching certification through a fifth-year program sponsored by the Ford Foundation.

Allen's definition of micro-teaching is:

Micro-teaching is a scaled down teaching encounter that has been developed at Stanford University to serve three 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 the variables in classroom teaching without being overwhelmed by the complexity of the situation. They are required to teach brief lessons (five to twenty-five minutes) to a small group of pupils (up to five).

Micro-teaching can be adjusted to suit the needs and resources of the user. The variables which can be adjusted include: length of lesson, the number of

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reteaches, number of pupils, types of pupils, the amount and kind of supervision, and the method of recording the interaction. At Stanford University, one of the uses with the prospective secondary student teachers was the work with technical teaching skills.

A number of research studies have indicated the value of the technical teaching skills in preparing prospective teachers in the secondary school, but a preliminary review of the literature reveals little effort with this in the elementary education departments. Specific technical skills of teaching that have been identified and tested at Stanford University by Allen and Bush are:

1. Establishing set.
2. Establishing appropriate frames of reference.
3. Achieving closure.
4. Recognizing and obtaining attending behavior.
5. Providing feedback.
7. Control of participation.
8. Redundancy and repetition.
9. Illustrating and use of examples.
10. Asking questions.
11. The use of higher order questions.
12. The use of probing questions.
13. Teacher silence and non-verbal cues.
14. Student-initiated questions.
15. Completeness of communication.
16. Varying the stimulus situation.
17. Lecturing.
18. Pre-cueing.

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The question of how to provide preservice education in technical skills of teaching has not been answered. The writer believes Allen's statement about the uses of micro-teaching in in-service education could be applied to preservice education for elementary teachers:

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 students learning and with much more satisfactory timing.

Providing teachers with an opportunity to try new ideas easily and without risk to student learning can be an important asset to professional development.3

Many elements of the micro-teaching technique are directly related to theoretical and scientific findings of psychology and sociology; thus giving micro-teaching a well-founded theoretical and scientific base. For

example, the provision of feedback on performance is related to psychological and sociological work.⁴

Micro-teaching is the focus of much current research, but little or none of it involves preservice education for prospective elementary teachers. Research on the micro-teaching technique is being carried on by the National Centers for Research and Leadership Development and the Regional Educational Laboratories all over the nation. It is being applied to business and distributive education, in the training of Job Corps teachers, and in the training of vocational and technical teachers for both high school and post-high school teaching.

Stanford University continues to use the technique in the preparation of prospective secondary teachers and for Peace Corps trainees. Wayne State University uses the technique in business and distributive education, in their Master of Arts in Teaching Program, and for their National Teacher Corps project.

The Center for Research and Leadership Development in Vocational and Technical Education at Ohio State University is conducting research on supervisory strategies for teacher education, testing evaluative instruments, and selecting appropriate teaching skills for vocational and technical education.

The usefulness of micro-teaching was reported by Allen and Fortune on their findings at Stanford University:

1. They found that students 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 competence than a similar group of students receiving separate instruction and theory, with teacher aid experience, involving about twenty hours each week.


3. There was 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. Student acceptance of the value of micro-teaching was high.

5. Selected technical teaching skills subjected to experimental treatment in micro-teaching produced significant changes in the performance of prospective secondary teachers.5

A study at Stanford University was made to determine if video recordings could be substituted for live observations in teacher education. Each trainee taught five students for five minutes, received feedback from supervisors (except the control group), and taught the same lesson to a different group of five students for five

minutes. The same format was duplicated one week later. The data were analyzed in terms of the changes which took place in the trainee's performance between the first teaching session and later sessions.

Some findings of this study were:

1. Do trainees need feedback if they are to change their teaching behavior? Answer: Trainees who received feedback changed the behaviors defined as "development of aims" more than trainees who received no feedback.

2. If the supervisor is able to "show" the trainee as well as "tell" the trainee what needs to be done to improve the teaching performance, will the trainee make greater improvement in the teaching performance than the trainee who received verbal feedback only from a supervisor? Answer: Trainees who had the opportunity to see themselves perform and to receive verbal feedback from supervisors make greater changes.

3. Can enough information be obtained from video recordings to permit effective supervisory conferences? Answer: The condition of observation of teaching performances from prerecorded video-tapes was not significantly superior to the live observation of teaching performance with the supervisor present in the classroom.6

The purpose of a study made by King was to determine if student teachers could identify the same lesson weaknesses which an expert could identify. The objectives

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of the research was to compare two groups of students in which each individual attempted to identify weaknesses in his first lesson. Student teachers in Group A were given personal critiques of their lessons by an expert before they saw playbacks, but students in Group B were given no suggestions whatever before watching playbacks.

The findings indicated that students' judgments of their own lessons agreed with the experts' judgments very nearly, as well as two experts could agree. Between the two groups of students, there was practically no difference in agreement with the experts.

Some conclusions from King's study were: (1) With the use of television recordings, it may be that adult college graduates can judge their own novice teaching efforts without expert help, at least after they have had some instruction in how to teach, and (2) From the interviews conducted after lesson playbacks, the conclusion was drawn that the television environment was not a significant distraction.  

Webb and Baird gave a report on several studies on micro-teaching. Their findings substantiate those of the Stanford University investigators on the following points: (1) There was a significant increase in the

candidate's self-perception of his teaching performance through identification of weaknesses as well as strengths, and (2) The trainee's acceptance of the value of micro-teaching was high. No other findings were reported by Webb and Baird for preservice education. Some programs using micro-teaching for in-service training in Utah school districts, sponsored by Bringham Young University, were reported. The tentative conclusions were:

1. A taped micro-teaching session is more threatening to the in-service teacher than to college students. It is inferred that this may be a result of taping in a public school setting.

2. Experienced teachers who micro-teach and then observe the video-taped playback privately, using an observation guide sheet, can be helped to make significant changes in their teaching behavior.

3. Most experienced teachers overcome their fear of taping in the first or second session and improve rapidly in achieving a specific skill or competency.  

ASSUMPTIONS INVOLVED IN THE PLAN OF THE PROPOSED STUDY

1. A panel of selected educators can, with the aid of a rating form, evaluate an elementary student teacher's performance on selected technical skills of teaching.

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2. A panel of selected educators can evaluate an elementary student teacher's performance by viewing a videotaped sample of the teacher's performance in a normal classroom setting.

SCOPE AND ORGANIZATION OF PROBLEM

SELECTION OF SAMPLE

Subjects for this study will be students majoring in elementary education. These will be undergraduate seniors and will be completing their final courses in education before being placed in the public schools for their student teaching experience. None will have had previous teaching experience.

This may be regarded as a random and sufficiently representative sample since the investigator will not have selected the subjects in advance. Students are randomly assigned to the courses by the college registrar.

LIMITATIONS OF THE PROPOSAL

Although it is desired that the proposed investigation have meaning for preservice elementary education programs in a variety of geographical locations, this study will involve as subjects only those individuals who are
elementary student teachers at Lenoir Rhyne College, Hickory, North Carolina.

PROCEDURES TO BE FOLLOWED IN THIS STUDY

The technical teaching skills focused upon in this investigation will be selected by the investigator, primarily on the basis of appropriateness for experimentation in the local school situation.

The experimental group will be prospective elementary teachers enrolled in a language arts course just prior to their student teaching experience.

These students will receive instructions on the selected technical skills of teaching. Their work with these skills will involve micro-teaching sessions and will use the complete micro-teaching cycle for this technique: teach, critique, replan, reteach, critique.

When these students go into the public schools to do their student teaching, the investigator will make video-tapes of them in normal classroom settings.

The control group will be elementary student teachers who will have studied in the required methods courses in elementary education. They will have had no experience with the micro-teaching technique. Their experience with technical skills of teaching will probably have been nil since methods courses are normally taught do not place emphasis on discrete teaching skills as such.
The investigator will make video-tapes of these student teachers in normal classroom settings. The tapes of the individuals in the control group will be made the semester before the members of the experimental group do their work with micro-teaching. The investigator considers that this is necessary because of the limited number of elementary student teachers available during any one semester. This should also help to control the Hawthorne Effect.

The experimental group will not know in advance that they are to be compared to a control group, with reference to their technical skills of teaching. At the completion of their student teaching experience, members of the experimental group will be asked to complete a questionnaire concerning the value of the micro-teaching sessions. The questionnaire will be developed by the investigator.

A panel of educators will view the video-tapes and by use of a rating form, rate the elementary student teachers on their competence in applying the selected technical skills of teaching.

From an analysis of the data collected through the above described procedure, the investigator then hopes to answer these questions: (1) Are the teaching skills, learned through the aid of micro-teaching, applied to the
classroom situation when the prospective teacher does his student teaching? and (2) Is micro-teaching an effective technique for preparing prospective elementary student teachers for the complexity of teaching?
CHAPTER II

REVIEW OF LITERATURE

RESEARCH ON TEACHING

Research on instructional methods is a relatively neglected, undernourished and underachieving subset of research on learning. Gage makes a distinction between research on learning and research on teaching. Research on learning deals with all the conditions under which learning, or a change in behavior due to experience, takes place; whereas research on teaching deals with a subset of conditions under which learning occurs in one person, namely, the conditions established by the behaviors of another person, the teacher. "Research on teaching has yielded relatively few solid and usable results." ¹

In Smith's discussion on observation systems and recent research studies on teaching, he says that "the most distinctive common feature is the emphasis placed upon the observation of actual teaching behavior instead

of static elements and theories about it." Earlier studies held that teaching can be understood from theories of thinking and learning and to determine the effectiveness of a teacher it was only necessary to find static correlates of teaching success; such as, the teacher's intelligence, knowledge and experiences.

Another feature that marks recent efforts to analyze teaching behavior is the attention given to language and its role in instruction. Language is the main instrument of instruction and as numerous studies have indicated, verbal activity is the dominant form of classroom behavior. Current research on teaching behavior assumes, for the most part, that many significant outcomes of instruction can be accounted for only by reference to linguistic behavior in both its cognitive and affective import.

Smith contends that:

> teaching behavior can be improved by modifying, among other things, the performance of operations taken on through the language and the disciplines. To make such improvements requires that the teacher in training becomes aware of those operations, studies them, and learns not only to perform them more skillfully, but also to analyze their structures. To train the teacher in this way, even though it is only part of the

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training needed for teaching, is to make use of the observational systems, and the analyses of teaching behavior they make possible.4

Joyce and Hodges report on a program in teacher education at the University of Chicago and Manhattanville College to help teachers enlarge their repertoire of teaching behaviors. They believe a teacher who can purposefully exhibit a wide range of teaching styles is potentially able to accomplish more than a teacher whose repertoire is relatively limited. "Instructional flexibility" is the term they use to designate this capability.

Instructional Flexibility Training is a system which is designed to help teachers to be more flexible in their teaching behaviors by:

1. training them to analyze teaching through several frames of reference (social climate, content, and teaching strategies),
2. helping them discriminate their own teaching behaviors through the analytic schemes provided,
3. helping them plan goals for enlarging their repertoire of teaching behaviors,
4. providing feedback about progress toward these goals.5

The authors stated that for better schools to be developed, teachers must learn wider ranges of teaching behavior. Teachers need to learn to radiate more kinds of

4Smith, "Research on Teaching," p. 72.
social climate, to extend the ways they can handle content, and to learn more teaching strategies.\textsuperscript{6}

According to Gage, one reason for the fruitlessness of much of the research on teaching in the past has been the global, conceptually impossible and highly complex variables that researchers have used. He says the so-called criterion problem has misled a whole generation of researchers on teaching and that it has:

embroiled them in endless and fruitless controversy and lured them into hopelessly ambitious attempts to predict teacher effectiveness over vast arrays and spans of outcomes, teacher behavior, time intervals, and pupil characteristics, all on the basis of predictive variables that had only the most tenuous theoretical justification in the first place.\textsuperscript{7}

In the 1962 writing on paradigms for the Handbook of Research on Teaching, Gage coined the term "micro-criteria" of effectiveness. He said in that chapter:

One solution within the criterion-of-effectiveness approach may be the development of the notion of micro-effectiveness. Rather than seek criteria for the over-all 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.\textsuperscript{8}

\textsuperscript{6}Joyce and Hodges, "Instructional Flexibility Training," p. 415.


In discussing the technical skills approach used in the teacher education program at Stanford University, Gage says that when analyzed-teaching in the form of technical skills is made the focus of our concern, we find it possible to do fairly satisfying research both on teacher education and on teacher effects.9

The research strategy reported by Fortune which has grown out of the micro-teaching format utilizes the video-tape recordings of teaching encounters to gain a repeatable analysis of classroom practices. This strategy involves focusing upon a specific teacher behavior while it was directed toward the accomplishment of a specific classroom goal, video-tape recording several instances of this teacher behavior, assessing student levels of goal acquisition, and then isolating instances of the behaviors that result in minimal and maximal goal attainment. From repeated applications of this strategy, generality of teaching behaviors and evidences of successful practice can be subjected to several formats of logical, philosophical, and statistical analysis.10

One utilization of this strategy was made in a study done in cooperation with the Central Midwestern


Regional Educational Laboratory in the summer of 1966.
This study was an investigation of the presenting behavior of Head Start teacher-trainees. Students from thirty classrooms in three Shelby County, Tennessee schools were taught two ten-minute lessons by thirty teacher-trainees enrolled in a Memphis State University Head Start Teacher Training Program. These lessons included four concepts from a transportation unit and four concepts on community workers. Each lesson was video-taped and the tape analysis identified four teacher behaviors which appeared to be discriminating factors in success at presenting. These behaviors were:

1. The teacher made provisions for the children to explore and manipulate elements of the content.
2. The teacher introduced and provided opportunities for verbal practice.
3. The teacher reinforced correct responses.
4. The teacher appeared sensitive to the children's needs, interests, and questions.11

Fortune believes that the micro-teaching clinic produces an environment for the researcher that falls somewhere in between the laboratory and the field environment. The controls of the laboratory are not duplicated, but the

micro-teaching clinic offers more experimental control than
is possible in field research. Through reducing the com-
plexity of both the class (in size and length) and the
teacher (in terms of single task orientation rather than
multiple task orientation and in terms of a reduced student
load), the researcher maintains adequate control for the
utilization of some classical designs. Since the teacher
is teaching and the students are actually learners, the
artificiality which lessens the authenticity of the labora-
tory situation is greatly reduced in the micro-teaching
situation. Both intern teachers and students are in a
familiar environment which does not exhibit experimental
cues but rather reflects teacher-training over-tones. The
intern is practice teaching and the students are learners
with similar motivation to that felt in the normal classroom.

**Fortune** makes the following statement about research
in teaching:

> For research in teaching to rely on
> student behavior changes as a criterion of
> teaching success, the gap between laboratory
> studies and field practices must be spanned.
> By studying an environment possessing con-
> ditions which fall somewhere between the
> usual laboratory and the usual field situa-
> tions, the educational researcher may learn
> how to span this environmental gap. By
> reducing the complexity of the classroom and
> still subjecting teaching practices to more
> precise research designs than are currently
> employed in field studies, effects of specific
> attributes of teacher behaviors may be linked
> to a student performance criterion.\(^2\)

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Recent attempts to improve our secondary schools have tended to emphasize increased stress on curricular changes and organizational innovation. Johnson sees new stress on the quality and nature of instruction as a necessary third ingredient in a general program of school improvement. He believes that micro-teaching has proven useful for the improvement of instruction in two ways: (1) as an environment where teachers may gain skill under a program of guided practice, and (2) as an environment where methods of teaching techniques may be systematically investigated and improved. Until recently the classroom was the only environment the educator had in which to conduct research.

Johnson has stated:

Given our present state of knowledge, the goal of providing meaningful experience components for courses in teacher preparation is ambitious and sometimes painful; ambitious because we do not know enough to fully implement the idea; and painful for the student who quickly discovers that teaching requires more than excellence in content, and for the methods teacher who just as quickly finds that his students did not understand him well enough to effect the desired behaviors, or that, when manifested, the desired teacher behaviors did not achieve the predicted pupil changes.13

Micro-teaching has been implemented at the University of Illinois under the title of Teaching Techniques

Laboratory. The purpose of the laboratory is to provide an experience or practice component for each course in the teacher preparation sequence. As presently organized, the laboratory functions as a service unit for instructors in the teacher preparation program. Instructors who wish their students to practice in a particular method call on the laboratory to provide the combination of pupils, rooms, materials, and hardware necessary for the experience. The instructor then conducts and evaluates his own program. The laboratory has been used to evaluate a lesson planning project in health education, a combination of lesson planning and methods activities in English, a variety of instructional ventures in social studies, a cooperative approach to English, science, and social studies methods instruction, and some exploratory work in the supervision of student teachers. These projects have enjoyed only varying degrees of success, but in so doing, have provided the investigators with information useful for the revision and further developments of their programs.  

The Teaching Techniques Laboratory adds complementary, somewhat practical experience to the theoretically oriented curriculum for prospective teachers.  

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15 School and Society. (Editorial) 96 (March, 1968), 128-130.
Investigations of teaching techniques have been more atomistic than conventional methods research. Johnson derived a set of hypotheses concerning cognitive closure from the theoretical literature of cognition, audio and visual perception, and factor analytical studies of mental abilities. He hypothesized that learning and retention would be facilitated when the learner perceived the lesson to be well organized, i.e. the various ideas, bits of information and principles involved in the lesson as integrated into conceptual wholes. Six hundred and sixty-seven San Francisco Bay area high school sophomores read either of two programmed texts, differentiated by degree of content integration, and took both an immediate and a delayed achievement test. The basic hypothesis was confirmed by both measures.16

In the past, little consideration has been given to the psychology of learning in the preparation of prospective teachers. One development that is focusing upon the process through which the prospective teacher approaches learning and acquires an understanding of how to help others learn is micro-teaching.

This process requires that the prospective teacher contrive a learning task which must be presented to learners. The teacher becomes aware of the skills needed in order for

someone to learn. Emphasis is upon trying out certain
theories about learning and in making applications in
functional applications of theory in the preservice teacher
education program. Implications from findings of research
need to be tried in actual classroom situations, including
field tests.

Micro-teaching, video-tapes and programmed instruc-
tion should be able to help teachers operate at a new
professional level. The classroom teacher will be the one
who applies theory to teaching and the one who tries out
materials and resources in the classroom and to provide
feedback for the producers of materials. According to
Meierhenry, the teacher of the future will do more experi-
menting and innovating in the classroom, as a result of
hunches and hypotheses he gathers from his own classroom
observations and his own analysis of the teaching-learning
act.17

Hornig said:

As a scientist, I am pleased to see,
in many areas, the beginnings of experi-
mentation on the education process itself;
on how learning really takes place and is
affected by various changes in approach,
how different curricula interact with
methods of instruction, with teachers and
students.18

17 Wesley C. Meierhenry, "The New Significance of
Learning Theory," Educational Screen and Audiovisual
Guide. 45 (January, 1966), 22-23.

18 Donald F. Hornig, "On Science Education in the
U.S." ESI Quarterly Report. (Summer-Fall, 1965), 79-82.
Micro-teaching can be a tool to help prospective teachers develop the competencies listed by the Teacher Competencies Project, as reported by Meierhenry. The competencies and the activities needed to produce them are as follows:

1. Need for theory in teacher education programs.

Theory becomes real when it is translated into forms in which the theory can be seen, manipulated, or tested.

Such theories as those concerned with learning, structure of knowledge, discovery, inquiry, and inductive reasoning must be translated into a form where teacher education students can examine and judge the validity of the approaches for themselves.

2. Development of an instructional sequence or an instructional system.

Students must have experiences in designing teaching bits, testing them out with one child or several children, obtaining feedback as a result of critical analyses, redoing the sequence and trying it out again, followed by further evaluation and feedback.19

The major objective of an effective teacher education program is to produce teachers capable of relating theoretical insights to actual practice, and as Rivlin stated, "No aspect of teacher education better

someone to learn. Emphasis is upon trying out certain theories about learning and in making applications in functional applications of theory in the preservice teacher education program. Implications from findings of research need to be tried in actual classroom situations, including field tests.

Micro-teaching, video-tapes and programmed instruction should be able to help teachers operate at a new professional level. The classroom teacher will be the one who applies theory to teaching and the one who tries out materials and resources in the classroom and to provide feedback for the producers of materials. According to Meierhenry, the teacher of the future will do more experimenting and innovating in the classroom, as a result of hunches and hypotheses he gathers from his own classroom observations and his own analysis of the teaching-learning act.17

Hornig said:

As a scientist, I am pleased to see, in many areas, the beginnings of experimentation on the education process itself; on how learning really takes place and is affected by various changes in approach, how different curricula interact with methods of instruction, with teachers and students.18


18 Donald F. Hornig, "On Science Education in the U.S." ESI Quarterly Report. (Summer-Fall, 1965), 79-82.
Micro-teaching can be a tool to help prospective teachers develop the competencies listed by the Teacher Competencies Project, as reported by Meierhenry. The competencies and the activities needed to produce them are as follows:

1. Need for theory in teacher education programs.

Theory becomes real when it is translated into forms in which the theory can be seen, manipulated, or tested.

Such theories as those concerned with learning, structure of knowledge, discovery, inquiry, and inductive reasoning must be translated into a form where teacher education students can examine and judge the validity of the approaches for themselves.

2. Development of an instructional sequence or an instructional system.

Students must have experiences in designing teaching bits, testing them out with one child or several children, obtaining feedback as a result of critical analyses, redoing the sequence and trying it out again, followed by further evaluation and feedback.19

The major objective of an effective teacher education program is to produce teachers capable of relating theoretical insights to actual practice, and as Rivlin stated, "No aspect of teacher education better

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exemplifies everything that John Dewey spoke of than the work that is done in professional laboratory experiences."^20

MICRO-TEACHING IN PRESERVICE EDUCATION

In the early developmental stages of micro-teaching at Stanford University, teacher trainees taught one demonstration lesson to four high school pupils who played roles designed to confound a new teacher and to drive home the point that a teacher must know how to teach as well as what to teach.^21 From this demonstration lesson, the concept of micro-teaching and the micro-teaching clinic evolved to help reduce the complexities and trauma which accompany first teaching experiences.^22 This first project was supported by the Ford Foundation and involved teacher


trainees working for secondary certification and a master's degree. As the process of micro-teaching has been refined, its acceptance has grown.

In the first, or tutorial, phase of the micro-teaching clinic, each teacher trainee tutored a student from a near-by secondary school who was having trouble in some area of his program. The tutor was a trainee particularly strong in the student's area of difficulty. Most of the trainees commented that the tutorial experience was particularly helpful because it gave them an understanding of the difficulties involved in securing reading materials suitable to the level of comprehension. In evaluating their teacher preparation program at Stanford University, a large majority of interns rated the tutoring program as a "very strong" element.

On the first day of the second, or micro-lesson, phase of the clinic, each teacher trainee taught a diagnostic lesson for the purpose of evaluating the intern's beginning performance and to expose the trainees to the video-tape and supervisory system. Each trainee was scheduled to teach two teach-reteach cycles each week of this period. The lessons were built around a single

\[\text{23}^\text{"Portable TV Recorders for Student Teachers," School and Society. 92 (November, 1964), 330.}\]

concept and taught to three or four students from near-by secondary schools; students were paid for their participation. In addition to focusing on a single concept in the lessons, the interns received one hour of instruction in a specific teaching skill to be emphasized during that week. For the first several lessons, the teaching candidates concentrated on the technical skill of teaching called "set induction."  

The cycle used in this phase of the micro-teaching work was as follows:

1. A five minute lesson taught to a team of students and observed by Stanford University supervisor.

2. A ten minute supervisory conference.

3. A five minute lesson re-taught to a new team of students and observed by supervisor.

4. Another ten minute supervisory conference.  

Many of the lessons were recorded on video-tape and played back at the completion of the micro-lesson to give the teacher an immediate picture of his performance and the students' reaction to it. In this phase of the clinic, teaching candidates gain teaching experience in a situation much less complex than that found in a regular classroom.


26Ibid.
In the third, or micro-class, phase of the clinic, the teaching interns were divided into teams of three or four. With the assistance of a supervisor, each team planned a twelve-day unit of work for presentation in twenty-minute sessions. In order to provide a realistic situation and learning continuity, the same four or five students were present for all lessons as a micro-class. Each candidate taught one lesson, in turn, while the other members of his team observed. At the end of the lesson, the teacher trainees participated in a critique discussion with the supervisor and other team members.27

Planning a unit of work for a micro-class served these purposes:

1. To give candidates experience in developing a unit.

2. To teach the need for specific, clearly defined objectives in any teaching situation.

3. To impress upon the trainees the need for advanced planning and regular daily planning combined with enough flexibility to adapt or change plans when needed.

4. To expose the teacher trainees to students for longer periods of time than during the micro-lesson phase.28

Some of the conclusions from the first micro-teaching clinic at Stanford University are as follows:

1. Sixty percent of the interns felt the


experience was "very" or "extremely" valuable.

2. The major teaching strategy involved the use of students and supervisory feedback to achieve behavior changes in teacher trainees. Seventy percent felt the supervisory feedback was useful. Twenty-four percent felt the student feedback was helpful.

3. The results affirmed the effectiveness of teaching skills previously identified.

Some of the problems encountered at Stanford University in the early efforts with micro-teaching are as follows:

1. The students doing role playing got carried away at times; they should exhibit only certain predefined behaviors.

2. More effort needed to train supervisors to make efficient use of videotape recordings.

3. The most inefficient way to critique a video-tape is to replay the entire lesson and just sit and watch it with the intern.

4. The supervisor should point out specific points (not more than two) on which he wants the intern to focus.

Allen lists several advantages of the micro-teaching procedure as compared with typical student teaching practices. These advantages are as follows:

1. Less complicated stimuli are presented for the novice teacher to cope with and

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30Ibid.
the supervisor can focus his supervision more precisely.

2. Unlike typical practice teaching situations, micro-teaching can be controlled to provide a wide variety of situations, as desired.

3. Greater individualization is possible.

4. Micro-lessons can be scheduled as needed, varying time and students for specific instructional purposes.

5. Experiments with micro-teaching have demonstrated that a high correlation exists between micro-teaching performance and performance in a full-sized classroom.31

The possibilities of micro-teaching have just begun to be identified. It is obvious that the extent of control and the simplicity of logistics in micro-teaching lessons make it promising for many applications of practice in teaching. It also has potential as a research tool to investigate the technical skills of teaching and other empirical questions about teaching and learning.32

Research evidence collected over the past several years at Stanford University provides increased confidence in the efficacy of specific training sequences in changing the classroom performance of intern teachers. Examples of teaching behaviors which have been studied are set induction

31 Dwight W. Allen, "A New Design for Teacher Education: The Teacher Intern Program at Stanford University," Journal of Teacher Education. 17 (Fall, 1966), 296-300.

(getting students ready to learn), multiple frames of reference (getting students to examine a body of material from more than one point of view), closure (bringing the class to a point of conclusion which is perceived as such by the students), and observation skills. Allen says, "Though the result of the studies to date represent a modest beginning, the demonstrable effects of training in specific skills and associated feedback on the classroom performance of beginning teachers achieve good results."33

Cooper presents some important ideas to be considered in developing teaching skills through micro-teaching. He says that skills must be defined and decisions made as to which skills would be the most useful for teacher trainees to have in their repertoire. There is no one set of technical skills of teaching which is better than another set. The selection and development of technical skills of teaching depend upon the objectives of the teacher education program. There is a great need for research in the area of selecting and defining skills in order to avoid wasting time and energy on skills which are of little use to the teacher. Cooper says very little is known about which skills will produce the greatest payoff for the teacher in the classroom. "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."^{34}

In order to develop the teaching skills, training protocols must be established. The behavioral components of any teaching skill expected of the trainees can be described in a lecture situation. However, Cooper believes that a more powerful training procedure would be to show various models demonstrating particular teaching skills.

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. The basic model is one of: teach, critique, reteach, critique. This model employs cybernetic principles of immediate feedback and immediate opportunity to incorporate that feedback into the teaching act.^{35}

The portable video-tape recorder has proven useful in the Stanford University program of teacher education. Its facility for immediate feedback makes it an invaluable aid in the supervision of both micro-teaching and classroom performance. The technological innovation has opened the door to new techniques in teacher trainee supervision. Dissertation research strongly suggests that video

^{34} James M. Cooper, "Developing Specific Teaching Skills Through Micro-Teaching," The High School Journal, 51 (November, 1967), 82.

^{35} Ibid., pp. 82-83.
recordings can be reliably substituted for live observations in the supervision of teachers. This finding opens up possibilities for enlarged supervision of teachers by senior staff members who traditionally have been precluded from direct supervision by the high demands of their time.  

Cooper gives two major uses for video-tape recordings in developing specific teaching skills for micro-teaching. First, video-tapes can be used to portray model teachers demonstrating specific skills. Second, video-tapes are useful as part of the supervisory process. It is 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. Through the use of video-tape recordings the trainee can also analyze his own performance in terms of its strengths and weaknesses. This self-analysis is important if the trainee is to continue to develop professionally after his initial training period.  

The development of instruments designed specifically to measure the skills which are the foci of training in micro-teaching is definitely needed in order to assess correctly the effects of training in various skills.


37 Cooper, "Developing Specific Teaching Skills Through Micro-Teaching," p. 84.
In the first three micro-teaching clinics conducted at Stanford University, 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. Evaluative instruments to measure progress in each of the technical skills included in the micro-teaching clinic at Stanford University have now been constructed.

Cooper has expressed the hope that every institution that attempts the development of specific technical skills of teaching 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 field of knowledge."

The micro-teaching technique has a well-founded theoretical base as suggested by several authors in their

38 Cooper, "Developing Specific Teaching Skills Through Micro-Teaching," p. 85.
discussion of learning theory in terms of its relationship to micro-teaching, with the preservice or in-service teacher being the student to whom the learning theory is applied.

The first consideration is that "the capabilities of the micro-teacher must be considered when a decision of what to teach must be made." The micro-teacher selects lesson content with which he feels comfortable and competent and is encouraged to concentrate on the perfection of one technical teaching skill at a time. If a teacher is asked to teach a micro-lesson for job placement screening, he should be able to select material in his area of competence.

Several aspects of learning theories deal with motivation and it is generally agreed that "intrinsic motivation is preferred." A micro-teaching experience allows a teacher to see the discrepancy between his ideal self-concept of a teacher and his real teaching as seen on video-tapes. Meier suggests that micro-teachers be allowed to view the early tapes alone and he believes the trainees will make many of the necessary corrections themselves.

The principles that "learning under the control of reward is preferred" and that "successful experiences make

39John H. Meier, "Rationale For and Application of Micro-Training To Improve Teaching," The Journal of Teacher Education. XIX (Summer, 1968), 149.

40Ibid., p. 150.
failure easier to take" are related. Micro-teaching has many possibilities for rewards and reinforcement of desirable teaching behaviors. The experience of oneself as a success has a positive influence on the development of a positive self-concept.

Another component of learning theories is that "goals have to be realistically set." Individual differences and capabilities of the trainees must be considered when attempts are made to modify teacher behavior under micro-teaching circumstances. One advantage of micro-teaching is that the teacher trainee can work on one behavior modification at a time.

"Knowledge and information about performance aids the learner" is related to the theory that "transfer will be better if the learner sees the relationship himself." The instant replays of video-tape recordings make it possible for the trainee to receive immediate information regarding his performance. And this is believed to be more valuable than delayed feedback. Allen says, "Immediate opportunity to rectify errors and weakness is preferable to periods of living with the weakness." The training

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41 Meier, "Micro-Training To Improve Teaching," p. 150.
42 Ibid., p. 151.
43 Ibid.
sessions of micro-teaching give the teacher an opportunity to apply knowledge from content and methods courses in scaled-down situations. This answers many prospective teachers' pleas for an opportunity to test some of their newly acquired ideas and try out what they are learning by teaching in "live" situations.45

Another commonality, "spaced distributive recalls are advantageous,46 supports micro-teaching experiences and presents the possibility that micro-teaching sessions over a longer period of time would be more effective than a concentrated period of student teaching. No way of teaching is right for all, but behavioral scientists are classifying behaviors which can be observed and modified. Micro-teaching offers a technique for appraising one's own behavior and modifying that which he desires.

Politser has experimented with foreign language teachers and micro-teaching in a program of "practice-centered" teacher training aimed at the creation of specific teaching skills. This program is designed to focus the trainee's attention on his role as a teacher and not on his role as a student. One important aspect of teacher training is to make the trainee aware of practice

and to help him realize all his preparation will help convert him from a student to a teacher. Politzer suggests that a micro-teaching lesson can be a culminating experience in which the prospective teacher applies his knowledge to the teaching of foreign languages. The teacher can prepare his own presentation or can watch a video-taped model on a specific teaching problem or skill and imitate the model in his presentation.47

Young says that the concept of modeling, although developed and researched, has not been incorporated into many teacher education programs. He defines a model as "a constructed teaching-learning situation in a micro-teaching format."48

The efficacy of two basic kinds of modeling has been investigated. These two basic kinds of modeling are perceptual and symbolic. A perceptual model in teacher education refers to a video-taped teaching episode stressing a specific teaching behavior. The modeled performance is usually five to seven minutes in length. A symbolic model is a written description of the specific teaching


behavior to be acquired by the teacher. The description is detailed and includes a rationale for using the behavior.\footnote{Young, "Models in a Micro-Teaching Sequence," p. 397.}

Research supports the concept of modeling as an effective technique to use in modifying teacher behavior. The self-instructional models (audio and/or video) offer an opportunity for teacher educators to supplement and complement the training of preservice and in-service teachers.\footnote{Ibid., p. 402.}

Sedwick and Misfeldt describe how the American Industry Project at Stout State University uses micro-teaching to "provide an opportunity for students to obtain a substantial amount of practice, preceding their entrance into student teaching, under optimum control and evaluation conditions for the trainee and at the same time without jeopardizing the learning of the students."\footnote{Larry K. Sedgwick and Harlyn T. Misfeldt, "Micro-Teaching: New Tool for a New Program," Industrial Arts and Vocational Education. 54 (June, 1967), 34.}

The American Industry Project includes a professional teacher education seminar and a professional teacher education laboratory and the sequential program is offered for seven semesters beginning the second semester of the freshman year and continuing through student teaching,
during the last semester of the senior year. The seminar meets four hours each week and integrates general educational and psychological information for the neophyte teacher as he develops in pursuing the role of teacher.52

The micro-teaching sessions in the laboratory follow the micro-teaching cycle as developed by Bush and Allen at Stanford University. Junior high school students serve as members of the evening micro-classes. The first sessions before the camera find the trainee concerned with how he looks and sounds on the video-tape. However, these considerations soon give way to the more specific aspects of the complex act of teaching and developing a satisfactory performance.53

Sedgwick and Misfeldt list these advantages of micro-teaching as observed from their work in the American Industry Project:

1. The trainee has an opportunity to obtain practice and self-confidence prior to student teaching.

2. The student can work on specific aspects of teaching rather than being expected to become competent in all skills during his student teaching experience.

3. A short, controlled micro-lesson is a more appropriate experience for a beginner than an hour-long presentation to a complete class.

52Sedgwick and Misfeldt, "Micro-Teaching," p. 34.

53Ibid.
4. Micro-teaching permits greater control over practice in terms of the variety and kinds of students and content, and length of lesson.

5. Micro-teaching allows for individual needs in terms of the amount of practice.

6. Micro-teaching permits several people to evaluate and re-evaluate a teaching performance.\(^\text{54}\)

Prospective secondary teachers enrolled in specialized methods instruction courses at Eastern Illinois University participated in micro-teaching experiences in 1966-1967. The format tended to vary with each of the eighteen instructors but the general procedure was as follows: Each student prepared a short, three to five-minute segment of material to present before the camera to the students in the methods class. The tape was viewed and strengths and weaknesses were discussed by the student and instructor. The micro-teacher replanned the material for a reteach which was also taped for another viewing.\(^\text{55}\)

Men's physical education majors gave demonstrations to seventh- and eighth-grade students and the camera recorded both the demonstration and the pupil's trial and practice of the specific skill being presented. Mathematics

\(^\text{54}\)Sedgwick and Misfeldt, "Micro-Teaching," p. 35.

and shorthand teachers were taped with emphasis being on the use of the chalkboard. Prospective life science teachers gave a demonstration of the use of the microscope before the camera. Home economics students gave two presentations and most of them could see evidence of an increased competence during the quarter. Most students at Eastern Illinois University were receptive of the idea of micro-teaching and video-tapes, and felt this experience gave them an opportunity to see and correct their own errors before doing their student teaching. They had a chance to check their visual image, to examine their appearance and style of dress and their facial expressions. They could see if they were standing in front of the writing on the chalkboard or using technical words too advanced for the students they would be teaching.  

Some advantages of micro-teaching as practiced at Eastern Illinois University are given by Schaefer and Stromquist:

1. The teaching sequence is simplified over a similar situation in a real classroom, and allows a student to practice specific methods.

2. The supervising instructor can pinpoint supervision in a much more precise manner because both he and his student can see the same thing at the same time.

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3. Each student can work on his own problem; greater individualization is permitted.

4. Students are less fearful of the first few days of student teaching.

5. The instant feedback allows immediate evaluation of his performance by each student, and allows for immediate improvement.57

The disadvantage encountered at Eastern Illinois University was that, due to the fact that they had only one camera and recorder, each student had only limited use of the equipment. Ideally, they felt that the instructor should be able to assign increasingly difficult experiences to be perfected. It would also be helpful to have equipment available for the student to tape, view, repeat, review until his level of performance pleased him, making him more proficient at self-evaluation. The faculty at Eastern Illinois University felt that micro-teaching served as an efficient way for students to relate theory to practice and that it gave the students in secondary education a chance to improve their performance level.58

McKitrick describes an experiment at Western Michigan University using micro-teaching and video-tapes in an undergraduate shorthand methods course to help students become better prepared for their student teaching

58 Ibid.
experience. A fifteen-period block was devoted to shorthand methods and four days were devoted to video-taped micro-teaching. Students who had had no experience in teacher demonstrations in other areas of business education were the micro-teachers and other students served as members of the micro-class. The purpose of the five minute lessons were to encourage prospective shorthand teachers to write shorthand on the chalkboard effectively. The project was also designed to measure the voice qualities and mannerisms of the micro-teachers.59

The schedule used at Western Michigan University was as follows:

1. First micro-teacher instructs for five minutes; lesson is video-taped.
3. First micro-teacher reteaches same material for five minutes; not videotaped.
4. Second micro-teacher teaches for five minutes on the same material; lesson video-taped and critiqued. The second micro-teacher did not have an opportunity for a reteach; it was hoped she profited from watching the first micro-teacher.60

60Ibid.
The members of the micro-class rated the micro-teachers on such items as: positive teacher actions, negative teacher actions, mannerisms, voice, use of board, accuracy and clarity of shorthand, pupil reactions. All shorthand students who participated in the experiment gave a written evaluation of the program. All sixteen students felt this was a profitable experience. Strengths and weaknesses in the use of the chalkboard were brought out in the video-tapes, and these were usually corrected in the reteach sessions. Annoying actions and mannerisms were reduced after the prospective teachers viewed themselves. Students who did not have an opportunity to reteach their lesson felt they had profited from watching the teach, replay, reteach of the first micro-teacher on their scheduled day. The director of this experiment at Western Michigan University believes that a video-taped micro-teaching experience is very effective for helping prospective shorthand teachers overcome their weaknesses before they face a high school shorthand class. The director felt this program achieved some success even though time and money necessitated a variation of Stanford's program.61

Some of the weaknesses found in this micro-teaching experiment with shorthand teachers at Western Michigan University were as follows:

1. Some of the micro-pupils failed to

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understand the objectives of the experiment.

2. Several micro-teachers felt they were nervous in front of the camera and their peers.

3. Some technical difficulties were involved; it was almost impossible to evaluate voice control. The chalkboard work showed up better if the board was washed between tapings.\(^62\)

Micro-teaching has been used at Wayne State University in fields such as Business and Distributive Education, Industrial Education, Secondary Science Education and in a basic introductory course for prospective teachers. Micro-teaching has also been introduced in the Master-of-Arts-in-Teaching Program and the Teacher Corps program.\(^63\) The video-tapes help student teachers in self-evaluation which is a difficult, but necessary part of student teaching.\(^64\)

Cook and Brown at Wayne State University have found the basic micro-teaching concept and the idea of supplemental supervision by video-tape to be a valuable addition


to a total program in business teacher education. They say, "We are still in a developmental stage, but we believe that we now have a base of experience on which we may refine and expand our existing program." \(^6^5\)

Cook and Brown offer certain recommendations for others attempting a micro-teaching program. They suggest that the specific teaching skills selected for development during a departmental micro-teaching program be limited to those specialized skills involved because of the unique subject matter of the area. The general teaching skills may be best developed in a general course offering in which preservice teachers from all departments are given an opportunity to develop general classroom teaching skills because of the tremendous expenditure of staff, equipment and money necessary for a program to develop the several general skills. \(^6^6\)

Another recommendation from the program at Wayne State University was that the training program be prepared in advance and understood by the staff preceding the initiation of a micro-teaching program. Procedures and techniques for video-taping, viewing, providing feedback, storing tapes, and retrieving tapes should be developed in


\(^{6^6}\)Ibid., p. 32.
advance. "Not only the staff but also the student teachers involved in the program should have a complete understanding of its objectives, the mechanics of its operations and its limitations."67

Cook and Brown state that they believe business educators should give consideration to the development of teaching skills through micro-teaching and video-taping and that business teacher educators and future business teachers should understand the capabilities and functioning of video-tape equipment. The authors feel that a micro-teaching program with video-tapes is an extremely expensive program and unless less expensive equipment is developed, it will be financially impossible for the typical university to follow Stanford University's micro-teaching/video-taping program.68

They also state that only a truly dedicated instructor would utilize micro-teaching in his methods course because it quadruples the amount of time that he must spend in a four-hour course simply to provide limited exposure to teaching techniques.69

Gibson attempts to identify and evaluate selected methods for the use of video-tape recordings in teacher

67Cook and Brown, "Micro-Teaching in Business Education," p. 34.
69Ibid., p. 39.
education. In discussing the use of video-tapes in the training of teachers, he says that although experimentation with video-tapes in teacher education has been limited, the teacher training program can effectively integrate video-tape recordings when it operates in micro-teaching situations. "The teacher of a methods course in speech may have students prepare a five- to seven-minute teaching unit on methods of support for main ideas. Their presentations are recorded on video-tape and rerun immediately for their observation." 70

Gibson believes that it is possible to integrate the micro-teaching approach suggested for any of the units typically developed in the speech methods course, units ranging from articulation to parliamentary procedure. Model teaching tapes can be developed by extracting a student's performance from the video-tape when a student micro-teaches a unit in an unusually effective and creative manner. These tapes can be replayed to methods classes in succeeding terms. Following this procedure for several quarters or semesters results in the development of a library of model performances, and the instructor may use the tapes to illustrate an effective method of teaching oral interpretation, or any of the other units included in the methods course. 71

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71 Ibid., p. 108.
Another possible use of video-tape recordings would be in preparing teachers to judge student speaking performance. Student speeches in an introductory speech course may be recorded and these recordings then edited and scored by a group of speech teachers or by the instructor himself. With a rating instrument, students could also participate in the rating of taped speeches. Student ratings could be examined and students whose ratings vary significantly from the evaluations rendered when the model tapes were selected could receive appropriate attention and instruction from the teacher of the methods course. The previously mentioned tapes of speaking performance also might be used for training in speech criticism.\footnote{Gibson, "Using Videotape," p. 108.}

To make intern teachers more aware of their classroom verbal behavior, an adaptation of the Amidon-Hunter technique may be used. During the micro-teaching situations, the role-played classroom interaction could be analyzed by a method of interaction analysis. About the use of replays, Gibson says the following:

After the micro-teaching unit has been taped, the replay should involve instructor identification of the nature of pupil and teacher talk. The identification also should involve suggestions, by the instructor, of the type of questions which would stimulate interaction, the type and timing of teacher approval
or disapproval of student behavior, and identification of situations where teacher initiated ideas are appropriate.\textsuperscript{73}

Gibson contends that the objectives in replay of micro-units must be clearly delineated in the mind of the instructor because replay for interaction analysis requires frequent comments while criticism of general teaching involves identifying fewer critical behaviors.\textsuperscript{74}

MICRO-TEACHING IN IN-SERVICE EDUCATION

One application of micro-teaching that Meier describes is a program conducted under the auspices of NDEA, Title XI for in-service training for early childhood education teachers. These teachers watch a three- to nine-minute filmed learning episode and read the accompanying materials, then the teacher makes a presentation to a small group of three to seven students, incorporating the objectives and procedures from the film. The teacher records and reviews her own work and mails a representative tape to the Child Study Institute at Colorado State College where the film is viewed and critiqued. Films and critiques are mailed back to the in-service teacher and when she is

\textsuperscript{73}Gibson, "Using Videotape," p. 109.

\textsuperscript{74}Ibid.
satisfied with her behavior regarding the learning episode, the next unit is sent to her.\textsuperscript{75}

Micro-teaching can be a remedial technique to help teachers overcome their weaknesses. Repeated practice enables a teacher to enlarge his repertoire of alternative techniques for coping with a variety of situations. Goodlad refers to the necessity of a well-stocked pharmacy for successful diagnostic and prescriptive teaching.\textsuperscript{76}

The Rocky Mountain Educational Laboratory is using micro-teaching in a program focused on individual learning disabilities and the effectiveness of remote teacher training by video-tape is being tested. One group comes to the laboratory headquarters for in-house "live" training sessions with supplemental written materials and on-site visits. Group two receives instruction through recorded canned sessions with supplementary information received on videotapes. Group three receives a combination of in-house and on-site training. Group four receives no training and serves as a control group. The performance of the participants will be assessed by comparing pre-training and post-training skills with specific terminal behaviors; such as, the ability to identify different learning disabilities,

\textsuperscript{75}Meier, "Microtraining to Improve Teaching," p. 146.

as depicted on film clips and video-tapes, and to prescribe and demonstrate the appropriate pedagogical remedy for each.  

Micro-teaching is being used in a summer program in Jefferson County, Colorado designed to upgrade the instructional program by providing in-service training in team teaching, flexible scheduling, etc. Micro-teaching is used by the planning component to perfect the curriculum before it is used in large groups. The observation component uses video-tapes for critiquing the teaching sessions. At the end of a summer, more than one hundred competent teachers complete the observing-planning-teaching cycle twice and several hundred students participate in an enriched learning experience.

Ashlock describes one example of adapting micro-teaching to an off-campus science methods course for in-service elementary school teachers. Each student prepared a five minute micro-lesson dealing with a limited science topic which would be new to the students and would include a brief demonstration. Micro-teachers could make assumptions concerning the previous knowledge of the four class members who served as the non-role-playing micro-class. The remaining class members served as observers, except for

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77 Meier, "Microtraining to Improve Teaching," pp. 146-147.

78 Ibid., p. 147.
four members of the class who were excused and later recalled to serve as pupils for the reteaching. After the lesson was taught, the students who served as pupils or as observers helped the micro-teacher evaluate the micro-lesson in terms of criteria agreed upon by the class at the beginning of the course. Immediately after the evaluation session, the four students who had been excused were recalled to serve as pupils for a reteaching of the same lesson. After the reteach, improvements were noted by observers.79

In order to select criteria for evaluating the micro-lessons, the class considered the need to plan carefully and state lesson objectives in terms of desired, observable pupil behaviors. They also considered the specific teaching skills identified in the development of the micro-teaching technique at Stanford University. One lesson was presented by each student in the class. The following list of criteria were agreed upon by the class for evaluation of the micro-lessons:

1. Was the objective stated in terms of desired pupil behavior?
2. Was the amount of material in relation to the time appropriate?
3. Was the purpose for the demonstration clear?
4. Was pupil participation sufficient for the type of lesson?

5. Was the stimulus situation varied?

6. Were students brought to instructional closure?80

One problem encountered by several of the students centered on a clear identification of the objectives for the micro-lesson. When the lesson objectives were not stated in terms of desired pupil behavior, the teacher had difficulty in achieving instructional closure. Another problem reported by Ashlock concerned limiting the topic sufficiently for the time available. In spite of some evidence of stress, most student reactions to their micro-teaching experience were quite positive.81

Dugas relates how micro-teaching was used at the University of Michigan in the 1966 NDEA Institute for Advanced Studies in French. The objectives for using micro-teaching were to establish how effective the concept might be in retraining experienced teachers and to learn how adaptable the concept would be to advanced-level courses with vaguely defined subject matter.82

Each participant in the institute taught two fifteen-minute sessions to a micro-class of twelve demonstration students on either culture, style or literature.


81 Ibid., p. 56.

The trainees were not given instructions on any specific teaching skills to be applied in the teaching sessions. Neither were they given ready-made lessons; these were worked out by the committee scheduled to teach on a specific day. It was later felt that staff members should work with trainees in preparing materials for courses of higher content levels of instruction. 83

Following the teaching session, which was videotaped, general comments were made orally to the teachers as a group. Two check lists were given to the teachers the next day to read before they viewed their own videotapes. One check list listed grammatical errors and the other indicated what approaches and techniques the teacher used. This second list also noted other methods which could have been used in the presentation. The trainees were not required to do a reteach of a poorly taught lesson. 84

During the second group of teaching and videotaping sessions, the camera was turned to show some of the student reactions. The trainees were not given written evaluations during the second session; the participant prepared a self-evaluation before viewing the video-tape.

84Ibid.
By using the check lists on the following day and the self-evaluation, the trainees received no immediate feedback on their teaching.  

In addition to using micro-teaching as a training tool, Dugas suggests this concept could be used to evaluate a training program. One approach to this implies that classroom behavior can be improved by training teachers to evaluate their classroom activity. In this approach, the trainee teaches a micro-class and prepares a self-evaluation. A staff member also prepares an evaluation and the trainee is graded according to how well his own evaluation compares to the staff member's evaluation. Another method of using micro-teaching as an evaluation tool would be to have the teacher's performance evaluated by specialists. This approach would measure his improvement between the first and successive micro-teaching sessions.

Dugas concluded that micro-teaching was effective in retraining teachers and the participants themselves felt it was helpful. The staff saw a definite improvement between the first and second micro-teaching sessions. The institute staff members felt there was a definite value in video-taping the teaching sessions and keeping a record of

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86Ibid.
teaching. A reviewing of the tapes could show what remedial materials the trainees needed in grammar and phonology.

A second viewing of the tapes could make it possible for the evaluator to be more sure his critique was balanced.\(^{87}\)

In order to create a cadre of clinical supervisors, instructed in the application of valid standards of supervision and to increase the operative power of the teacher education program at Whitman College, Walla Walla, Washington, a micro-teaching clinic was established in 1964. The term 'micro-teaching clinic' refers to a series of lessons presented by student teachers to groups of five high school pupils under the supervision of clinical supervisors. Each lesson lasts fifteen to twenty minutes and is followed by independent rating of the lesson by the supervisor, the high school pupils and the student teacher. Following the rating, the supervisor and the student teacher privately confer for twenty to thirty minutes to analyze the lesson and seek ways by which the student teacher's instruction can be improved in the future.\(^{88}\)

The basic structure of the Whitman Micro-Teaching Clinic was designed to provide occasions for supervisors as well as student teachers for practice in three areas: behavioral analysis of teaching and learning,


establishment of conditions of teaching, and organization and evaluation of instruction. Aubertine says that the two years experience with the clinic indicated that continuity of teacher training was improved and the clinic was considered valuable by supervising teachers and school administrators. The program also helped screen out the unfit and made the transition, for those qualified to teach, less abrupt from college to field phases of training. Micro-teaching was worthwhile in the training of clinical supervisors, particularly in development of:

1. Adroitness in utilizing conceptual models, and in analyzing the teaching process with new insights into the instructional act.

2. Sophistication in interpreting high school pupil behavior.

3. Dexterity in selecting and synthesizing relevant aspects of a lesson.

4. Expertise in devising and asking probing questions of the student teacher in order to aid him analyze his instruction and create alternatives in it.

5. Facility in human relations, especially in creating rapport with the student teachers by way of increased sensitivity to his problems.

6. Capacity to instill and build confidence within the student teacher.  

In his suggestions regarding training of clinical supervisors, Aubertine recommended that video-tape recordings be used as part of the micro-teaching clinic. He says:

_video-taped micro-teaching sessions can increase efficiency in developing sophisticated observation and assessment of instruction. Furthermore, video-tapes used in the feedback and evaluation conferences and the clinical diagnostic sessions would promote accurate analyses among the participants.\(^0\)

The Teacher Education Program of the Far West Laboratory for Educational Research and Development in Berkeley is building a series of in-service training courses for the purposes of helping teachers in dealing with specific classroom problems.\(^1\)

MiniCourse I, which has been demonstrated to improve the questioning techniques of elementary teachers in northern California and Nevada, is a self-contained package (film, handbooks, checklists, refresher materials) that can be used in any school where a video-tape recording system is available. It differs from the Stanford University micro-teaching approach since no trained supervisors are needed to assist the teacher; instead, he gets his

\(^0\)Aubertine, "Micro-Teaching in Training Supervisors," pp. 103-104.

\(^1\)Fred S. Rosenau, "How To Cut 'Teacher-Talk' In Half," Educational Leadership. 26 (October, 1968), 93-95.
feedback from self-evaluation or comments by another teacher. About ten percent of the course involves telling the teacher, twenty percent involves showing the teacher, and in the remaining seventy percent the teacher is trying the specific skill in a controlled situation and watching his own performance in order to evaluate his progress, eliminate bad habits and more firmly establish the new techniques he is learning.92

The first minicourse deals with twelve specific skills the teacher can use effectively in a discussion lesson. The first session of this course includes an introductory film describing micro-teaching. During the second session the teacher is introduced to three specific questioning techniques through an instructional film and also sees a model film of a teacher using these skills in a lesson. On the third day the teacher has a micro-teaching session in a small room with five to eight of his own pupils and records the activity on video-tape. After the pupils go back to their regular room, the teacher plays back the tape and studies his own behavior. During the fourth session the teacher reteaches the lesson to a different group of students from his class. He plays back the video-taped lesson and evaluates his performance. After school, with another teacher taking the same in-service

course, he sees the lesson again. The two teachers can give each other further feedback and suggestions for improvement. However, if he prefers, he may view the replay alone.

In its operational form, MiniCourse I consists of four such sequences of instruction, micro-teaching and reteaching.\(^{93}\)

Analysis of the video-taped lessons of the forty-eight teachers who took MiniCourse I showed that the average teacher talked only twenty-eight percent of the time during class discussion; whereas, before taking the course the average teacher talked nearly fifty-two percent of the time. Three negative behaviors (repeating the question, repeating the pupil's answer, answering one's own question) were significantly reduced. The teachers also asked more questions that required longer pupil responses and required pupils to use higher cognitive processes. Thus, the MiniCourse seemed to offer considerable promise as an instructional model to develop specific teaching skills and to change teacher behavior.\(^{94}\)

Gage describes an experiment designed to test the hypothesis: The teacher would seek to change her behavior so that it would more closely approximate her pupils'

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\(^{93}\)Rosenau, "Cut Teacher-Talk," pp. 93-95.

\(^{94}\)Ibid.
description of the behavior of their "best imaginable" teacher.\textsuperscript{95}

One sixth-grade teacher was chosen by each Superintendent of Schools in Illinois. This teacher's students marked how their teacher rated and how a "best" teacher would rate. Sixth graders were chosen because the investigators felt they were more mature. Only one teacher in each district was chosen so there would be no comparing of notes. It was found that feedback from pupils produced changes in behavior and also produced corresponding changes in the accuracy of teachers' perceptions of their pupils' perceptions of them. The teachers changed in the direction of pupils' ideals as a result of getting feedback.\textsuperscript{96}

Gage says there are many unanswered questions regarding the use of feedback to change behavior, even though in this case the teacher's behavior did change as hypothesized. He feels that the idea of feedback offers many possibilities in the field of education. A superintendent could be given feedback from school boards; principals could be given feedback from their teachers, rated on their actual and ideal principal.\textsuperscript{97}

\textsuperscript{95}N. L. Gage, "A Method for Improving Teacher Behavior," \textit{Journal of Teacher Education}. 14 (September, 1963), 261-266.

\textsuperscript{96}\textit{Ibid}.

\textsuperscript{97}\textit{Ibid.}, p. 266.
Micro-teaching can be used to predict the instruction level of materials. In Jefferson County, Colorado, a science lesson was developed for fifth- and sixth-graders. After using this material in a micro-teaching situation, it was found that second-graders understood the work more quickly than the students for whom it was prepared. Micro-teaching offers opportunities for in-service people to receive immediate feedback and alter the materials before they are used in the classrooms.  

Micro-teaching can be used for pre-employment prediction for teachers seeking employment. Stanford University and the Fremont Union High School conducted an experiment on pre-employment predictions. The teachers seeking employment in this school district taught a micro-lesson. Fremont officials selected teachers using traditional methods while Stanford University personnel predicted success solely on micro-teaching evaluations. This investigator could not find the results of this experiment to find which teachers succeeded as predicted. Allen does feel that micro-teaching techniques offer a

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source of evaluative evidence and might also be used to evaluate current teachers for possible promotion. 99

Micro-teaching can be used in supervision, allowing supervisors to focus on specific techniques in the training of teachers. Allen has listed the following facets of supervision that could be studied with micro-teaching:

1. Testing and looking at alternatives for supervision.
2. Varying the time and length of visits.
3. Letting teachers select the time for supervision.
4. Experimenting with the concept that the quality of supervision improves with a reduction in the number of conference suggestions.
5. Experimenting with and without video-tapes.
6. Studying and enumerating the skills of teaching.
8. Distinguishing between behavioral objectives and pious hopes.
9. Improving the ability to diagnose and state behavioral objectives.
10. Developing instructional techniques. 100

Micro-teaching can be a tool for supervising and continuing the evaluation of beginning teachers because it can be adapted to different grade, ability and interest

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100 Ibid., p. 360.
levels. This would be a requirement for a good evaluation tool since individual adaptations would need to vary from school to school.\textsuperscript{101}

Micro-teaching can facilitate curriculum planning. Allen has suggested that during the summer, students can be hired for pre-class trials of materials, trying and testing alternatives. If curriculum planning is conducted during the regular school year, the material could be presented to a micro-class a few days before it would be used in a classroom, making it possible for the teacher to make necessary alterations. Allen stated, "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."\textsuperscript{102}

\textbf{VIDEO-TAPES IN PRESERVICE EDUCATION}

Cyphert and Andrews present the argument that the video-tape recorder is a "tool which can be useful for well defined objectives in improving teacher education."\textsuperscript{103}

\begin{enumerate}
\item[\textsuperscript{101}]Allen, "Micro-Teaching for In-Service Education," p. 361.
\item[\textsuperscript{102}]\textit{Ibid.}, p. 362.
\end{enumerate}
education is limited; reports of practice are plentiful. The lack of research presents problems to scholars interested in beginning work with video-tapes. Many of the early studies are not available in print and the rapidity of technical developments outdates many reports by the time they are published and indexed. The limited information that is available to educators suggests that experimentation with video-tapes can result in creative and effective results.104

A research project was designed at Hunter College to test the usefulness of closed circuit television and video-tape recordings in student teaching. This study tested the hypothesis that different techniques of observing student teachers in the classroom result in different degrees of learning by teachers-in-training. It was predicted that kinescope recordings are more effective than closed circuit television and that closed circuit television is more effective than traditional direct observation in the classroom.105


The rationale for the project at Hunter College as reported by Schueller and Gold was as follows:

1. Television and kinescopes offer unique opportunities for improvement in teacher education. One of these is the opportunity for student teachers to see their own teaching performance.

2. Student teachers are often unaware of many things they do. A more accurate perception of what he does will probably help the student improve his performance.

3. Video recordings should help the supervisor communicate more effectively with the student teacher than through discussion based only on his notes.106

In order to obtain data for this research project, three supervisory methods were used in the study design. The supervisory methods used in this research and the follow-ups were as follows:

1. Supervision by personal visitation.

   The supervisor visited the student teacher five times; a conference followed each visit. Conference discussion depended on notes made by the supervisor.

2. Supervision by kinescope recordings.

   The supervisor did not visit the classroom. Five kinescope recordings were made and these were the basis for conferences between the supervisor and student teacher.

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3. Supervision by a combination of personal visitation and kinescope recordings.

The supervisor visited the student teacher five times and a kinescope recording was made during the supervisor's visit. The conferences were based on the recording as well as the supervisor's notes.\textsuperscript{107}

The staff attempted to develop an evaluative instrument which would describe significant aspects of teaching performance, including teacher personality, rapport with students, classroom management and handling of academic content. The instrument was to be made up of specific behaviors which could be observed and counted. The scales were ultimately labeled OScAR 3d, 3e, and 3f. The initials represent Observation Schedule and Rating. OScAR 1 and 2 were developed at the City University of New York by Mitzel and Medley. A number of ratings were added at Hunter College for such items as grooming and clarity of speech.\textsuperscript{108}

An interview was held at the beginning and ending of the student teaching experience to measure changes in teacher self-concept. Both student teachers and supervisors were asked for personal reactions to the kinescope recordings. A conclusion was made that kinescopes do provide a suitable record for developing objective measures


\textsuperscript{108} Ibid.
of teacher and pupil behavior, and the video-tapes provide a permanent record for evaluation which is superior to many other methods. This research at Hunter College demonstrates the possibility of measuring, quantitatively, significant variables in lesson planning, organization of content and creative approaches to teaching.109

The student teachers were strongly in favor of kinescopes as a tool in teacher education and some small differences favored the kinescope supervisory method over the other two methods used. Supervisors reacted favorably, preferring the combined method, observation in person plus the video-tapes. The supervisors seemed to welcome the individualization potentialities of this new medium. Changes in teacher behavior in the participants at Hunter College were noted in the following dimensions: voice and speech, interest and attention, nature of responsive statements made by teacher, type of teacher-initiated statements, better pupil order, greater evidence of teacher preparation, greater command of language and more conceptual teaching.110

The Department of Education at the University of Utah utilizes video-tapes to record student teacher data. College supervisors, cooperating teachers, and student teachers review and analyze video-tapes of presentations.


110 Ibid.
made by student teachers in elementary and secondary classrooms.  

Another experiment in Utah, described by Winters and McHenry, attempted to determine how video-tapes can extend and reinforce laboratory experiences in teacher education.  

Burleigh and Peterson report on an experiment at Oberlin College involving video-tapes in the supervision of student teachers. By using the video-tape recorder, teachers are no longer solely dependent on subjective perceptions of others or on their own personal recollections to try to determine their classroom effectiveness. Video-tape provides objective evidence on techniques of teaching and possibly the accumulation of objective evidence is an important step toward developing an understanding of classroom interactions.  

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At Oberlin College, three hours of tapes were made for each student teacher. These were viewed by the student teacher, the college supervisor, and in many instances, the building principal. The taping equipment was left in the classroom a day early in order to diminish anxieties. The student teachers volunteered for the experiment; only one student requested not to be taped. Of those taped, all gave their permission for the tapes to be viewed by college classes in education. Peterson and Burleigh have suggested that because of the time involved, it might be more practical to have a technician do the taping in order for the supervisor to have adequate time for viewing and evaluating.114

The supervisors at Oberlin College have given several suggestions on how to use video-tapes in teacher education programs, public schools and research on teaching. These suggestions are as follows:

1. Video-tapes might accompany recommendations to superintendents who are considering the student teachers as potential teachers in their schools.

2. Strengths and weaknesses of a school staff can be determined to decide in what areas in-service programs are needed.

3. The children's reactions to particular teaching materials and methods can be noted.

4. Administrators, whose classroom observation time is limited, could make their own evaluations by use of tapes.

5. A school psychologist could follow one child through a variety of situations.

6. Group evaluation of a student teacher might increase his understanding of teacher-pupil interaction.

7. Video-tapes of a teaching team would allow all members of the team to evaluate the team as a whole and as individuals.115

Another report of work being done with video-tapes at Oberlin College is Peterson's description of an attempt to devise a technique to improve the powers of observation in potential teachers. They assume that the ability to observe classroom behavior is a skill that can be improved by practice. It is the belief at Oberlin College that the beginning teacher is often unaware of many of the activities of his students and unable to interpret adequately those he does observe.

In this Oberlin study, television tape recordings were made of a variety of actual classrooms. By assuming that the tape recordings represent a relatively complete and accurate record of typical classroom behavior, observation becomes a skill which can be practiced. Also small segments can be isolated and repeated until an acceptable level of performance is achieved. The instructor can now

control the stimulus, repeat it indefinitely, and interrupt it to make comments or ask questions without changing the actual stimulus (the classroom behavior) in any way. It is possible to treat observation as a skill which can be taught and practiced.\textsuperscript{116}

The Oberlin recordings were made by placing two remotely controlled television cameras in the classroom. The camera at the back of the room followed the teacher and a camera was placed in the front of the room to observe the students. The recordings could include the teacher or the class or a composite picture showing both the teacher and the class.

These recordings have been used at Oberlin College in the following ways:

1. As an introduction to and practice in observational techniques.

2. As a supplement to live observations by providing a wide range of teachers, pupils, and subjects.

3. As raw data for the analysis of classroom behavior (both teacher and students).

4. As illustrations of specific teaching methods (both effective and ineffective).\textsuperscript{117}


\textsuperscript{117}\textit{Ibid.}
In an attempt to make his methods course, Intermediate Upper Methods, more meaningful and interesting to the students, Eaton utilized video-tape replay equipment. Each member of the class was given twelve minutes in which to teach concepts from the resource units being developed. These concepts were taught to the fifth- and sixth-graders at the University Laboratory Elementary School, Wisconsin State University - Superior. Students in the methods class were given the opportunity to observe and be observed by the children they were to teach. The students were not graded on their presentations. Sixteen concepts were taught during a one-week period. Each televised lesson was reviewed and critiqued during subsequent sessions of the class.118

There were three basic reasons given for teaching the concepts to the youngsters:

1. That we might learn through teaching.

2. That we might learn by observing others.

3. That we might develop a better understanding of the curriculum units being developed, by presenting concepts represented in these units.119

The members of the methods course were asked to write their impressions of the benefit derived from their


119Ibid., p. 300.
video-taped teaching experiences. Some of their comments were as follows:

"We observed others teaching in a controlled situation."

"We became aware of the many small habits that develop to make a teaching presentation less effective."

"It was made evident that extensive preparation is necessary in order to be an effective teacher."

"The technique of working and being patient with students were evident." 120

Eaton's evaluation of the experiment led him to believe that he had found part of the spice that he was seeking for his methods course.

Under a grant from the United States Office of Education to the Stanford Center for Research and Development in Teaching, those in social studies teacher education at Stanford have used the video-tape to maximize television as a facilitator of instruction. A series of video-tapes is being developed to portray key elements in the process of teaching the social studies. These tapes have been obtained in the classrooms of experienced and intern teachers alike and are used to demonstrate the types of behaviors and situations which are being described to students in teacher education classes.

120 Eaton, "Video-Tape Helps Students," p. 300.
On the video-tape, a real teaching situation in an actual classroom is observed. This proves far superior to the usual "hit and miss" observation, as the excellent or poor model, demonstrating the exact behavior which has just been discussed in the methods course, is readily available.  

At the time Gross and McCormac reported their work, the number of video-tapes consisted of about twenty-five, ranging in time length from ten minutes to one hour. The observable teaching behaviors of the social studies teacher was classified into ten basic areas. These areas include: small group work, motivation of students, teacher-lead discussions, lecturing, handling of controversial issues, unit work, use of resource materials, treatment of current affairs, student oral presentations and the use of audio visual equipment. As the professor lectures on the techniques of instruction, the tapes are used to illustrate the points at issue. Initial research and trials and positive intern reactions revealed immediate visual example is superior to the old method of discussion or lecture, then time lapse, and eventual observation in a classroom. "We are convinced that the use of video-tapes as we have developed them is a substantial advancement in the field of social studies education."  


122 Ibid., p. 31.
The authors feel that almost all of the tapes could be valuable as in-service aids. Many of the experienced teachers expressed interest not only in seeing themselves, but in seeing other tapes as well. Consequently, they believe that such tapes will have increasing use at all levels of teacher education.123

The University of Massachusetts used video-tapes to supplement direct observation with emphasis being placed upon specific activities; such as, the teacher's role on the first day of school, tapes of preparatory activities for holidays, subject area lessons in mathematics, social science and science experiments.124

Cook and Brown at Wayne State University have reported the following advantages for using video-tapes in teacher education programs:

1. The video-tape recordings made at intervals during the student teaching experience provide a permanent record of the student teacher's performance and progress.

2. The use of video-tape provides the university supervisor with a supplementary source of classroom observations on which to base his evaluation of the student teacher's performance.

3. Multiple observations by "live" and video-tape supervision has developed in the

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preservice teachers a certain insulation against self-consciousness at having their lessons observed.

4. Video-tape recordings provide immediate reinforcement to the student teacher during the critique session with his college supervisor.

5. Teaching tapes provide, in a real situation, audio and visual evidence of what really occurs in a classroom in a fashion that is not available from any other source. With the permission of the student teachers involved, segments of these video-tapes may be dubbed onto master tapes for use in methods classes and workshops to demonstrate teaching techniques or teaching situations.125

In the summer of 1965, eleven teachers from Carmel Public School System, California, participated in an in-service workshop designed to introduce new science material into the curriculum and use video-tape recordings for teacher education. Each day a teacher was taped for one hour teaching science, and the entire group viewed the tape in the afternoon. These tapes were analyzed from three points of view:

1. What patterns could be observed in the teaching performance?

2. What effects did these patterns have on the children?

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125Cook and Brown, "Micro-Teaching in Business Education," p. 16.
3. How what was observed, patterns and student behavior, related to the objectives from the individual lesson?  

The necessity for teachers to "invent" and for allowing children to discover was stressed. Every effort was made to demonstrate the intuitive nature of teaching and no attempt was made to develop a stereotyped pattern of teaching. The participating teachers felt the workshop had been a profitable experience. The director ascertained the workshop was successful in that the teachers became self-critical and self-analytical of their behavior.

The principals and assistants to the superintendent visited these teachers during the Fall of 1965 to determine the effectiveness of their teaching and to see if their teaching behavior was different from other teachers in Carmel Schools. Fischler does not give any reports on the observations made by the school administrators. Neither does he report on a questionnaire which the teachers were to have completed several months after the workshop. Fischler considered the workshop success to be dependent upon the video-tapes which made possible the identification

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126 Abraham S. Fischler, "Change in Classroom Behavior Resulting From an In-Service Program Utilizing Television," School Science and Mathematics. 67 (April, 1967), 321.

127 Ibid., pp. 321-324.
of patterns and their effects. The teachers indicated they would have preferred shorter, but more frequent tapings.128

Lane County, Oregon has a Mobilab which is a video-tape system that records classroom situations and plays back the scene for a teacher's private showing or for group showings with counselors or other teachers. A teacher's awareness of group dynamics is a goal of Mobilab, as well as to show how interplay between students and teachers affect attitudes.

Cameras are set up in the classroom and controlled remotely. By viewing the video-tapes, the teacher can see how he handled the teaching experience and where he held and lost the students' attention. The teacher has often been motivated to change his behavior because the Mobilab is like a mirror that reflects teacher attitudes and techniques. Other teachers can profit by viewing successful techniques of a fellow teacher.

Many teachers have expressed an enthusiastic approval of the video-taping sessions. Some teachers felt threatened, but Mobilab enters a classroom in Lane County only when a teacher requests it. The Mobilab is not a "weapon of the administration, but a tool to help the teacher improve his presentation." Each teacher can have a private showing

of the tape or can give his permission for other teachers to view the tape.129

Strawberry Mansion Junior High School in Philadelphia is a new school with a young, inexperienced staff. The administrative staff had some common problems identified and developed into role-playing situations. These were video-taped and played at the in-service meetings. A panel of seven who had not seen the tapes and a moderator who had previewed the tapes described how they would solve the problems. The audience had an opportunity to discuss how they had handled similar situations or to quiz the panel. The program proved to be a practical one for younger teachers to learn there are many ways to handle classroom problems. The student teachers in the building felt this was a valuable experience and would help alleviate many of their anxieties about classroom control.130

In the summer of 1966, students in a general methods course in secondary education at the University of New Mexico presented two lessons in simulated teaching situations which were video-taped. The purpose of using the video-tape recorder was to give each student an opportunity to see himself performing in the role of teacher so

129 Michael Dunne. "Video-tape: Teacher In-Service Programs," The Instructor. 77 (March, 1968), pp. 140-141.

130 William D. Kautz and Max Wald, "Closed-Circuit Television as an In-Service Aid," Audiovisual Instruction. 12 (December, 1967), 1048-1049.
he could begin to decide whether the image being projected was the kind he would want to project when he began actual teaching. No attempt was made to measure changes in behavior or attitude but it was hoped that when students saw themselves, they would, on their own accord, change the kinds of behavior that might lead to difficulty in student teaching.

The methods class students were told to prepare an eight to ten minute presentation for the beginning of a unit in a group guidance course for fifteen-year-old high school sophomores. These presentations were videotaped. After the taping sessions, schedules were prepared to view the tapes. Twenty elected to have the instructor present and sixteen elected to view the tapes privately. The students were given a twelve-item rating form to serve as a guide in self-examination or as the basis for discussion with the instructor.¹³¹

For the second taping sessions, students prepared a ten to fifteen minute daily lesson from the unit they had introduced earlier. The students seemed less nervous and had more confidence in their performance. The same arrangement was made for viewing the tapes and the second time, twenty-seven asked the instructor to be present for the playbacks.

The students involved in this experience felt the video-taping was worthwhile and the playbacks were very helpful. Some students said the experience gave them confidence in their own ability, others said they could more clearly see their mistakes and the need to search for other techniques in teaching. Many of the students felt that their own teaching field should have been used for the taping sessions. Some felt the first session should have occurred later in the term. Removing the threat of a grade took the fear out of the experience for some but removed the motivating factor for some students. Most participating trainees indicated a desire for more than two times before the camera. Many indicated the instructor should have taken a more active role in the playback sessions and that the critique with the instructor should be mandatory for all students.¹³²

The University of Delaware has used video-tapes in an arithmetic methods and curriculum course for elementary education majors. The directors felt one of the most profitable aspects of this project was the opportunity for critical review by means of a playback of a lesson planned and taught by a prospective elementary teacher

¹³²Dettre, "Video Taping Simulated Teaching," p. 695.
or a presentation planned by a group of students and taught by one of them. 133

The University of Missouri at Columbia uses mobile video-tape recorders to tape student teachers in the Laboratory School of the College of Education. The primary objective of their work is the improvement of student teacher behavior by providing immediate feedback of the teaching experience reflecting the climate of the classroom and showing rapport, or lack of it, between teacher and students. This is accomplished through an objective-subjective analysis by the supervisor and the student teacher. 134

Evaluating via tape recordings can help develop the self-direction needed for improvement of teaching skills. Using the tape recorder to improve teaching places an increased amount of responsibility on the student teacher and makes it easier to objectively point out teaching weaknesses to the student teacher. 135


135 Theodore R. Cooper, "Helping the Student Teacher Develop Instructional Expertise Via the Tape Recorder," Audiovisual Instruction. 12 (December, 1967), 1072.
The University of Missouri is attempting to bring theory and practice closer together in the methods and curriculum courses by using video-taped presentations concerned with specific learning concepts, approaches and methods. These tapes use Laboratory School students and have been used in thirteen courses with twenty-seven instructors requesting use of the eighty-five taped lessons on hand at the time this report was made.136

Conner has suggested that video-tapes be used to film lectures by distinguished teachers and scholars so prospective teachers will be able to scrutinize teaching styles of many good teachers. He also suggested the possibility of taping practitioners, people not licensed to teach but who could do so very adequately and could serve as resource people.137

UCLA students enrolled in a curriculum and instruction course prior to student teaching were participants in a study designed to test the effectiveness of videotaped instructional sequences in bringing about certain test behavior changes in prospective teachers; namely, the student's ability to identify the presence of certain instructional principles in video-taped teaching


situations. Instructional video-tapes were prepared to provide the learner with examples of uses of a given principle. In the post-test, the trainees were to identify which principles were present in each of a series of classroom scenes.

This study was designed so that the first group received audio-taped or written materials plus the video-taped programs, the second group received written material or audio-taped material and the third group was a control group. In the post-test of identifying the principles in use, the highest scores were received by the group viewing the video-tape programs. On paper-and-pencil tests given several weeks after the treatment, there were no significant differences among the groups. The real problem in teacher education is to modify the instructional behavior of teachers in desired directions and Popham has shown that the teacher needs to be given an opportunity to practice the behavior, in this case, discriminations from video-taped teaching solutions.138

Another study at the University of California, Los Angeles, was designed to test the hypothesis that a program of prompt, practice, and feedback would improve a beginning teacher's ability to observe pupil performance in the classroom. Eighty-four students enrolled in a

secondary curriculum course were randomly divided into four groups. The first group received programmed training for observation of video-taped scenes; they were given clues about future scenes, answered questions about the scenes and were given knowledge about correct responses to the questions. The second group only watched the video-taped scenes. The third group heard a tape-recorded lecture on observing pupil performance in the classroom. The fourth group was a control group.\textsuperscript{139}

Results from Johnson's study indicated that the first group performed significantly better than any other group. Since the second group watched the video-tapes and performed no better than the control group, success was attributed to the prompting, practice and feedback. Johnson suggests that programmed video-tapes can be an effective instructional tool in teacher training.\textsuperscript{140}

Video-tape recordings can provide a student teacher with an opportunity for self-evaluation in terms of teaching techniques. One can judge himself more objectively when he is removed from the emotional involvement of the classroom.\textsuperscript{141} At the University of Michigan, video-tapes


\textsuperscript{140}Ibid.

\textsuperscript{141}Charlotte Ann Botsch, "I Use the Tape Recorder for Self-Evaluation," The Instructor. 66 (June, 1957), 33-34.
have been used in direct observation of teaching, recording progress of student teachers and aiding student teachers in the process of self-appraisal. The methods, procedures and techniques used in evaluating the work of the student teacher should be diagnosed so that the student teacher can identify the various stages of growth and progress involved in his work of learning to teach.

Video-tapes have been used at Syracuse University to tape student teachers primarily to enable them to see and react to their teaching behavior. Their main concern at Syracuse has been that the tape be used for "objective feedback and analysis of instructional behavior."

The Industrial Arts Department at the State University College, Oswego, New York, has used video-tapes in an attempt to show their prospective teachers in industrial arts how their students would view them when they go into the classroom for student teaching. The directors taped class presentations and laboratory teaching experiences.


These were critiqued by the instructor and other students in order to help the presenter see himself as others do, and become more competent before he did student teaching. 145

Marywood Educational Television Project A was concerned with the problem in education dealing with the placement of prospective teachers who must observe classroom procedures. Many colleges send their junior education majors into the schools for first-hand observations, but this approach has many disadvantages. There will be no common experience for the students and instructor to use as a base for a profitable class discussion. Sometimes it is difficult to find enough master teachers for the students to observe and even then, the observations will of necessity be limited to specified geographical areas. It was also believed that direct observations were often a failure because the prospective teacher failed to relate classroom procedures and teacher techniques to principles in the psychology of learning. 146

In an attempt to improve the observation experiences of teacher trainees, the Department of Education at Marywood College, Scranton, Pennsylvania, purchased a twenty-foot International Harvester van and equipped it

145 C. A. Tucker, "Video Recordings Implement Teaching," Industrial Arts and Vocational Education. 56 (June, 1967), 36.

with a control console, three television cameras, an Ampex portable video-tape recorder, cable racks and units for air conditioning and heat. With this equipment, entire classroom procedures can be filmed with the cameras remotely controlled and the students are not too aware of the small camera in the classroom. Much experimentation has been carried on in order to achieve the best possible results with sound and lighting. Equalizing the amount of light in all parts of the room was often difficult in older classrooms. Microphone cables made it possible to divide the classroom into quadrants and place a microphone in each quadrant for student voice reception; a lavliier microphone was used for the teacher. The electronic equipment for Marywood's mobile unit cost about $50,000.147

It is possible for one person to operate all equipment in the unit and produce a video-taped program. However, much of the time a college professor, either a specialist in the academic area being taped or a member of the education department faculty, assists the technician in picture selection. At the time of the playback, the professor will direct the observation, making comments and pointing out various teaching techniques and methods. A tape can be used for purposes of observation, provide

living examples of characteristics of child growth and development, supplement a lecture, or translate principles of psychology from the purely theoretical to actual teaching-learning situations.\textsuperscript{148}

Michel reports that the video-taping experiment at Marywood College has had very good cooperation with school administrators and teachers in public, private and parochial schools. In this project the focus has been on the teacher as he teaches and most teachers have regarded the entire experience to be valuable for themselves. They have found that most students accept the presence of the camera and only occasionally have they run into "actors or actresses" who focus on the camera instead of the teacher. In regard to this project, Michel says that "pioneering has always been full of hazards and costs - and probably never more so than in this electronic age. But pioneering is also exciting and rewarding, especially when the goal is the improvement of education."\textsuperscript{149}

College history instructors at Stanford University participated in a study, involving video-tape recordings and select counselor techniques, designed to promote specific changes in instructor behavior to influence the frequency of student oral participation.

\textsuperscript{148}Michel, "Marywood's Mobile TV Unit," pp. 28-29.

\textsuperscript{149}Ibid., p. 30.
The investigator in this study was a counseling psychologist who presented himself as a "learning consultant" interested in helping students and instructors. He and seven history instructors viewed tapes of psychologists, counselors and students discussing verbal reinforcement and their feelings about oral class participation. Instructors then viewed video-tapes of their own classroom discussion sessions. Four instructors viewed their tapes individually with the investigator and three viewed their tapes as a small group with the investigator. In both cases, counselor and instructors reacted verbally and nonverbally to instructor responses observed on the video-tapes.150

An analysis of a follow-up questionnaire and the observations of the counselor led to the following tentative conclusions as reported by Thoresen:

1. Use of video recordings may be an effective procedure in modifying instructor behavior in the classroom.

2. Counselors can establish a consultative relationship with college instructors on classroom learning problems.

3. Social reinforcement and modeling principles can be used to teach specific classroom procedures.151


151Ibid.
The instructors in this exploratory study felt the video-counseling was a positive and meaningful experience and many felt it was instrumental in modifying specific behaviors. Counselors considered the instructors to be very responsive to the opportunity to view themselves and discuss their feelings about classroom interaction. Viewing and discussing the video-tapes appeared to increase their feelings of self-confidence.\textsuperscript{152}

This study was different from many involving video-tapes in that the participants were not trainees or graduate students and participation was strictly voluntary, based on an indication that they wished to improve discussion sessions. The psychologist acted as an applied behavioral scientist rather than a person waiting for students to present themselves for help. There was no control group in this study; therefore, it is not known how much an interested instructor, not receiving video treatment, would have changed solely on initial motivation. The counselor reinforcement is hard to evaluate because none of the instructors viewed the video-tapes without reinforcement by the counselor.\textsuperscript{153}

Any innovation in the educational process is usually met with skepticism on the part of teachers concerned

\textsuperscript{152}Thoresen, "Video in the College Classroom," pp. 144-149.

\textsuperscript{153}\textit{Ibid.}, p. 149.
with what the new devices or procedures will do to alter teaching effectiveness. Video-taping is still subject to some skepticism by speech teachers; however, many speech departments in various college and universities have been using video-taping with very good results.

At Purdue University in 1964, video-tapes were used in beginning speech courses and "found to be very valuable when used on students' second speeches when they are over the initial confusion of the first speech."\(^{154}\)

The Air Force Academy has used video-taping in teaching speech and seventy-two percent of the students' responses indicated that they felt the tape playbacks, accompanied with critiques were very helpful.\(^{155}\)

Southern Illinois University has developed a set of video-taped informative speech models to aid in training teachers and students to rate speakers.\(^{156}\)

A study at the University of Wisconsin involving the use of video-tapes in undergraduate speech instruction indicated that the instructor effectiveness as a communicator


may be enhanced by using this device if he reserves his comments until after the student views the replay.

At Penn State, speech instructors may use videotaping facilities on a voluntary basis. The equipment and personnel are available to the instructors. Nelson used video-tapes in a basic speech course at Penn State; he taped panel discussions involving five or six students. While one group was taping, other groups were preparing for their discussions. All the tapes were played back to the entire class to be critiqued. Many of the students indicated that their speech faults became more obvious when played back on video-tapes. The students felt the tapes were more helpful in checking on delivery than on content or organization.

Another study is underway at Penn State in which two sections of a basic speech course will use video-tapes. Students in one class will view their tapes with the instructor and students in the other class will view their tapes with a classmate. A questionnaire will be used to determine which type of critique is most beneficial.157

At the University of Iowa, video-tapes were used with two sections of a beginning discussion course in 1966-1967 to determine if video-tapes could help students

acquire the sensitivities needed in discussions. These kinds of sensitivities are:

1. Become sensitive to the discussion: what is happening, the direction in which the discussion is going, what is needed to get it moving and keep it moving in a productive direction.

2. Become sensitive to others with whom he discusses: what they are trying to say, their knowledge of and attitudes toward the matters being discussed and their reactions toward other participants.

3. Become sensitive to himself: what he knows and does not know, the effects of his knowledge and attitudes on his perceptions and behavior, and his behavior while interacting with others.\textsuperscript{158}

Class discussions were video-taped and played back for the class. Most students discussed and saw themselves on tape each week. This was not a controlled experiment but an exploration in some of the problems and possibilities in using video-tapes. The tentative conclusions of this project show that students responded well to this method of instruction. The use of video-tapes takes much more time since each discussion is gone through twice - the original plus the playback. The use of video-tapes can be an expensive method of instruction but in spite of

\textsuperscript{158}Samuel L. Becker, John Waite Bowers and Bruce E. Gronbeck, "Videotape in Teaching Discussion," \textit{The Speech Teacher}. 17 (March, 1968), 104-106.
these disadvantages, the investigators were convinced that video-tapes offer sufficient promise to continue explorations into its possibilities.\textsuperscript{159}

The speech department at Loras College, a college with 1600 students in Dubuque, Iowa, purchased video-tape equipment that would be simple and easy to use as an aid in enhancing oral presentations in their speech performance courses. The basic aim of the experiment involving video-tapes was "to provide the student with an image of himself as a speaker which is clearly related to that which his audience sees and hears, a real image which he can evaluate more objectively and can compare with other speakers." The students expressed a sense of achievement if they performed well, a sense of embarrassment if they spoke poorly and a sense of utter amazement at simply seeing and hearing themselves. The students are also taught standards to use for analyzing and criticizing oral presentations.\textsuperscript{160}

The students were video-taped during the one- to five-minute presentations of their second speech assignment. Each student was given a written critique from the instructor. All the presentations were taped before viewing

\textsuperscript{159}Becker, Bowers and Gronbeck, "Teaching Discussion," pp. 104-106.

\textsuperscript{160}R. V. E. Reynolds, "Videotape in Teaching Speech in a Small College," The Speech Teacher. 17 (March, 1968), 113-115.
any of the playbacks. After some training in evaluating speeches, the students wrote an analysis of their own speeches prior to viewing the playback.

The main objectives of that particular assignment were reviewed before the student watches himself and his classmates on the monitor. Instructor remarks may be based on the written critiques and whatever points seem helpful. Instructor comments may be directed to the student whose tape is playing or to the class as a whole. The tape may be stopped for fuller explanations, some portions may be repeated, or the instructor may skip ahead to view and comment on selected parts of the speeches.

Students' opinions at Loras College have been highly favorable of the video-tape experience. Many ask for more taping time or an additional viewing and seldom does a student miss a scheduled assignment. The staff at Loras College feel their work with video-tapes has great potentials and more equipment will be bought in an effort to make their work more effective.161

Advanced public speaking students at the University of California - Davis participated in an experiment using video-tapes. An eight- to ten-minute speech was assigned and the students were told the speech itself would not be graded. The student prepared a written self-analysis after

the speech and a second self-analysis was prepared after the tape playback. These self-analysis sheets were turned in and graded.

The speeches were taped with other class members serving as the audience. Five students prepared written critiques while others in the class served as oral evaluators. The written critiques helped the instructor learn what students knew about effective communication and also encouraged them to learn and apply theoretical material.

A student questionnaire evaluating the project revealed the following responses:

1. Students felt it would be beneficial to repeat the same speech to a different audience, incorporating the critical suggestions.

2. Removing the worry about grades and conducting the unit as a laboratory learning experience helped students focus their attention on the principles of communication.

3. Students agreed it was beneficial to watch playbacks of the entire class because it gave them an opportunity to check the accuracy of their initial observations and written analysis. They also wanted classmates present during the video-taping so they could benefit from classmates' opinions.

4. Students felt that viewing the videotapes did lend greater objectivity to their own self-analysis.162

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A 1964-1965 study at Wayne State University involved five sections of speech students in an attempt to answer questions about video-tapes. These questions were as follows:

1. Is video-taping worth the investment of time, effort and money?

2. How objective are students in evaluating themselves?

3. Is there any advantage in using classmate evaluations and how accurate are they?

4. How early can these diagnostic recordings be made?

5. Can the average beginning speech student bear the possible trauma not only of facing a TV camera, but also of seeing and hearing himself in the presence of his fellow students.163

To find answers to these questions, speech students were video-taped as they gave one and one-half to two minute extemporaneous speeches about a personal experience. Two groups were video-taped the second week of the semester and three groups were video-taped the seventh week. During the playbacks, students evaluated their own speeches and those of their classmates. Ratings were tabulated and made available to each student so he could compare his self-ratings with the average rating of his classmates. All video-taped

speeches were rated by a panel of three judges and their averaged ratings served as an accuracy yardstick.

Student evaluations of their own and their classmates' speeches were fairly accurate, both in the second and seventh week of the class. Students noted more stage fright in their own speeches than did classmates or judges, and this was true of observing accent and regionalism in their speech.

Hirschfeld believes the early recording is preferable because objectivity of self-analysis did not differ between the groups and the early groups had additional time to improve their weaknesses. Delaying tapping until the seventh week did not lower the ratings on stage fright. Students in the seventh week recordings had an increased tendency to overrate classmates' speeches, possibly due to acquaintship.

Hirschfeld recommends classmate evaluation of the video-taped speeches because it is helpful to a sensitive student to realize he did no worse than his classmates and, although classmates may be overly kind in their rating, it does encourage the student to keep trying. Students become more aware of the elements of a good speech through repeated observations and identification of speech criteria.164

Hirschfeld gave the following recommendations as a result of the study at Wayne State University:

1. Assignment of a personal narrative to reduce student fear of forgetting.

2. Assurance that evaluations of the video-taped speech will not be a part of the final course grade.

3. Maintenance of a friendly, casual atmosphere during the recording and playbacks.165

Video-tapes are also being used in the training of counselors. At Michigan State University's College of Education, a research technique, Interpersonal Process Recall (IPR), was developed. This technique is in the general area of simulated recall methodology and provides participants cues for reliving the experience by means of video-taped playbacks.

The experimentation at Michigan State University with IPR has been used in this manner: A counselor and a client conduct a counseling interview and the participants are video-taped. After the interview, the counselor and client go to separate rooms for simultaneous viewing of the tapes. The investigator or subject may stop the playback of the interview at any time to discuss parts of the tape. When the tape is stopped in one room, it is automatically stopped in the other so that parallel reactions

are obtained. Counselor and client are encouraged to
describe their feelings, interpret statements and elabo-
rate on meanings.

Several potential uses of IPR given by the authors
are as follows: (1) validation of theory, (2) gaining new
insights about the nature of various supervisory relation-
ships, (3) examination of group processes, and (4) education
of counselors.\footnote{166}{Norman Kagan, David R. Krathwohl and Ralph
Miller, "Simulated Recall in Therapy Using Video-Tape:
A Case Study," \textit{Journal of Counseling Psychology}. 10
(1963) 237-243.}

Walz and Johnston report on an exploratory study
in which video-tapes were made of a counselor's interviews
with a coached counselee. The counselors who viewed the
tapes expressed greater confidence in their interviewing
and more awareness of personal qualities. The investigators
agreed that there were individualistic changes in perception
and these were more in the direction of the supervisor's
perception than the client's.

Although no control group was used in this study,
the authors imply that video-tapes offer a means of assist-
ing counselor candidates discover changes they need to make
in interviewing. They suggest also this can be done alone
and will make less demands on the supervisor's time. Since
there were different responses to the video-taping, Walz
and Johnston have suggested the developing of an "index of
readiness" for video-taping and counselor candidates could be taped at that stage of their preparation where the work would be most useful to the individual.167

Diedrich has discussed several distinctive features in the use of video-tapes to teach clinical skills in special education. He believes the immediate feedback available from video-tapes is extremely valuable to students who are working in clinical practice. Another advantage in using video-tapes is that therapy can be video-recorded in a natural setting through a one-way mirror or clear glass. The therapy process can then be studied in a variety of ways. Therapy of different clinicians can be taped and erased on the same video-tape numerous times.168

Diedrich reported that video recordings were very useful for parent observation. The parents felt more comfortable and were more objective of their child when they watched a playback of their child's behavior than when they watched their child in a live observation. Another advantage over live observation was that the video-tape could be stopped and different points about the child's behavior could be discussed critically.169


169Ibid., pp. 646-647.
Video-tape can be used in normal classroom instruction to demonstrate different patients in "natural" form. The instructor can go back over a specific point and can talk about patients without their presence. Diedrich says, "There are things which the patient does in therapy that can only be seen. The video-tape also provides a concrete starting point from which participant classroom discussion will ensue."170

VIDEO-TAPES IN SIMULATION AND WORKSHOPS

Simulation is a process that involves all the materials and technics of audiovisual communication -- TV, radio, tapes, slides, films -- to re-create actual situations and activities.171

Simulation means the re-enactment of a situation or an observable problem for which the learner has to make decisions or take action. War games, mock air raids and role playing in business games are some well-known uses of simulation. Simulation offers many possibilities in the field of education. Many situations can be video-taped


and edited for a few hours of training for teachers-in-
training.172

Ramey has used video-tape simulation as the frame-
work for conducting successful workshops.

Video-tape simulation provides a framework within which it is easier for
the workshop participants to experience at "gut level" what is involved in
solving the problem, whether it is one
of integrating the parish, getting
teachers to accept guidance counselors,
selling a budget increase, or helping
doctors understand the problem of
hospital administrators.173

The technique described by Ramey involves writing
a case that effectively portrays the basic problem around
which the workshop has been organized, and having three sets
of volunteers from the group role play the case on video-
tapes before the workshop begins. These three tapes then
become the basis for analysis, evaluation, and discussion
of the problem. Using tapes of approximately thirty
minutes each, the workshop can be planned to take an entire
day.

Ramey states that he has adapted this methodology
to a variety of workshops, teaching and other uses in

172Frank W. Broadbent, "Simulating Problems of
Beginning Teachers," The Elementary School Journal. 68
(October, 1967), 39-43.

173James W. Ramey, "Using Video-Tape Simulation
to Make a Workshop Work," Phi Delta Kappan. XLIX (May,
1968), 525.
business, medicine, library science and education. He states:

It has been found appropriate to almost any crisis situation, many decision-making situations, and some more analytical situations. It has proven to be exciting to all those who have used it and to have provided a real stimulus to additional growth.

Video-tapes were used in the AACTE Workshop in Teacher Education which was designed to present to teacher educators four innovative approaches and media systems that might be incorporated into their own teacher education programs. Each model was presented via video-tapes, followed by additional discussion sessions. The approaches presented via video-tapes were: Interaction Analysis developed by Dr. Ned Flanders, Nonverbal Behavior in the Classroom developed by Dr. Charles Galloway, Micro-teaching developed by Dr. Dwight Allen and Simulation by Dr. Donald Cruickshank. 175

The Ohio Cooperative Extension Service used the video-tape recorder in an exploratory workshop series to see if video-tape equipment would be useful in in-service education programs for informal adult educators. Each workshop participant, County and Extension Agents, prepared


a lesson using the teaching principles learned. These twenty-minute lessons were taught to role-playing peers. The presentations were taped and played back for immediate critiquing and suggestions for improvement. Participants considered the project to be extremely valuable.

Another aspect of the workshop was to ask the participant to bring a taped program from his field work to be evaluated by workshop members. In informal programs of adult education, the audiences are volunteers and the interest level should be kept high if the adult learner is to keep returning. The self-evaluation provided by video-tapes help to give the County and Extension Agents a positive picture of where improvements need to be made. Video-tapes also make it possible to bring the field to the class and have a "real" problem for discussion. One of the disadvantages of the video-taping described by Cunningham is the time involved. For the amount of time taped, an equivalent amount of time must be allowed for the playbacks.176

VIDEO-TAPES IN DEVELOPMENT OF MEDIA COMPETENCIES

The development of media competencies has been lacking in many programs of preservice teacher education.

McMahan has suggested that such a program needs to be developed as an integral part of a university's total teacher education program, fitted into specific professional courses and duplication avoided. Each media subsystem should identify inputs, desired outputs and components available. The system should be tested, evaluated and redesigned as necessary. The media subsystem should have the support of an adequate center to make it possible for prospective teachers to explore the uses of media. Such a center might include individual learning spaces; such as, for using video-tape recorders to record and evaluate a demonstration lesson, and viewing and critiquing video-taped micro-teaching situations. Micro-teaching could be employed to help students become proficient in specific media skills, preferably in group learning spaces in an adjacent studio.177

The College of Education at the University of Bridgeport, Norwalk, Connecticut has developed a multi-media complex which is attempting to translate curricular and technological advances into programs at the operational level. During the 1966-1967 academic year, elementary education majors were video-taped while making classroom presentations in basic content areas. Individual students viewed the tapes for self-analysis; students viewed the

tapes with the supervisors to prepare joint critiques; students and cooperating teachers viewed the video-tapes in weekly seminars and used them as a basis for group discussion and evaluation. The video-tapes were very effective in helping prospective teachers see their strong and weak points and each attempted to eliminate his deficiencies. Many of the tapes from basic content areas at different grade levels were preserved to use in elementary education methods courses. A library of video-tape recordings of elementary classroom situations was started and tapes were added showing certain behavioral patterns of culturally disadvantaged and preschool children in a variety of learning activities.178

An engineering firm is helping the University of Pennsylvania develop an Instructional Resources Laboratory embracing all the multimedia concepts and designed to be operated by one person - the instructor. This equipment will be used to provide leadership in the preparation of teachers to use many approaches to teaching and to conduct research leading to the development of better instructional media and procedures.179


179 Hugh M. Shafer, "One-Man-Operated Instructional Resources Lab," Audiovisual Instruction. 12 (December, 1967), 1066.
The College of Education at the University of Hawaii prepared a series of video-taped programs to increase teacher understanding and experience in the utilization of media for learning. These video-tapes were played on educational television and in-service teachers viewing them could register for college credit at the University of Hawaii.180

Wayne reports on a system of instruction which seems to be worthy of investigation, development and experimentation. He says it is now technically feasible to provide a system of instruction which is a two-way communication system; that is, one which permits the teacher to ask questions and allows the student to respond. The Video Tape Response System is an effort to bring the student back in contact with a "human" instructor and still provide self-instruction or programmed instruction to the individual or group. An important distinction between V.T.R.S. and existing programmed instruction is that it has sound and motion capability. The system includes a television camera, video-tape recorder, student response unit, TV monitor and a programmer/addressing unit.181


VIDEO-TAPES IN PUBLIC SCHOOLS

There are many reports of various public schools making use of video-taping systems. The school system in Los Alamos, New Mexico has set up an instructionally flexible TV system to meet individual classroom and student needs by using video-tape record/playback units in each school and circulating video-tapes among the schools. TV programs are video-taped and teachers may use the tapes whenever study schedules call for them; consequently, teachers are not confined to a fixed time schedule and the materials may be used many times. Since tapes are circulated among schools in the system, equipment was purchased to allow for the interchanging and the equipment can also be converted to color recording. The central audiovisual center is the key unit in this program and when fully equipped will contain a large variety of equipment and instructional materials. There will be facilities for taping live programs.  

In Palo Alto, California, a group of fifth- and sixth-graders had their performance of Shakespeare's *Julius Caesar* video-taped. Other classes in the school system were able to view the tapes. Knowing they were going to be video-taped seemed to bring out the actors' best performance. An immediate critique from the adult

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director was also possible. Some of the students had an opportunity to operate the camera and gain an understanding of how television and video-tape equipment actually work. 183,184

Many school districts have adapted video-taped lecture-demonstration techniques to the particular needs and schedules of their students. At Chelmsford, Massachusetts, physical education, music and art classes are taped for replay on schedules of each individual school in the system. 185

New Trier East High School, Winnetka, Illinois has developed a system to provide specialized instructional programs for their twenty-five elementary schools. 186

South Hills High School, Covina, California, has video-taped presentations by policemen, civic officials and residents who have specialized knowledge which can add enrichment to the classes. These tapes are available when classes need them. South Hills also uses video-tapes to adapt television to the independent study level. Individual


186 Ibid.
student carrels are equipped with monitors and earphones 
and students can view tapes on subjects ranging from foreign 
language to driver's training.187

The Fontana Unified School District, California, 
purchased video-tape equipment with funds from Title III of 
NDEA. A science teacher records lessons for the fifth- and 
sixth-graders in the entire district to view. They have 
also recorded lessons in elementary Spanish, orchestra 
practice and the city council in session in order to enrich 
their school programs. A new school plan was visited and 
taped in action with the teachers and principals inter-
viewed; this tape was shown to local teachers, PTA and 
service clubs in an attempt to answer, "Is this what we 
want?" This school district feels they are adding enrich-
ment at less than half the cost of special teachers.188

Cupertino High School (Fremont Union High School 
District, California) was one of the early schools to add 
video-tape equipment to increase instructional potentials. 
They prepared ten orientation tapes for the freshman class 
on such topics as "How to Study" and "Use of the Library." 
The mechanical drawing instructors record drawings on tape 
and can give individual attention while students view the 

188Lee Follis, "TV Taping: A Rewarding and Re-
markable Departure," Educational Screen and Audiovisual 
Guide. 44 (May, 1965), pp. 17,24,50 (Part I) and 
44 (June, 1965), pp. 19,30 (Part II).
tapes. English classes have recorded a series on Shakespeare. Physical education and team sports units have used video-tape equipment to expedite teaching team play. Lectures of experts or top-notch teachers are recorded for enrichment. A mobile unit in a truck enables the science department to record field information, or this mobile unit can be used to record in other schools. Many of these tapes are filed in the library for later use. The school administrators feel they are extending the teacher's effectiveness and saving man-hours for the administrative staff as well as giving the students greater depth in training.\(^{189,190}\)

Lewis has suggested many ways that video-tapes can be utilized in the public schools. Drama classes can record presentations for critiques or for background information in planning sets and costumes. A science instructor can record experiments on video-tape instead of repeating the same experiment to three or four classes. The tape can be edited, up-dated and modified so students are assured of an effective presentation. Hazardous experiments could be video-taped with no students present. Video-tapes can

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\(^{189}\) Jean L. Morrison, "To Tape or Not to Tape," *Educational Screen and Audiovisual Guide*. 43 (March, 1964), 134-146.

\(^{190}\) "Schoolmen Stretch Their Time With a Portable TV Recorder," *Nation's Schools*. 74 (July, 1964), 30.
be used to tape activities of animals during daylight hours and by using infrared illumination, nocturnal habits can be studied.¹⁹¹

Video-tapes could be used in social studies classes by having role-playing students and teachers record open-ended, dramatized situations to stimulate constructive discussions. Community resource people or speeches and interviews of people of current interest or importance could be video-taped for use in the school as needed. Activities away from school not adapted for visitation by student groups could be video-taped.¹⁹²

Physical education instructors could record postures in motion to permit an objective diagnosis. "How To" instructions could be taped for the introduction to new, organized games.¹⁹³

Hungerford says video-tapes have changed radically the production patterns of commercial television and may have an even greater impact upon educational television. The state of South Carolina is tapping all its televised high school lessons prior to distribution. In Texas, several colleges show the same video-taped courses on a special microwave network between them. Tapes can be re-run

¹⁹¹Phillip Lewis, "How Video-Tape Recorders Help In Field and Classroom," Nation's Schools. 79 (March, 1967), 136-140.

¹⁹²Ibid.

¹⁹³Ibid.
at several convenient times to reach the greatest student potential. Hungerford says it will soon be rare for a university or large school system to even think of televised instruction without the use of video-tape recorders.

"The opportunities for better televised instruction provided by video-tape are almost beyond our current comprehension."194

San Jose State College, California, has found that with lecture-demonstrations recorded on video-tapes, the instructor has more time to meet with small groups or individuals. Students are assigned outside reading, special video-tapes and other special instruction to meet individual needs and interests. Video-tape recorders enable students to practice aircraft navigation in classrooms with specially prepared tapes of in-flight visual and instrumentation data. Taped sessions are also used to teach clinical procedures in speech and psychology. Classroom observation experiences for teacher-training candidates use video-tapes; these tapes range from teaching the gifted child to educating the mentally retarded. The student counseling center at San Jose uses video-tapes in individual and group therapy to help people develop self-recognition of their problems.195


Colgate University uses video-tapes to record speeches delivered by outside speakers which will be used to fit into economics courses at the proper time.\textsuperscript{196}

The medical school at Duke University uses video-tapes to teach anatomy visually and test the students by a combination of verbal and written exchanges of questions and answers. Examinations are recorded so that during the exam, visual material is seen on television monitors with typewritten questions superimposed underneath.\textsuperscript{197}

Speed feels that the use of the video recorder could revolutionize many areas of educational instruction. In his article he illustrates the many advantages of teaching and coaching through the use of video-tape. At Sibley High School, West St. Paul, Minnesota, where he is the head tennis coach, a recorder was purchased with the idea of using the instant playback feature to teach tennis. Speed says, "The instant replay feature makes the video recorder a terrific teaching aid, because the players can run through a play and then see it played back immediately." Each sport has many applications which are useful because the participants can view themselves in action right on the spot.\textsuperscript{198}


\textsuperscript{197}Ibid.

A football coach in West Hartford, Connecticut uses video-tapes during games and makes use of the instant playback feature with a receiver at the sidelines and also shows the tapes in the dressing room at halftime. He plans to make tapes of season highlights, erasing the tapes of individual games so these tapes can be re-used to tape educational television programs, classroom presentations or class projects.199

A golf instructor in Eugene, Oregon uses video-tape equipment for instant replays of a golf student's swing.200

The Sun Valley Ski Director, Sigi Engl, first used video-taping in his ski school in 1967-1968. The camera is housed at the base of Dollar Mountain and can cover all the degrees of steepness that would be skied by the beginner, the advanced skier or the expert. The instructor stands at the starting point at the top of the slope and sends the pupils down at intervals, each being video-taped. Then the instructor follows, demonstrating the maneuvers he had requested his pupils to do. The class views the tape and the instructor points out the exact instance of any error.

200Dunne, "Video Tape," pp. 140-141.
The camera man, who had never skied, view the tapes. He purchased skis and with no further instruction tried out what he had learned. He was soon skiing competently on most of the runs on Dollar Mountain. Engl says video-tapes will not replace basic teaching techniques, but it is the greatest aid that has occurred in the sport so far.201

SUMMARY OF LITERATURE

A review of the literature shows that published research literature on micro-teaching and video-tape recording in teacher education is limited. Articles reporting uses of micro-teaching and video-tape recordings are more numerous. However, most of the articles reporting on micro-teaching and video-tape recording in teacher education contain information relating more to the education of teachers for secondary schools than for prospective elementary teachers.

Johnson at Northern Illinois University conducted a survey of student teacher practices in the United States. He estimates there are 1,110 institutions with teacher education programs and his survey included completed data from 847 institutions. Part of the questionnaire

201Sigi Engl, "Sigi on Skiing: Teaching via Video Tape." (Kingsport, Tennessee: Kingsport News) 31 (December 27, 1968), p. 5-C.
attempted to determine to what extent the institutions are using some of the widely discussed innovations available for use in teacher education programs.

Johnson found that forty-seven percent of the institutions reporting did not use micro-teaching prior to or during student teaching; twenty-eight percent reported using micro-teaching a small amount; twelve percent a good deal; four percent extensively; while one percent did not know how extensively micro-teaching was used in their institutions. Micro-teaching was reported to be used extensively by at least ten percent of the reporting institutions in these states: Kansas, Minnesota, North Dakota, Oklahoma, Oregon, Utah, and Vermont.202

Concerning the use of video-taping equipment, forty-seven percent of the institutions that reported are not making any use of the equipment; thirty-one percent are using it a small amount; thirteen percent are using it a good deal; three percent extensively; and one percent did not know to what extent the equipment was being used in their institutions in the teacher education programs. Of the institutions reporting, video-taping equipment was used extensively in at least thirteen percent of the reporting institutions in Kansas, Oregon and Vermont.203


203Ibid.
Johnson found that public institutions use both video-taping equipment and micro-teaching techniques more extensively than do private schools.\(^{204}\) He also reports that institutions with NCATE accreditation use video-taping equipment and micro-teaching techniques more extensively than do those institutions who do not have NCATE (National Council for Accreditation of Teacher Education) accreditation.\(^{205}\)

The available research and reported uses of micro-teaching and video-taping show that both are being used in a variety of ways in an attempt to provide school systems with better qualified personnel. There is no one way to use micro-teaching; it can be adapted to fit the needs and objectives of many aspects of teacher education.

Micro-teaching has been used to introduce prospective teachers to the complexity of teaching by allowing them to teach in a scaled-down, controlled situation. Micro-teaching has allowed prospective teachers to focus on one technical skill of teaching at a time. Micro-teaching has been used to give prospective teachers experience in developing and trying out units of work and curriculum materials.

\(^{204}\)Johnson, *Survey of Student Teaching Programs*, p. 75.

\(^{205}\)Ibid., p. 81.
Use of the video-tape recorder permits the micro-teacher to view his own teaching performance and supplies feedback in a way that simply is not otherwise possible.

Other reported uses of video-tape recordings in teacher education are: evaluation of a student teacher's performance by a supervisor, to provide observational experiences prior to student teaching, to illustrate specific teaching techniques in methods courses, to provide models and feedback for developing specific technical skills of teaching, and to aid the student teacher in becoming proficient in self-evaluation.

The investigators who reported exploratory studies generally concluded that micro-teaching and video-tape equipment are assets to teacher education programs and offer potentials for theory, practice and research to "get together."
CHAPTER III

DESIGN OF THE STUDY

SITE OF EXPERIMENTAL STUDY

This experimental study was conducted at Lenoir Rhyne College, Hickory, North Carolina. Lenoir Rhyne College is a coeducational liberal arts college enrolling approximately 1300 students from about twenty states, with the largest proportion being from North Carolina. The Lenoir Rhyne College faculty consists of approximately one hundred members. Lenoir Rhyne College is supported by the North Carolina Synod of the Lutheran Church of America and is a charter member of the Piedmont University Center which is composed of nineteen small North Carolina colleges. Lenoir Rhyne College is an accredited member of the Southern Association of Colleges and Schools and is accredited by the National Council for Accreditation of Teacher Education for the preparation of teachers. Its instructional program is approved by the Board of Education of North Carolina.

The student majoring in Education at Lenoir Rhyne College may complete requirements for a degree in Elementary
Education, Secondary Education or Special Education for the Deaf. The degree candidate majoring in Elementary Education includes in his curriculum specified areas of work designed to give him a broad experience in academic fundamentals and to provide a general cultural education. Most of the general education requirements are completed during the first two years of study and consists of sixty-three semester hours of credit. During his junior and senior years, the student majoring in Elementary Education studies the following courses:

- **Music** .................................................. 6 hours
- **Art** .................................................... 6 hours
- **Physical Education** ............................. 6 hours
- **Geography; Earth Science** ................. 4 hours
- **History** .............................................. 6 hours
- **Government** ...................................... 3 hours
- **Psychological Foundations of Education** .................................................. 6 hours
- **Historical, Philosophical, Sociological Foundations of Education** ................. 6 hours
- **Elementary Methods: Reading, Language Arts, and Mathematics** ........... 9 hours
- **Methods in Social Studies** .................. 2 hours
- **Teaching and Practicum in the Elementary School** .................................. 6 hours

During the senior year, Elementary Education majors who have completed the required courses and have a credit-point standing or point-hour ratio of at least 2.00 (4 point system) are admitted to the student teaching program for six semester hours of credit. The student teachers are placed in public schools in the Hickory area for a period
of eight weeks to work under certificated, competent teachers.

During the first week of student teaching, these prospective elementary teachers observe the classroom teacher and students. This period of observation gives the student teacher an opportunity to understand the educational point of view of the school. Observing accepted practices helps in understanding the philosophy of the school and community. A period of observation helps the student teacher become acquainted with the learners in his class, the roles each is assuming and the interaction among the group members. The student teacher has an opportunity to determine where the pupil is and what his needs are with respect to planning a program to meet individual needs.

The student teacher begins teaching one reading group during the second week of student teaching and adds other reading groups as his capability increases. By the third week, he is teaching all the reading groups. If reading is taught as one group, another subject is added to the student teacher's work during the third week.

During the fourth and fifth weeks of the student teaching experience, other subject areas are taught for at least five consecutive periods. The schedule and order of teaching in these weeks are left flexible to meet the student teacher's individual capabilities and classroom situations.
During the last three weeks of student teaching, the student teacher teaches a social studies unit and is expected to have at least two weeks of full time teaching.

SELECTION OF SAMPLES

In the first phase of the experimental work in this investigation, the experimental group was a class of thirty-six elementary education majors enrolled in a language arts methods course just prior to their student teaching experience. This is a required professional education course and the students were assigned by the college registrar to this investigator's class in the spring semester of the 1968-1969 academic year.

The experimental group for the second phase of this study was eight elementary student teachers randomly assigned by the department chairman to the investigator for supervision in their student teaching experience in the spring semester of the 1968-1969 academic year. These student teachers had been members of the language arts methods course involved in the first phase of the experimental work. The student teachers were seniors who had completed the required general education and professional education courses and met the college requirements for entrance to student teaching. None of these student teachers had had any previous classroom teaching experiences.
The elementary education majors in the experimental group had an average grade point standing of 2.99 upon entrance to the student teaching program.

The control group in this experiment consisted of eight student teachers in elementary education. These student teachers were randomly assigned by the department chairman to the investigator for supervision in their student teaching experience during the fall semester of the 1968-1969 academic year. The student teachers were seniors who had completed the required general education and professional education courses and met the college requirements for entrance to student teaching. None of these student teachers had had any previous classroom teaching experience. The elementary education majors in the control group had an average grade point standing of 2.88 upon entrance to the student teaching program.

The small samples (eight student teachers in the control group and eight student teachers in the second experimental group) were necessary in this investigation because of a lack of adequate video-tape recording equipment and because of the expenses involved in purchasing video-tapes.

EXPERIMENTAL GROUP TREATMENT

The thirty-six prospective elementary teachers enrolled in the language arts methods course were given
instruction about the introductory, or set induction, skill of teaching. The method of instruction consisted of lectures, class discussion and mimeographed materials handed out by the instructor. Establishing set refers to the establishment of cognitive rapport between pupils and teachers. These introductory procedures set the stage for student participation in activities which are to follow and should create student desires to want to accomplish the objectives of the lesson. The introductory procedures should encourage pupil interest and involvement in the lesson. Inducing a learning set is an initiating act on the part of the teacher for the purpose of facilitating a communicative link between the experiential field of the pupils and the behavioral objectives of the learning experience.

To establish set, or introduce a lesson, the teacher selects a known object, person, event or condition which will serve as a point of reference between pupils and teacher. This referent must be appropriate and meaningful with reference to the new material which will follow this introduction. Deliberate use of analogies with characteristics similar to the concept or principle in the lesson will add meaning to the new material. The teacher illustrates the common elements of the analogue and the new material. The analogue should help the students see the new material in an ordered and structured form, should clarify the
comprehension of the new concept or principle, and should help with the transition from the known to the unknown.\(^1\)

The introductory skill can be used by the teacher to set the stage for any new situation. The following are some of the situations for which the introductory skill would be appropriate:

1. At the beginning of a lesson or unit.
2. Prior to discussion.
3. Preceding a question - answer recitation.
4. Assigning homework.
5. Before panel discussions.
6. Prior to student reports.
7. Before assigning student reports.
8. Prior to showing a film, filmstrip, etc.\(^2\)

The experimental group was also given instruction on other technical skills of teaching as developed by Bush and Allen at Stanford University. This instruction


was by means of lectures and written materials. These
skills of teaching and a brief description are as follows:

1. 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 understanding 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 teacher might present more than one way of
   solving a mathematics problem.


   Closure is complementary to set induction.
   Closure is attained when the major purposes and
   principles of a lesson are judged to have been
   learned so that the student can relate new
   knowledge to past knowledge. Closure pulls
   together the major points, acts as a cognitive
   link between past knowledge and new knowledge,
   and provides the pupil with a needed feeling
   of achievement.

3. Recognizing and obtaining attending behavior.

   An experienced teacher is sensitive to the
   classroom behavior of pupils and quickly notes
   indications of interest or boredom, comprehension
   or bewilderment. Many recurrent cues make it
   possible for the teacher to evaluate his perform-
   ance according to the pupil's reactions and he
   can change the pace, vary the activity, and
   introduce new instructional strategies as needed.

4. Providing feedback.

   The feedback process in the training of
   teachers provides knowledge of results.
   Questioning, visual cues, informal examination
   of performance are sources of feedback. Teachers
   can be taught appropriate techniques to elicit
   feedback from students to modify their teaching
accordingly. The new teacher tends to get feedback on how well the lesson is being learned by calling for the feedback from too few students, usually those he soon learns will know the right answer.

5. Employing rewards and punishments (reinforcements).

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.

6. Control of participation.

Control of pupil's 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 the encouraging or discouraging classroom interaction and to gain insight into the casual relationship between a series of teacher-pupil interactions.

7. 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 redundancy and repetition is a powerful technique in focusing and highlighting important points, and describing them from a different point of view.

8. Illustrating and use of examples.

The use of examples is basic to teaching for good, sound, clear teaching. Examples are necessary to clarify or verify concepts. Both inductive and deductive users of examples can be used effectively by the teacher. Effective uses of examples include: starting with simple
examples and progressing to more complex ones, starting with examples relevant to students' experience and knowledge, or relating examples to the principles or ideas being taught.

9. 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.

10. 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 principle rather than defining one. The critical requirements for a "good" classroom question is that it prompts students to use ideas rather than just to remember them.

11. 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, for example, by: asking pupils for more information and/or meaning, requiring the pupil to rationally justify his response, or bringing other students into the discussion by getting them to respond to the first student's answer.3

3Bush and Allen, "Micro-Teaching: Controlled Practice in the Training of Teachers."
The students were given lectures and written materials about the micro-teaching technique. A summarized description of micro-teaching, as presented to the experimental group, follows:

Micro-teaching is a scaled-down teaching experience. It is scaled-down in terms of the number of students in the class and the time spent on the lesson. Typically, a lesson is four to twelve minutes and is presented to a micro-class of three to seven students.

Micro-teaching was conceived of and put into practice at Stanford University in the summer of 1963. The technique was used in a preservice education program for about one hundred fifty liberal arts majors seeking secondary teaching certification through a fifth year program sponsored by the Ford Foundation.

At Stanford University, the demonstration lesson was taught to a small group of students of secondary-school age. This lesson was critiqued by the micro-class members, the supervisors, the intern, and the members of the intern-class. The teaching episode included teaching and feedback. It was recognized that the feedback would be useful only if acted upon, and the micro-teaching cycle was developed. The cycle consists of a teach, critique, replan, reteach, and critique.

Micro-teaching can be adjusted to suit the needs and resources of the user. The variables which can be adjusted include: lesson length, the number of reteaches, number of pupils, types of pupils, the amount and kind of supervision, and the method of recording the interaction. Video-taping of the lesson was added as a method of improving feedback and retaining a record of progress in teaching ability.
For the micro-teaching sessions, the thirty-six members of the experimental group were divided into four groups with nine prospective elementary teachers in each group.

The students were given instruction in planning a micro-lesson. They were told that the micro-lesson would consist of a complete lesson; that is, it included an introduction, presentation and evaluation. Emphasis was placed on limiting the topic sufficiently for the time available and on writing the objectives for the lesson. The means of instruction was through lecturing, and the students were also given written materials about writing lesson plans. A list of the verbs defined by the American Association for the Advancement of Science was given to the students to help them write their objectives. A copy of this may be found in Appendix A. Examples of lesson plans emphasizing the set induction, or introductory, skill were given to the students to help them in preparing their micro-lesson.

Each student was asked to prepare a micro-lesson, approximately five minutes in length. The student could select material from any area of the language arts for the lesson content. Samples of lesson plans which were prepared by the students in the language arts methods course may be found in Appendix B.
A schedule was developed and posted showing the date and time when each member of the experimental group would serve as a micro-teacher, micro-class member, or a member of the micro-class for a reteach. The following is an example of the plan followed for each micro-teaching session. Students one, two and three from Group I were scheduled to be the micro-teachers for the day. The remaining six members in Group I served as members of the micro-class. Each micro-teacher was given the choice of having his micro-class role-play, if he so desired. Members of Group III were scheduled to come in at a later time to serve as the micro-class for the reteach. Each micro-class for the reteach sessions had three students.

The micro-teaching cycle was to teach, critique, replan, reteach and critique. Student one presented his micro-lesson. The lesson was video-taped and played back immediately. The playback was viewed by the micro-teacher, the members of the micro-class and the instructor. The lesson was evaluated by means of a critique form filled out by the micro-class members and the micro-teacher. The set induction, or introductory, skill had been selected by the investigator to be emphasized and rated. The rating forms were marked to indicate if the micro-teacher did accomplish or did not accomplish such items as: state what the objectives of the lesson were, relate the new material to known information, help the students acquire an interest
in the lesson, use instructional aids to promote interest, and indicate teacher interest in the lesson. Space was provided for additional comments on how the micro-lesson could be improved. A copy of the critique form used to evaluate the micro-teaching may be found in Appendix C.

After the video-tape was played back and the critique forms were marked, time was provided for an oral discussion of the micro-lesson. The discussion centered around the technical skills of teaching and, particularly, the introductory skill. The instructor did not complete a written critique form, but did participate in the oral discussion. After the discussion, the micro-teacher used the feedback provided by the critique forms and discussion to plan a reteach of the same lesson.

The same procedure was followed for micro-teachers two and three, scheduled to teach that day. At the completion of the critiques and discussions for these two micro-teachers, the micro-class members were excused and Group III came in to serve as micro-classes for the reteaches. Group III was divided into three micro-classes and the three micro-teachers presented their reteaches simultaneously in different sections of the classroom. An oral critique followed the reteach. The investigator considered the simultaneous reteaches necessary because of the amount of time involved. Each micro-teaching session, with three teachers completing the micro-teaching cycle, was about sixty minutes in length.
This plan was followed for twelve micro-teaching sessions until each member of the experimental group had presented his micro-lesson. A complete copy of the schedule for the micro-teaching sessions in this experiment may be found in Appendix D.

In addition to the micro-teaching experience described, each of the four groups prepared a micro-lesson approximately twenty minutes in length. This lesson was prepared as a group and one member volunteered to teach the lesson. This lesson was taught to a micro-class of seven peers. Each of these twenty-minute lessons was video-taped. The video-taped playbacks were observed and discussed by the entire group of students enrolled in the language arts methods course.

Upon completion of the block of professional education courses, the thirty-six prospective elementary teachers did their student teaching during the last eight weeks of the semester. Eight of these students were randomly assigned to the investigator for supervision during their student teaching experience. Video-tapes were made of the student teachers' introductions in reading and mathematics lessons in normal classroom settings. Each of the video-tapes showed approximately four to six minutes of the teacher's presentation in each of the two subject areas.
These video-tapes were viewed by a panel of educators and rated, along with video-tapes of the control group, to test the hypothesis related to the effectiveness of micro-teaching/video-taping experiences prior to student teaching.

CONTROL GROUP TREATMENT

The student teachers who were members of the control group had had no instruction in the specific technical skills of teaching, as developed at Stanford University. The control group had no micro-teaching/video-tape experiences prior to or during student teaching. This investigator served as the college supervisor for these student teachers. Classroom visitations and individual conferences were the basic parts of the supervisory processes. While the control group members were doing their student teaching, the investigator made video-tapes of the student teachers introducing lessons in reading and mathematics in normal classroom settings. Each video-tape showed approximately four to six minutes of the teacher's presentation in each of the two subject areas.

PROCEDURES TO COLLECT DATA

Data were collected in order to evaluate the experiment and to answer these questions: (1) Are the teaching skills learned through the aid of micro-teaching applied
to the classroom situations when the student does his student teaching? and (2) Is micro-teaching an effective technique for preparing prospective elementary student teachers for the complexity of teaching? The following paragraphs describe the procedures followed by the investigator in collecting data from the participating student teachers and from a panel of educators.

A panel of three educators viewed the video-tapes which the investigator had made of the control and experimental groups while they were teaching in normal classroom settings during their student teaching experience. The panel used a rating form to rate the student teachers on the different aspects of their use of the introductory, or set induction, skill as they set the stage for the activities which were to follow in the main part of the lesson. The panel attempted to answer the following questions about the video-taped lessons: Did the teacher define the objectives of the lesson? Did the teacher give sufficient information on procedures to accomplish the objectives? Was the lesson related to prior knowledge or experience of the students? Did the teacher express enthusiasm in the lesson and help the students acquire an interest in the lesson? Were instructional aids used to promote student interest? Was the material organized so that introductory time was well used?
The panel of educators viewing the video-tapes indicated on the rating form their opinion of the extent to which the teacher did accomplish or did not accomplish the item in question. If the teacher did accomplish the item, the rater then indicated to what degree the item was accomplished by marking: Excellent, Good, Average, Poor, Very Poor. A complete copy of the rating form as used by the panel may be found in Appendix E.

The thirty-six prospective elementary teachers who participated in the micro-teaching/video-taping sessions in the first half of the 1968-1969 spring semester did student teaching during the last eight weeks of that semester. At the completion of their student teaching experience, the investigator asked them to complete a questionnaire about the micro-teaching/video-taping experience. The purpose of the questionnaire was an attempt to evaluate the experiment based on the participating student teachers' answers to questions, such as: Of what value was the time spent on technical skills of teaching? Was the opportunity to view your own teaching performance on video-tape helpful? Did the micro-teaching sessions meet the need for an opportunity to apply theories and ideas learned in content and methods courses? Were the oral and written critiques helpful in planning a reteach? Did the reteach itself help you in correcting mistakes?
Did the micro-teaching/video-tape experience help you to gain confidence and be less fearful of the first few days of student teaching?

The student teachers indicated their reactions to the items on the questionnaire by rating each item: Extremely Helpful, Very Helpful, Helpful, Somewhat Helpful, and Of Little Help. The student teachers were also asked to make additional comments on the entire project as conducted in the language arts methods course. A complete copy of the questionnaire may be found in Appendix F.

EQUIPMENT USED

The investigator used a Sony Video Camera ensemble (Model VCK-2100) and a Sony Videocorder (Model CV-2100) to video-tape the micro-teaching sessions of the experimental group. The Sony video camera ensemble included a solid state Vidicon camera with 25 mm, F. 1.9 lens, a microphone equipped with desk stand and lavalliere, and an elevator tripod. The videocorder puts both sound and picture on tape, simultaneously. The videocorder is simple to operate. It contains an automatic audio level control and automatic video level control. The audio recording level and the video recording level can also be adjusted manually. One hour's recording time is possible with a seven-inch reel having a tape speed of seven and one-half
inches per second. Together with the camera and twenty-one inch monitor/receiver, it was possible to video-tape the micro-lessons and play them back immediately.

A Sony battery operated Videocorder (Model DVK-2400) and hand-held video camera (Model VCK-2400) was used by the investigator to video-tape both the control and experimental groups in the public school classrooms. The battery operated videocorder weighs only eleven pounds and uses the one-half inch wide magnetic video-tape with a tape speed of seven and one-half inches per second. There is a remote-control trigger on the camera handle that started the recording immediately. The camera had a microphone mounted on top which picks up the audio, and a built-in-one-inch TV screen viewfinder that helps frame the picture and show what is being taped. The video level and audio level controls are fully automatic. A cable connects the videocorder and camera. The lens on the TV camera is Sony's 16-64 mm., F-2 C-Mount, Zoom. The recording time on the five-inch reel of video-tape was twenty minutes. Two Globe-Union Inc. (Model 626-2) rechargeable storage batteries furnished the source of power. The videocorder was carried over the shoulder and the camera held in the hand. The unit was transportable into the classroom.

This experimental study was designed with a control group of student teachers who had had no micro-teaching/video-taping experiences prior to or during student
teaching and an experimental group which participated in micro-teaching/video-taping experiences just prior to student teaching, with the focus of this work being on the introductory, or set induction, skill of teaching.

The investigator made video-tapes of the student teachers' presentations in the classrooms of local public schools. With the use of a rating form, a panel of educators rated the taped presentations of the student teachers in the experimental and control groups on the effectiveness of the use of the introductory skill of teaching. The writer was interested in determining the effectiveness of micro-teaching/video-taping in training prospective elementary teachers in the use of specific technical skills of teaching.
CHAPTER IV

RESULTS OF THE STUDY

The purpose of the writer in conducting this study was to investigate certain questions facing teacher educators concerning the use of micro-teaching in preservice teacher education programs for elementary teachers. The investigation was mainly concerned with the questions:
(1) Are the technical skills of teaching learned through the aid of micro-teaching applied to the classroom situation when the prospective teacher does his student teaching? and
(2) Is micro-teaching an effective technique for preparing prospective elementary student teachers for the complexity of teaching?

The major hypothesis tested in this study was as follows: "There will be a greater degree of competency in selected technical skills of teaching for those student teachers who participated in micro-teaching sessions." In order to determine whether the experimental results were significant, the null hypothesis, i.e., there is no difference between the scores achieved by those
student teachers who participated in micro-teaching sessions and those student teachers who did not participate in micro-teaching sessions, was used for statistical purposes.

The second hypothesis tested in this study was that: "Prospective elementary teachers who participated in the micro-teaching/video-tape program will regard this experience as being a meaningful part of the total teacher education program, and as being helpful in preparing them for the complexity of teaching." Student teachers' opinions stated in response to items on a questionnaire were analyzed to test the hypothesis.

A panel of three educators\(^1\) used an eight-item rating form to rate the video-tape recordings of the elementary student teachers in the experimental and control groups. The student teachers were rated on their competency in introducing a lesson and setting the stage for the activities which would follow in the main part of the lesson. Panel members indicated on the rating form their judgments of the extent to which the student teachers did accomplish or did not accomplish the items regarded

\(^{1}\)The writer wishes to thank those individuals who graciously consented to serve on the panel to view and rate the video-tapes. The members of the panel were faculty members in the Department of Education, Lenoir Rhyne College: Dr. W. Clyde Taylor, Department Chairman and Professor of Education; Dr. William C. Schwarzbek, Associate Professor of Education; and Dr. Annie Laurie Keyes, Professor of Education.
by the investigator as pertinent aspects of introducing a
lesson. If the rater indicated that the teacher did
accomplish the item in question, he then indicated the
degree of accomplishment by marking Excellent, Good,
Average, Poor, or Very Poor. Numerical values were assigned
to the degrees of accomplishment to permit statistical
analysis of the data. The numerical values assigned by
the investigator were as follows: Did Not Accomplish - 0,
Very Poor - 1, Poor - 2, Average - 3, Good - 4, Excellent - 5.
This rating form was adapted by the investigator from the
Critique Form for the Skill of Introducing a Lesson -
Phase 1, used in a micro-teaching/video-tape experimental
program at the Ohio State University with teachers of
vocational and technical education.\(^2\)

A second area of concern in this study was to
determine how the participating student teachers eval-
uated: (1) the different aspects of the micro-teaching/
video-tape program, (2) the value of the experience for
self-analysis of their teaching, and (3) this experience
in relation to the total teacher education program.

\(^2\)The writer wishes to thank Dr. C. J. Cotrell,
Specialist and Principal Investigator, for his permission
to modify and use the Critique Form for the Skill of Introdu-
ducing a Lesson, Phase 1, Project 44, Assessment of Micro-
Teaching and Video Recording in Vocational and Technical
Education, The Center for Research and Leadership Develop-
ment in Vocational and Technical Education, The Ohio State
University, Columbus, Ohio.
At the completion of their student teaching program, the thirty-six student teachers came back to the college for a two-day seminar conducted by the college staff in the Elementary Education division of the Department of Education. During the seminar, the investigator asked the student teachers to complete a questionnaire on micro-teaching. On the fourteen-item questionnaire, the student teachers rated: specific items pertaining to the micro-teaching/video-tape program as conducted in the language arts methods course, items related to the playback and the value of self-evaluation, and questions about the value of micro-teaching in relation to their total program of teacher education. Questionnaire items were rated Extremely Helpful, Very Helpful, Helpful, Somewhat Helpful, or Of Little Help. The prospective elementary teachers were also asked to make additional comments on the value of the micro-teaching project or ways in which future micro-teaching projects could be improved.

The questionnaire on micro-teaching for the student teachers was adapted by the investigator from The Classroom Application Questionnaire, Phase 4 and the Micro-Teaching Teacher Questionnaire. These forms were used in an experimental micro-teaching/video-tape program at the Ohio State University.  

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3 This questionnaire was adapted for this study with the permission of Dr. C. J. Cotrell, Specialist and Principal Investigator, Project 44, Assessment of Micro-Teaching and
The Wilcoxon two-sample test and the Chi-Square test were utilized for a statistical analysis of the data in this study. Assistance and consultation regarding data analysis were extended to the investigator by a staff member in the Department of Mathematics, Lenoir Rhyne College, Hickory, North Carolina.  

ANALYSIS OF DATA

The reading and mathematics lessons presented by the student teachers in the video-tape recordings were rated by a panel of educators, using the same rating form for each subject area, the Introductory Skill Rating Form. The total possible score for each student teacher in each subject area was one hundred twenty points (forty points from each panel member). The following tables show the individual scores in reading and mathematics, and a total score for each student teacher. Table 1 shows the data for the experimental group. Table 2 reports the scores received by members of the control group.

Video Recording in Vocational and Technical Education, The Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University, Columbus, Ohio.

4 The investigator wishes to thank Mr. Lloyd B. Smith, Jr., Department of Mathematics, Lenoir Rhyne College, Hickory, North Carolina for the assistance graciously provided regarding the analysis of data in this investigation.
Each panel member indicated on the Introductory Skill Rating Form the extent to which the student teacher "Did Accomplish" or "Did Not Accomplish" the particular items. Table 3 shows the total number of times that rating form entries were rated "Did Not Accomplish" for the control and experimental groups.

### TABLE 1

**SCORES FROM THE INTRODUCTORY SKILL RATING FORM**

**EXPERIMENTAL GROUP**

<table>
<thead>
<tr>
<th>STUDENT TEACHER</th>
<th>READING SCORE</th>
<th>MATHEMATICS SCORE</th>
<th>TOTAL SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>112</td>
<td>92</td>
<td>204</td>
</tr>
<tr>
<td>S₂</td>
<td>89</td>
<td>95</td>
<td>184</td>
</tr>
<tr>
<td>S₃</td>
<td>68</td>
<td>68</td>
<td>136</td>
</tr>
<tr>
<td>S₄</td>
<td>103</td>
<td>104</td>
<td>207</td>
</tr>
<tr>
<td>S₅</td>
<td>111</td>
<td>107</td>
<td>218</td>
</tr>
<tr>
<td>S₆</td>
<td>85</td>
<td>78</td>
<td>163</td>
</tr>
<tr>
<td>S₇</td>
<td>66</td>
<td>76</td>
<td>142</td>
</tr>
<tr>
<td>S₈</td>
<td>96</td>
<td>95</td>
<td>191</td>
</tr>
</tbody>
</table>
### TABLE 2

**SCORES FROM THE INTRODUCTORY SKILL RATING FORM**

**CONTROL GROUP**

<table>
<thead>
<tr>
<th>STUDENT TEACHER</th>
<th>READING SCORE</th>
<th>MATHEMATICS SCORE</th>
<th>TOTAL SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>S9</td>
<td>115</td>
<td>93</td>
<td>208</td>
</tr>
<tr>
<td>S10</td>
<td>74</td>
<td>70</td>
<td>144</td>
</tr>
<tr>
<td>S11</td>
<td>51</td>
<td>82</td>
<td>133</td>
</tr>
<tr>
<td>S12</td>
<td>97</td>
<td>95</td>
<td>192</td>
</tr>
<tr>
<td>S13</td>
<td>69</td>
<td>97</td>
<td>166</td>
</tr>
<tr>
<td>S14</td>
<td>73</td>
<td>87</td>
<td>160</td>
</tr>
<tr>
<td>S15</td>
<td>50</td>
<td>84</td>
<td>134</td>
</tr>
<tr>
<td>S16</td>
<td>41</td>
<td>54</td>
<td>95</td>
</tr>
</tbody>
</table>
TABLE 3

ITEMS RATED "DID NOT ACCOMPLISH"
(NUMBER OF TIMES)

<table>
<thead>
<tr>
<th>ITEM FROM RATING FORM</th>
<th>CONTROL GROUP</th>
<th>EXPERIMENTAL GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the teacher in the Introduction:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Clearly define the objectives or goals of the lesson?</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td>2. Give sufficient information on procedures to accomplish objectives of the lesson?</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>3. Relate the lesson to student prior knowledge or experience?</td>
<td>23</td>
<td>4</td>
</tr>
<tr>
<td>4. Provide opportunity for student response and participation?</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. Help the student to acquire an interest in the lesson?</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6. Express enthusiasm in the lesson?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7. Use instructional aids which helped the student to become interested in the lesson?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>8. Organize material so that introductory time was well used?</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
WILCOXON TEST

The Wilcoxon two-sample test was used to test the null hypothesis, i.e., that the scores listed in Tables 1 and 2 are independent samples from non-normal populations having the same mean. The use of the Wilcoxon two-sample test is not restricted to non-normal populations. Walpole reports that this test can be used in place of the t test when the populations are normal, although the probability of committing a Type II error will be larger.5 "The Wilcoxon two-sample test is generally superior to the t test for non-normal populations."6

The data were first analyzed by testing the means of the total scores, and then scores for each subject area were analyzed separately.

To test the null hypothesis, that is, that no difference exists between total scores of the two populations, the observations were arranged in ascending order and ranks from one to sixteen were assigned. The null hypothesis will be accepted or rejected by the investigator at the .05 level of significance. Table 4 shows the total scores and ranks. The ranks of the observations belonging to the control group are underscored for identification purposes.

---

5A Type II error is committed when we accept a null hypothesis which should have been rejected.

TABLE 4

TOTAL SCORES AND RANKS

<table>
<thead>
<tr>
<th>Original Data</th>
<th>95</th>
<th>133</th>
<th>134</th>
<th>134</th>
<th>143</th>
<th>144</th>
<th>160</th>
<th>163</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranks</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Original Data</td>
<td>166</td>
<td>184</td>
<td>191</td>
<td>192</td>
<td>204</td>
<td>207</td>
<td>208</td>
<td>224</td>
</tr>
<tr>
<td>Ranks</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

From a table: $\Pr(U \leq 19 \mid \text{Ho is true}) \geq 0.05$;
where $u = w - 36$, $w$ being the sum of the ranks of the observations in the control group.\(^7\) The value $U = 19$ is not significant at the .05 level of significance but is at the .10 level of significance. Hence the null hypothesis is accepted at the .05 level, but rejected at the .10 level of significance.

The data were grouped into observations for reading and observations for mathematics, and the results for each subject area were analyzed separately. The original data and ranks for reading are shown in Table 5.

TABLE 5

READING SCORES AND RANKS

<table>
<thead>
<tr>
<th>Original Data</th>
<th>41</th>
<th>50</th>
<th>51</th>
<th>66</th>
<th>68</th>
<th>69</th>
<th>73</th>
<th>74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranks</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Original Data</th>
<th>85</th>
<th>89</th>
<th>96</th>
<th>97</th>
<th>103</th>
<th>112</th>
<th>115</th>
<th>117</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranks</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

The observations were arranged in ascending order and ranks from one to sixteen were assigned. The observations of the control group are underscored. From the table: \( Pr(U < 18 \mid Ho \text{ is true}) = .08 > .05 \). The value \( U = 18 \) is not significant at the .05 level of significance, but is at the .10 level of significance. Hence the null hypothesis is accepted at the .05 level of significance, but rejected at the .10 level of significance.

Table 6 shows the scores and ranks for mathematics. The scores were arranged in ascending order, and ranks were assigned from one to sixteen.
TABLE 6

MATHEMATICS SCORES AND RANKS

<table>
<thead>
<tr>
<th>Original Data</th>
<th>54</th>
<th>68</th>
<th>70</th>
<th>76</th>
<th>78</th>
<th>82</th>
<th>84</th>
<th>87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranks</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Original Data</td>
<td>92</td>
<td>93</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>97</td>
<td>104</td>
<td>107</td>
</tr>
<tr>
<td>Ranks</td>
<td>9</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

The observations of the control group are underscored. The 11th, 12th, and 13th observations were identical, so the observations were replaced by the mean of the ranks that the observations would have if they were distinguishable. From the table: Pr (U ≤ 25 | Ho is true) = .323 > .05; the value of U = 25 is not significant. The null hypothesis (that the samples come from populations with equal means) cannot be rejected.
The Chi-Square statistic was used to test the null hypothesis of independence, that is, that competency in technical skills of teaching is independent of micro-teaching. The actual observations appear in the table as the observed frequencies. The frequencies determined on the basis of the null hypothesis are called the expected frequencies. The expected frequencies for each cell are recorded in parentheses beside the actual observed value in Table 7.

TABLE 7

OBSERVED AND EXPECTED FREQUENCIES

<table>
<thead>
<tr>
<th></th>
<th>MATHEMATICS</th>
<th>READING</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental Group</strong></td>
<td>715 (745)</td>
<td>736 (706)</td>
<td>1451</td>
</tr>
<tr>
<td><strong>Control Group</strong></td>
<td>662 (632)</td>
<td>570 (600)</td>
<td>1232</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1377</td>
<td>1306</td>
<td>2683</td>
</tr>
</tbody>
</table>

To test the null hypothesis, it is necessary to calculate the probability of obtaining such a difference
between the observed and expected frequencies if the two groups are drawn from the same population. The null hypothesis will be accepted or rejected by the investigator at the .05 level of significance.

From a statistical table, the statistical value of $X^2$ at the .05 level of significance is 3.841. The calculated $X^2$ from the rows and columns shown in Table 7 is 11.828, using Yates' correction. Since this exceeds 3.841, the null hypothesis of independence is rejected. The calculated $X^2$ of 11.828 is significant at the .01 level of significance. The discrepancies between the observed and expected frequencies are too large to be attributed to chance and the investigator concludes there is a relationship, that is, a dependence, between scores on the Introductory Skill Rating Form and the micro-teaching program in which the experimental group participated.

In summary, the micro-teaching program seemed to have some effect on the performance of the experimental group when the introductory, or set induction, skill was applied in the classroom. The statistical analysis of the scores attained on the Introductory Skill Rating Form tend to support the research hypothesis that there will be a greater degree of competency in selected technical skills of teaching for those student teachers who participated in micro-teaching sessions.
ANALYSIS OF MICRO-TEACHING QUESTIONNAIRE

The Micro-Teaching Questionnaire was the instrument used by the investigator to obtain the opinions of the student teachers who participated in the micro-teaching/video-tape program prior to their student teaching.

The results of the questionnaire were used in this investigation to test the following hypothesis: "Prospective elementary teachers who participated in the micro-teaching/video-tape program will regard this experience as being a meaningful part of the total teacher education program, and as being helpful in preparing them for the complexity of student teaching."

From the thirty-six prospective elementary teachers who participated in the micro-teaching program, the investigator received thirty-five completed questionnaires. One student who participated in the micro-teaching program did not enter the student teaching program this particular semester, and did not complete the questionnaire. All data pertaining to the questionnaire concludes thirty-five responses to be one hundred percent.

Table 8 shows the items from the questionnaire, and the number and percentage of responses to each item in the different categories.
<table>
<thead>
<tr>
<th>ENTRIES ON QUESTIONNAIRE</th>
<th>Extremely Helpful</th>
<th>Very Helpful</th>
<th>Helpful</th>
<th>Somewhat Helpful</th>
<th>Of Little Help</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>1. Do you think the time spent learning specific teaching skills through micro-teaching was</td>
<td>8</td>
<td>22.8</td>
<td>22</td>
<td>62.9</td>
<td>4</td>
</tr>
<tr>
<td>2. Do you think the opportunity to observe others in your group presenting their micro-lesson was</td>
<td>15</td>
<td>42.9</td>
<td>12</td>
<td>34.3</td>
<td>8</td>
</tr>
<tr>
<td>3. Do you feel that the feedback provided by members of the micro-class was</td>
<td>6</td>
<td>17.2</td>
<td>13</td>
<td>37.1</td>
<td>9</td>
</tr>
<tr>
<td>ENTRIES ON QUESTIONNAIRE</td>
<td>Extremely Helpful</td>
<td>Very Helpful</td>
<td>Helpful</td>
<td>Somewhat Helpful</td>
<td>Of Little Help</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>--------------</td>
<td>---------</td>
<td>-----------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>4. Do you think that the opportunity to analyze your teaching performance in the micro-class by means of video-tape playback was</td>
<td>19</td>
<td>54.3</td>
<td>14</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>5. Do you think the opportunity to apply some of your ideas, acquired from content and methods courses, through micro-teaching was</td>
<td>8</td>
<td>22.9</td>
<td>18</td>
<td>51.4</td>
<td>7</td>
</tr>
<tr>
<td>6. Was the opportunity to reteach the lesson</td>
<td>1</td>
<td>2.8</td>
<td>3</td>
<td>8.6</td>
<td>11</td>
</tr>
<tr>
<td>7. Of what value were the critique forms in planning the reteach lesson</td>
<td>2</td>
<td>5.7</td>
<td>8</td>
<td>22.8</td>
<td>11</td>
</tr>
<tr>
<td>ENTRIES ON QUESTIONNAIRE</td>
<td>Extremely Helpful</td>
<td>Very Helpful</td>
<td>Helpful</td>
<td>Somewhat Helpful</td>
<td>Of Little Help</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>--------------</td>
<td>---------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>8. Do you think the micro-teaching experience helped you gain confidence in yourself?</td>
<td>9</td>
<td>25.7</td>
<td>19</td>
<td>54.3</td>
<td>5</td>
</tr>
<tr>
<td>9. Did the opportunity to see the video-tape playback of your teaching help to make you more aware of how your students would see you?</td>
<td>17</td>
<td>48.5</td>
<td>15</td>
<td>42.9</td>
<td>3</td>
</tr>
<tr>
<td>10. Do you think the micro-teaching and video-tape experience helped you be less fearful of the first few days of student teaching?</td>
<td>5</td>
<td>14.3</td>
<td>12</td>
<td>34.3</td>
<td>8</td>
</tr>
<tr>
<td>11. Do you feel that the micro-teaching experience helped you to become more proficient at self-evaluation?</td>
<td>6</td>
<td>17.1</td>
<td>13</td>
<td>37.1</td>
<td>12</td>
</tr>
</tbody>
</table>
TABLE 8 (CONTINUED)

<table>
<thead>
<tr>
<th></th>
<th>Extremely Helpful</th>
<th>Very Helpful</th>
<th>Helpful</th>
<th>Somewhat Helpful</th>
<th>Of Little Help</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>12. Would the micro-teaching experience have been more helpful in preparing you for student teaching if you had taught elementary students instead of peers in the methods course?</td>
<td>16</td>
<td>45.7</td>
<td>15</td>
<td>42.9</td>
<td>4</td>
</tr>
<tr>
<td>13. Would you have liked to teach more under the micro-teaching method, if course time had permitted?</td>
<td>8</td>
<td>22.9</td>
<td>22</td>
<td>62.9</td>
<td>3</td>
</tr>
<tr>
<td>14. In relation to your total preparation for teaching, was this teaching experience</td>
<td>13</td>
<td>37.1</td>
<td>16</td>
<td>45.7</td>
<td>6</td>
</tr>
</tbody>
</table>
Ninety-seven percent of the student teachers valued the time spent learning specific teaching skills to be "Helpful," "Very Helpful," or "Extremely Helpful" with eighty-five percent of the responses being in the two upper ratings.

The opportunity to observe others in the group presenting their micro-lesson was rated as "Helpful," "Very Helpful," or "Extremely Helpful" by one hundred percent of the teaching interns. The students commented on this item as follows:

"One could pick out good points in others' presentations and integrate those into his own."

"Many techniques presented by others are useful."

"You can learn from others' mistakes."

The value of the feedback provided by members of the micro-class was rated as "Helpful," "Very Helpful," or "Extremely Helpful" by eighty percent of the student teachers; twenty percent rated the feedback value to be "Somewhat Helpful" or "Of Little Help." One student teacher felt it would have been beneficial for the instructor to have conducted individual conferences for additional feedback.

The opportunity to reteach the lesson was rated "Helpful," "Very Helpful," or "Extremely Helpful" by forty-three percent of the participants; fifty-seven
percent of the participants rated this item "Somewhat Helpful" or "Of Little Help." Comments about the reteach included:

"I found I was not as enthusiastic about the lesson, teaching it again right away."

"It is hard to see the value of reteaching until you have been teaching in the classroom."

"We needed more specific critical feedback for the reteach."

"The student teachers should reteach only those lessons which could definitely show improvement. Much of the reteaching was repeating the first lesson without comparison of the two which is necessary to gain from the reteach."

Sixty percent said the value of the critique form in planning the reteach was "Helpful," "Very Helpful," or "Extremely Helpful." Forty percent rated this item as "Somewhat Helpful" or "Of Little Help." Many student teachers felt more constructive criticisms should have been given and that their peers were too kind in their ratings.

The entire experimental group felt that the micro-teaching project would have been more helpful in preparing them for student teaching if elementary students had been members of the micro-class, instead of peers. This item was rated as would be "Helpful" to "Extremely Helpful" by one hundred percent of the participants. Some of the
student teachers' comments about peers vs. elementary pupils were:

"Elementary-age children to teach would have made the micro-lesson much more effective."

"There is a need for using both peers and elementary students. Peers help evaluate; students make the situation more real and natural. It would be helpful to have a balance of both."

"Peers are more understanding, but children will try to catch every mistake."

"Micro-teaching would be more realistic and challenging if elementary students were the micro-class members. One can see their reactions and tell whether or not the message is getting across. However, using fellow students is a good beginning for constructive criticism."

"We get used to teaching our peers; but, actually teaching in the classroom is so different, our first few lessons flop. I believe it would be of much more value to teach elementary pupils in the micro-classes."

Ninety-four percent of the student teachers indicated it would have been "Helpful" to "Extremely Helpful" to have participated in more micro-teaching sessions, if course time had permitted. Approximately six percent rated this question "Somewhat Helpful" or "Of Little Help." Some of the comments made by students concerning this item are as follows:

"I feel more micro-teaching projects would be beneficial. The micro-lessons could be lengthened to give you some additional time. Micro-teaching should play a more vital part in the methods courses."
"The micro-teaching project was very helpful; it would be wonderful if more time could be spent during the quarter, allowing individuals to make more use of it."

"I think I would have liked more opportunities to do micro-teaching. I know that time is a demanding factor, but if time could be allotted, micro-teaching would benefit all student teachers."

On the item concerning the value of analyzing one's own teaching performance in the micro-lesson by means of video-tape playback, one hundred percent indicated this was "Helpful" to "Extremely Helpful." Ninety-four percent rated this particular aspect to be "Very Helpful" or "Extremely Helpful." The students made additional comments about the video-tape playback as follows:

"The video-taping gave us a chance to see ourselves as others do and to see for ourselves what are our strong and weak points."

"I think the micro-teaching project was extremely helpful in that it made me aware of how I would look in front of a group. I didn't realize some of my "quirks" until I saw them on film."

All of the participating student teachers felt the video-tape playback helped to make them more aware of how their students would see them. One hundred percent rated this item "Helpful" to "Extremely Helpful." Ninety-one percent indicated this to be "Extremely Helpful" or "Very Helpful." The students commented:

"The video-taping was very valuable to me and I feel that more of this type of work
should be done. We can see and hear ourselves, and improve from what we did."

"It helped you to see yourself as others would see you, and you could see your own mistakes more objectively."

The item on the questionnaire relating to the value of micro-teaching in helping prospective teachers become more proficient at self-evaluation (of their teaching) was rated "Helpful," "Very Helpful," or "Extremely Helpful" by eighty-nine percent of the participants. Eleven percent felt that micro-teaching was "Somewhat Helpful" in self-analysis of teaching.

Ninety-four percent of the teaching interns indicated that the opportunity to apply ideas, acquired from content and methods courses, through micro-teaching was "Helpful" to "Extremely Helpful." One student teacher said:

"Micro-teaching was very valuable in that we began to apply the instructional and motivational devices learned in our previous courses. Future micro-teaching sessions should be varied in subject area, so that a lesson could be taught in each area, and could involve various teaching skills."

Eighty percent of the student teachers indicated that the micro-teaching experience was "Very Helpful" or "Extremely Helpful" in helping them gain confidence in themselves. This item was rated "Helpful" by fourteen
percent and "Somewhat Helpful" by six percent. The student teachers commented:

"The most helpful part of the micro-teaching, to me, was gaining confidence and seeing that I actually did look like a teacher."

"Micro-teaching is an excellent method to prepare us for student teaching, and to give us confidence to go before a group."

Seventy-one percent of the student teachers felt the micro-teaching/video-tape program helped them to be less fearful of the first few days of student teaching by rating the item "Helpful" to "Extremely Helpful." Twenty-nine percent of the student teachers rated this value of the micro-teaching project to be "Somewhat Helpful" or "Of Little Help."

In relating the micro-teaching/video-tape experience to the total teacher education program, one hundred percent rated the experience "Helpful" to "Extremely Helpful." Eighty-three percent rated the experience "Very Helpful" or "Extremely Helpful." Student teacher comments on the questionnaire were:

"I think the classes should do more of this type of planning and presenting lessons before starting student teaching. To me, this was the most valuable preparation for student teaching."

"Most of the class members had never had the opportunity to plan a lesson or teach a lesson; but, the micro-teaching project provided the opportunity for both activities."
Other comments made by the prospective elementary teachers about the micro-teaching experimental program, both favorable and unfavorable, are as follows:

"I feel the micro-teaching sessions are helpful, but should be started earlier in the college career."

"The micro-teaching has been so beneficial that it is difficult to put my feelings in words."

"Lengthening the lessons would help."

"Micro-teaching was not as valuable as I had once felt it would be. In the classroom it can be discovered that these lessons of only five minutes meant very little. If micro-teaching is used again, lessons should be longer."

"All the student teachers should see the playbacks and they should be more critical."

"It would help to let the micro-teacher view his tape recording a second time, alone."

"Micro-teaching should be used in other subject areas of the elementary school curriculum."

"Micro-teaching is very helpful, whether video-taped or not."

In summarizing the results of the questionnaires, it was found that the following entries were rated "Helpful," "Very Helpful," or "Extremely Helpful" by one hundred percent of the participating student teachers:

Do you think that the opportunity to observe others in your group presenting their micro-lesson was --
Did you think that the opportunity to analyze your teaching performance in the micro-lesson by means of video-tape playback was --

Did the opportunity to see the video-tape playback of your teaching help to make you more aware of how your students would see you --

Would the micro-teaching experience have been more helpful in preparing you for student teaching if you had taught elementary students, instead of peers in the methods course?

In relation to your total preparation for teaching, was this teaching experience --

These entries on the micro-teaching questionnaire were rated "Helpful," "Very Helpful," or "Extremely Helpful" by eighty to ninety-seven percent of the respondents:

Do you think the time spent learning specific teaching skills through micro-teaching was --

Do you feel the feedback provided by members of the micro-class was --

Do you think the opportunity to apply some of your ideas, acquired from content and methods courses, through micro-teaching was --

Do you think the micro-teaching experience helped you gain confidence in yourself?

Do you feel that the micro-teaching experiences helped you to become more proficient at self-evaluation?

Would you have liked to teach more under the micro-teaching method, if course time had permitted?
The following entries on the questionnaire received less than eighty percent response in the categories of "Helpful," "Very Helpful," and "Extremely Helpful:"

Do you think the micro-teaching/video-tape experiences helped you to be less fearful of the first few days of student teaching?

Was the opportunity to reteach the lesson --

Of what value were the critique forms in planning the reteach --

If the responses to the questionnaire are considered to be a random sample from a population having the binomial distribution with $p = .6$, $n = 35$, then using the normal approximation to the binomial distribution, the probability of a particular question receiving twenty-seven or more favorable responses, i.e., "Helpful," "Very Helpful," and "Extremely Helpful" is .03. Inspection of Table 8 reveals that with the exception of three questions, the number of favorable responses exceeds twenty-seven. Thus, with regard to the present findings from the Micro-Teaching Questionnaire, the investigator accepts the hypothesis:

"Prospective elementary teachers who participated in the micro-teaching/video-tape program will regard this experience as being a meaningful part of the total teacher education program, and as being helpful in preparing them for the complexity of student teaching."

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FINDINGS

1. The experimental group received higher total scores on the Introductory Skill Rating Form than did the control group. The difference between the means was not significant at the .05 level of significance, but was significant at the .10 level of significance.

2. The experimental group received higher scores in both reading and mathematics on the Introductory Skill Rating Form. The difference between the means of the scores on reading was not significant at the .05 level of significance, but was significant at the .10 level of significance. The difference between the means of the two groups in mathematics was not statistically significant.

3. The experimental group exceeded the control group in the total number of items accomplished on the Introductory Skill Rating Form. The control group was rated "Did Not Accomplish" nineteen percent of the time. The experimental group was rated "Did Not Accomplish" seven percent of the time.

4. A test of independence indicated that there was a relationship between the scores on the Introductory Skill Rating Form and the micro-teaching program in which the experimental group participated. The results
of the Chi-Square test was statistically significant at the .01 level of significance.

5. Student teachers considered the time spent in the methods course studying specific technical skills of teaching to be worthwhile.

6. All of the participants in the micro-teaching project considered the analysis of one's own teaching by means of video-tape playback to be helpful in preparing them for student teaching. The student teachers indicated the video-tape playbacks made them more aware of how their students would see them. The video-tape playbacks were considered to be helpful in making prospective elementary teachers more proficient at self-evaluation of their teaching.

7. Micro-teaching was considered to be a valuable experience in helping the student teachers gain confidence in themselves.

8. Micro-teaching was considered by the student teachers to meet the need for "trying out" and applying ideas, acquired from content and methods courses. Most of the student teachers felt that more opportunities for micro-teaching would have been beneficial.

9. Prospective elementary teachers in the experimental group felt that the micro-teaching project would have been more meaningful if elementary students had
been used for the micro-classes. However, the opportunity to observe other student teachers presenting their micro-lessons was considered to be beneficial.

10. The "reteach" in the micro-teaching cycle was not considered by the student teachers to be significantly helpful.

11. Information from the critique forms used in the micro-teaching sessions were not considered by the student teachers to be significantly helpful in planning the reteach.

12. In relation to the total teacher education program, the micro-teaching/video-tape program was considered by the participants to be a helpful experience.
SUMMARY, CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

SUMMARY AND CONCLUSIONS OF STUDY

The purpose of this study was to investigate the effectiveness of the micro-teaching technique as a means of instructing prospective elementary teachers in selected technical teaching skills. The set induction, or introductory, skill was selected as the skill of teaching to be focused upon in this investigation, primarily on the basis of appropriateness for experimentation in the local school situation. This investigation was conducted: (1) to determine whether or not the technical skills of teaching, as these are learned through micro-teaching sessions prior to the student teaching experience, are applied in the classroom setting, (2) to determine if micro-teaching is of value in preservice teacher education programs for elementary teachers and, (3) if this procedure should be included in methods courses prior to the student teaching experience.
The experimental group consisted of thirty-six prospective elementary teachers who participated in micro-teaching sessions prior to their student teaching. These students received instructions in the technical skills of teaching. Each prepared a five-minute micro-lesson for presentation to a micro-class composed of peers. The lessons were prepared by the micro-teachers from language arts content material. Video-tape recordings were made of the lessons and played back immediately. After the playback, the micro-teacher received written and oral critiques from the micro-class and from the investigator. The set induction skill was emphasized in the critiques. The micro-teacher prepared a reteach and presented it to a new micro-class, also composed of peers. Each of the thirty-six prospective elementary teachers participated in the micro-teaching cycle: teach, critique, replan, reteach, and critique.

When these prospective teachers were given assignments in the local public schools for their student teaching, eight were randomly assigned to the investigator for supervision. These eight student teachers were the experimental group for the second phase of this investigation. Video-tape recordings were made of the student teachers presenting lessons in reading and mathematics in normal classroom settings.
The control group was eight student teachers randomly assigned to this investigator for supervision in the preceding semester of work. These student teachers had had no micro-teaching/video-tape experience prior to or during student teaching. Video recordings were made in the classrooms as these student teachers presented lessons in reading and mathematics.

The video-tape recordings of the control and experimental groups were rated by a panel of educators using an eight-item rating form, emphasizing the set induction skill, in an attempt to determine whether or not the teaching skills learned through the aid of micro-teaching are applied in the classroom situation when the prospective teacher does his student teaching, and to determine if micro-teaching is an effective technique for preparing prospective elementary student teachers for the complexity of teaching.

At the completion of the student teaching experience, the members of the experimental group who participated in the micro-teaching sessions completed a questionnaire about micro-teaching. The purpose of the questionnaire was to determine how the student teachers valued the micro-teaching experience in relation to the total teacher education program, and to determine if the experience had been helpful in preparing them for the complexity of the student teaching program.
The first hypothesis identified as one to be tested in the research related to this study, stated in Chapter I, is as follows: "There will be a greater degree of competency in selected technical skills of teaching for those student teachers who participated in micro-teaching sessions."

The data obtained from the Introductory Skill Rating Form were analyzed by means of the Wilcoxon two-sample test* and Chi-Square test.** A difference between the means of the total scores was not found to be significant at the .05 level of significance, but was found to be significant at the .10 level of significance, using the Wilcoxon two-sample test. When the data were analyzed by means of the Chi-Square test for independence, statistical significance was found to exist at the .01 level of significance.

In speaking of levels of significance, a lower number means a higher significance level; the lower number means that the event has a lower probability of occurring under the null hypothesis. Events with a lower probability are significant at a higher level of significance. For example, an event with a probability of .05 is actually expected to occur, on the average, five times in every


one hundred times the same experiment is performed, even if the null hypothesis is correct. A level of significance between .05 and .10 is a lower level than the .05 level of significance. An event with a probability of .01 is significant at a higher level of significance than an event with a probability of .05. Such an event would occur by chance no more often than one time in one hundred experiments, and such an event is said to be significant at the .01 level of significance.

The major hypothesis to be tested by this research was supported by the findings in this study, in that there does seem to be a likelihood of significance in the obtained results. These results indicate that there is a relationship between the scores obtained and the micro-teaching program in which the experimental group participated.

By making a generalization from the scores obtained by the experimental vs. control groups on the Introductory Skill Rating Form, it appeared that technical skills of teaching as learned through micro-teaching sessions prior to the student teaching experience, are applied in the classroom setting when the prospective elementary teacher does his student teaching.

It seemed that the technical skills of teaching that are emphasized in methods courses were applied in the student teaching experience to a greater degree in the
subject area for which the prospective teacher had taught micro-lessons than were applied in subject areas for which no micro-teaching experience had been provided.

The second hypothesis identified for testing by the research of this study, as stated in Chapter 1, is: "Prospective elementary teachers who participated in the micro-teaching/video-tape program will regard this experience as being a meaningful part of the total teacher education program, and as being helpful in preparing them for the complexity of participating in the student teaching program."

On the Micro-Teaching Questionnaire, five items received a one hundred percent response in the combined categories of "Helpful," "Very Helpful," and "Extremely Helpful." Six entries on the questionnaire received an eighty to ninety-five percent response in the combined categories of "Helpful," "Very Helpful," and "Extremely Helpful." Three entries on the questionnaire received less than a combined response of eighty percent. The three highest categories of response received an overall percentage response of ninety-four.

Using student teachers' opinions stated in response to items on the Micro-Teaching Questionnaire, the second hypothesis is supported. The writer concludes that micro-teaching can be of measurable value in preservice teacher education for teachers of children in the
elementary-school grades. Generalizing from responses on the Micro-Teaching Questionnaire, the advantages of micro-teaching, as seen by the participating student teachers, outweigh many of the disadvantages present in conducting a micro-teaching program in a small liberal arts college.

RECOMMENDATIONS AND IMPLICATIONS

The basic purpose of micro-teaching in preservice teacher education is to make the prospective teacher ready for student teaching or internship. Shaplin justifies the inclusion of practice as a part of the training of teachers and describes some of the fundamental types of practice which should be part of systematic training. Micro-teaching can provide opportunities for some of the fundamental types of practice which would make the prospective teacher ready for student teaching and also provide opportunities for the prospective teacher to encounter situations he might not have the opportunity to encounter during the student teaching period.

Teaching is a complex process and it is helpful to concentrate practice on one or another specific feature at

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any given time. Shaplin says that "Practice should not be viewed as a total immersion of the teacher in the tasks of the school, to test his strength and endurance, but rather as a period of concentration required of teachers." 2

Micro-teaching can be used to permit the intern to concentrate upon one technical skill of teaching, and reteach the lesson from the feedback provided, until he has attained reasonable proficiency. Reteaching a lesson to an entire class of elementary-age pupils during the regular period of student teaching, is very difficult to arrange.

A very difficult obstacle which the novice teacher must overcome is his own tendency to establish aims which are so general, diffuse, and abstract that they bear little relation to the behavior which a teacher may really expect to observe from the student. The behavior expected of the student is likely not to be made explicit to him, and required tasks may bear little relationship to the expected behavior. 3 Micro-teaching provides the teacher with the opportunity to improve his ability to diagnose and state behavioral objectives, and help him to distinguish vague, general aims from more specific, concrete objectives which may be translated into operations to be performed by the student.

3Ibid., pp. 44-45.
Through the planning and teaching of a micro-unit, micro-teaching can provide the setting for developing a feeling in the intern for the need for repetition and instruction over periods of time in a variety of contexts. The intern can then practice developing lesson plans and relating the lesson he is presenting to what has been taught before. It is then possible for the intern to develop a sense for the pace of learning.

New methods of presenting the identifiable subject matter of a curriculum can be tested in a short time and with a relatively small number of students by means of the micro-teaching technique. Decisions can be made by others about the implementation of methods or materials and the suitability of the concepts for the level of the students. The viability of behavioral outcomes can also be determined. For example, an intern may wish to include a social studies game as part of a teaching unit during his student teaching assignment. Micro-teaching seems to be a good vehicle for testing the material before actually using it with the entire class during the student teaching assignment.

Training in self-analysis (of teaching) should be a major objective in the teacher education program for most of teaching occurs in isolation from other critical adults.\(^4\)

\(^4\)Shaplin, "Practice in Teaching," p. 36.
Supervisory services are usually limited and often times the inservice programs planned for teachers have limited application to the improvement of instruction they offer. Major reliance must be placed upon the ability of the teacher to analyze and criticize his own work. Micro-teaching with video-taped recordings provides opportunities for the intern to analyze and evaluate himself and bring about changes in his behavior as a result of his self-analysis.

The novice teacher needs help to achieve his own synthesis of the many disciplines contributing to teaching, and to analyze and improve his own teaching behavior. Improved feedback can be a major advantage for the use of micro-teaching and video recording. However, one of the necessary conditions for improved feedback through observation is the trained observer. It is doubtful that a person who does not recognize the components of the teaching act will be able to differentiate good from poor strategies. Trained supervisors and instructors, and the recognition that the analysis of teaching requires highly specialized knowledge are essentials of practice. Shaplin says it is inefficient and unrealistic to expect the novice teacher to analyze and improve his own teaching behavior without systematic help from more experienced and expert professors and teachers who have specialized in both content and
process of teaching, and who have attempted to make the kind of synthesis which is required of the novice.\textsuperscript{5}

Micro-teaching can provide experiences which will give meaning to many other aspects of instruction in education. The intern with no experience in teaching often sees the instructional materials in methods courses in education as unnecessary and a waste of time. After an opportunity to do micro-teaching, the intern may become motivated to seek answers to questions which are now his own. He has questions about concepts and knowledge in the subject field in which he is micro-teaching. He seeks the experience of others in employing a variety of methods and in organizing the material for his teaching purposes. By participating in micro-teaching sessions in connection with the methods courses, the teacher can try out principles, concept, and content in his own teaching.

Although the writer believes that micro-teaching can contribute to the overall program in teacher education in a small liberal arts college, there are certain problems and some limitations which arose in the implementation of this technique. The most predominant problems and limitations the investigator encountered are discussed in the following paragraphs.

\textsuperscript{5}Shaplin, "Practice in Teaching." p. 36.
The micro-teaching sessions require a large percent of the total time normally spent in a three semester-hour-credit course. In the language arts method class of thirty-six members, the writer had to spend what would be equivalent to one-fourth of the total teaching time to allow each member just one micro-teaching session. It was also necessary to spend time with the components of a lesson plan and the technical skills which were focused upon. If he is to conduct an effective micro-teaching program, the instructor must be willing to devote additional time to the course for the most effective program.

Scheduling practice sessions outside of the regular scheduled class time is not always easy. If the micro-teaching sessions are planned just prior to student teaching as a part of the several specialized methods courses, scheduling time other than regular class time is difficult. For example, at Lenoir Rhyne College during the semester in which the student does his internship, the student completes eleven semester hours of credit in approximately eight weeks. This is done by meeting the classes twice as often as normally scheduled. Most of the day is taken up meeting scheduled classes. The last eight weeks of that semester, the student does his student teaching.

The expense involved in initiating a micro-teaching/video-tape program may place an additional limitation on
the micro-teaching program. It is estimated that three complete units, including a monitor, camera, and recorder, would be needed if each member of the elementary education staff at Lenoir Rhyne College engaged in a micro-teaching video-taping program. The cost of each unit would be approximately $2000. A small portable video recorder (such as the one used by the investigator) would be very beneficial for each supervisor to do follow-up work with the intern while he is doing his student teaching. Each portable unit costs approximately $1200. The buying of video-tapes would add additional expense to the program. By quantity purchase, one-half inch tape is available for approximately $37 per hour. The tapes are reusable, but a library of tapes for demonstration purposes would be very helpful.

Assuming that the needed equipment is available, and that the faculty members are willing to devote the necessary time to initiate a micro-teaching program, the writer offers several recommendations for an effective program. These are presented below.

For the most effective preservice micro-teaching program, all faculty members in the Department of Education should cooperate in the planning and execution of the project. Micro-teaching experiences could begin early in the intern's professional courses, with experiences of increasing difficulty assigned to the prospective teacher.
In the introductory educational course, work could begin with formulating behavioral objectives and the construction of lesson plans. Video-tapes could be used in Educational Psychology and Child Psychology courses to help the prospective teachers analyze teacher behavior and student-teacher interactions. The staff in the Department of Education should identify and define the technical skills of teaching to be focused upon in the preservice program. To avoid duplication or omission, it should be agreed upon which specific skills of teaching would be concentrated on in each professional course. Technical skills of teaching common to all teaching areas could be focused upon in general education courses. Teaching strategies particular to a content area could be emphasized in the specific methods course. Video-tapes of micro-lessons emphasizing different technical skills of teaching could be used, along with lecture materials and mimeographed-handouts from the instructor, to prepare prospective elementary teachers for micro-teaching experiences.

In a micro-teaching program organized in a way similar to the experimental program basic to the present study, (a methods class divided into groups with micro-classes being those group members not scheduled to be micro-teachers on that day), it is recommended that the micro-teachers be allowed to choose the subject-matter field from which to prepare and present a micro-lesson.
Having lessons presented in the various subject fields would be beneficial to the micro-class members (and observers, if other methods-class students serve in this capacity), especially if a micro-teaching program is a part of only one methods course prior to student teaching. The student teachers in this program rated very high the opportunity to observe others presenting their micro-lessons, and by having lessons presented in many subject areas, the prospective elementary teacher's experiences are widened in analyzing and evaluating teaching in different subject areas. There is also the opportunity to observe how the various technical skills of teaching apply to the different subject areas.

The micro-teaching program could be extended to the student teaching experience. Most elementary student teachers begin the student teaching work being responsible for one reading group. The student teacher's work with the reading group could be video-taped. If the student teacher has had previous experiences in becoming proficient in self-analysis of his teaching, he could view the tape recording and use a critique form to evaluate the small group work. The critique session could also include the college supervisor and/or the cooperating teacher, and other student teachers in the same building. The content material could be presented to another small group of his students. In this experience, the student teacher has an
objective image of his teaching, making possible the
identification of his strong and weak points, and permits
correction of the identified weaknesses. His previous work
on analyzing teacher behavior and student-teacher inter-
actions should help him in eliminating ineffective techniques
from his own teaching behavior.

If scheduling does not permit conducting micro-
teaching sessions in the evening or on Saturday in order
to have elementary-school students serve as members of the
micro-classes, then peers will, of necessity, be used in
the micro-classes. By extending micro-teaching into the
student teaching program, the teaching intern has the added
experience of working with elementary-school students, thus
making the micro-teaching a more realistic situation.

The extension of micro-teaching to the early parts
of student teaching gives the teaching intern additional
experiences with many of the technical skills of teaching
and should increase competency in the skills, as well as
increasing proficiency in self-evaluation.

On the Micro-Teaching Questionnaire completed by
the student teachers, two of the three items receiving less
than an eighty percent response in the combined categories
of "Helpful," "Very Helpful," and "Extremely Helpful" were:

1. Of what value was the opportunity
to reteach the lesson?

2. Of what value were the critique
forms in planning the reteach?
The investigator offers the following recommendations for improving the value of critique forms for a micro-class and for making the reteach more meaningful:

Prospective elementary teachers need more experiences in analyzing the components of teaching. This type of experiences would help micro-classes (of peers) to offer more useful, constructive criticisms to the micro-teachers.

The investigator recommends that micro-class members be given thorough training in the use of the critique forms which will be used to evaluate the micro-teacher.

Assuming that time, space, and adequate video-tape recording equipment are available, the investigator recommends that reteaches be video-taped.

For the first micro-teaching session, it would be beneficial to allow the micro-teacher to view his video-taped lesson alone, after viewing it with the micro-class for critiques. The prospective teacher could use the critiques and the self-analysis to replan the lesson; the investigator recommends that for the first micro-teaching session, the micro-teacher be given a longer time for planning the reteach. As the micro-teacher becomes more competent, the time for incorporating critique material for a reteach could be shortened. The continuance of private, additional viewings of the video-tapes would be
beneficial for the micro-teacher in becoming more proficient at self-analysis of teaching.

For the first micro-teaching experience, it is recommended that the critique sessions be longer and more detailed than would be necessary in succeeding sessions.

Although micro-teaching can be an effective technique without video-tapes, the programs are enhanced by using them. In addition to the use in micro-teaching, video-tape recorders are being used in a variety of ways in teacher education programs throughout the nation. For example, video-tape recorders are being used in the supervision of student teachers; video recordings are being used to replace on-site observational experiences and give the classes a common experience for discussion; video-taped presentations are being used to demonstrate good teaching models to prospective teachers.

When video-tape recorders first appeared about twenty years ago, the high cost restricted their use to commercial and educational television, or large university organizations. Solid state electronics has helped to reduce the price and has resulted in the appearance of a number of competitive units at approximately equal prices.\(^6\)

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Applications of video-tape recorders prohibited by cost will now be possible. More experimentation with preservice and in-service teacher self-analysis of teaching will be conducted utilizing video-tape recorders.  

Video-tape equipment must be selected for specific needs and instructional or training objectives. A relatively inexpensive model could be satisfactory for recording preservice teacher performance. Many inexpensive models provide for immediate review and analysis with their rapid rewind and playback features. The more inexpensive models of video-tape recorders cannot be used for broadcast or continuous use, but do open new possibilities which could not be realized before because of the excessive cost.  

Compatibility is a factor not yet achieved and tapes recorded on one manufacturer's product cannot be played back on equipment from a different company. However, video-tape recorders should demonstrate playback compatibility between like model machines from the same manufacturer.  

10 Rudy Bretz, "Low-Cost Video Tape Recordings: AV Tool or Medium?" Audiovisual Instruction, 12 (November, 1967), 948-951.
Different models of low-cost video-tape recorders have different features\textsuperscript{11} and each recorder has its own advantages and disadvantages.\textsuperscript{12}

Prospective purchasers and users of video-tape recorders should determine the features the video-tape recorder will need, based on the objectives of the proposed program, and select the machines which can fulfill those objectives. The prospective purchaser should test and evaluate the video-tape recorders and, if possible, confer with persons using similar or like models.\textsuperscript{13} Prospective users could consider leasing different models to determine which would best help them in their specific program. Many technicians would profit from attending the factory school for a training program to be able to use and service the machines. The technicians need to know how to handle, play and store tapes and should understand the particulars of the different manufacturers' products.\textsuperscript{14}

Research workers at Michigan State University experimented with a variety of portable video-tape recorders to

\begin{itemize}
\item[\textsuperscript{11}] "Check List of Video-Tape Recorders," \textit{Audiovisual Instruction}, 12 (November, 1967), 968-969.
\item[\textsuperscript{12}] Robert Angus, "Directory of Video Tape Recorders," \textit{Audiovisual Instruction}, 12 (November, 1967), 953-958.
\item[\textsuperscript{13}] Charles Vleck, "The Video Tape Recorder?" \textit{Audiovisual Instruction}, 12 (November, 1967), 952.
\item[\textsuperscript{14}] Philip Lewis, "How To Choose and Use the Right Kind of Videotape," \textit{Nation's Schools}, 80 (September, 1967), 84-88.
\end{itemize}
determine their values in a large, widely diversified student teaching program. Their experiment involved 2,300 student teachers assigned to centers throughout Michigan, some of them one and two hundred miles from the campus.

The student teacher coordinators from the resident centers were given training in the use of the video-tape recorders and it was concluded that a short training session was sufficient to enable most people to use the equipment.

In using the equipment, it was found that for recording student teacher presentations, radio microphones were good for picking up the teacher's voice, but the student voices could not be heard. Regular microphones near the front of the room worked fairly well for student and teacher voices, but it was found that the cable tended to be a nuisance. A Zoom lens was found to be desirable and a four-wheel dolly and a monitor were deemed essentials.

Other modifications of the video-tape equipment suggested at Michigan State University to facilitate in the recording of student teachers are as follows:
permanently attached power cord and cover on the recorder;
permanently attached power cord on the camera; the addition of a video out terminal; better labeling of the switches, levers and buttons; faster wind and rewind of the tape;
stronger tripod with different type of locking nut on the
bolt used to attach the camera to the tripod; color coding of connections; and more AC outlets on the recorder.

The Michigan State University experiment was met with enthusiasm on the part of administrators, school boards, parents, and supervising teachers. It was difficult to determine how the classroom environment was altered by the video-tape recording equipment. Many of the people involved felt this depended on the security of the teacher, maturity of the students, the students' attitudes toward school and the teacher, and the type of activity occurring at the time of the recording.

Some of the problems encountered with the equipment in regard to buildings and classroom facilities were: multistory buildings with no elevators made moving the recording equipment difficult, many classrooms lacked a sufficient number or placement of electrical outlets or had inadequate lighting. A large number of windows could cause glare and it was difficult to make a recording when the teacher was using the overhead projector.15

In the micro-teaching experiment at Wayne State University which was reported by Cook and Brown, it was concluded that a semi-portable video-tape recorder weighed too much to make a quick trip to a school for recording; it required considerable effort and advance planning.

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The portable units were easier to transport and provided a high quality video recording, but the audio recording was a poorer quality.

Cook and Brown report that when technicians are recording video-tapes of the student teachers, they need to have specific directions from the college supervisor to assure the recording of only those activities desired for analysis and evaluation. A sufficient number of tape deck/monitors must be available for viewing and critiquing in order to return the tapes into circulation, and avoid scheduling problems with supervisors and student teachers.16

For this micro-teaching/video-tape experiment, basic to this study, with student teachers in the elementary schools, the investigator used a Sony video camera ensemble (Model VCK-2100) and a Sony Videocorder (Model CV-2100) for the micro-teaching sessions. For the video recordings in the field, the investigator used a Sony battery operated Videocorder (Model DVK-2400) and a Sony hand-held video camera (Model VCK-2400).

The Sony Video Camera ensemble (Model VCK-2100) and Sony Videocorder (Model CV-2100) were easy to operate, had a fast forward speed, and the tapes could be played on

any other Sony Videocorder. With a seven-inch reel, a full hour's recording time is available. The investigator found this equipment to have a high video quality. A Sony F-98 microphone was used and the teachers' voices were picked up very well, but there were some audio problems with the students' voices in the micro-class.

The equipment used in the micro-teaching sessions is heavier and takes longer to set up than the equipment used in the field.

The Sony battery-operated Videocorder (Model DVK-2400) and the Sony hand-held Video camera (Model VCK-2400) used in the field was easy to transport and simple to operate. This equipment was compact, with no wires or cables, causing a minimum of distraction for the students in the classrooms. This equipment was maintenance free while the study was in progress, and would begin recording immediately upon being switched on. The tapes are easy to change and produce a high video quality. The Zoom lens aids in obtaining a better picture and the lens is easily adjustable to control the zoom, as well as the amount of light. Using batteries eliminates the problem of the number and placement of electrical outlets in the classrooms. The batteries are easily rechargable with a Sony Battery Charger BC-2400; however, the investigator recommends that an extra set of batteries be available. Approximately twenty minutes recording time is available on a five-inch
reel; there is no rewind facility and the tapes must be rewound by hand for the playback. This ensemble has no playback facility, but the tapes can be played back on any Sony Videocorder.

The investigator had no major problems with lighting or sound quality while recording the student teachers in the public school classrooms. It is recommended that the recording not be made directly into the light. If the chalkboard is to be used in the presentation, a clean board will show the work more effectively on the tapes.

The video-tape recorder has been used in various ways in teacher education programs. The reported users and researchers involved with the video-tape recorders have been enthusiastic about the work, advantages and results. There are many questions still unanswered about the most efficient way to use the video-tape recorder as an aid in improving the quality of preservice education for prospective elementary teachers. More research is needed to show how teacher and student time can best be used, and to help college personnel involved in teacher education programs decide how the video-tape recorder can best be used with their individual prospective teachers.

Many teacher education programs send their prospective elementary teachers into laboratory or public school classrooms for observational experiences during their junior year. Because many of these students have had little
experience in developing observational skills, the time spent in the classroom is not always as meaningful as it should be. When the prospective teachers return to the professional courses after the observations, there is no common observational experience for the discussions. Video-tapes could be used in the professional courses to help prospective teachers develop observational skills. By viewing video-taped observations, the students and instructor have a common observational experience for class discussions.

Classroom observations do, of necessity, take place in a very limited locale. The prospective teachers will probably not be limiting their employment possibilities to such a limited geographical area. Preservice education programs attempt to train teachers to teach in a variety of conditions and educational settings. By using video-tapes to provide observational experience, the prospective elementary teachers could observe and analyze how a variety of situations are handled in inner-city, suburban and rural schools. Video-tapes could provide observational experiences showing how teachers work with the handicapped child, the gifted child, the disadvantaged child or the slow learner. In many situations, video-tapes could be recorded with less class interruptions than if the prospective teachers made on-site observations.
Video-tapes could be used in educational methods courses to provide prospective teachers many experiences with a variety of teaching models. With guidance from the instructor, the students could observe and analyze the individual styles of teaching. Prospective elementary teachers could adapt effective techniques from the video-tapes to their own style of teaching.

Interactions between the teacher and students could be observed on video-tapes viewed in professional courses. The prospective teachers could become aware of different types of teacher-initiated interactions and the effectiveness of each. These tapes could serve as models from which techniques could be adapted or avoided for one's own teaching. These tapes could be very effective in working with the technical skills of teaching; such as, the effective use of questions. Theory and practical applications could be brought closer together for the students in these experiences.

Reports concerning the use of video-tapes in the supervision of student teachers have shown that this supervisory technique has been met with enthusiasm on the part of the college supervisor, student teacher and cooperating teacher. The persons involved in the supervisory conference view the recording of the student teacher's work and can talk specifically about parts of the lesson. The conference material is not dependent upon the
supervisor's notes, and the student teacher has a more objective image of the way his students see him. The supervisory conferences with video-tapes could involve the cooperating teacher and building principal, as well as the college supervisor and student. Following the viewing of the tape, the conference could consist of oral discussions or could have the addition of written critiques. Individual supervisory needs of the student teachers could be met more effectively with such a supervisory program.

One of the problems involved with using video-tapes in the supervision of student teachers, in addition to the cost, is the amount of time involved. Some of the reports concerning supervision with video-tapes attempted to solve this problem by having technicians do the video recording of the student teacher's work in the classroom. By eliminating taping and travel time for the college supervisor, he has more time for viewing the tapes and for conferences with the student teachers.

When used with discrimination and to fulfill specific objectives in teacher education programs, the video-tape recorder becomes an effective and useful aid.
VERBS FOR STATING BEHAVIORAL OBJECTIVES

To assist you in stating measurable objectives, a modified version of a list of performance verbs used by Science - A Process Approach* published by the American Association for the Advancement of Science is reproduced below:

1. IDENTIFY

The individual selects (by pointing, picking up, or other response) the correct object of a class, in response to its class name. For example, "Show me the frog," when presented a set of small animal pictures. This category of performance also includes identifying object properties (such as; rough, smooth, straight, curved, etc.) and, in addition, kinds of change; such as, an increase or decrease in size.

2. DISTINGUISH

Identifying under conditions where the objects or events are potentially confusible (square, rectangle) or when two contrasting identifications (right, left) are involved.

---

3. NAME

Supplying the correct name (orally or in written form) for a class of objects or events. For example, "What is this three-dimensional object called?"
Answer - Cone.

4. CONSTRUCT

Generating a construction or drawing which identifies a designed object or set of conditions. For example, beginning with a line segment, the problem is: "Complete this figure to represent a triangle."

5. ORDER

Arranging two or more objects or events in proper order in accordance with a stated category. For example, "Arrange these moving objects in order or their speed."

6. STATE A RULE

Makes a verbal statement (not necessarily in technical terms) which conveys the meaning of a rule or principle, including the names of the proper classes of objects or events in correct order. For example, "What is the test for determining whether this surface is flat?"

7. APPLY THE RULE

Using a learned principle or rule to derive an answer to a question. The answer may be a correct identification, supplying a name, or some other kind of response.
The question is stated in such a way that the individual must employ a rational process to arrive at the answer. For example, "Which of the following diagrams meet the definition of an angle?" The answer requires that the individual determine that there are two rays which intersect at a point.

8. DEMONSTRATE
Performing the operations necessary to the application of a rule or principle. For example, "Show how you would tell whether this surface is flat."

9. PREDICT
Using a rule or principle to predict an outcome (or to infer some consequence). For example, "What will happen to the boiling point of water if the operation of boiling is carried out on a high mountain?"

10. CLASSIFY
To place objects, words, or situations into categories according to defined criteria for each category. For example, the student could be asked to classify the members of a family according to criteria of relationship to one another. It would be necessary that the student has the criteria defined in order to do this.

11. DEFINE
To stipulate the requirement for inclusion of an object, word, or situation in a category or class.
Elements of one or both of the following must be included: (1) the characteristic of the words, objects, or situations that are included in the class or category, (2) the characteristics of words, objects or situations that must be excluded from the class or category. To define is to set up criteria for classification.

12. LOCATE

To identify the position of an object, place, or event in relation to specified other objects, places, or events. The student could be asked to locate a city on a map by stating its latitude or longitude, its position near another city, its position in relation to a coastline, etc. A student could also be asked to locate a particular desk in his classroom by stating the row it is in and the ordinal position from the front of the room. The student could be asked to locate the time of an event in history by naming events that immediately preceded and followed it, or by merely giving the date of the event.

13. MEASURE

To demonstrate application of a standard or unstandardized scale or measuring device to an object, series of objects, events, or conditions, according to practices accepted by those who are skilled in the use of the
device or scale. For example, the student could be asked to measure the scaled distance between two points on a map for which a scale is given. The student could be asked to measure the temperature of the air in a room, given a thermometer. The student could be asked to measure the time elapsed from the beginning of an event to its end, given a watch.

14. ORGANIZE
To arrange in order according to specified criteria or according to conventional or logical practice. This class of activity differs from order in that a definite sequence is not implied. The end result of the activity, that is, the organized product need not be arrived at by pursuing a particular sequence related action. The student could be asked to organize a research study in which several types of organization would be acceptable. The steps taken to arrive at the organization would be neither specified or demonstrated.
APPENDIX B

LESSON PLANS PREPARED BY MICRO-TEACHERS
I. Teacher's objective

To teach the meanings of the word "prefix" and how words are formed by adding prefixes to base words.

II. Behavioral outcomes

As a result of this lesson, the pupil will be expected to do the following:

A. Recognize the prefixes of the words listed on the flannel board and the same prefixes used with other base words.

B. Explain orally or written what a prefix does when added to a base word.

C. Use the words on the flannel board in a sentence.

III. Procedure

A. Approach: Arouse interest and curiosity of pupils by use of pictures which lead up to the purpose of the lesson.

Point out that understanding prefixes can help us understand many words, thus making reading more enjoyable.

B. Work-Study Activities: Give a base word to pupils, one at a time, and have him choose a prefix and use it in forming a new word.

Have the class discuss how the prefix changed the meaning of the word.

C. Conclusion: Have pupils show that they understand what each word on the flannel board means by using it in a sentence.

D. Follow-Up:

1. Have pupils find the meaning of the following words, directing them to use the dictionary
and to be ready to discuss them orally at the next class period.

unkind
mislead
compass
compress

rejoin
remark
prepay
subtotal

2. Extension: Have pupils find five prefixes not used in this lesson and present examples to the class that illustrates each of the prefixes.

IV. Evaluation:

Did I accomplish my objectives?

How well did the children respond?

Were they interested?

Did each child participate in some way?

Which children need special attention? Why?

What part of the lesson did I need to reteach?
MICRO-LESSON IN LANGUAGE ARTS - 2

I. Aims. I wish to:

A. Make pupils aware that capital letters and punctuation marks are signals that help the reader understand thoughts expressed in writing.

B. Teach the pupils to be able to use capital letters and punctuation marks correctly.

II. Content. I shall include:

A. Capital letters.

B. Commas, periods, question marks, and exclamation points.

III. Method. I shall:

A. Present punctuation marks as sign posts.

1. Every time you go for a ride or a walk, you see signs which help you to find your way, or which tell you what to do. When you come to a railroad crossing, you are told to Stop! Look! Listen! On crossings in busy parts of town, you might see a sign which says No Left Turn or One Way Street. Buses have signs on them which tell you where the bus is going. When you come to a crossroads on the open highway, there is usually a sign telling you which way to go. There are also signs telling you the speed limit. These signs, which you see everywhere, help you to find your way and make the way safer for you.

B. Explain that our language has traffic signs also. If there were no punctuation marks, would you know what these sentences are saying, "Here it is. This is my poster for the exhibit. I worked hard on it."

C. Ask a student to come up to the board and see if he can put some sign posts of punctuation that
will make these sentences easier to read. Most of the class will remember the rules from earlier grades.

D. Ask the student to read the sentences after he has corrected them. What happens to your voice? Do these punctuation marks tell you what to do with your voice?

E. Present a chart which might help the student to remember which punctuation marks you use where.

CHART

Go! Capital letter that begins a sentence
Pause! Commas,
Stop! Period. Question marks? Exclamation Point!

F. Begin with a review of the most important punctuation marks. These are the ones that come at the beginning and the end of the sentence. From the chart, can you tell me what these are?

IV. Evaluation.

A. Did the students grasp the importance of capital letters at the beginning of a sentence and the period, question mark, and exclamation point at the end of the sentence?

B. Do the children realize how the punctuation marks affect their voice?

C. Did the examples of the sign posts help them to see the need for punctuation signals?

D. Did the pupils learn to use these punctuation marks?
1. Aims or objectives

(a) To help the students recognize prefixes.

(b) To show students how a knowledge of prefixes can help them find the meaning of unfamiliar words.

(c) To show students how prefixes can help them build new words.

2. Procedure

(a) I will show the picture of a trailer and ask the students how it functions. Then I will show a picture of a car and ask how it changes the function of the trailer.

(b) I will point out that a car is to a trailer as a prefix is to a word. It comes before a word and changes its meaning.

(c) I will show on a flannel board a prefix attached to a word. I will use it in a sentence and ask what it means. They will decide how the prefix changes the meaning. Then I will show them the exact meaning of the prefix.

(d) I will present some root words and ask the class to choose the appropriate prefix.

3. Evaluation

(a) As an evaluation, I would have the class do the exercises in the book.

(b) I would also have them look for words containing prefixes on a page in a book or magazine. The class should be able to decide how the prefix influences the meaning of the word.
MICRO-LESSON IN LANGUAGE ARTS - 4

A. Aims or objectives

1. To understand the meaning of the word universe.

2. To know why this word is relevant right now, and why it is important.

3. To understand how the universe affects us specifically.

4. To be able to read this poem with understanding and compare it with others read.

B. Procedure

1. Approach, introduction, or motivation.
   a. Place the cut-out "universe" on the flannel board.
   b. Ask "What does this word mean to you?"

   Definition: Everything, a great whole made up of many different things.

   c. "Why do you think it is important to know about the universe? "What has happened recently to show us why we should know about the universe?"

   d. Place on the board cut-outs of moon, rocket, "space."

C. Work-Study Activities

1. Explain that this is only a part of the universe which we have heard a lot about because of the astronauts.

2. Introduce poem in their textbooks by saying, "A poet has told us about other parts of our universe in her poem called 'Universe'."
3. Place chart on the board.

4. "Now as ------ reads the poem to us, listen for what the poet says the universe is, and how you can come to know it."

5. After the reading of the poem, ask, "What is one thing the poet tells us the universe is?"

6. Place the picture and connecting yarn on the board.

7. "What are two other things the poet says it is?" Place these on the board (skies, seas, earth, etc.)

8. "What else does the poet tell us the universe is?" (one star, one beach, one meadow)

9. Place these pictures on the board.

10. State: "One might say that the poet first gives us an explanation, and then a recipe."

11. Have someone read the explanation (first three verses) and someone read the recipe (last four verses).

D. Conclusion - Follow-Up

1. "Now you see that the universe is made of many parts: sky, sea, and earth. We can know it by seeing each of these parts. Perhaps you would like to read more about the universe. Here is an article about 'Our Awesome Universe'."

2. "Let us compare another poem by the same author that we have already read, "History." As you read it again, compare it to this poem and see that the poet is describing a great whole made up of many parts."

3. If the lesson could be longer, it would include a discussion of different phrases; such as, "Spreading in unseen degrees," and "You can know one meadow's worth." The poem could also be used in choral reading.
E. Evaluation

Do the students understand the meaning of the word universe?

Do they understand how the universe is many things?

Were they able to understand the poem about the universe?

Could the students compare the two poems, "Universe" and "History?"
APPENDIX C

CRITIQUE FORM FOR MICRO-TEACHING
CRITIQUE FORM FOR MICRO-TEACHING

1. Did the teacher state specifically what the objective/s of the lesson were?
   Accomplished _____ Did Not Accomplish _____

2. Did the teacher relate known information to the new material?
   Accomplished _____ Did Not Accomplish _____

3. Did the teacher help me acquire an interest in the lesson?
   Accomplished _____ Did Not Accomplish _____

4. Were instructional aids used effectively in helping to create an interest in the lesson?
   Accomplished _____ Did Not Accomplish _____

5. Did the teacher's presentation indicate an interest on her part?
   Accomplished _____ Did Not Accomplish _____

6. What can the teacher do to improve her introduction of the lesson?
   (Comments)
APPENDIX D

MICRO-TEACHING SCHEDULE
### SCHEDULE FOR MICRO-TEACHING

<table>
<thead>
<tr>
<th>Session</th>
<th>Group</th>
<th>Date</th>
<th>Time</th>
<th>Micro-Teachers*</th>
<th>Micro-Class**</th>
<th>Reteach Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>I</td>
<td>Thur., Feb. 6</td>
<td>9:00</td>
<td>A,B,C</td>
<td>Group I</td>
<td>Group II</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>Fri., Feb. 7</td>
<td>9:00</td>
<td>J,K,L</td>
<td>Group II</td>
<td>Group IV</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Sat., Feb. 8</td>
<td>9:00</td>
<td>S,T,U</td>
<td>Group III</td>
<td>Group I</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>Mon., Feb. 10</td>
<td>9:00</td>
<td>BB,CC,DD</td>
<td>Group IV</td>
<td>Group III</td>
</tr>
<tr>
<td>II</td>
<td>II</td>
<td>Mon., Feb. 10</td>
<td>2:00</td>
<td>M,N,O</td>
<td>Group II</td>
<td>Group IV</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Tues., Feb. 11</td>
<td>9:00</td>
<td>D,E,F</td>
<td>Group I</td>
<td>Group III</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Tues., Feb. 11</td>
<td>2:00</td>
<td>V,W,X</td>
<td>Group III</td>
<td>Group II</td>
</tr>
<tr>
<td></td>
<td>IV</td>
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<td>9:00</td>
<td>EE,FF,GG</td>
<td>Group IV</td>
<td>Group I</td>
</tr>
<tr>
<td>III</td>
<td>II</td>
<td>Wed., Feb. 12</td>
<td>2:00</td>
<td>P,Q,R</td>
<td>Group II</td>
<td>Group IV</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>Thur., Feb. 13</td>
<td>9:00</td>
<td>G,H,I</td>
<td>Group I</td>
<td>Group III</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Thur., Feb. 13</td>
<td>2:00</td>
<td>Y,Z,AA</td>
<td>Group III</td>
<td>Group II</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>Fri., Feb. 14</td>
<td>9:00</td>
<td>HH,II,JJ</td>
<td>Group IV</td>
<td>Group I</td>
</tr>
</tbody>
</table>

*For the classroom schedule, names of teachers were posted. For this copy of the micro-teaching schedule, the investigator has assigned a letter for each micro-teacher.

**Group members not scheduled to teach served as the micro-class.
APPENDIX E

INTRODUCTORY SKILL RATING FORM
INTRODUCTORY SKILL RATING FORM

Micro-teacher

Subject being taught

Panel member

The introduction phase of a lesson "sets the stage" for student participation in the activity which is to follow. The introduction should help inspire the student to want to accomplish the objectives of the lesson.

The following items will be used to evaluate teaching. If the teacher did not accomplish the item, only mark "Did Not Accomplish." If the teacher did accomplish the item, mark "Accomplished" and then mark the column which describes how well the item was accomplished.

DID THE TEACHER IN THE INTRODUCTION:

<table>
<thead>
<tr>
<th>Did Not Accomplish</th>
<th>Accomplished</th>
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<tbody>
<tr>
<td>Degree of Accomplishment</td>
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</table>

1. Clearly define the objectives or goals of the lesson?
   (For example: Did the teacher tell the students what the objectives of the lesson were for the student to learn to write, speak, identify, construct, compare, solve, etc.?)

2. Give sufficient information on procedures to accomplish the objectives of the lesson?
   (For example: Did the teacher state what the student was to do in order to learn the objectives of the lesson?)
3. Relate the lesson to student prior knowledge or experience?
(For example: Did the teacher arouse student curiosity and interest in the lesson by relating the lesson to the student's previous knowledge or past experience?)

4. Provide opportunity for student response and participation?
(For example: Did the teacher allow the student the opportunity to ask questions, make comments or participate in class activities?)

5. Help the student to acquire an interest in the lesson?
(For example: Did the student want to learn what was to be presented in the lesson?)

6. Express enthusiasm in the lesson?
(For example: Did the teacher express enthusiasm by speech and physical gestures and give facts or stories concerning the nature of importance of the lesson, etc.?)
7. Use instructional aids which helped the student to become interested in the lesson?  
(For example: Did the teacher use the chalkboard, charts, drawings, lists, maps, etc.?)

8. Organize material so that introductory time was well used?  
(For example: Did the teacher use his introductory time wisely? Was the amount of introductory material appropriate for the time?)
APPENDIX F

MICRO-TEACHING QUESTIONNAIRE
MICRO-TEACHING QUESTIONNAIRE

Please place an X below each word or words that describe your feelings about the micro-teaching project included as part of the language arts methods course.

1. Do you think the time spent learning specific teaching skills through micro-teaching was

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<tr>
<th>Extremely Helpful</th>
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<th>Somewhat Helpful</th>
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2. Do you think that the opportunity to observe others in your group presenting their micro-lesson was

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<th>Somewhat Helpful</th>
<th>Of Little Help</th>
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3. Do you feel that the feedback provided by members of the micro-class was

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4. Did you think that the opportunity to analyze your teaching performance in the micro-lesson by means of video-tape playback was

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<th>Very Helpful</th>
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<th>Somewhat Helpful</th>
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5. Do you think the opportunity to apply some of your ideas, acquired from content and methods courses, through micro-teaching was

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<th>Extremely Helpful</th>
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<th>Somewhat Helpful</th>
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6. Of what value was the opportunity to reteach the lesson

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<th>Somewhat Helpful</th>
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7. Of what value were the critique forms in planning the reteach lesson

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<th>Extremely Helpful</th>
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8. Do you think the micro-teaching experience helped you gain confidence in yourself?

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<th>Extremely Helpful</th>
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<th>Helpful</th>
<th>Somewhat Helpful</th>
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9. Did the opportunity to see the video-tape playback of your teaching help to make you more aware of how your students would see you?

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<tr>
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<th>Helpful</th>
<th>Somewhat Helpful</th>
<th>Of Little Help</th>
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10. Do you think the micro-teaching and video-tape experiences helped you be less fearful of the first few days of student teaching?

<table>
<thead>
<tr>
<th>Extremely Helpful</th>
<th>Very Helpful</th>
<th>Helpful</th>
<th>Somewhat Helpful</th>
<th>Of Little Help</th>
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11. Do you feel that the micro-teaching experience helped you to become more proficient at self-evaluation?

Extremely Helpful Very Helpful Somewhat Helpful Of Little Help

12. Would the micro-teaching experience have been more helpful in preparing you for student teaching if you had taught elementary-age students instead of peers in the methods course?

Extremely Helpful Very Helpful Somewhat Helpful Of Little Help

13. Would you have liked to teach more under the micro-teaching method, if course time had permitted?

Extremely Helpful Very Helpful Somewhat Helpful Of Little Help

14. In relation to your total preparation for teaching, was this teaching experience

Extremely Helpful Very Helpful Somewhat Helpful Of Little Help

15. Make any additional comments as to the value of the micro-teaching project or ways to improve future micro-teaching projects.
BOOKS


DISSERTATIONS


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