Knowledge and performance of home economics education majors as a function of teaching strategy

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IOWA STATE UNIVERSITY, PH.D., 1976

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Knowledge and performance of home economics education majors as a function of teaching strategy

by

Ruth Evelyn Martin

A Dissertation Submitted to the Graduate Faculty in Partial Fulfillment of The Requirements for the Degree of DOCTOR OF PHILOSOPHY

Major: Home Economics Education

Approved:

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In Charge of Major Work

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For the Graduate College

Iowa State University
Ames, Iowa

1978
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DEDICATION

To my parents,
Glen F. and Ellen Martin,
who taught me to set high goals,
and nurtured in me the desire to attain them
Dissatisfaction with conventional forms of learning experiences for teacher-trainees has resulted in a widespread search for forms of preservice training which will enable students to be more productive (Nias, 1974). In recent years the use of videotape recordings has become prevalent in teacher education as a means for presenting modeling experiences of teaching strategies and for the recording of teaching experiences to facilitate practice-feedback (Kirschner & others, 1975; Winslow, 1976). A current question of teacher educators is not the usage of videotape in preservice programs but how to incorporate modeling experiences and practice experiences on videotape most effectively (Reed, 1976). Carefully designed combinations of videotape with other available methods are necessary in order to take advantage of videotape characteristics and attain effective instruction simultaneously (Gagné, 1970).

Research conducted by Opacinch and others (1974) indicates that offering videotape presentations of effective teaching strategies may facilitate the educative process in a teacher education program. Recommendations for further use of videotape presentations have also been made by Kallenbach and Gall (1969), Biberstine (1971), Hansen (1971), Barrington (1972), Sadker and Cooper (1972), Nias (1974), and Wochholz (1976).

Videotape recordings of microteaching experience have typically concentrated on specific teaching skills such as the asking of higher-
order questions (Ingram, 1974; Lowe, 1975; McCann, 1976; Tremba, 1976) and not on complex teaching strategies which encompass specific pedagogical skills. In the microteaching experience videotape recordings facilitate practice and feedback as viable elements in the acquisition of a teaching skill (Clift, Batten, Burke & Malley, 1976).

Many teacher education institutions have added videotape equipment to the resources available for preparing teachers. A national survey of teacher-trainee programs indicated that almost 50 percent of all teacher education programs used videotape programming and some form of microteaching (Sadker & Cooper, 1972). If teacher educators are going to continue to invest time, money, and effort in learning laboratories it is crucial to continue research in this area (Roush, 1971). Research has not dealt with the integration of videotape recording into instructional programs nor the effect of videotape programming on student achievement (Campeau, 1974; Moldstad, 1974).

The present research seeks to explore not only the impact of videotape model programs of teaching strategies on student achievement and performance but also the effect of microteaching experiences which are videotaped on the acquisition of the taught skill. It also seeks to explore student attitudes when taught by a live versus a videotape model. Assumptions for the study include: 1) teacher performance is the same in the live model presentation and in the videotape model presentation, and 2) students have the same academic ability between quarters in the program. This study is limited to students at Iowa State University who were enrolled in the Home Economics Education course 406,
Methods of Teaching Home Economics (H.Ed. 406), Spring and Fall Quarters, 1977.

The following definitions are used in this study:

Teacher-trainee - a student enrolled in an undergraduate preservice teacher education program.

Teaching skill - a specific pedagogical behavior such as questioning, set, and closure.

Teaching strategy - a complex pedagogical behavior such as demonstration, laboratory, and discussion.

Practice - performance of a teaching strategy in an eight-minute lesson to three or four learners. As a part of the practice, the teacher-trainee has an opportunity to view the lesson, and receive feedback in order to replan and reteach the lesson to a new group of learners.
Preservice teacher preparation believed to facilitate teachers becoming more effective has typically included the teaching of specific teaching skills through the use of a variety of technical devices. Little has been done to study factors affecting the acquisition of complex teaching strategies.

Since the purpose of this investigation was the study of the achievement, performance, and attitude of home economics education majors related to demonstration and laboratory teaching strategies as a function of presentation method and practice, this review is limited to literature relating to teacher preparation in the areas of teaching skills, modeling, and microteaching. Since videotaping is a tool that may be used to facilitate both microteaching and modeling, videotaping as it relates to the preceding topics is discussed concurrently in those sections.

Teaching Skills and Teaching Strategies

The developing of teaching competence involves both proficiency with teaching skills and teaching strategies. The present research is concerned with the acquisition of teaching strategies. However, the focus of the literature reported has been on teaching skills due to the paucity of teaching strategy research. In this study a teaching skill is defined as a specific pedagogical behavior such as questioning, set, and closure. A teaching strategy is defined as a complex
pedagogical behavior such as demonstration, laboratory, and discussion.

For years teacher education programs depended upon the sequence of observation and student teaching to provide the necessary preparation in acquisition of teaching skills. Acquisition of teaching skills has been inhibited by college and school supervisors due to limited observation and varying evaluation criteria.

A movement to narrow the focus of the teaching act in the 1960s resulted in the refinement of extraneous environmental concerns so teaching behaviors were isolated and these became the focus of educational preparation (Allen & Ryan, 1969). If the skills of teaching could be considered as discrete although not necessarily independent they would be capable of independent practice (Clift et al., 1976). Gage (1964) focused on the number of different activities that teachers engage in during the pedagogical activity.

Based on the concept that the teaching process can be analyzed according to different types of activity in which a teacher is engaged, the Stanford Teacher Education Program staff members identified, isolated, and built training programs for critical teaching skills. Priority was given to the general teaching skills that were most important for the novice teacher to possess so a systematic training in a variety of teaching skills provided a teacher with a repertoire to select from in a classroom. Skills specified for the program at Stanford included the following (Allen & Ryan, 1969)

1. Stimulus variation
2. Set induction
3. Closure
4. Silence and nonverbal cues
5. Reinforcement of student participation
6. Fluency in asking questions
7. Probing questions
8. Higher-order questions
9. Divergent questions
10. Recognizing attending behavior
11. Illustrating and use of examples
12. Lecturing
13. Planned repetition
14. Completeness of communication (p. 15)

This list is composed of specific teaching skills which were deemed most useful for the teacher-trainee in a variety of situations regardless of subject matter.

Ward (1970) found in an extensive study of 141 teacher education institutions that the most commonly selected skills in rank order of frequency were: 1) asking questions, 2) establishing set, 3) reinforcement, 4) use of examples, and 5) varying stimulus.

While there are variations of the format for teaching skills in the various teacher education institutions, three assumptions about the skills of teaching which appear in programs are:

1. Teaching may be operationally defined into specific acts which are referred to as the "technical skills" approach.
2. Mastery of these skills increases the probability of becoming a successful teacher.


Technical teaching skills were identified and are used in teacher education programs. However, various criticisms have been aimed at the skills selected since objective evidence of the relationship between teaching skills and student performance has not been established (Sadker & Cooper, 1972; Berliner, 1969). Further, the practice of a single skill is questioned because this approach is too simplistically oriented (Clift et al., 1976). By concentrating on a single skill the teacher-trainee does not acquire experience in identifying and selecting the most appropriate skill for the educative environment.

To give the student training in identifying and selecting the most appropriate skill for the occasion, a more dynamic approach to content design in programs is emerging. Shavelson (1973) argued that the basic teaching skill is decision-making, not questioning, reinforcing, or explaining. Further, empirical means are necessary to systematically investigate the integration of skills into more complex teaching strategies and their effect on student performance (Berliner, 1969; Sadker & Cooper, 1972). Also unresolved is the role of modeling and practice in the acquisition of specific teaching skills and complex teaching strategies.
Informal observation suggests that models are used in all cultures to promote the acquisition of socially approved behavior patterns. In many languages "the word for 'teach' is the same as the word for 'show' and the synonymity is literal" (Reichard, 1938, p. 471). Observation of human models for the acquisition of a skill is not a new concept. Imitation of human models has played an important function in the acquisition of learned behavior. Allen and Ryan (1969) stated, "The use of models in teaching skills could have a major impact on pre-service and in-service training" (p. 32). Hence, modeling and imitation are two basic facets for the acquisition of behavior patterns.

Learning theories supporting modeling

One approach to acquiring pedagogical skills is to direct the attention of the student to an instructional model which can be reproduced. According to Garten and Hudson (1975) one of the most widely used and recognized approaches to teaching skill type learning is through the use of modeling.

Bandura and Walters' (1963) research is basic to understanding the concept of the imitative approach to learning. In several experimental studies dealing with children, the shaping of children's moral judgments was studied as a function of absence of the model with reinforcement, presence of the model with reinforcement, and presence of the model with no reinforcement. From these experimental studies
on imitative learning Bandura and Walters (1963) claimed that complex social behavior could be acquired almost entirely through imitation.

Much of the early modeling research directed by Bandura, Ross, and Ross (1963) dealt primarily with young children but these studies on imitative learning provide the foundation for use of modeling in teacher education and support Bandura and Walters' (1963) arguments that teacher educators need to teach by modeling rather than by conditioning.

Numerous uses are found for well-executed models of instructional skills. Uses of these models, as identified by Allen and Ryan (1969) are: they serve as examples to be imitated, they show instructional alternatives available, and they stimulate discussion about teaching. Greater use of modeling techniques in preservice training was identified as a trend in doctoral research from 1969-1972 (Kirschner & others, 1975).

Kinds of modeling

Modeling studies in teacher education have a basic format which have included two kinds of modeling, perceptual and symbolic (Young, 1969). Symbolic models transmit desired behaviors to the teacher-trainee by means of written or verbal instructions (Bandura & Walters, 1963). A basis for symbolic model preparation is a written description of the specific teaching behavior to be attained. Included in the symbolic model preparation is a rationale and detailed description for using the behavior (Wai-Kong, 1977).
In perceptual modeling, desired behaviors are transmitted to the teacher-trainee by means of an actual portrayal of the desired behavior (Cameron & Cotrell, 1970). A perceptual model is prepared by selecting a topic appropriate for the teaching skill to be modeled and developing a lesson plan approximately 15 minutes in length. Sufficient practices must be made to ensure a competent performance (Wai-Kong, 1977).

Symbolic models and perceptual models can be presented to teacher-trainees in conjunction with each other or separately and further, the perceptual model could be presented live or by videotape (McDonald & Allen, 1967). Little research has been done exploring live versus videotape presentations of the perceptual model (Rutherford, 1973).

Carefully designed combinations of media may be required to achieve the appropriate effect in educative environments (Allen, 1971). All the functions of learning cannot be met through one medium. Effective instruction includes carefully designed combinations of media which exploits the properties of media to the best advantage while attaining desired learning behavior changes (Gagné, 1970).

Research studies on modeling

Two types of modeling were investigated by Orme (1967) in the Stanford Secondary Teacher Education program. The two types of modeling considered were: a) symbolic - modeling in which the behavior is learned by written or verbal instructions, and b) symbolic perceptual - modeling in which a filmed model portrays the desired behavior.
in conjunction with verbal instructions. Random assignment of 120 teacher-trainees to six experimental groups was made: two groups were exposed to the symbolic modeling and four groups to the perceptual. Each teacher-trainee taught three lessons focusing on higher-order questioning skills in a five-minute time period. The experimental treatment was administered after the first lesson. After the first teaching cycle, the symbolic perceptual groups received modeling demonstrations on videotape whereas the symbolic modeling groups received only written or verbal instructions. After this treatment, the teacher-trainees taught the lessons twice to a different group of students. The dependent variable was counting the number of higher-order questions that occurred during the videotaped lesson. Findings suggest that combining verbal and perceptual modeling proved to be the most beneficial training process. Orme concluded that there was support for symbolic perceptual modeling since greater gains in acquiring specific teaching skills resulted than in symbolic modeling.

Modeling procedures and their effectiveness on teaching performance were studied by McDonald and Allen (1967). Perceptual modeling was contrasted with symbolic modeling in the acquisition of basic questioning skills. Participants in the experiment were 85 students enrolled in the master of arts secondary education program. Effectiveness of performance was judged by counting the number of questions asked; data were obtained from videotapes of students' performance.
Evidence indicated that perceptual modeling tended to be recommended over symbolic modeling for the acquisition of this specific pedagogical skill in teacher training.

Young's (1968) study on perceptual and symbolic modeling on the acquisition of a repertoire of alternative teaching techniques involved 94 teacher-trainees working on the master of arts in education degree. Three groups of teacher-trainees taught three five-minute lessons to a group of five students. Between teaching cycles the subjects participated in a 45-minute training session concentrating on modeling protocols. All subjects studied the symbolic model which was the only training given the control group. One group viewed the symbolic perceptual model with the perceptual being presented on film and videotape and the other group viewed symbolic perceptual modeling with the perceptual being on videotape. In each the dependent variable was the proficiency of acquisition of a repertoire of alternate teaching techniques. The major conclusion from the study was that subjects viewing the videotape model in conjunction with the symbolic model used a greater number of different techniques in each successive teaching session than the other two experimental groups.

In a review of the research on imitative learning Young (1969) focused on several studies in teacher education which dealt with specific teaching skills. In these studies the general pattern has been presenting models in symbolic and perceptual frameworks using as a criterion various performance levels of teaching skills. Young's principal conclusions were:
1. Modeling as a training variable has been demonstrated effective in modifying teaching behavior.

2. Videotaped models are most effective when a supervisor provides specific comments on selected teacher-trainee behavior while viewing the videotape with the teacher-trainee or when such comments are provided by the addition of auditory and visual cues on the tape.

3. Models featuring only desirable or optimum instances of teaching behavior have been demonstrated to have a greater transfer to teaching situations other than the one in which training occurred. (p. 402)

Modeling and effectiveness of teacher preparation methodology were the focus of a review conducted by Manis (1973). Reviewing 69 studies related to teacher preparation, Manis discussed important issues and unknowns regarding modeling in the development of pedagogical skills. He stressed that the kinds of models used to demonstrate teaching behaviors need to be researched in order to maximize the acquisition of teaching skills and learn more about the parameters of preservice teacher education.

Perceptual and symbolic models have served as the basic format for modeling studies in teacher education for the acquisition of specific teaching skills with perceptual modeling in combination with symbolic seeming to be a better facilitator of knowledge of teaching skill acquisition. In a major review of research related to teacher preparation, Berliner (1969) claimed that no good information
exists with respect to whether a videotaped, transcribed, or live model should be used for the acquisition of complex teaching skills. In Berliner's critical analysis of the research, he identified modeling as an important issue to be studied in future research endeavors.

Microteaching

Microteaching, an innovative teacher education technique, was conceived during the 1960s at Stanford University. Based on the premise that teacher education majors would benefit from experiences gained in a nonteaching instructional environment, microteaching focuses on specific teaching skills and provides a scaled down teaching performance for teacher interns to practice elements of a teaching task with feedback. Microteaching in varying formats has been widely accepted in teacher education programs throughout the United States.

A national survey of 141 teacher education programs indicated that almost 50 percent had integrated microteaching into the teaching program (Sadker & Cooper, 1972). Over the last decade literally hundreds of studies, journal articles, papers and dissertations related to microteaching and its role in teacher education have been written (Hoerner, 1972). Although microteaching has been used widely and there is considerable research data in existence about it, its value and usefulness are still debated by researchers and educators (Peck & Tucker, 1973).
To determine what is known about the process and effects of microteaching on teacher education majors, the utility of microteaching as a training methodology is discussed in this section. Specifically, topics discussed are the development of microteaching and basic characteristics underlying its use in teacher education programs, theoretical concepts underlying microteaching, and identification of research on the effect of practice on microteaching performance.

**Characteristics of microteaching**

Educators in the Teacher Education Program and the Student Center for Research and Development in Teaching at Stanford originated the basic ideas for microteaching. The implementation of the microteaching was facilitated by the availability of videotaping. Portable videotape recording equipment together with the new approach for defining teaching skills allowed a new pattern of practice for acquiring teaching skills.

Designed as a major departure from the traditional teacher preparation sequence of observation and student teaching, microteaching was developed to reduce the complexities and trauma associated with the first teaching experiences of student teachers. Microteaching, according to Allen and Ryan (1969) has five essential characteristics:

1. Microteaching is real teaching. Although the teaching situation is a constructed one in the sense that teacher
and students work together in a practice situation, bona fide teaching does take place.

2. Microteaching lessens the complexities of normal classroom teaching. Class size, scope of content, and time are all reduced.

3. Microteaching focuses on training for the accomplishment of specific tasks. These tasks may be the practice of instructional skills, the practice of techniques of teaching, the mastery of certain curricular materials, or the demonstration of teaching methods.

4. Microteaching allows for the increased control of practice. In the practice setting of microteaching, the rituals of time, students, methods of feedback and supervision, and many other factors can be manipulated. As a result, a high degree of control can be built into the training program.

5. Microteaching greatly expands the normal knowledge of results of feedback dimension in teaching. Immediately after teaching a brief micro-lesson, the teacher-trainee engages in a critique of the individual performance. (pp. 2-3)

These five characteristics form the framework for the microteaching model which commonly has four phases in which the teacher-trainee:
a) studies a specific teaching skill; b) attempts to apply the skill in a five- to ten-minute lesson taught to three to seven pupils; c) receives feedback from a supervisor while watching a recording of the lesson together and through written evaluation of pupils; and
d) uses information from the feedback phase to replan and reteach the lesson to a new group of pupils trying to improve performance quality (Allen & Ryan, 1969; Meier, 1968; Borg et al., 1969).

The Stanford Teacher Education Program coordinated its microteaching research efforts with the utilization of videotape equipment (Berliner, 1969). While videotaping is not considered an essential part of the microteaching process it has definite characteristics which promote its use. According to Allen and Ryan (1969) the way in which videotaping can facilitate the microteaching process is through its use for feedback to the teacher-trainee.

**Learning theories supporting microteaching**

Microteaching as a training methodology is based on stimulus response theory which incorporates the principles of repetition and reinforcement. Repetition involves the opportunity of practicing and repracticing the skill while reinforcement operates through providing some kind of reward or positive reinforcement when behavior is in the desired manner (Meier, 1968). Repetitive efforts are important in situations for acquiring skill and in bringing enough overlearning to guarantee retention (Hilgard & Bower, 1975). Depending upon the learning outcome, the process such as microteaching may need to be repeated or practiced until desired results are attained. As the teaching skill is repeated samples of the total stimulus situation are associated with particular responses. With practice, the more successful responses in the microteaching experience produce reinforcement and
Structured in ways which provide conditions for reinforcement of desired teacher behavior, microteaching facilitates the potential for bringing a change of a teacher-trainee's classroom behavior in the direction of a criterion performance. In the feedback phase a supervisor can praise or reinforce the teacher-trainee in some way when performance approximated that of the model. Praising or rewarding the teacher-trainee for teaching performance that approximated that of the model will increase use of the behavior in the future. The process of microteaching pupils and/or the audio or videotape recording of the lesson also provide feedback which can be used for the same purpose. However, this feedback may not emphasize positive performance reinforcement as much as the feedback from the supervisor (Manis, 1973).

Studies on teaching skills in microteaching

Research studies involving the effects of microteaching on the acquisition of teaching skills are reported in this section. Major studies regarding acquisition of specific teaching skills as a function of practice and then feedback are presented followed by a study on the acquisition of a complex teaching strategy.

A study conducted by Berliner (1969) investigated the acquisition of higher-order questioning behavior in beginning teachers. The independent variable was the acquisition of the skill as a function of the number of practice sessions. Subjects were 120 education
students working on the master of arts degree. Random procedures were used to assign subjects to experimental classrooms; measures of performance were obtained by counting numbers of higher-order questions in practice sessions. Each subject in the experiment participated in a training schedule which included four microteaching cycles. Repeated chances to practice teach in the microenvironment provided the teacher-trainee with insights from a supervisor, students, or by self-viewing. Findings indicated that practice facilitated the acquisition of higher-order questioning behavior.

The acquisition of selected teaching behaviors using microteaching was studied by Lowe (1975). The basic experimental design of the study was a pretest and posttest format. Measurements on teaching skills were made by trained workers the first and last weeks of the quarter. Identified teaching skills were the use of higher-order questions and the use of probing questions. Subjects were students enrolled in an introductory education course with varying class levels and academic majors who were randomly divided into four treatment groups, two in winter quarter and two in spring quarter. The microteaching program winter quarter used an autoinstructional program designed by the Far West Laboratory for Educational Research and Development. During spring quarter one group used the autoinstructional microteaching program and another group used a lecture-discussion format. Implications as a result of the study were that acquisition of questioning skills was facilitated in an introductory course by practice occurring in microteaching since teacher-trainer performance
was improved at the conclusion of the course.

Clift et al. (1976) investigated different number of practice sessions varying from one to six in a microteaching program on acquisition of set induction. Subjects in the study were 72 student teachers majoring in economics or commercial practice. Student teachers followed a microteaching cycle which consisted of a five-minute teaching session followed by a 10-minute feedback session. Statistical analysis yielded no significant difference in performance in relation to the number of teaching cycles practiced.

An experimental study performed by Bell (1970) investigated the effectiveness of microteaching on the acquisition of five teaching skills (establishing set, reinforcing, questioning, closure, and framing a reference). Twenty-two home economics teacher-trainees were randomly assigned to student teach without microteaching and the other half to the experimental group which experienced microteaching prior to student teaching. Following the student teaching experience, each teacher-trainee prepared and taught a five-minute lesson to ninth grade vocational home economics students in a microteaching setting. Data were obtained from the microteaching lessons with trained evaluators rating the effectiveness of performance using acquisition of the five teaching skills as criteria. A major conclusion reached by Bell was that microteaching or a practice effect was more significant in contributing to the gains in teaching effectiveness than the usual form of preservice teacher preparation.

Acquisition of basic questioning skills and the effects of
feedback on teaching performance was the focus of a study conducted by McDonald and Allen (1967). The investigators used videotape recordings to compare the effects of self-evaluation with immediate and delayed feedback provided by a supervising instructor. Subjects were 85 students enrolled in the master of arts in secondary education. Each subject initially received written directions on questioning skills. Wide variations in time of feedback did not produce differences in the effectiveness of the feedback procedure.

Berliner (1969) summarized a series of empirical studies for the Stanford Center for Research and Development in Teaching on the acquisition of teaching skills as a function of feedback in microteaching and arrived at these major conclusions: 1) a feedback system in which a teacher-trainer and a supervisor view the teaching behavior with accompanying comments is effective; and 2) the immediacy of the feedback is not paramount to the acquisition of the desired teaching behavior.

From these selected studies, it is apparent that microteaching has been studied as a function of the amount of practice, and with or without the presence of feedback. Furthermore, these same studies and other similar studies have been reviewed by the following authors: Cooper and Allen (1971); McAleese and Unwin (1971); and Clift (1973).

The conclusions are that practice usually makes a difference in the acquisition of specific teaching skills. For the feedback function, variations in time and format do not produce differences in the acquisition of specific teaching skills although there is support for
obtaining feedback on the teaching behavior from a supervisor.

**Studies on teaching strategies in microteaching**

Although studies have investigated the acquisition of specific teaching skills in a microteaching setting, only one study was found which used microteaching to acquire complex teaching strategies. In an experimental study which concentrated on 12 classroom behaviors which facilitate conducting a discussion lesson, Borg et al. (1969) randomly assigned 79 elementary teachers to five groups. These groups were: three who completed the entire microteaching program with practice and feedback including videotape recording and replay; one group which completed the entire program with practice and feedback and no videotape recording and no replay; and one group which served as a control group and did not participate in the microteaching and received no feedback. Behavior change was measured by trained raters who scored 16-minute pre- and postcourse videotapes of the teacher-trainees. Borg concluded that omission of practice and feedback had little effect on acquisition of a complex teaching strategy since treatment groups that did not practice and did not receive feedback in the microteaching environment were not significantly different than groups that did.

Since only one study of the effect of practice with feedback versus no practice or feedback on the acquisition of complex pedagogical skills has been completed, further work seems warranted. No studies were found which dealt with achievement, performance, and attitude as a function of teaching method and practice-feedback.
The present study is an attempt to identify acquisition of knowledge and performance related to the teaching strategies of demonstration and laboratory when presented by various modes and with the opportunity to practice with feedback and no opportunity to practice. Further, an attempt is made to identify attitudes toward the method of presentation of the live and videotape model teaching strategies.
METHOD OF PROCEDURE

This study was pursued in relation to an expressed need for an investigation regarding method of presenting teaching strategies to prospective home economic teachers. An effective portrayal of teaching strategies can make a viable contribution to the professional development of students enrolled in a teacher preparation program. The experimental study was conducted in a senior course in the Home Economics Education Department at Iowa State University during Spring and Fall Quarters, 1977.

This chapter presents information concerning objectives of the study, population and sample, preparation of the instructional lesson, development of evaluative instruments, design of the study, collection of data, and analysis of the data.

Objectives of the Study

The objectives of the study were:

1. To contrast the effectiveness of live model presentations and videotape model presentations of the demonstration and laboratory teaching strategies of senior home economics education majors in terms of:
   a. achievement scores,
   b. attitudes related to the method of presentation, and
   c. teaching performance.

2. To contrast the effectiveness of practice with no practice
of demonstration and laboratory teaching strategies in a microteaching experience of senior home economics education majors regarding:

a. achievement scores, and  
b. teaching performance.

Population and Sample

Home economics education majors who were senior level undergraduate students were selected for the research. Subjects in the demonstration experiment were 30 senior home economics education majors at Iowa State University who were enrolled in the course H.Ed. 406, Methods of Teaching Home Economics, Spring Quarter, 1977. The data were complete for all subjects except one who did not respond to the posttest. The laboratory experiment included 28 senior home economics education majors at Iowa State University who were enrolled in H.Ed. 406, Methods of Teaching Home Economics, Fall Quarter, 1977.

Subjects were matched on teaching strategy experience and cumulative grade point average and randomly assigned to four groups as follows: 1, model live, no practice; 2, model videotape, no practice; 3, model live, practice; and 4, model videotape, practice.

The Instructional Lesson

A fundamental knowledge of different teaching strategies is basic to the preparation of home economics education majors at the undergraduate level at Iowa State University. Several teaching strategies that were relevant to home economics were considered for the study. Two
teaching strategies that were as different from each other as possible were identified using the criteria of whether the strategy was
a) teacher oriented with few opportunities for student involvement or
b) student oriented with definite opportunities for student involvement.
Two teaching strategies which would contribute to the various areas of
home economics were selected for the instructional program, demonstration and laboratory. Each of these teaching strategies will be dis-
cussed.

Demonstration strategy

In home economics, part of the teaching responsibility involves
manipulative skills. One of the basic methods of presenting a manipula-
tive skill is the demonstration.

Content of the lesson A review of the literature related to the
demonstration facilitated the identification of basic concepts. Major
sources for the identification of demonstration concepts were: Demon-
stration Techniques (Allgood, 1959); Teaching Home Economics (Hall &
Paolucci, 1970); Toward Better Teaching of Home Economics (Fleck, 1974);
and Demonstrate A Manipulative Skill (The Center for Vocational Educa-
tion, 1977a). These concepts were helpful in developing the instruc-
tional objectives for the selected teaching strategy. The objectives
written to develop the lesson plan for the demonstration instruction
are stated below:

1) Identify the major characteristics of the demonstration
   method of teaching.

2) Know the preparation steps and procedures involved in
demonstrating a manipulative skill.

3) Develop a lesson plan for demonstrating a manipulative skill.

4) Evaluate the performance of a teacher demonstrating a manipulative skill.

5) Demonstrate a manipulative skill in a microteaching experience.

A lesson plan was written which included demonstration principles comprising the major characteristics of the demonstration strategy. To be qualified as a demonstration the learning opportunity must involve a manipulative skill which is accompanied by a verbal explanation of the essential points.

Guidelines for implementing the demonstration strategy in the classroom were also identified in the lesson plan. Practical aspects such as adequate preparation and practice for a demonstration were discussed.

A summary of the lesson plan reviewed the major characteristics of the demonstration. Preparation factors involved in demonstrating a manipulative skill, lesson plan development, evaluation of a demonstration, and directions for participation of home economics education majors in a microteaching experience were also explained in the summary.

Directions for participation of the home economics education majors in a microteaching experience were that each teacher-trainee was to prepare a minimum of one demonstration involving a manipulative skill and present it to three or four secondary students in the videotape studios in the Home Economics Education Department. Each demonstration was to be limited to a time period of eight minutes.

A faculty member in the Home Economics Education Department who
was responsible for teaching the methods component of the undergraduate program reviewed the lesson plan. The written instructional plan was also critiqued by an evaluation specialist of the Home Economics Education Department.

Suggested revisions made on the lesson plan included the following: identifying additional demonstration examples which involved manipulative skills; introducing student assistance during the demonstration presentation; adding another example to emphasize the importance of adequate demonstration preparation; and deleting a section of food equipment specifications. A copy of the Demonstration Principles Lesson Plan is found in Appendix A.

Selection of model demonstration topic

Selection of the model demonstration topic was limited to a process involving manipulative skills which would be readily visible to the students since this was consistent with the identified teaching strategy definition. Potential topics which were discussed were wiring an electrical plug, lining a jacket, shaping rolls, and making a pie. Shaping rolls was the topic selected since it met the definition requirements and the time allotment for the instructional period. Rolling, cutting, and shaping the roll dough involved manipulative skills, the process could be completed in the time period, and the manipulative skills would be readily visible. The researcher was designated as the demonstrator and a model demonstration was developed.

Live model demonstration

A model demonstration was planned which would serve as a standard for the teaching strategy. The
demonstration was written word for word to assure the researcher that the live model demonstration and the videotape model demonstration would be identical in content. Application of demonstration principles led the writer to develop and practice the selected topic so that a desired level of competence was evident in the model demonstration. A copy of the Model Demonstration Script is found in Appendix B.

Pilot testing of the demonstration instructional lesson was carried out in H.Ed. 406, Methods of Teaching Home Economics, Winter Quarter, 1977, since these students were not going to be included in the main study. The entire instructional lesson was presented.

This pilot testing was done to ascertain the acceptability of the content to teacher-trainee students as well as to view student response to the model demonstration. Pilot testing also provided an opportunity to administer and revise the cognitive instrument.

**Videotape model demonstration** Plans for the videotape model demonstration were identical in topic and style to the live model demonstration. The same script and content were used so that the videotape model demonstration was equivalent to the live model demonstration. Numerous rehearsals were made to assure a smooth performance.

The Coordinator of Instructional Development assisted in making recommendations for videotape recording of the model demonstration at WOI-TV, Iowa State University. Suggestions which were followed were: delivering the demonstration script to the television studio one week in advance of the scheduled taping; using a plain color backdrop which would be similar to a classroom; having sufficient food
supplies available for three tentative tapings of the model demonstration; using dark finish baking sheets for the yeast rolls; wearing plain color pastel clothing of classic design; and wearing no special cosmetic makeup.

Videotape recording of the model demonstration was made under the direction of the supervisor in charge of closed-circuit television at the WOI-TV, Iowa State University in March, 1977. Viewing of the videotape recording was made by the supervisor and the investigators to ascertain the clarity of presentation and the videotape was judged acceptable.

Laboratory strategy

In a home economics laboratory, a teacher has the responsibility to direct and supervise students in an educative endeavor which will maximize learning potential. A systematic management of resources can assist in the effectiveness of the learning opportunities in a laboratory.

Content of the lesson Major laboratory concepts were identified in a review of literature which focused on teaching methods. Resource books which were used in preparing the laboratory instructional lesson included: Choosing Techniques for Teaching and Learning (Spitze, 1970); Teaching Home Economics (Hall & Paolucci, 1970); and Direct Student Laboratory Experience (The Center for Vocational Education, 1977b). Basic concepts which were identified in these resources were used to develop instructional objectives for the laboratory teaching strategy. The objectives written to develop the laboratory instructional lesson
are stated below:

1) Identify the major components of the laboratory teaching strategy.

2) Determine the possible uses of the laboratory teaching strategy.

3) Determine the plan and process involved in directing a laboratory.

4) Conduct a laboratory in a microteaching experience.

A definition of the laboratory was given in the lesson plan introduction. Basic to the definition is the principle that a laboratory provides an educational opportunity which allows students to learn by doing which often involves acquiring psychomotor skills.

Principles related to the preparation and implementation of the laboratory were included in the lesson plan. The three main components of a laboratory, planning, controlling, and evaluating, formed the major part of the total lesson so these were emphasized.

Microteaching directions were given to the home economics education majors for the laboratory teaching. Each teacher-trainee was to prepare a minimum of one laboratory for three to four secondary students with the videotaping to be recorded in the microteaching studios in the Home Economics Education Department. A time period of eight minutes was designated for the laboratory with the major portion devoted to learner activity. A brief introduction and an appropriate laboratory topic were requirements. Any learner forms which would facilitate the laboratory were to be prepared prior to the scheduled microteaching experience.
Several practices of the laboratory lesson were made prior to a trial black-and-white videotape recording in which the investigator was the instructor. The videotape recording was reviewed by a faculty member in the Home Economics Education Department who was responsible for teaching the methods component of the undergraduate program and by an evaluation specialist in the same department for content and clarity approval. Recommendations were made to revise the lesson plan.

Revisions which were made on the laboratory lesson plan included: a concise definition of the term, laboratory; more areas of home economics identified as laboratory examples; more emphasis placed on time management; identification of alternatives for a large number of students in a laboratory; identification of various methods of determining laboratory groups; and more learner orientation in the overall lesson plan. A final copy of the Laboratory Principles Lesson Plan is found in Appendix C.

Selection of model laboratory topic A model laboratory topic was selected which would include learner involvement in the development of psychomotor skills. Exemplification of the laboratory definition was desired so that a model laboratory could be developed and included in the instructional lesson. Various possibilities for a model laboratory were discussed including hemming a garment, wiring an electrical plug, shaping yeast rolls, and making relishes with the factors of laboratory definition, time segment, and visibility considered. Shaping of yeast rolls was the topic chosen for the model laboratory. Learners were selected and a model laboratory was planned and practiced.
The complete instructional package was pilot tested in H.Ed. 406, Methods of Teaching Home Economics, Spring Quarter, 1977, and as a result adjustments were made in the knowledge acquisition phase and in the laboratory topic. The adjustment made in the knowledge acquisition phase prior to the research study was the deletion of overhead transparencies. Since nonoptimum modeling was exhibited in the laboratory and the literature supported nonnegative aspects of modeling behavior, a new laboratory topic and approach were selected. This new topic was vegetable relishes.

The discussion focuses on the relishes since this topic was finally used. Making four vegetable relishes (cucumber cartwheels, radish roses, carrot curls, and stuffed celery) involved psychomotor skills, provided for division of labor, and would be visible to instructional purposes. In addition, the setting provided an opportunity to portray evidence of planning, controlling, and evaluating.

**Live model laboratory** A live model laboratory was planned and developed incorporating instructional principles. A script was written, word for word, for the investigator as the teacher and four laboratory learners who were enrolled at Iowa State University. The laboratory partners were divided so that the four learners formed two kitchen units consisting of one male and one female in one unit and one male and one female in the second unit. Related laboratory instructional resources which were developed for the live model laboratory included vegetable relish directions, plan sheets, and self-evaluation forms.
Numerous practices of the model laboratory were made prior to a trial black-and-white videotape recording. The investigators critiqued the videotape recording and several suggestions were made for revisions. Adjustments which were made included separating the learners into two definite work areas, allowing pauses between learners' conversation, and having the learners leave the room at the conclusion of the laboratory. A copy of the Model Laboratory Script is found in Appendix D.

Pilot testing   A laboratory on relishes was developed and tried out in Family Environment 421, Demonstration, Spring Quarter, 1977, and H.Ed. 515, Evaluation, Summer Session, 1977, since these students were not going to be included in the final study.

Acceptability of the laboratory lesson content was examined as well as the student response to the model laboratory. Discussion focused on reaction to the portrayal of ideal student conduct in the laboratory presentation. The decision to exemplify an efficient and effective laboratory was reinforced by two subject matter specialists and an evaluation specialist.

Videotape model laboratory The videotape model laboratory was identical to the live model laboratory since the same topic and script were used. Scheduled practices of the model laboratory were made so everyone was familiar with the tasks involved and the script.

Videotape recording of the model laboratory was made at WOI-TV, Iowa State University in May, 1977, under the direction of the supervisor of closed-circuit television. The videotape recording of the model laboratory was viewed by the supervisor and the investigators
to ascertain the clarity of presentation and picture quality and the videotape was judged acceptable.

Design of the Study

Instructional objectives associated with each teaching strategy were developed and learning opportunities for presenting each strategy by live and videotape were planned. The instructional lesson consisted of two phases, the first a knowledge acquisition phase and the second a skill acquisition phase. In a one-hour class period the researcher taught the knowledge acquisition phase which included three parts: A, principles of the teaching strategy; B, model presentation of the teaching strategy (live or videotape); and C, the summary. In the skill acquisition phase, students had practice or no practice in a microteaching experience. Both lessons on teaching strategies had identical formats which are presented in Table 1.

Evaluative Instruments

In order to determine the effectiveness of the instructional lesson it was necessary to develop the following evaluation instruments: pre-post demonstration achievement test, demonstration observational rating scale, pre-post laboratory achievement test, laboratory observational scale, and presentation (live, videotape) attitudinal inventory. To study the effect of previous experience in the teaching strategy, two background information devices were developed. Development of each of the instruments is discussed.
Table 1. Instructional lesson format for teaching strategies

<table>
<thead>
<tr>
<th>Instructional lesson format</th>
<th>Demonstration lesson plan</th>
<th>Laboratory lesson plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge acquisition phase</td>
<td>A. Principles</td>
<td>A. Principles</td>
</tr>
<tr>
<td></td>
<td>B. Presentation</td>
<td>B. Presentation</td>
</tr>
<tr>
<td></td>
<td>live, videotape</td>
<td>live, videotape</td>
</tr>
<tr>
<td></td>
<td>C. Summary</td>
<td>C. Summary</td>
</tr>
<tr>
<td>Skill acquisition phase</td>
<td>Microteaching</td>
<td>Microteaching</td>
</tr>
<tr>
<td></td>
<td>practice, no practice</td>
<td>practice, no practice</td>
</tr>
</tbody>
</table>

**Demonstration achievement test**

An objective test was developed to determine student achievement relative to the demonstration subject matter. From the objectives for the instructional lesson a table of specifications was developed. A table of specifications provides that a representative sample of the desired behavior is being tested (Gronlund, 1976). Cell weights were established from the objectives and lesson plan so that a sufficient sample at the knowledge-comprehension levels and application and higher
levels was made. A table of specifications for the demonstration achievement test is presented in Table 2.

Twenty-one, four-option multiple choice items and seven matching items were written. Of these a minimum of two items were referenced to the knowledge-comprehension levels and application and higher levels for each objective of the instructional program. These items comprised a trial test and were screened for inclusion in the final test.

Each question was developed to measure the attainment of a specific objective of the instructional program. Each item was reviewed by a subject matter specialist and an evaluation specialist. This panel also judged as accurate the factual base on each test question.

The trial device was administered to 29 home economics education majors enrolled in H.Ed. 406 Methods of Teaching Home Economics, Winter Quarter, 1977. Administration of the trial device to these teacher-trainees not in the sample facilitated determining the clarity and quality of the items. Students had no questions regarding the test items so it was assumed that they could understand them. The Kuder-Richardson Formula 20 provided a reliability estimate of .16 so items were revised considering difficulty level, discrimination index, and distracter analysis.

A copy of the Demonstration Test including 12 four-option multiple choice items and seven matching items is found in Appendix E. Correct responses are indicated for both types of items.

Administration of the demonstration posttest occurred at the end of Spring Quarter, 1977. The reliability estimate of the demonstration
Table 2. Table of specification for demonstration achievement test

<table>
<thead>
<tr>
<th>Demonstration content area</th>
<th>Knowledge-comprehension items</th>
<th>Application and higher items</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item number</td>
<td>Cell weight</td>
<td>Item number</td>
</tr>
<tr>
<td>Definition and major components</td>
<td>5, 7, 9</td>
<td>17%</td>
<td>11, 12</td>
</tr>
<tr>
<td>Use of demonstration</td>
<td>1</td>
<td>6%</td>
<td>3, 10, 13, 14, 15, 16, 17, 18</td>
</tr>
<tr>
<td>Preparation steps and lesson plan</td>
<td>8</td>
<td>6%</td>
<td>2, 4, 6</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>29%</td>
<td>13</td>
</tr>
</tbody>
</table>
posttest as calculated by the Kuder-Richardson Formula 20 was .45 on a sample size of 29. The estimate of reliability refers to how consistent test scores are from one measurement to another. Although the reliability was not high, plausible factors influencing the reliability coefficient are the few number of test items and respondents (Gronlund, 1976).

Item analysis data for the demonstration posttest are presented in Table 3. Best items are determined by: a) a discrimination index between .2 and .4 unless it is greater than .4 in which case the standard deviation has to be greater than .2; b) an item difficulty between 30 percent and 70 percent; and c) items with effective distracters functioning at a level of one or more responses for each if 50 respondents took the test. Since 50 respondents did not answer the test items, best items were selected on the first two criteria. Further, potentially good items were identified on the basis of "closeness of fit" to these two criteria.

Of the 19 items, three are indicated as best items. Eight of the 19 were designated as potentially good. Rewriting of items is not recommended until additional item analysis data are available as item analysis data tends to stabilize when \( n \geq 100 \).
Table 3. Item analysis data for the demonstration posttest

<table>
<thead>
<tr>
<th>Item number</th>
<th>Difficulty index (%)</th>
<th>Discrimination index</th>
<th>Standard deviation</th>
<th>Distracter analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multiple choice items</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>76</td>
<td>0.50</td>
<td>0.43</td>
<td>4 22&lt;sup&gt;b&lt;/sup&gt; 1 2</td>
</tr>
<tr>
<td>2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>90</td>
<td>--&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.30</td>
<td>3 0 26&lt;sup&gt;b&lt;/sup&gt; 0</td>
</tr>
<tr>
<td>3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>79</td>
<td>0.47</td>
<td>0.41</td>
<td>23&lt;sup&gt;b&lt;/sup&gt; 1 4 1</td>
</tr>
<tr>
<td>4&lt;sup&gt;e&lt;/sup&gt;</td>
<td>55</td>
<td>0.65</td>
<td>0.50</td>
<td>12 0 1 16&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>76</td>
<td>0.39</td>
<td>0.43</td>
<td>1 5 22&lt;sup&gt;b&lt;/sup&gt; 1</td>
</tr>
<tr>
<td>6&lt;sup&gt;e&lt;/sup&gt;</td>
<td>48</td>
<td>0.31</td>
<td>0.50</td>
<td>2 0 13 14&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>41</td>
<td>0.15</td>
<td>0.49</td>
<td>12&lt;sup&gt;b&lt;/sup&gt; 7 1 9</td>
</tr>
<tr>
<td>8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>86</td>
<td>0.32</td>
<td>0.34</td>
<td>0 25&lt;sup&gt;b&lt;/sup&gt; 2 2</td>
</tr>
<tr>
<td>9&lt;sup&gt;c&lt;/sup&gt;</td>
<td>97</td>
<td>0.39</td>
<td>0.18</td>
<td>28&lt;sup&gt;b&lt;/sup&gt; 1 0 0</td>
</tr>
<tr>
<td>10&lt;sup&gt;c&lt;/sup&gt;</td>
<td>100</td>
<td></td>
<td>0 29&lt;sup&gt;b&lt;/sup&gt; 0 0</td>
<td></td>
</tr>
<tr>
<td>11&lt;sup&gt;e&lt;/sup&gt;</td>
<td>52</td>
<td>0.51</td>
<td>0.50</td>
<td>5 2 7 15&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>12&lt;sup&gt;a&lt;/sup&gt;</td>
<td>66</td>
<td>0.17</td>
<td>0.48</td>
<td>2 0 8 19&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>Items that would probably meet item analysis criteria if sample size equaled 50.

<sup>b</sup>Indicates correct answer.

<sup>c</sup>Items that need revision due to distracter analysis, discrimination index, or difficulty level.

<sup>d</sup>Discrimination index less than 0.05.

<sup>e</sup>Items that meet the item analysis criteria: A difficulty index between 30 and 70% and a discrimination index above .20.
Table 3 (Continued)

<table>
<thead>
<tr>
<th>Item number</th>
<th>Difficulty index (%)</th>
<th>Discrimination index</th>
<th>Standard deviation</th>
<th>Distracter analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matching items</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13&lt;sup&gt;c&lt;/sup&gt;</td>
<td>83</td>
<td>--&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.38</td>
<td>5</td>
</tr>
<tr>
<td>14&lt;sup&gt;c&lt;/sup&gt;</td>
<td>93</td>
<td>0.37</td>
<td>0.25</td>
<td>27&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>15&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17</td>
<td>0.35</td>
<td>0.38</td>
<td>20</td>
</tr>
<tr>
<td>16&lt;sup&gt;a&lt;/sup&gt;</td>
<td>76</td>
<td>0.68</td>
<td>0.43</td>
<td>7</td>
</tr>
<tr>
<td>17&lt;sup&gt;c&lt;/sup&gt;</td>
<td>93</td>
<td>--&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.25</td>
<td>27&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>18&lt;sup&gt;c&lt;/sup&gt;</td>
<td>14</td>
<td>--&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.34</td>
<td>4&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>19&lt;sup&gt;c&lt;/sup&gt;</td>
<td>10</td>
<td>--&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.30</td>
<td>25</td>
</tr>
</tbody>
</table>

<sup>f</sup> NA indicates the selection option was not applicable since these are matching items.

**Demonstration observational rating scale**

Development of an observational rating scale was necessary to ascertain the evaluation of teacher-trainee demonstration performance in a microteaching experience. Objectives and the lesson plan for the demonstration instructional lesson served as references for the development of the observational rating scale.

A subject matter specialist and an evaluation specialist reviewed the items for clarity, objectivity, and observability. Several items were reworded and a general reorganization of the instrument was made.

The Demonstration Observational Rating Scale includes 11 items to be observed on each demonstration. Order of the demonstration
presentation sequence was considered in arranging the items for the instrument. The Demonstration Observational Rating Scale is found in Appendix F.

A nine-point scale was selected by the investigator to use in rating the items. The most appropriate response category was selected from a continuum of fair (1) to excellent (9). Descriptive statements were developed for each item in order that the same elements would be considered as the teacher-trainee was rated. Demonstration Item Descriptors are found in Appendix G.

The observational rating scale developed and used by the judge assisted in determining if the teacher-trainee observed was demonstrating below or above good on each specific item and the degree of competence related to each function was recorded on the device. If the teacher-trainee was above good, a number between 6-9 was recorded; if below good, a number between 1-4 was recorded. A 5 indicated that the performance was good. If, because of special circumstances, a competency was inapplicable, or impossible to perform, an X was recorded in the column (see Appendix F).

To ensure uniform rating of videotapes the investigator and evaluation specialist viewed videotapes which were selected from the department library videotapes of senior home economics education majors teaching by the demonstration strategy. During the sessions a demonstration videotape was observed and rated using the Demonstration Observational Rating Scale. Items that had conflicting responses were discussed.
After consensus was reached 10 videotapes were used to establish interrater reliability between the evaluation specialist and the investigator for the total score for the items of the observational rating scale. The interrater reliability coefficient between the two judges for the total items was .99. An interrater reliability of 0.85 is regarded as acceptable.

**Laboratory achievement test**

In order to determine student learning of the laboratory subject matter an objective test was developed. Development of the test was based on the objectives written for the instructional program.

A table of specifications assisted in determining a representative sample of the desired behavior being tested. Cell weights were derived from the objectives for the instructional program and the lesson plan. A table of specifications for the laboratory achievement test is presented in Table 4.

Seventeen four-option multiple choice items and six matching items were written. Of these at least two items were referenced to the knowledge-comprehension levels and application and higher levels for each objective of the instructional lesson.

A subject matter specialist and an evaluation specialist reviewed each item for the accuracy of the factual base and for technical errors. Items were assembled in a trial device.

Each of the items was screened for technical errors such as negative wording in the stem of an item. A computer program, Computer Simulation for Writing and Evaluating Multiple Choice Items (Hausafus, 1978)
Table 4. Table of specification for laboratory achievement test

<table>
<thead>
<tr>
<th>Laboratory content area</th>
<th>Knowledge-comprehension items</th>
<th>Application and higher items</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item number</td>
<td>Cell weight</td>
<td>Item number</td>
</tr>
<tr>
<td>Definition</td>
<td>1, 2, 7</td>
<td>13%</td>
<td>--</td>
</tr>
<tr>
<td>Learning potential</td>
<td>5</td>
<td>4%</td>
<td>25</td>
</tr>
<tr>
<td>Components:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td>16</td>
<td>4%</td>
<td>6, 8, 14, 18, 19, 20, 21, 22, 23</td>
</tr>
<tr>
<td>Controlling</td>
<td>10</td>
<td>4%</td>
<td>3, 4</td>
</tr>
<tr>
<td>Evaluating</td>
<td>9, 12</td>
<td>8%</td>
<td>11, 17</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>33%</td>
<td>15</td>
</tr>
</tbody>
</table>
identified technical difficulties which were corrected for items included in the revised test.

The trial device was administered to 12 home economics students enrolled in Family Environment 421, Demonstration, Spring Quarter, 1977. This procedure facilitated determining the clarity of the items for the final laboratory device. A reliability estimate of .68 was reported using the Kuder-Richardson Formula 20.

The trial device was revised and administered to 23 graduate students enrolled in H.Ed. 515, Evaluation in Home Economics, Summer Session, 1977. The reliability coefficient for the administration of the device was .47. Items which evidenced poor discrimination were further revised.

A copy of the final Laboratory Test containing 17 four-option multiple choice items and six matching items is found in Appendix H. Correct responses are indicated for both types of items.

Administration of the laboratory posttest occurred at the end of Fall Quarter, 1977. The reliability estimate of the posttest as computed by the Kuder-Richardson Formula 20 was .42 using a sample of 28. While the reliability coefficient was not high, factors influencing the reliability are the few number of test items and the few number of student responses (Gronlund, 1976).

Item analysis data for the laboratory posttest are presented in Table 5. Best items and potentially good items were selected by the same criteria used for the demonstration posttest. Of the 23 items, eight are designated as best items. Further, four of the 23 items are
Table 5. Item analysis data for the laboratory posttest

<table>
<thead>
<tr>
<th>Item number</th>
<th>Difficulty index (%)</th>
<th>Discrimination index</th>
<th>Standard deviation</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple choice items</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>82</td>
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<td>0.38</td>
<td>2</td>
<td>23&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2</td>
<td>1</td>
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<tr>
<td>2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>57</td>
<td>0.31</td>
<td>0.49</td>
<td>0</td>
<td>2</td>
<td>16&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0</td>
</tr>
<tr>
<td>3&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>0.35</td>
<td>24&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>4&lt;sup&gt;d&lt;/sup&gt;</td>
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<td>0.41</td>
<td>0.19</td>
<td>27&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0</td>
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<tr>
<td>5&lt;sup&gt;c&lt;/sup&gt;</td>
<td>68</td>
<td>0.22</td>
<td>0.47</td>
<td>19&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>5</td>
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<td>0.45</td>
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<td>8</td>
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<tr>
<td>7&lt;sup&gt;d&lt;/sup&gt;</td>
<td>96</td>
<td>0.06</td>
<td>0.19</td>
<td>0</td>
<td>1</td>
<td>27&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0</td>
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<tr>
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<td>0.41</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>22&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>9&lt;sup&gt;c&lt;/sup&gt;</td>
<td>64</td>
<td>0.41</td>
<td>0.48</td>
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<td>0</td>
<td>18&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>0.26</td>
<td>0.50</td>
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<td>7</td>
<td>3</td>
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<td>25</td>
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<td>0.00&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.00</td>
<td>28&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>14&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>14&lt;sup&gt;d&lt;/sup&gt;</td>
<td>96</td>
<td>0.06</td>
<td>0.19</td>
<td>27&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<sup>a</sup>Items that would probably meet item analysis criteria if sample size equaled 50.

<sup>b</sup>Indicates correct answer.

<sup>c</sup>Items that meet the item analysis criteria: A difficulty index between 30 and 70% and a discrimination index above .20.

<sup>d</sup>Items that need revision due to distracter analysis, discrimination index, or difficulty level.

<sup>e</sup>Discrimination index less than 0.05.
Table 5 (Continued)

<table>
<thead>
<tr>
<th>Item number</th>
<th>Difficulty index (%)</th>
<th>Discrimination index</th>
<th>Standard deviation</th>
<th>Distracter analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>Multiple choice items</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>15&lt;sup&gt;c&lt;/sup&gt;</td>
<td>68</td>
<td>0.29</td>
<td>0.47</td>
<td>19&lt;sup&gt;b&lt;/sup&gt; 0 3 6</td>
</tr>
<tr>
<td>16&lt;sup&gt;d&lt;/sup&gt;</td>
<td>96</td>
<td>0.41</td>
<td>0.19</td>
<td>0 1 27&lt;sup&gt;b&lt;/sup&gt; 0</td>
</tr>
<tr>
<td>17&lt;sup&gt;d&lt;/sup&gt;</td>
<td>100</td>
<td>0.00&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.00</td>
<td>0 0 0 28&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Matching items</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>18&lt;sup&gt;d&lt;/sup&gt;</td>
<td>100</td>
<td>0.00&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.00</td>
<td>0 28&lt;sup&gt;b&lt;/sup&gt; NA&lt;sup&gt;f&lt;/sup&gt; NA</td>
</tr>
<tr>
<td>19&lt;sup&gt;c&lt;/sup&gt;</td>
<td>54</td>
<td>0.56</td>
<td>0.50</td>
<td>12 15&lt;sup&gt;b&lt;/sup&gt; NA NA</td>
</tr>
<tr>
<td>20&lt;sup&gt;d&lt;/sup&gt;</td>
<td>96</td>
<td>--&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.19</td>
<td>27&lt;sup&gt;b&lt;/sup&gt; 1 NA NA</td>
</tr>
<tr>
<td>21&lt;sup&gt;d&lt;/sup&gt;</td>
<td>93</td>
<td>0.09</td>
<td>0.26</td>
<td>2 26&lt;sup&gt;b&lt;/sup&gt; NA NA</td>
</tr>
<tr>
<td>22&lt;sup&gt;c&lt;/sup&gt;</td>
<td>64</td>
<td>0.51</td>
<td>0.48</td>
<td>10 18&lt;sup&gt;b&lt;/sup&gt; NA NA</td>
</tr>
<tr>
<td>23&lt;sup&gt;d&lt;/sup&gt;</td>
<td>93</td>
<td>--&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.26</td>
<td>26&lt;sup&gt;b&lt;/sup&gt; 2 NA NA</td>
</tr>
</tbody>
</table>

<sup>f</sup>NA indicates the selection option was not applicable since these are matching items.

considered potentially good items and should not be revised until a greater number of respondents are obtained.

Laboratory observational rating scale

An observational rating scale was needed to determine the evaluation of teacher-trainee laboratory performance in a microteaching setting. References for the development of the observational rating scale were the laboratory instructional objectives and lesson plan.

A panel consisting of a subject matter specialist and an evaluation
specialist reviewed the items for clarity, objectivity, and observability. One item was deleted and several items were reworded.

The Laboratory Observational Rating Scale is comprised of seven items to be observed on each laboratory microteaching session. Items are ordered in a sequence related to laboratory principles. The Laboratory Observational Rating Scale is found in Appendix I.

Selection of a nine-point scale was made by the investigator to rate the items. A continuum of fair (1) to excellent (9) was the range for the most appropriate response category. Descriptive statements were developed for each item in order that the same elements would be considered as the teacher-trainee was rated. Laboratory Item Descriptors are found in Appendix J.

Plans for using the Laboratory Observational Rating Scale are similar to using the demonstration observational rating scale which was discussed in an earlier section.

Similar training sessions were conducted for establishing interrater reliability for the laboratory evaluation. Selections were made from the department library videotapes of senior home economics education majors teaching by the laboratory strategy. The Laboratory Observational Rating Scale was used in the rating of laboratory videotapes. Any conflicting responses and interpretation of items were discussed with the evaluation specialist.

To establish interrater reliability between the evaluation specialist and the investigator seven videotapes were used for the seven items on the observational rating scale. Videotapes not used in the training
sessions were independently rated by the judges.

An interrater reliability coefficient between the two judges for the total score for the items of the observational rating scale was .98. To be considered acceptable, 0.85 interrater reliability should be attained.

**Attitude inventory**

An instrument, Attitudes Toward Presentation Methods, was developed to measure student responses toward two different model presentations of a teaching strategy, live or videotape. The measurement of attitudes will help determine student perception of the model presentation.

Basic dimensions which were identified and included in the development of the instrument were: method of presentation, set toward example, teacher-student contact, and set toward total. A concise definition of each dimension facilitated the development of the attitude inventory. The dimensions, definitions, and corresponding item numbers are listed in Table 6.

A minimum of seven items reflecting negative and positive aspects for each dimension was written. Two subject matter specialists and an evaluation specialist designated 23 items appropriate with approximately half of the items being rated positive and half negative.

A nine-point scale of degrees of agreement and disagreement was used. Directions for use of the scale instructed the respondent to indicate the extent of agreement or disagreement with each statement. A number between 6 and 9 was used to indicate the degree to which the
Table 6. Dimensions of attitudes toward model presentation

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Definition</th>
<th>Item numbers (see Appendix K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of presentation</td>
<td>Attitudes toward the method of delivery or medium used to transmit information, live or videotape.</td>
<td>6, 13, 16, 19, 22</td>
</tr>
<tr>
<td>Set toward example</td>
<td>Attitudes toward the example of the teaching strategy.</td>
<td>4, 9, 11, 15, 18</td>
</tr>
<tr>
<td>Teacher-student contact</td>
<td>Attitudes toward opportunities for teacher and student interaction.</td>
<td>2, 5, 7, 4, 17</td>
</tr>
<tr>
<td>Set toward total</td>
<td>Attitudes toward the expectation and application of the presentation in general.</td>
<td>1, 3, 8, 12, 14, 29, 21, 23</td>
</tr>
</tbody>
</table>

student agreed with the statement, and a number between 1 and 4 was to indicate the degree to which they disagreed. A 5 indicated that the student neither agreed nor disagreed with the statement. A copy of the Attitudes Toward Presentation Methods is found in Appendix K.

Administration of the Attitudes Toward Presentation Methods occurred in several Iowa State University educational settings in conjunction with presentations of the instructional lesson. Responding to the device were 27 student members of the Home Economics Education Club; 10 students enrolled in Family Environment 421, Demonstration; and 22 graduate students enrolled in H.Ed. 515, Evaluation in Home
Economics. With the 58 research subjects participating in the study this resulted in a total available number of 117 responses.

The first step in the analysis of the Attitudes Toward Presentation Methods instrument was to transform the data to normalized ranks. The transformation to normalized ranks is found in Appendix L. This was done because intervals between the response values were not believed to be equal, i.e., a person who indicates strong agreement or disagreement with an item does so with more certainty than one who mildly agrees or disagrees.

A 23 x 23 item intercorrelation matrix was computed across the 117 respondents and inspected for evidence of clusters. This inspection not only showed that the intercorrelation matrix did not contain subscales but that only one general scale of 15 items was present. These items were identified by finding correlation coefficients ≥ 0.40. The matrix is presented in Table 7.

Subsequently, the responses to the Attitudes Toward Presentation Methods were summed across these 15 items. Six items (4, 8, 12, 13, 19, 21) had response patterns reversed because these items described undesirable characteristics and their correlation coefficients were negative. Using the Spearman-Brown procedure, reliability for the device was .89.

Background information and cumulative grade point average

The amount of experience with the teaching strategies and the grade point for the teacher-trainees were hypothesized to be factors affecting student achievement, performance, and attitude. Cumulative grade point average (CGPA) was used as an index of student ability to
Table 7. Intercorrelation matrix for attitudinal items

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<tr>
<th></th>
<th>1</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>11</th>
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</table>

\(^a\)The decimal point has been omitted from the correlations on this table.
achieve as recommended by Crabtree (1965). The range of CGPA was 2.26 to 3.88 and 2.36 to 3.94 respectively for demonstration and laboratory strategies.

Background information on each teacher-trainee regarding amount of demonstration or laboratory experience (Appendix M) was obtained using forms developed by the researcher. Each teacher-trainee was assigned one point per unit of background experience. Scores ranged from 0 to 6 for each teaching strategy. These data were not coded until the conclusion of the experiments.

Summary

Development of the evaluative instruments has been discussed in this section. A pre-post achievement test was constructed for the demonstration strategy and a pre-post achievement test was constructed for the laboratory strategy. Observational rating scales were developed for evaluation of the performance of the teacher-trainee in a microteaching setting for the demonstration strategy and for the laboratory strategy. An attitudinal inventory was developed to measure student response to the live model presentation and the videotape model presentation of the teaching strategy. Background experience forms were developed for each teaching strategy and plans to obtain student cumulative grade point average were made.

Administration of the pretest was directed by the researcher and occurred prior to the instructional lesson. Previous experience was recorded using a self-report technique referenced to the respective teaching strategy. At the conclusion of the instructional lesson in
which the live presentation or videotape presentation was a part, the
researcher administered the attitudinal inventory. Students responded
to the posttest of achievement during the last two weeks of the quarter.
The researcher administered the posttest during a scheduled class
period.

Collection of Data

The data collection for the demonstration occurred during Spring
Quarter, 1977, and laboratory data collection took place during Fall
Quarter, 1977. Dependent variable data were collected by three instru­
ments: a pre-post achievement test, an attitudinal inventory, and
an observational rating scale. Implementation of the administration of
the evaluative instruments is presented schematically in Table 8 with
each instrument developed and used in this study identified.

Table 8. Administration of evaluative instruments

<table>
<thead>
<tr>
<th>Administration sequence of evaluative instruments</th>
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<td>Background information - Informed consent</td>
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<tr>
<td>Cumulative grade point average</td>
</tr>
<tr>
<td>Pretest of achievement a</td>
</tr>
<tr>
<td>Lesson presentation (live, videotape)</td>
</tr>
<tr>
<td>Attitudinal inventory a</td>
</tr>
<tr>
<td>Microteaching</td>
</tr>
<tr>
<td>Practice, no practice</td>
</tr>
<tr>
<td>Posttest of achievement a</td>
</tr>
<tr>
<td>Rating of performance a</td>
</tr>
</tbody>
</table>

a Instruments developed and used in study.
Scheduled dates for the teacher-trainee demonstration presentations for the microteaching experience were set for three days in the last month of the quarter. The designated dates allowed for the completion of one microteaching experience requirement for H.Ed. 406, Methods of Teaching Home Economics. Teacher-trainees voluntarily signed for the desired time and a list was compiled and posted in the Home Economics Education Department as a reminder of the microteaching responsibility. Thirty teacher-trainees participated in the microteaching experience.

Each videotape was observed and rated by the researcher using the Demonstration Observational Rating Scale which has 11 items (Appendix F). A nine-point scale was used with the most appropriate response category ranging from fair (1) to excellent (9). Demonstration Item Descriptors related to each item facilitated the evaluation of individual demonstration items (Appendix G). At the conclusion of the videotape evaluations, the researcher randomly selected four videotapes to check the consistency of evaluation and the second evaluation was equivalent to the first evaluation. The evaluation specialist, who assisted in establishing interrater reliability for the demonstration evaluation, independently and randomly selected five videotapes for checking. Ratings of the researcher and the second judge were identical so the evaluation work was accepted for the study. Data from the evaluation of demonstration presentations were transferred to a tabular form and verified for accuracy.

After the experiment was completed, demonstration experience
background information (Appendix M) and cumulative grade point average were transferred to a tabular form and verified for accuracy. Data collection for the laboratory teaching strategy utilized the same management plan as the demonstration teaching strategy.

Analysis of Data

Correlation coefficients were calculated to study the relationship between previous experience and student performance in terms of achievement scores, attitudinal inventory, and observational rating for the demonstration teaching strategy and for the laboratory teaching strategy. The cumulative grade point average of students was also studied through correlation procedures using the same correlation analysis.

Various analyses of variance designs were used to study the effect of modeling and practice-feedback on student achievement, performance, and attitudes as related to the demonstration and laboratory teaching strategies. The specific model statements (Winer, 1971) and the associated expected mean squares follow. The three model statements are:

Achievement scores

\[ Y'_{ijk} = \bar{Y}_{ijk} - \beta (\bar{X}_{ijk} - \bar{X}) = \mu + M_j + P_k + (MP)_{jk} + \epsilon_{ijk} \]

Performance scores

\[ Y_{ijk} = \mu + M_i + P_j + (MP)_{ij} + \epsilon_{ijk} \]

Attitude scores

\[ Y_{ij} = \mu + M_i + \epsilon_{ij} \]

where

\( Y = \) score assigned \( i \)th student by the \( j \)th treatment for the \( k \)th group

\( \mu = \) overall mean

\( \beta = \) covariate (pretest score)
M = model presentation effect
P = practice effect
MP = model by practice interaction
€ = error

The expected mean squares for the ANOVA are shown in Table 9. The level of significance selected for testing was the .05 level.

Table 9. Expected mean squares for factorial analyses of variance designs

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Expected mean squares (^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievements scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Covariate (pretest)</td>
<td>1</td>
<td>(\sigma^2 + npM^2)</td>
</tr>
<tr>
<td>Model presentation (M)</td>
<td>1</td>
<td>(\sigma^2 + npM^2)</td>
</tr>
<tr>
<td>Practice (P)</td>
<td>1</td>
<td>(\sigma^2 + npP^2)</td>
</tr>
<tr>
<td>Model by practice (MP)</td>
<td>1</td>
<td>(\sigma^2 + npMP^2)</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>(\sigma^2)</td>
</tr>
<tr>
<td>Performance scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model presentation (M)</td>
<td>1</td>
<td>(\sigma^2 + npM^2)</td>
</tr>
<tr>
<td>Practice (P)</td>
<td>1</td>
<td>(\sigma^2 + npP^2)</td>
</tr>
<tr>
<td>Model by practice (MP)</td>
<td>1</td>
<td>(\sigma^2 + npMP^2)</td>
</tr>
<tr>
<td>Error</td>
<td>26</td>
<td>(\sigma^2)</td>
</tr>
<tr>
<td>Attitude scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model presentation (M)</td>
<td>1</td>
<td>(\sigma^2 + npM^2)</td>
</tr>
<tr>
<td>Error</td>
<td>28</td>
<td>(\sigma^2)</td>
</tr>
</tbody>
</table>

\(^a\) All effects are considered fixed.
FINDINGS AND DISCUSSION

The purposes of the study were to investigate the effectiveness of live versus videotape presentations of demonstration and laboratory teaching strategies in home economics education regarding student achievement, skill in the teaching strategy, and attitudes toward the presentation method and to contrast practice against no practice of each teaching strategy on student achievement and skill acquisition.

Background factors are reported first followed by the experimental results related to the demonstration and laboratory teaching strategies.

Relationships Between Background and Dependent Variables

Correlation coefficients between background and dependent variables for demonstration and laboratory are presented in Table 10. Background variables were previous experience and cumulative grade point average whereas the dependent variables were achievement, performance, and attitude. Inspection of Table 10 shows that none of the correlation coefficients were significant for the demonstration or the laboratory teaching strategies indicating that previous experience and cumulative grade point average were not associated with achievement, performance, and attitudes of students. Because these variables were not significant, they were not used as covariates in subsequent analyses.

The finding that cumulative grade point average was not significant is interesting as it differs from Crabtree's (1965) findings. While she found that undergraduate cumulative grade point average was
Table 10. Correlation coefficients between background and dependent variables for demonstration and laboratory

<table>
<thead>
<tr>
<th></th>
<th>Demonstration</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge</td>
<td>Attitude</td>
</tr>
<tr>
<td>Experience^a</td>
<td>-0.07</td>
<td>-0.14</td>
</tr>
<tr>
<td>CGPA^b</td>
<td>-0.31</td>
<td>-0.18</td>
</tr>
</tbody>
</table>

^aPrevious experience in learning opportunities related to the respective teaching strategy.

^bCumulative grade point average.

the most significant predictor of global teaching performance, no relationship was found in this study. Perhaps the difference is that Crabtree's study was concerned with overall teacher performance while this study was concerned with two teaching strategies.

Demonstration Experimental Findings

Findings associated with the three dependent variables for the demonstration teaching strategy are presented in the following order: achievement test results, performance results, and attitude results.

Achievement test results

Results of the two-factor analysis of variance with one covariate used to investigate if there was a significant difference between live versus videotape, practice versus no practice, and interaction between these variables on demonstration achievement are presented in Table 11.
Table 11. Analysis of variance for demonstration achievement

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F-ratio^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>(4)</td>
<td>(70.56)</td>
<td>17.64</td>
<td>(5.99)</td>
</tr>
<tr>
<td>Pretest</td>
<td>1</td>
<td>51.23</td>
<td>51.23</td>
<td>17.40</td>
</tr>
<tr>
<td>Live-Video</td>
<td>1</td>
<td>1.95</td>
<td>1.95</td>
<td>.66</td>
</tr>
<tr>
<td>Practice-No practice</td>
<td>1</td>
<td>8.79</td>
<td>8.79</td>
<td>2.99</td>
</tr>
<tr>
<td>Interaction</td>
<td>1</td>
<td>1.26</td>
<td>1.26</td>
<td>.43</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>70.68</td>
<td>2.95</td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>28</td>
<td>141.24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^aThe degrees of freedom for F are 1 and 24. Table value for F is 4.26 at 5%.

Table 12. Mean scores for demonstration achievement

<table>
<thead>
<tr>
<th>Number of students</th>
<th>Mean Pretest</th>
<th>Mean Posttest</th>
<th>Score range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model presentation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live</td>
<td>13</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Video</td>
<td>16</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td><strong>Microteaching</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice</td>
<td>16</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>No practice</td>
<td>13</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live-Practice</td>
<td>7</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Live-No practice</td>
<td>6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Video-Practice</td>
<td>9</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Video-No practice</td>
<td>7</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

**Note:** Maximum score = 19.
Mean scores for each of the treatments are presented in Table 12.

Inspection of these tables indicates that there was no difference in achievement of students as a result of live versus videotape, practice versus no practice, and the interaction effect. The lack of significant effects is not due to a ceiling on test scores as the maximum number of points possible was 19 and the highest score was 16. Hence, further variance could have occurred if it had been present.

The optimum score for maximum differentiation between students for the demonstration test is 12-13 (Gronlund, 1976). Since the overall test mean is in this range, student learning can be judged adequate.

These findings suggest that in teacher education settings the demonstration teaching strategy could be presented by either live or videotape models. While these findings imply that practice does not really seem to make any difference in the acquisition of knowledge, it probably does not suggest that practice should be omitted since not all possible variables were measured. Some of these variables are teacher-trainee awareness of characteristics of students, commitment to professional development, or degree of transfer from the microteaching setting to the classroom.

**Performance results**

Results of the two-factor analysis of variance to study if there was a significant difference between live versus videotape, and practice versus no practice on demonstration performance are presented in Table 13. Mean scores for each of the treatments are found in Table 14.
Table 13. Analysis of variance for demonstration performance

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F-ratio&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>(3)</td>
<td>(2213.47)</td>
<td>737.82</td>
<td>(2.57)</td>
</tr>
<tr>
<td>Live-Video</td>
<td>1</td>
<td>1423.21</td>
<td>1423.21</td>
<td>4.96*</td>
</tr>
<tr>
<td>Practice-No practice</td>
<td>1</td>
<td>145.36</td>
<td>145.36</td>
<td>0.51</td>
</tr>
<tr>
<td>Interaction</td>
<td>1</td>
<td>741.18</td>
<td>741.18</td>
<td>2.58</td>
</tr>
<tr>
<td>Error</td>
<td>26</td>
<td>7462.00</td>
<td>287.00</td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>29</td>
<td>9675.47</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>The degrees of freedom for F are 1 and 26. Table value for F is 4.22 at 5%.

<sup>*</sup>P < .05.

Table 14. Mean scores for demonstration performance

<table>
<thead>
<tr>
<th></th>
<th>Number of students</th>
<th>Mean</th>
<th>Percentage</th>
<th>Score range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model presentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live</td>
<td>14</td>
<td>59</td>
<td>60%</td>
<td>27-95</td>
</tr>
<tr>
<td>Video</td>
<td>16</td>
<td>72</td>
<td>73%</td>
<td>27-95</td>
</tr>
<tr>
<td>Microteaching</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice</td>
<td>16</td>
<td>68</td>
<td>69%</td>
<td>27-95</td>
</tr>
<tr>
<td>No practice</td>
<td>14</td>
<td>64</td>
<td>65%</td>
<td>27-95</td>
</tr>
<tr>
<td>Interaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live-Practice</td>
<td>7</td>
<td>66</td>
<td>67%</td>
<td>54-95</td>
</tr>
<tr>
<td>Live-No practice</td>
<td>7</td>
<td>52</td>
<td>53%</td>
<td>27-71</td>
</tr>
<tr>
<td>Video-Practice</td>
<td>9</td>
<td>70</td>
<td>71%</td>
<td>27-93</td>
</tr>
<tr>
<td>Video-No practice</td>
<td>7</td>
<td>76</td>
<td>77%</td>
<td>58-95</td>
</tr>
</tbody>
</table>

Note: Maximum score = 99
A significant difference in demonstration performance in a micro-teaching experience was found between those students who viewed the live model presentation and those who viewed the videotape model presentation. Inspection of the mean scores shows that students who viewed the videotape model presentation had a higher mean score (72 or 73%) than students who watched the live model presentation (59 or 60%).

An acceptable level of performance of 70 percent was judgmentally established. Since the students who observed the videotape had 73 percent of the total possible performance points, student performance was considered acceptable. Students who observed the live model presentation had 60 percent of the total possible performance points which was judged not acceptable. Hence, it appears that the videotape model presentation of the demonstration teaching strategy was more effective than the live model presentation for the acquisition of demonstration performance skills.

No significant difference was found between practice versus no practice and the interaction effect on the acquisition of demonstration performance skills. While these findings suggest that practice of the teaching strategy may not be necessary, it probably does not suggest that practice should be omitted because not all possible variables were measured. Some of these variables, such as teacher-trainee awareness of characteristics of students, have already been identified.
Attitude results

Presented in Table 15 are the results of the one-way analysis of variance used to study if there was a significant difference between live versus videotape model presentations of the demonstration teaching strategy on student attitudes. Mean scores for the model presentation attitudinal inventory are presented in Table 16.

Table 15. Analysis of variance for model demonstration attitudes

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F-ratio$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>(1)</td>
<td>(13.21)</td>
<td>13.21</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Model presentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live-Video</td>
<td>1</td>
<td>13.21</td>
<td>13.21</td>
<td>0.49</td>
</tr>
<tr>
<td>Error</td>
<td>28</td>
<td>754.65</td>
<td>26.95</td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>29</td>
<td>767.87</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$The degrees of freedom for $F$ are 1 and 28. Table value for $F$ is 4.20 at 5%.

Table 16. Means for model demonstration attitudes

<table>
<thead>
<tr>
<th>Model presentation</th>
<th>Number of students</th>
<th>Means</th>
<th>Percentage</th>
<th>Score range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live</td>
<td>14</td>
<td>36</td>
<td>80%</td>
<td>32-40</td>
</tr>
<tr>
<td>Video</td>
<td>16</td>
<td>34</td>
<td>76%</td>
<td>22-44</td>
</tr>
</tbody>
</table>

Note: Maximum score = 45.
Inspection of the table shows that there was no significant difference in attitude of students toward live or videotape presentations. The range of points on the attitudinal measure was 0-45 with high numerical scores representing a positive feeling toward the method of presentation. The mean score was 36 for the live presentation and 34 for the videotape presentation which indicates that feelings toward either method were not only essentially the same but also positive. While these findings imply that videotape is a viable option for this form of preservice teacher education it is not an endorsement that all teaching should use videotape presentation methods.

Laboratory Experimental Findings

Results for the laboratory teaching strategy on each of the three dependent variables are presented in the following order: achievement test results, performance results, and attitude results.

Achievement test results

Results of the two-factor analysis of variance with one covariate used to investigate if there was a significant difference between live versus videotape, practice versus no practice, and interaction between these variables on laboratory achievement are presented in Table 17. Mean scores for each of the treatments are presented in Table 18.

A nonsignificant F value was found for the effect of live versus videotape, practice versus no practice, and interaction on the achievement of students. For maximum differentiation between students for the tests with multiple choice and matching format of the laboratory
Table 17. Analysis of variance for laboratory achievement

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F-ratio(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>(4)</td>
<td>(21.13)</td>
<td>5.23</td>
<td>(1.06)</td>
</tr>
<tr>
<td>Pretest</td>
<td>1</td>
<td>13.60</td>
<td>13.60</td>
<td>2.72</td>
</tr>
<tr>
<td>Live-Video</td>
<td>1</td>
<td>3.10</td>
<td>3.10</td>
<td>0.62</td>
</tr>
<tr>
<td>Practice-No practice</td>
<td>1</td>
<td>2.52</td>
<td>2.52</td>
<td>0.50</td>
</tr>
<tr>
<td>Interaction</td>
<td>1</td>
<td>1.84</td>
<td>1.84</td>
<td>0.37</td>
</tr>
<tr>
<td>Error</td>
<td>23</td>
<td>114.98</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>27</td>
<td>136.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)The degrees of freedom for F are 1 and 23. Table value for F is 4.28 at 5%.

Table 18. Mean scores for laboratory achievement

<table>
<thead>
<tr>
<th>Number students</th>
<th>Mean Pretest</th>
<th>Mean Posttest</th>
<th>Score range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live</td>
<td>14</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Video</td>
<td>14</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Microteaching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice</td>
<td>14</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>No practice</td>
<td>14</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live-Practice</td>
<td>7</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>Live-No practice</td>
<td>7</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Video-Practice</td>
<td>7</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Video-No practice</td>
<td>7</td>
<td>16</td>
<td>18</td>
</tr>
</tbody>
</table>

Note: Maximum score = 23.
test, an optimum score is 15-16 (Gronlund, 1976). Since the overall mean was 18, it indicates not only that the test was a little too easy but that achievement was acceptable. Further, this high numerical mean score probably did not affect these experimental results as the maximum score was 23 and students had the opportunity to achieve higher scores. Therefore, these findings suggest that either method of presentation is equally effective in preservice teacher education settings for acquisition of laboratory knowledge.

**Performance results**

Presented in Table 19 are the results of the two-factor analysis of variance used to study if there was a significant difference between the live versus videotape, practice versus no practice, and interaction on laboratory performance. Mean scores for each of the treatments are presented in Table 20.

A nonsignificant F value was found for the effect of live versus videotape, practice versus no practice, and interaction on the performance of students in a microteaching experience. These findings suggest that type of instruction and practice versus no practice had no effect on performance.

Student performance mean scores for the live model presentation was 34 while the students who viewed the videotape model presentation had 32. Of the total possible performance points, students who watched the live model presentation had 54 percent while students who viewed the videotape had 51 percent.
Table 19. Analysis of variance for laboratory performance

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F-ratio&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>(3)</td>
<td>(462.39)</td>
<td>154.13</td>
<td>(0.76)</td>
</tr>
<tr>
<td>Live-Video</td>
<td>1</td>
<td>38.89</td>
<td>38.89</td>
<td>0.19</td>
</tr>
<tr>
<td>Practice-No practice</td>
<td>1</td>
<td>211.75</td>
<td>211.75</td>
<td>1.04</td>
</tr>
<tr>
<td>Interaction</td>
<td>1</td>
<td>211.75</td>
<td>211.75</td>
<td>1.04</td>
</tr>
<tr>
<td>Error</td>
<td>24</td>
<td>4887.71</td>
<td>203.65</td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>27</td>
<td>5350.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>The degrees of freedom for F are 1 and 24. Table value for F is 4.26 at 5%.

Table 20. Mean scores for laboratory performance

<table>
<thead>
<tr>
<th>Number of students</th>
<th>Mean</th>
<th>Percentage</th>
<th>Score range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live</td>
<td>14</td>
<td>34</td>
<td>54%</td>
</tr>
<tr>
<td>Video</td>
<td>14</td>
<td>32</td>
<td>51%</td>
</tr>
<tr>
<td>Microteaching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice</td>
<td>14</td>
<td>30</td>
<td>48%</td>
</tr>
<tr>
<td>No practice</td>
<td>14</td>
<td>36</td>
<td>57%</td>
</tr>
<tr>
<td>Interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live-Practice</td>
<td>7</td>
<td>34</td>
<td>54%</td>
</tr>
<tr>
<td>Live-No practice</td>
<td>7</td>
<td>34</td>
<td>54%</td>
</tr>
<tr>
<td>Video-Practice</td>
<td>7</td>
<td>26</td>
<td>41%</td>
</tr>
<tr>
<td>Video-No practice</td>
<td>7</td>
<td>37</td>
<td>59%</td>
</tr>
</tbody>
</table>

Note: Maximum score = 63.
Performance means scores for students who practiced was 50 and for those without practice, 36. Of the total possible performance points, this represents 48 percent for practice and 57 percent for no practice.

Since a 70 percent level of performance was judged as a minimum acceptable performance level, these performance levels were judged not acceptable. These findings suggest that additional learning opportunities are necessary to ensure students' acquisition of the skills. The apparent need for additional learning opportunities is not surprising given the complexities of conducting a laboratory.

**Attitude results**

Results of the one-way analysis of variance used to study if there was a significant difference between the live versus videotape model presentations of the laboratory teaching strategy are presented in Table 21. Mean scores for the model presentation attitudinal inventory are presented in Table 22.

Inspection of the table shows that there was no significant difference in attitude of students toward live or videotape presentations. Since the possible range of scores on the attitude device was 0-45 with a high score representing a positive attitude, the mean scores of 29 and 33 show students were responding favorably in either presentation method.

These findings are similar to the demonstration attitudinal findings. Students seem to feel that either method of presentation is equally good. This suggests that videotape presentations may be one
Table 21. Analysis of variance for model laboratory attitudes

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>Sum of squares</th>
<th>Mean squares</th>
<th>F-ratio^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model (1)</td>
<td>1</td>
<td>141.75</td>
<td>141.75</td>
<td>(3.69)</td>
</tr>
<tr>
<td>Model presentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live-Video</td>
<td>1</td>
<td>141.75</td>
<td>141.75</td>
<td>3.69</td>
</tr>
<tr>
<td>Error</td>
<td>26</td>
<td>998.93</td>
<td>38.42</td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>27</td>
<td>1140.68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^a The degrees of freedom for F are 1 and 26. Table value for F is 4.22 at 5%.

Table 22. Means for model laboratory attitudes

<table>
<thead>
<tr>
<th>Model presentation</th>
<th>Number of students</th>
<th>Means</th>
<th>Percentage</th>
<th>Score range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live</td>
<td>14</td>
<td>33</td>
<td>73%</td>
<td>20-42</td>
</tr>
<tr>
<td>Video</td>
<td>14</td>
<td>29</td>
<td>64%</td>
<td>17-36</td>
</tr>
</tbody>
</table>

Note: Maximum score = 45.

viable option for preservice teacher education.

Summary

The present study dealt with student knowledge, performance, and attitude as related to two complex teaching strategies as a function of instructional method and practice. No significant differences were
found between instructional method and practice effect on achievement related to either strategy; achievement was acceptable by any method.

A significant difference in the demonstration performance was found between those students who viewed the live model presentation and those who viewed the videotape model presentation with the latter being superior. Whereas no differences were found in laboratory performance due to instructional method or practice, performance was not judged acceptable. This may be due to the complexity of conducting a laboratory experience.

Student attitude was not affected by either presentation method. Student attitude was positive toward either method in both cases.

Comparison of the findings with previous studies is limited since this study concentrated on complex teaching strategies, not specific teaching skills. These findings support those of Borg et al. (1969) who found that omission of practice and feedback had little effect on the acquisition of a complex teaching strategy. The Borg study focused on 12 classroom behaviors which were helpful in conducting a discussion lesson. Of the five groups of 79 elementary teachers, three groups completed microteaching with practice and feedback including videotape recording and replay, one group completed the program with practice and feedback but no videotape recording or replay, and one group did not participate in microteaching. Trained raters evaluated pre-postcourse videotapes for behavior changes and found that students who did not practice and did not receive feedback in the microteaching environment were not significantly different than groups that did.
Further comparison of the findings are not possible because Borg's study did not measure student achievement and attitudes. Although Campeau (1974) and Moldstad (1974) recommended videotape research which incorporated measurement of student achievement, no other studies were found which showed the effect of videotape programming on student cognitive achievement and performance.

The research findings need to be interpreted conservatively because of the size of the sample, the time available for instruction, and the degree of rehearsal by the teacher-trainee. A cell size of 30 (120 total) subjects would strengthen the findings because as the sample size is increased, the treatment effect tends to stabilize. An opportunity to enlarge the scope of the content would be possible with increased instructional time. The instructional lesson could be presented in more depth which would permit additional teaching and testing.

Work towards an effective approach for the acquisition of laboratory performance skills could include increased time as well as control of length of time of the rehearsal factor. Increased time for the acquisition of laboratory performance skills can include different levels of preservice laboratory experiences. These different levels could be structured as teaching peers and teaching adolescents from a youth organization. As the teacher-trainee developed laboratory performance skills which were satisfactory at one level, the teacher-trainee could move to a higher level. These teaching experiences could precede the microteaching in which the teacher-trainee conducts a laboratory with three to four learners from a junior high or high school.
SUMMARY

A concerted effort has been made in recent years to improve pre-service teacher education programs. During the 1960s a trend to narrow the teaching act to specific teaching skills was introduced and microteaching evolved. Microteaching, frequently accompanied by videotape recordings, has been widely accepted. Approximately half of all teacher education programs at the national level have added videotape equipment to the resources available for teacher preparation.

Since videotape usage is widespread, effectively designed combinations of videotape models with other available methods have been proposed to incorporate modeling and practice experiences for the acquisition of complex teaching strategies. The present experimental study was designed to focus on the complex teaching strategies of demonstration and laboratory incorporating modeling and practice experiences.

The purposes of the study were to investigate the effectiveness of live model versus videotape model presentations of demonstration and laboratory teaching strategies in home economics education in relation to student achievement, performance of the teaching strategy, and attitudes toward the presentation method, and to contrast practice against no practice of each teaching strategy on student knowledge acquisition and teaching skill acquisition.

In order to carry out the experiment two instructional packets were developed. The instructional format included two major phases, knowledge acquisition and skill acquisition. The knowledge acquisition
phase was conducted during a 50-minute class period and contained three parts: A, principles of teaching strategy; B, model presentation (live or videotape); and C, summary. The skill acquisition phase was provided in university microteaching studios with the teacher-trainees having the opportunity to practice the teaching strategy or to practice an alternate teaching strategy.

Instructional objectives associated with each teaching strategy were developed, and learning opportunities for presenting the model teaching strategy by live and videotape models were planned for each instructional packet. The written instructional plans were reviewed by faculty members in the Home Economics Education Department prior to field testing.

To determine the effectiveness of the instructional lessons the following evaluative instruments were developed for each teaching strategy: pre-post achievement test, observational rating scale, and model presentation (live, videotape) attitudinal inventory. Forms were also developed to obtain student background experience on the teaching strategies.

Pilot testing of the instructional lessons was carried out prior to the research study. Following the pilot testing the model presentations were videotaped at WOI-TV, Iowa State University.

Subjects who participated in the study were 58 senior home economics education students at Iowa State University: 30 enrolled Spring Quarter, 1977, and 28 enrolled Fall Quarter, 1977. Students were randomly assigned to four groups for the testing of the teaching strategy
as follows: Group 1, model live presentation, no practice; Group 2, model videotape presentation, no practice; Group 3, model live presentation, practice; and Group 4, model videotape presentation, practice.

Data collection occurred throughout the quarter. Prior to the knowledge acquisition phase, background experience information, cumulative grade point average, and pretest responses were obtained. During the knowledge acquisition phase the attitudinal inventory was administered. The observational rating scores were determined following the skill acquisition phase. Posttest responses were obtained during a class period at the end of the quarter.

Correlations and analyses of variance were used to study the experimental treatments of the demonstration and laboratory teaching strategies on the acquisition of teacher-trainee knowledge and performance as well as student attitude response. None of the correlation coefficients was significant for the demonstration and laboratory teaching strategies indicating previous experience and cumulative grade point average probably did not influence student achievement, skill in the teaching strategy, or attitudes toward the presentation method.

A significant difference beyond the .05 level was found between the live and videotape model demonstration presentation on the performance of students in microteaching with the videotape model presentation being superior. The analyses of variance results for the demonstration teaching strategy showed that no significant differences were found between achievement and the presentation method, practice effect, and interaction. No significant difference between attitudinal response
and presentation method was found. In all cases, achievement, performance and attitude were acceptable except performance for live.

For the laboratory teaching strategy, the findings were not significant. The analyses of variance showed no significant differences for achievement, performance, and attitudes with presentation method, practice effect, and interaction. While achievement and attitude were at acceptable levels, laboratory performance was not judged acceptable for either method. This may suggest that more learning opportunities were needed due to the complex nature of the teaching strategy.

As a result of videotape model presentations of the demonstration and the laboratory teaching strategies, student achievement and performance in the acquisition of the teaching strategy was as good or better than those receiving live model presentations. The findings support the feasibility of videotape model presentations for the acquisition of knowledge and performance of the demonstration and laboratory teaching strategies in a similar preservice teacher education setting. Furthermore, practice of the teaching strategy did not seem to have any effect on achievement and performance. Since all possible variables were not studied, further investigation needs to be completed before practice of teaching strategies is omitted from teacher preparation programs. Student attitudes toward the demonstration and laboratory presentations were essentially the same for the live or videotape models. In both cases, student attitudes were positive which implies that live or videotape model presentations would be equally acceptable in a similar teacher preparation program.
LITERATURE CITED


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The Center for Vocational Education, The Ohio State University. Direct student laboratory experience (Module C-7 of Category C - Instructional Execution Professional Teacher Education Module Series). Athens, Georgia: American Association for Vocational Instructional Materials, 1977. (b)


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Shavelson, R. J. What is the basic teaching skill? The Journal of Teacher Education, 1973, 2, 144-151.


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Praise and glory be to God for wisdom and strength.
APPENDIX A: DEMONSTRATION PRINCIPLES LESSON PLAN
The objectives for the Demonstration Principles Lesson Plan have been identified on pages 26 and 27.

I. Demonstration as a teaching strategy

   A. Introduction

      1. Good teachers are always looking for ways to present their lessons in a stimulating and interesting way.

      2. The method of lesson presentation which is most appropriate will depend on the nature of the subject matter being taught and the different ways in which students learn.
         a. For less experienced in a bread unit, quick bread; more experienced, yeast bread.
         b. For less experienced in clothing, machine buttonholes, more advanced, bound buttonholes.

      3. The demonstration method is dependent also on the competencies of the teacher.
         a. Being competent in demonstrating manipulative skills will help a home economics teacher in the classroom.
         b. Seeing a demonstration does not mean that practice is unnecessary for practice will be needed.

   B. Definition of demonstration

      1. Demonstration has had a special meaning in home economics all through the years - it is a word that suggests show-how based on know-how.

      2. The Center for Vocational Education defines a demonstration as a visualized explanation of an important process;
within this process manipulative skills are used.

3. Allgood refers to the lecture-demonstration as a means of presenting material in a raw form and changing this form to a product.

4. Manipulative skills means a "hands on" experience for demonstrations; it is more than using visual aids in teaching.

C. Purpose of the demonstration

1. The purpose of the lecture demonstration is promotional, educational or frequently a combination of both.
   a. Promotional to create interest and motivate learners.
   b. Educational by providing information.

2. The primary function of a demonstration is to show proper procedures and new skills.

3. Educational demonstrations are like continued stories for they should leave the learners with motivation for continuation of the work rather than with completed satisfaction.

4. Demonstrations can help an individual develop poise and the ability to talk and act at the same time as well as learn the importance of organization and timing.

5. Involvement of learners is a positive feature of the demonstration.
   a. Learners can help measure, assist the teacher.
   b. Learners can be active in the demonstration instruction.

6. Demonstrations can be economical on the department budget since fewer supplies and equipment are needed for the
learning activity instead of using a laboratory.

D. Uses of the demonstration

1. Use the demonstration as a method of teaching for increased understanding of a skill and to bring about improved standards.

2. Use the demonstration method to show:
   a. Proper procedures and skills for the desired results.
   b. Point out new techniques to be developed by the learners
   c. Set up standards for the end product.

3. In home economics the subject matters are varied and the demonstration can be used for classes in:
   a. Food and nutrition - beating egg whites
   b. Textiles and clothing - attaching a collar
   c. Child development - making a toy
   d. Housing - refinishing furniture

4. Other home economists may use the demonstration as a teaching strategy:
   a. Commercial demonstration
   b. Utility company
   c. Equipment company
   d. Extension personnel and 4-H leaders
   e. Post-secondary and adult education

II. Preparing for a demonstration

   A. Selection of demonstration topic
1. Select a concept which lends itself to demonstration with manipulative skills
   a. Inserting a zipper
   b. Repairing furniture

2. Select a subject suitable for intended audience
   a. Subject needs to be appropriate for learners' interests

B. Placement of the demonstration in the unit

1. Should be sufficient background concerning subject matter so learners are ready for the information.

2. If there are new terms or new cognitive information which students need to know in order to understand the demonstration, an informational type lesson should be scheduled and presented before the demonstration.

3. When the above procedure is followed, the students will be better prepared to follow the teacher's demonstration.

4. The demonstration should also fit in with future learning activities.

C. Length of demonstration

1. Demonstrations vary in length depending on the ages of the learners.

2. If there are many steps involved in the manipulative skills smaller segments should be prepared for better comprehension.
   a. In yeast rolls, break the process into mixing ingredients, kneading dough, and shaping and baking the dough.
   b. In a meringue pie, break it into pastry shell, cream
filling, and meringue.

3. Whenever possible, certain steps can be done in advance to save time and not interfere with the clarity of the process.
   a. Mixing sugar and cinnamon for sweet rolls.
   b. Greasing a baking sheets.

4. Timing of the demonstration is important; the teacher should know in advance the approximate time that each step requires to have control over the learning process.

III. Organization of subject matter

A. Outline for demonstration

1. Outline can provide a logical step-by-step sequence and safety measures should be incorporated.

2. Outline provides a framework to assure that all required materials are being presented.

3. Teacher needs to have a thorough knowledge of the subject material and how it is to be presented.

4. Recipe cards can be used to outline the major points of a demonstration.

B. Demonstration guide sheet and work sheet

1. A guide sheet is helpful to direct the activities associated with the demonstration.
   a. There is a place for name, date, demonstration title, objectives, materials needed, and references used.
   b. This guide sheet can be filed for future reference.

2. A work sheet identifies the logical order of each step...
in the demonstration.

a. In the left hand column the activity is identified and in the opposite column the content is listed.

b. The explanation of the activity coincides with the portrayal of the manipulative skills involved with the task.

IV. Prerequisites of demonstration

A. Tools and equipment

1. All tools, materials, supplies and visuals should be in good condition and adequately organized before the demonstration begins so no stops are necessary.

2. Having to stop and look for a necessary item interrupts the effectiveness of the demonstration.

3. Using the same tools and equipment that students will be using encourages the less experienced; learners identify with the teacher, tools and equipment.

B. Preparation responsibilities

1. Any major appliances should be tested before the demonstration starts.

2. Smaller equipment should be checked also to be sure it is in working order.

   a. Give example of fry pan which threw sparks all over, not checked.

   b. Blender without the lid, ingredients splashed all over.

3. Trays are extremely helpful in organizing equipment.

4. Noise level needs to be controlled.
a. Precautions should be taken to keep the noise level as low as possible.
b. Placing a small cloth under a mixing bowl helps absorb noise.
c. Wooden spoons are less noisy than metal spoons.

C. Physical setting

1. Room arrangement should be prepared so each learner will be able to see every movement and hear every direction clearly.
   a. Nothing should obstruct the learner's view during the demonstration.
   b. Keep the working area clear, keep things to the side.

2. In foods, a demonstration mirror is a helpful piece of equipment for it provides the learners a view of every movement of the teacher in the food preparation.
   a. If you don't have this equipment, you may have to stop and show the learners what you are doing; slightly tilted table may help.
   b. Other areas besides foods can take advantage of the demonstration mirror.
   c. Glass bowls may be used in food demonstrations for visibility.

3. Physical comfort of the learners should be considered for attention will not be optimum with uncomfortable observation conditions.

4. Appropriate lighting and ventilation should be considered
in the demonstration setting.

D. Practice

1. Before giving a demonstration, go through the outline step by step and practice.
   a. It is not easy to talk and work at the same time.
   b. Process is like patting your head with one hand, rubbing your stomach with the other.
   c. Practice, talk, and work at the same time.

2. Helpful to practice because it is a trouble shooter for being sure that the steps are in order and the tools and equipment are ready.

3. Identify any time-consuming steps which can be completed ahead of time and complete this time-consuming step prior to the demonstration.
   a. Opening paint containers in housing
   b. Measuring ingredients for art in child development

V. Presentation

A. Introduction

1. Introduction should do several major things:
   a. Get attention and lead into major purpose.
   b. Learners should be motivated to listen.

2. Be poised and show a genuine interest in what you are doing.

B. Demonstration content

1. Show and explain completely the procedure by going through the process step by step.
2. Perform the demonstration tasks slowly enough so that learners do not miss key points.

3. Be sure to explain new terms by talking to the learners and NOT TO THE MATERIALS.

4. Safety measures should be practiced such as keeping the work area clean.

5. Show the best and commonly used procedure to do the job.

6. Do a competent job throughout the demonstration so standards of workmanship are established which will motivate the learners.

7. Motivate the learners by showing how to do difficult manipulative skills properly.

8. Use of grammar should be acceptable.
   a. Do not get possessive about food and equipment.
   b. Embarrassment can be sometimes avoided by not using "my", and "our".

9. Involve the learners as you are demonstrating.
   a. This is important in the learning process; include them as an assistant or as helpers as the demonstration proceeds.
   b. Avoid shot calling. A universal bad habit of demonstrators is "Now I am going to..." Instead, say "The eggs are added".

C. Conclusion

1. May be a product to display
2. The main points must be pulled together and stated in a form that will be remembered.
3. Regardless of a display of a finished product, be sure a summary of the key points are given.
4. Questions may come at the conclusion.

VI. Evaluation
   A. Teacher demonstration performance
      1. Various instruments can be used to rate the demonstrator's level of performance.
      2. Evaluation needs to be based on the concepts presented throughout this talk - preparation, practice, competence in performance, and so on.
   B. Demonstration Observational Rating Scale
      1. The evaluation form which will be used in the microteaching will be the Demonstration Observational Rating Scale.
      2. (Go over rating scale.)

VII. Model demonstration presentation
   A. Overview
      1. Remind students of principles of demonstration teaching strategy
      2. Have them look for demonstration principles
   B. Evaluation form
      1. Have them evaluate the demonstration
      2. Have them identify where student assistance would be feasible
VIII. Microteaching demonstration experience

A. Overview
   1. Remember the definition of a demonstration
   2. Consider the 8-minute block of time/subject matter

B. Suggestions
   1. Think through the process carefully
   2. Use the demonstration observational rating scale as a guide in planning
   3. Give examples

IX. Conclusion

A. Key points
   1. Demonstration is a teaching strategy which can be used in a variety of settings.
   2. Principles of demonstration should be reviewed in planning a demonstration

B. Summary
   1. Briefly identify strengths of the demonstration teaching strategy
   2. Remind students of microteaching responsibility
### APPENDIX B: MODEL DEMONSTRATION SCRIPT

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHOW BAKED ROLLS</strong></td>
<td>INTRODUCTION</td>
</tr>
<tr>
<td></td>
<td>Many things contribute to successful bread and roll making. With a little practice and know-how a variety of beautiful rolls can be made.</td>
</tr>
<tr>
<td></td>
<td>Special tips on the art of rolling, cutting, and shaping the dough can help you in the laboratory and in the home.</td>
</tr>
<tr>
<td></td>
<td>In this presentation two kinds of rolls will be made. Butterhorns, a dinner roll will be demonstrated first.</td>
</tr>
<tr>
<td></td>
<td>(GET TRAY)</td>
</tr>
<tr>
<td><strong>PAstry CLOTH - FLOUR</strong></td>
<td>Only a light film of flour is used on the pastry cloth to avoid making the dough too stiff.</td>
</tr>
<tr>
<td></td>
<td>Any surface which is clean can be lightly floured and used for making rolls.</td>
</tr>
<tr>
<td><strong>SHOW BOWL OF DOUGH</strong></td>
<td>This dough was mixed several hours ago; it has doubled in volume so it is ready to shape into rolls.</td>
</tr>
<tr>
<td></td>
<td>(GET TRAY)</td>
</tr>
<tr>
<td><strong>DIVIDE DOUGH IN HALF</strong></td>
<td>The dough is divided into two equal portions because the recipe makes two dozen rolls.</td>
</tr>
<tr>
<td></td>
<td>The dough can be pinched by the hands to divide it or it can be cut with a sharp knife.</td>
</tr>
<tr>
<td></td>
<td>Place one half the dough on the lightly floured pastry cloth.</td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>CONTENT</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ROLL OUT DOUGH</td>
<td>For a dinner roll, I am making Butterhorns.</td>
</tr>
<tr>
<td></td>
<td>Use a rolling pin to roll the dough into a circle about 10 inches in diameter.</td>
</tr>
<tr>
<td></td>
<td>This would be slightly larger than a pie crust.</td>
</tr>
<tr>
<td></td>
<td>If excess flour is used the crust will have a pale poor color because it will not brown evenly while baking.</td>
</tr>
<tr>
<td></td>
<td>Check to see that the circle is uniform in shape so that equal size rolls can be made.</td>
</tr>
<tr>
<td>SPREAD BUTTER</td>
<td>Spread the circle lightly with cool melted butter or margarine.</td>
</tr>
<tr>
<td>CUT CIRCLE</td>
<td>Cut the circle like a pie; first cut it in half, then cut it in half again.</td>
</tr>
<tr>
<td></td>
<td>Each quarter is cut in three pieces so there are 12 rolls.</td>
</tr>
<tr>
<td></td>
<td>A kitchen knife works fine to cut the dough.</td>
</tr>
<tr>
<td></td>
<td>Be gentle with the dough so that there is no mistreatment.</td>
</tr>
<tr>
<td>SHAPE BUTTERHORNs</td>
<td>Starting at the wide part of the piece of dough, use both hands and roll this tightly towards the narrow pointed end.</td>
</tr>
<tr>
<td>BAKING SHEET</td>
<td>Place rolls on sheet</td>
</tr>
<tr>
<td></td>
<td>Place the butterhorn with the small tip underneath on a greased baking sheet.</td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>CONTENT</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(Continued)</td>
<td></td>
</tr>
<tr>
<td>Place roll-sheet</td>
<td>This sheet was greased before the demonstration.</td>
</tr>
<tr>
<td></td>
<td>Continue to shape the rest of the rolls in the same way, tucking the tip under so it will not pop out during the baking process.</td>
</tr>
<tr>
<td></td>
<td>The rolls can be shaped in mid-air by taking a hold of the wide ends with both hands, then twirl the dough towards the narrow end. However, this does not make as uniformly shaped rolls as shaping them on a floured board.</td>
</tr>
<tr>
<td></td>
<td>Place the rolls about two inches apart so there is room for an increase in volume.</td>
</tr>
<tr>
<td>SHOW ROLLS</td>
<td>This is how the rolls look when they are shaped.</td>
</tr>
<tr>
<td>TOWEL OVER ROLLS</td>
<td>Cover the rolls with a clean towel so there are no sharp changes in temperature and they are free from dirt.</td>
</tr>
<tr>
<td></td>
<td>These rolls will be placed in a warm place of 80 to 90°F, to rise until they are doubled in volume. This will take about 30 to 40 minutes.</td>
</tr>
<tr>
<td></td>
<td>They will be baked at 400°F oven for 12 to 15 minutes in a preheated oven with the rack placed in the center of the oven.</td>
</tr>
<tr>
<td>(GET TRAY)</td>
<td></td>
</tr>
<tr>
<td>BEAR CLAWS TRAY &amp; ROLL OUT</td>
<td>The second kind of rolls are sweet rolls which are called Bear Claws.</td>
</tr>
<tr>
<td></td>
<td>Roll out the other half of the dough into a square about 12 x 12 inches.</td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>CONTENT</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(Continued)</td>
<td></td>
</tr>
<tr>
<td>ROLL OUT BEAR CLAWS</td>
<td>It is better to make the sweet rolls last because the sugar-cinnamon mixture will not get into the dinner rolls. Use light motions in rolling the dough so the dough is not hurt. Check to see that the shape is symmetrical as the dough is being rolled.</td>
</tr>
<tr>
<td>SPREAD BUTTER</td>
<td>Spread the square of dough lightly with soft butter or margarine. Be sure that the entire surface is coated with the butter.</td>
</tr>
<tr>
<td>SPRINKLE SUGAR-CINNAMON</td>
<td>Sprinkle the dough with a mixture of sugar and cinnamon. This was premixed using 1/4 cup sugar and 1 teaspoon cinnamon. Be sure to get the sugar-cinnamon to the edges so the mixture will be distributed evenly. You don't want to get a cinnamon roll without any cinnamon!</td>
</tr>
<tr>
<td>ROLL UP DOUGH</td>
<td>Roll the dough up carefully and seal the edges firmly with the palm and fingers so the roll will stay together and the sugar-cinnamon will stay in. Roll the seal underneath on the pastry cloth.</td>
</tr>
<tr>
<td>CUT DOUGH</td>
<td>Use a sharp knife to cut the dough in thirds; then divide each third so there are three portions. Cut each of these portions into threes. Make clean cuts so there are no jagged tears in the dough. By cutting the dough this way you will have 9 uniform pieces.</td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>CONTENT</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BAKING SHEET</td>
<td>Shape Bear Claws</td>
</tr>
<tr>
<td></td>
<td>Hold each cut piece as close to the baking sheet as possible and use a pair of kitchen shears to make two cuts through each piece. Extend the cuts to within one-half inch of the other side. Thus, the roll is being divided into thirds. Turn each Bear Claw on its side and spread the three claws apart into a fan shape on a greased baking sheet. Space the rolls about two inches apart to allow for rising. Continue to shape the remaining pieces in the same way. Raisins or currants can be added to the sugar-cinnamon for variety and nutrition.</td>
</tr>
<tr>
<td>TOWEL - COVER ROLLS</td>
<td>Cover and let rise at 80 to 90°F, until doubled in bulk. Bake in a preheated oven of 375°F, for 15 to 20 minutes. Frost with confectioner's frosting while warm.</td>
</tr>
<tr>
<td>SHOW BAKED ROLLS</td>
<td>These baked rolls are examples of the two kinds demonstrated; these are the Butterhorns for dinner rolls. These are the frosted Bear Claws for sweet rolls.</td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>CONTENT</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>CONCLUSION</td>
<td>In making these rolls you have followed the steps of rolling, cutting, and shaping the dough. By using a light film of flour on the shaping surface and careful handling of dough beautiful rolls can be made. Be sure to follow these special steps for success when you make rolls in the laboratory and in the home.</td>
</tr>
</tbody>
</table>
APPENDIX C: LABORATORY PRINCIPLES LESSON PLAN
The objectives for the Laboratory Principles Lesson Plan have been identified on pages 30 and 31.

I. Laboratory as a teaching strategy

A. Introduction

1. Often in educational settings, teacher presentations are effective in bringing about changed student behavior than actual student experience in doing the desired activity.

2. Laboratory experiences have been one of the unique features of vocational classes since their introduction into the school.

3. Firsthand experiences do not necessarily bring about the desired learning results - there needs to be planning and integrating of the activity to the total learning to attain optimum results.

B. Definition of laboratory examples

1. A laboratory is an instructional opportunity which allows students to learn by doing - getting concrete "hands on" experience in a subject matter area - often the laboratory involves acquiring psychomotor skills.

2. Examples in subject matter areas of home economics:
   a. Refinishing furniture and repairing furniture
   b. Cleaning and oiling sewing machines
   c. Using different kinds of cooking pans
   d. Working with children
C. Uses of laboratory

1. Laboratory work allows the learners to have experience with a concrete task rather than just an abstract idea, especially good for slow learners.

2. Laboratory experiences provide opportunities for direct student involvement in planning, participating, and evaluating activities related to the facts and principles that are being studied.
   a. Students who have difficulty with verbal comprehension may find laboratory experiences interesting and helpful in clarifying concepts.
   b. A student may not be able to contribute to class discussion or do well on written tests, but can achieve success in psychomotor skills in the laboratory.
   c. Other opportunities for students include developing ability to follow directions, solve problems, experience observational skills, and work in a laboratory with or without a demonstration.

3. A laboratory can stimulate students to be creative or to express themselves.
   a. Design a wall hanging
   b. Make a child's toy.

4. Students can learn to develop generalizations and apply these generalizations in new situations.
   a. In preparing and comparing convenience foods versus
food from scratch in a laboratory experience - generalize as to flavor, cost, time, and personal preference.

b. Students can prepare products in different ways and react and compare the results; use different kinds of interfacings on garments or use different kinds of finishes on wood.

5. Laboratory work can provide a student with meaningful group experience by working in a democratic laboratory situation; this can provide the development of human relations skills which can be transferred to other areas.

6. Laboratory practice may be especially useful in learning management skills.

   a. Management skills are valuable to develop and can be used in other areas.

   b. Students can have opportunities to practice time management, cost management, resources management, energy management.

D. Laboratories are not the complete answer

1. A laboratory consists of much more than actual doing because of the cognitive and affective dimensions involved.

2. If laboratory activities are planned nearly every day because the students enjoy them and the teacher can get by with little preparation, the students probably are learning very little in spite of their opportunity to be active in a "learning experience".
3. Careful preparation and planning are necessary to make the laboratory meaningful and worthwhile which leads directly into the first step of the laboratory.

II. Steps in laboratory work

A. Planning step

1. Introducing the students to the nature of the subject prior to the actual laboratory planning period is important.
   a. This introduction may take the form of oral instruction, written assignments, reading, or discussion.
   b. Integration into the unit being studied is helpful.

2. It is crucial to plan long range so that the overall unit incorporates sufficient information prior to the laboratory so that students have an adequate understanding of the subject.

3. Include the students in planning so that they know what is happening and gain from the learning experience - planning is crucial.

4. Students can assist in the development of laboratory guidelines which can be written up in the form of a handout; these vary with the subject matter.
   a. In the foods laboratory hair care needs attention; a box of rubber bands centrally located can aid in controlling the hair - the teacher as well as the students should follow the guidelines.
   b. If aprons are to be used in a foods laboratory,
determine how they are to be provided.

c. In any laboratory safety measures are to be introduced and followed; fire drills and use and location of the fire extinguisher should be common knowledge.

5. Laboratory partners will need to be decided

a. Students may have input into the decision but discretion will have to be used; if too much chaos results because good friends are together changes will have to be made.

b. Seating the laboratory student alphabetically at the first of the unit may be helpful.

c. A sociogram can be a guideline in determining partners.

d. Usually recommend having the capable students distributed evenly with the less capable students.

6. A laboratory student work sheet helps guide the activity

a. Labs are usually planned 1 day prior to the actual laboratory so a work sheet can assist in the decision making process.

b. Students can identify the work tasks involved, dividing the tasks so the work is shared; major tasks are identified without keeping a very rigid time schedule.

c. The worksheet can be adapted for a 1 person laboratory or several persons.

d. The completed worksheet is planned, filled out, and turned in to the teacher on the planning day prior to
the laboratory so the teacher can make any suggestions on the plan and give it back to the students the next day. If any students are absent, the plan sheet is still available.

e. If the laboratory is a long range laboratory such as clothing, plan sheets can be completed for each week.

7. A supply sheet is needed for the laboratory
   a. This may be part of the student work sheet or it can be separate.
   b. Partially determined by the length of the laboratory.

8. Plan for individual student differences.
   a. Try to help each student reach his highest learning potential.
   b. Try to challenge the student, not frustrate the student.

9. Laboratory equipment tends to limit the number of students participating at one time.
   a. Large class may have to be divided in half for the laboratory
   b. Other half the class will have to have well-planned activities to keep them involved in a learning setting, not just busy work.

B. Controlling the laboratory

1. Much more successful in laboratory when the planning has been carefully developed.

2. Availability of supplies and equipment needs to be discussed
with students since there are several possibilities.

a. Teacher may divide all the supplies and distribute them to stations.
b. Students may help get supplies from a central cupboard.
c. Supplies may be brought by students from home.

3. Activity period for the student is demanding of the teacher

a. Similar to a computer program with many checks being made.
b. Care needs to be taken of those students who finish early, involve them in meaningful work.

4. Students may need teacher assistance during the laboratory; the teacher can circulate among the work stations, maintaining a desirable learning environment.

a. Advise, suggest, aid, direct as the process is taking place.
b. Need eyes in the back of head to see the laboratory classroom as a whole.

5. Attention on any laboratory should be given to cleanliness, orderliness, management, and safety throughout the laboratory.

6. May be helpful to also give a 5-minute warning signal near the close of the class period so students are alerted to the remaining time and tasks.

7. Smoothly functioning laboratory may look almost self-operating to the casual observer, this only occurs when the
students have been carefully guided in planning controlling and evaluating time and other resources.

C. Evaluation

1. There are several methods of evaluating a laboratory and the 2 main categories are process and product.
   a. Process - is the actual laboratory itself; manner in which the students are conducting themselves in the psychomotor skills.
   b. Product - is the end product/result of the laboratory - may be a food product, clothing, etc.

2. Laboratory evaluation form for process
   a. Give the example of the laboratory observational rating scale.
   b. Discuss with the students prior to the actual laboratory; they should know what they are going to be evaluated on.
   c. Look for these characteristics as you observe the model laboratory.

3. Laboratory product evaluation form
   a. Hand out an example of an evaluation form
   b. Discuss with the students prior to the actual laboratory
   c. Input from students is important in increasing their awareness, critical judgment and poise as they move to maturity in the educational setting.

4. Laboratory evaluation form
a. Hand out an example of student self-evaluation form

b. Purposely kept short so completion is possible at the close of the period

c. Keeps in touch with the feelings, attitudes of the students, gain new insights.

III. Model laboratory presentation

A. Overview
   1. Remind students of principles of laboratory teaching strategy
   2. Have them look for laboratory principles

B. Evaluation form
   1. Go over list with the class
   2. Same form used in microteaching experience

IV. Microteaching laboratory experience

A. Overview
   1. Remember the definition of a laboratory
   2. Consider the 8-minute block of time/subject matter

B. Suggestions
   1. Keep familiar with the laboratory observational rating scale
   2. Think through the process very carefully
   3. Give examples

V. Conclusion

A. Key points
   1. Laboratory is not an end in itself but is an integral part of a total learning experience - can never lose sight
of this.

2. Keep in mind the three major steps in a laboratory-plan-
ning, controlling, evaluating.

B. Summary

1. Briefly identify main points of the laboratory

2. Remind students of microteaching responsibility
APPENDIX D: MODEL LABORATORY SCRIPT
INTRODUCTION TO LABORATORY:

Ms. Martin: As you remember, today's laboratory is on relishes - I'm glad to see you have washed your hands and have your aprons on. The plan sheets you've worked on last period and the guide sheets are on your work space. The vegetables are cleaned so they are ready to work with. A warning bell will be given near the close of class so you will know when you have about 2-3 minutes left.
A

B

We better get moving because we are to start on time and keep working. Let's check the plan sheet to be sure on things. I signed up for stuffed celery; what's your job?

I'm doing carrot curls; that is my favorite of all the different kinds of relishes. I need to check on the instruction sheet.

C

D

Here we go - I can't remember how to make radish roses. Ms. Martin, will you help me? Ms. Martin: Here's your guide sheet; it helps to have a picture to go by. Use the grapefruit knife, and cut THIN petals around the radish from the root end almost to the stem end. Does that help?

Let's see - a fork is used to make the design; make a grooved pattern from one end to the other end. I had better repeat that so it is deeper. There, that does it.
Well, this should be pretty easy. I am going to fill half of them with peanut butter, the other half with cheese.

Oh, this one really turned out nice; let's see what the directions say - after the radish rose is cut, place it in iced water to blossom. I wonder how much ice water will change it.

Now, for the thin slices; it says about 1/8 of an inch thick. How thick is that? I'll try it out and see. I've seen my grandmother make these only she puts them in salads or uses sour cream on them.

I'm going to put raisins on these for 'ants on a log' - I'm going to have a lot of ants - like a family reunion.

These are to be cut in 3 or 4 inch lengths.
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Martin, can you help me? I don't know how long to make them.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ms. Martin: This is about how long to make them. If you cut several stalks at once it helps save time and keeps them uniform.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These carrot curls are fun but sometimes they break.

Ms. Martin: It is better to keep the carrot resting on the cutting board.

Look at these roses - what do you think of them?

Oh, they are all right for a beginner - you could use some more practice. I'm all finished cleaning up; what can I do?

Ms. Martin: Why don't you look at some of these books for different kinds of garnishes and relishes?

This lab is a nice change; I like lab better than taking notes.
I'm going to have to make these at home sometime; it's fun to do. It must be almost time to finish.

**WARNING SIGNAL**

Hey, what else are we supposed to do?

We're both supposed to help clean up; we have to have everything put away and the counter clean before we leave.

What kind of a meal are we going to use these with?

I think it's going to be sandwiches - that way we'll have something crunchy to eat with the bread.

You could use these garnishes on the main dish or on the individual plates. There's a lot of neat ones in this book - pickle fans and lemon twists. I'd like to make those.

Oh, what time is it? Are you keeping track? Look at all my roses.
Wow - guess we better get finished up; we are supposed to be done on time. How are you coming? I may need some help. Here's my stuffed celery.

Oh, I'm about done - see my carrot curls. We want to be sure that we are cleaned up or we'll be counted down. We talked about that last time in class.

What are we to do with the carrot curls, Ms. Martin?
Ms. Martin: Place the lid on the plastic container and we'll refrigerate them so that they can be used tomorrow. You did a nice job.

There - we are all cleaned up - that wasn't so bad; guess that's about it for today.
Ms. Martin: Here are the self-evaluation sheets for you to fill out - be sure that you turn them in before you leave today.

Students fill out self-evaluation forms

Ms. Martin: Tomorrow we'll have you report on relishes and garnishes, Craig. That will fit in nicely with our unit on fruits and vegetables. See you all tomorrow.
APPENDIX E: DEMONSTRATION TEST

DIRECTIONS: Read each of the following multiple choice statements. Select the one best answer and use a number 2 pencil to darken the corresponding letter to the question on the separate answer sheet provided.

1. If you wanted to use a demonstration in a unit your first consideration should be
   a. a thorough knowledge of the subject material.
   C b. considering the objectives for the learners.
   c. checking the availability of resource materials.
   d. the length of time available for the demonstration.

2. You want to demonstrate lining a jacket to a tailoring class of 15. Some of the learners are ready to start on the lining but other learners are working on a different part of the jacket. You have elected to demonstrate to a few of the learners at a time. Select the reason that best supports that choice.
   a. Students can see better in small groups.
   b. Students have fewer chances to be distracted.
   C c. Students respond better when they are ready.
   d. Students in small groups are easier to control.

3. In planning demonstrations, the teacher needs to consider various factors. A common problem in planning a demonstration is too
   a. little practice time is allowed.
   b. many learners are involved.
   C c. much time is allocated to teacher talk.
   d. narrow a topic is selected.

4. The greatest drawback to using the demonstration method is that it
   a. is difficult to evaluate learning activities.
   b. places the teacher in a position of secondary importance.
   c. places too much responsibility on the learners.
   C d. takes competence and skill on the part of the teacher.

5. An objective for a demonstration is to
   a. gain an appreciation.
   b. develop a comprehension.
   C c. learn a manual skill.
   d. learn to evaluate.
6. Cindy, a secondary home economics teacher, competently demonstrated the wiring of an electrical plug to a semester housing class. Learners assisted her during the presentation and were motivated to try the new skill. Which of the following reasons are most likely for Cindy's success?

a. non-manual skills involvement.
b. previous reading on subject.
c. the novelty of the topic.
d. teacher preparation and practice.

7. The best definition of a demonstration is a

a. learning activity focused on manual skills.
b. plan of instruction focused on a physical skill.
c. talk illustrated with visual and audio materials.
d. visualized explanation of a fact or an idea.

8. Nancy, a teacher, was preparing a lesson for a demonstration for recovering a chair seat and she needed ideas for the conclusion. One thing she should plan to include in the demonstration conclusion is a

a. demonstration evaluation form.
b. display of the finished product.
c. illustrated guide sheet.
d. motivation device.

9. The demonstration method of teaching is useful for teaching

a. process and product.
b. process but not product.
c. product but not process.
d. neither process or product.

10. Eight students in an advanced foods class at the secondary level were complaining about being bored after observing a baking powder biscuits demonstration. Identify a probable cause for the negative comments.

a. difficulty in viewing.
b. new skills were not introduced.
c. recipes were not distributed.
d. too much subject matter covered.

11. Students who are absent during a demonstration presentation miss important information. In order to have these students make up the missed demonstration the closest substitution would be

a. illustrated talk using visuals.
b. student talk on demonstration.
c. viewing a film strip.
d. viewing a movie.

12. A teacher's demonstration is to the related laboratory activities as a

a. bibliography is to a book.
b. glossary is to a chapter.
c. index is to a book.
d. road map is to the complete trip.
DIRECTIONS: In Column I are listed factors that may or may not be relevant to choice of the demonstration teaching method. In Column II are listed possible effects on learning that the factor has on selecting or not selecting the demonstration technique. Darken the corresponding letter from Column II on the answer sheet that best fits the statement in Column I.

<table>
<thead>
<tr>
<th>COLUMN I</th>
<th>COLUMN II</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 15. Time of day</td>
<td>C. Factor is neutral, i.e., it neither facilitates nor inhibits learning.</td>
</tr>
<tr>
<td>B 16. Limited vision</td>
<td></td>
</tr>
<tr>
<td>A 17. Shows an accepted standard</td>
<td></td>
</tr>
<tr>
<td>A 18. Restricted budget</td>
<td></td>
</tr>
<tr>
<td>C 19. Attitude development</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX F: DEMONSTRATION OBSERVATIONAL RATING SCALE

Rate the demonstrator's level of performance on each of the following performance components involved in demonstrating a manipulative skill. Indicate the level of the demonstrator's accomplishment by placing a number in the appropriate column following the statement. Use a 9 for excellent, 5 for good, and 1 for fair and any of the numbers in between which would be suitable. If, because of special circumstances, a competency was inapplicable, or impossible to perform, place a N/A in the column.

<table>
<thead>
<tr>
<th>FAIR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>EXCELLENT</th>
</tr>
</thead>
</table>

1. The demonstration had a brief introduction. 

2. The subject matter selected involved manipulative skills. 

3. Sufficient substeps of the operation were included in the demonstration. 

4. Each step of the skill was easily viewed by the learners. 

5. Necessary materials were organized and available. 

6. Each step of the skill was presented in logical sequence. 

7. The manipulative skill was performed with ease. 

8. The demonstrator talked to the students regarding the demonstration. 

9. Sufficient subject matter was presented with accuracy. 

10. The demonstration had enthusiasm and effective pacing to maintain student interest. 

11. Summary included main points.
APPENDIX G: DEMONSTRATION ITEM DESCRIPTORS

<table>
<thead>
<tr>
<th>Level</th>
<th>INTRODUCTION</th>
<th>TOPIC</th>
<th>SUBSTEPS</th>
<th>VISIBILITY</th>
<th>SUPPLIES</th>
<th>SEQUENCE</th>
<th>EASE OR PERFORMANCE</th>
<th>TEACHER DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair 1</td>
<td>1. Introduction attempted but not related to demonstration; uncertainty conveyed about topic</td>
<td>2. Topic does not have manipulative skills</td>
<td>3. Too much advance preparation which reduced viewing of substeps</td>
<td>4. No attempt made so that students could see the various steps</td>
<td>5. Missing supplies; unnecessary placement of supplies</td>
<td>6. Content not in sequence; no order to activity</td>
<td>7. Awkward; lack of practice evident</td>
<td>8. Unnecessary discussion with students; teacher/student discussion dominated demonstration</td>
</tr>
<tr>
<td>Good 5</td>
<td>Introduction appeared hurried with activity starting too quickly</td>
<td>Limited possibility for manipulative skills involvement</td>
<td>Some substeps needed more inclusion for clarity</td>
<td>Some concern shown for each student to see various steps</td>
<td>Slight delays caused by lack of organization of supplies</td>
<td>Some order evident but more precise sequence needed</td>
<td>Shows some practice but more was needed</td>
<td>Talked to students some; also concerned with task</td>
</tr>
<tr>
<td>Excellent 9</td>
<td>Introduction included attention getting phrase with a statement of product or process to be made</td>
<td>Topic selected had potential for manipulative skills</td>
<td>Adequate showing of substeps for understanding</td>
<td>Obvious concern for every student to see each step to be learned</td>
<td>Smooth flow of work; no stopping to get supplies</td>
<td>Logical order to tasks; content in sequence</td>
<td>Practice evident with competent performance</td>
<td>Concern for students; talked to students regarding demonstration</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>Good</td>
<td>Excellent</td>
<td></td>
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<td>1</td>
<td>5</td>
<td>9</td>
<td></td>
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</tbody>
</table>

**CONTENT**

9. Content sketchy or inaccurate; inappropriate for learners

Content needed some additional facts

Content included accurate subject matter; quantity adequate

**INTEREST**

10. No enthusiasm; monotonous and slow moving; mannerisms too cute

Lack of interest much of time

Flowed at an interesting pace; sparkle evident

**END**

11. No closure; lack of control

Weak attempt to close

Brief and clear closure; main points identified
APPENDIX H: LABORATORY TEST

DIRECTIONS: Read each of the following multiple choice statements. Select the one best answer and use a number 2 pencil to darken the corresponding letter to the question on the separate answer sheet provided.

1. Which of the following objectives is most likely to be met using a laboratory?
   a. to acquire a body of facts.
   b. to develop psychomotor skills.
   c. to evaluate related information.
   d. to solve necessary problems.

2. The major parts to include in developing a laboratory are
   a. facts, concepts, and principles.
   b. introduction, body, and generalizations.
   c. planning, controlling, and evaluating.
   d. organization, direction, and implementation.

3. Frequently Bill comes to the laboratory without supplies. Which of the following teacher actions would be most beneficial for Bill?
   a. start him on independent study.
   b. ignore him and reduce his grade.
   c. have him make a bulletin board.
   d. have him work on departmental tasks.

4. At the close of a daily clothing laboratory, some of the necessary bobbin carriers were missing. Select a reason why this happened.
   a. storage instructions were ignored.
   b. storage facilities were satisfactory.
   c. resource management was realistic.
   d. bobbin carrier supply was adequate.

5. Laboratory activities help students develop their
   a. dexterity ability.
   b. abstract thinking ability.
   c. verbal interaction ability.
   d. comprehension ability.
6. One of the best ways to encourage students to start a laboratory activity on time is to
   a. establish a flexible open environment.
   C b. provide guidance in advanced planning.
   c. prepare for individual differences.
   d. distribute supplies to each work station.

7. A laboratory activity is a learning opportunity in which students
   a. collect data from books and magazines.
   b. portray actions in simulated situations.
   C c. participate in a simulated experience.
   d. solve abstract problems in small groups.

8. Consider the following activities related to planning a housing laboratory
   1. provide project evaluation forms.
   2. discuss daily management.
   3. distribute supply list.
   4. consider unit objectives.

Select the most appropriate sequence from the list below
   a. 4 1 2 3
   b. 4 1 3 2
   c. 4 2 1 3
   C d. 4 2 3 1

9. Student evaluation is recommended in laboratory activity because it
   a. is a way to measure growth.
   b. is difficult for individuals to do.
   C c. promotes self-direction.
   d. saves the teacher time.

10. A disadvantage of a laboratory activity is that
    C a. many demands are placed on the teacher.
    b. emphasis is placed on student direction.
    c. individual needs are difficult to recognize.
    d. limited student-teacher interaction is possible.

11. After directing a nursery school in child development for two weeks, the teacher reflected on the success of the nursery school. A likely reason for the success is
    a. students had an understanding of children.
    C b. activities for the children were planned.
    c. children ages 2 to 4 were attending.
    d. children liked to come to the nursery school.
12. A laboratory can be evaluated by
   C a. both process and product.
       b. product but not process.
       c. process but not product.
       d. neither process nor product.

13. Laboratory plans are being made for a foods class of 32 students.
    Since kitchen units will accommodate 16 students the class is di­
    vided into laboratory and nonlaboratory sections. The best use
    of students' time in the nonlaboratory would be
       a. work on a departmental exhibit case.
       C b. work on a related foods report.
       c. observe general laboratory activity.
       d. use the time for independent study.

14. The following steps are necessary in planning and implementing a
    nursery school
    1. conduct the nursery school.
    2. select appropriate activities.
    3. determine effectiveness of nursery school.
    4. identify characteristics of preschoolers.
    5. order or make play materials.

    Select the most appropriate sequence from the list below
    C a. 4 2 5 1 3
        b. 4 2 1 5 3
        c. 4 2 1 3 5
        d. 4 2 5 3 1

15. In determining whether to include a laboratory in a unit a major
    teacher consideration is
    C a. translation of knowledge to action.
        b. development of positive attitudes.
        c. recognition of varying student abilities.
        d. obtaining the necessary supplies.

16. The factor most likely to contribute to the success of a laboratory
    is
    C a. budget.
        b. time.
        c. organization.
        d. space.
17. At the end of a foods laboratory period, the units were left dirty. A probable reason was that the foods planned
   a. were not liked by students.
   b. required special equipment.
   c. did not challenge students.
   d. were too much for period.

DIRECTIONS: Below are listed possible classroom activities. Darken A if the activity is APPROPRIATE for a laboratory. Darken B if the activity is NOT APPROPRIATE for a laboratory.

ACTIVITIES

B 18. Complete a textile worksheet using information in text.

B 19. Develop a housing budget for a low income family.

A 20. Change the cord on an electric lamp.

B 21. Identify leisure activities of the elderly.

B 22. Plan diets for weight reduction of teen-agers.

A 23. Determine the gluten content of wheat flour.

USE

A. Appropriate for a laboratory experience.

B. Not appropriate for a laboratory experience.
APPENDIX I: LABORATORY OBSERVATIONAL RATING SCALE

Rate the laboratory activity on each of the following performance components involved in directing a student laboratory activity. Record a number from 1 to 9 on the answer blank to indicate level of competence. Use a 9 to indicate excellence, a 5 to indicate good and 1 to indicate fair. Use 2, 3, 4 and 6, 7, 8 as appropriate.

<table>
<thead>
<tr>
<th>SCALE</th>
<th>FAIR</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>EXCELLENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use N/A for not applicable when necessary.

1. Appropriate activity selected. 1._____

2. Activity introduced with necessary directions (oral or written). 2._____

3. All supplies available. 3._____

4. Provisions made for each student to participate. 4._____

5. Teacher assisted students but did not do activity for them. 5._____

6. Students followed recommended procedures. 6._____

7. Activity concluded on time. 7._____
### APPENDIX J: LABORATORY ITEM DESCRIPTORS

<table>
<thead>
<tr>
<th></th>
<th>Fair 1</th>
<th>Good 5</th>
<th>Excellent 9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOPIC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson selected had</td>
<td>Lesson selected had</td>
<td>Lesson had appropriate experience for laboratory experience</td>
<td></td>
</tr>
<tr>
<td>little, if any, potential for laboratory experience</td>
<td>limited potential for laboratory experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No directions were</td>
<td>Some directions were given but more precision was needed</td>
<td>Specific written or oral directions were given</td>
<td></td>
</tr>
<tr>
<td>given in a weak opening which conveyed uncertainty</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>SUPPLIES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing supplies and equipment caused delay</td>
<td>Slight delays were caused by lack of management</td>
<td>Smooth flow of activity was evident with no interruptions to get supplies</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STUDENT PARTICIPATION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little or no provision was made for each student to participate</td>
<td>Some provision for individual participation but more opportunity was needed</td>
<td>Each learner had full opportunity to participate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TEACHER ASSISTANCE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher made no attempt to assist; teacher directed activity too much; teacher stayed in one spot</td>
<td>Some teacher assistance but better balance was needed; some movement by teacher made</td>
<td>Teacher assistance as needed with no evidence of domination; teacher looks at progress of each student</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WORK HABITS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little or no concern was shown for quality of work habits</td>
<td>Some additional structure needed to practice correct work habits</td>
<td>Appropriate job skills were identified or promoted</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TIME</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor use of time was evident with no attempt made to finish laboratory experience in period</td>
<td>Some effort was made to complete laboratory experience in period</td>
<td>Wise use of time; major parts of laboratory experience completed in period</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX K: ATTITUDES TOWARD PRESENTATION METHODS

INSTRUCTIONS: You are asked to respond to each statement below in terms of your agreement with the idea expressed. In statements in which the phrase live (videotape) presentation is used, react in terms of the type of presentation (live or video) you saw. Please respond to each of the statements using any number from 1 to 9. Use the following scale:

- Write 9 in the answer blank if you agree completely.
- Write 1 in the answer blank if you disagree completely.
- Write 5 in the answer blank if you neither agree nor disagree.
- Use a number from 6 to 9 if you agree to some degree.
- Use a number from 1-4 if you disagree to some degree.

The general scale is shown below:

<table>
<thead>
<tr>
<th>Disagree Completely</th>
<th>Neither Agree Nor Disagree</th>
<th>Agree Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

1. The content of the lesson gave me new ideas on teaching strategies.  
   1._______

2. There should be more contact between teacher and students.  
   2._______

3. Every expectation I had for this lesson has been exceeded.  
   3._______

4. It was a waste of time to show me an actual example of how to implement the teaching strategy.  
   4._______

5. Student participation is as extensive as it should be in this lesson.  
   5._______

6. The live (videotape) presentation in this lesson should be used by teachers in other classes.  
   6._______

7. The teacher changed the presentation as needed to answer students' questions.  
   7._______

8. This lesson has not met the hopes that I had for it.  
   8._______

9. Seeing an example of the teaching strategy makes me more willing to try it.  
   9._______

10. I would like more opportunity to participate in this lesson.  
    10._______
11. Seeing an example of the teaching strategy helped me to integrate knowledge and process.

12. The content of this lesson was dull.

13. The live (videotape) presentation used in this lesson leaves a lot to be desired.

14. I find the content of this lesson interesting

15. I could implement the teaching strategy without seeing an example.

16. I retain the material in this lesson because of the live (videotape) presentation.

17. The teacher related subject matter to needs of students in the class.

18. Seeing an example helps me visualize how to implement the teaching strategy.

19. The live (videotape) presentation provided little opportunity for learning.

20. This lesson presented no new information on the teaching strategy.

21. The subject matter in this lesson has little application for me.

22. My feelings about the live (videotape) presentation in this lesson are positive.

23. This lesson helped me to see the complexities of the teaching strategy.
APPENDIX L: TRANSFORMATION FOR NORMAL RANKS

<table>
<thead>
<tr>
<th>Attitude Response</th>
<th>Transformed Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0.553</td>
</tr>
<tr>
<td>3</td>
<td>0.913</td>
</tr>
<tr>
<td>4</td>
<td>1.210</td>
</tr>
<tr>
<td>5</td>
<td>1.485</td>
</tr>
<tr>
<td>6</td>
<td>1.760</td>
</tr>
<tr>
<td>7</td>
<td>2.057</td>
</tr>
<tr>
<td>8</td>
<td>2.417</td>
</tr>
<tr>
<td>9</td>
<td>2.970</td>
</tr>
</tbody>
</table>
APPENDIX M: DEMONSTRATION AND LABORATORY EXPERIENCE BACKGROUND INFORMATION

Background Information of Demonstration Experience

Name ______________________________

1. Have you had demonstration experience? ____ yes ____ no

2. If yes, indicate number presented. ______ 1
   ______ 2, 3
   ______ 4 or more

   If yes, what type of demonstration experience have you had?
   ______ 4-H
   ______ H.Ed. 206
   ______ Other

   If other, please specify.
Background Information of Laboratory Experience

Please read the following statements and respond to them.

HAVE YOU HAD

4-H experience with H.Ec.Ed. Club? Yes ___ No ___
If yes, how many experiences? __________

4-H club, Camp Fire, Girl Scouts, other club experiences? Yes ___ No ___
If yes, how many years? __________

Club group advisor experience such as 4-H, Girl Scouts, Camp Fire? Yes ___ No ___
If yes, how many years __________

Swimming, tennis, or other recreational instruction? Yes ___ No ___
If yes, how many years? __________

Supervision or assistant responsibilities with summer playgrounds? Yes ___ No ___
If yes, how many years? __________

Nursery school or day care experience? Yes ___ No ___
If yes, how many years? __________

Sunday school teaching experience? Yes ___ No ___
If yes, how many years? __________

If you have had other similar laboratory type teaching experiences which are not listed above, please specify on the back side of this sheet.