A STUDY TO DETERMINE THE EFFECTIVENESS OF VIDEO TAPE MODELS AND OF SUPERVISORY CRITIQUE SUPPLEMENTED BY VIDEO TAPE REPLAY AS A MEANS OF IMPROVING THE PERFORMANCE OF STUDENT INSTRUCTORS IN THE IN-CAR PHASE OF DRIVER EDUCATION

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This is to certify that the

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A Study to Determine the Effectiveness of Video Tape Models and Of Supervisory Critique Supplementary By Video Tape Replay As A Method Of Improving The Performance Of Student Instructors In The In-Car Phase of Driver Education

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ABSTRACT

A STUDY TO DETERMINE THE EFFECTIVENESS OF VIDEO TAPE MODELS AND OF SUPERVISORY CRITIQUE SUPPLEMENTED BY VIDEO TAPE REPLAY AS A MEANS OF IMPROVING THE PERFORMANCE OF STUDENT INSTRUCTORS IN THE IN-CAR PHASE OF DRIVER EDUCATION

By

Frederick Charles Hoffmeister

The purpose of this study was to determine whether the use of video tape models of in-car instruction and video tape replay as a means of feedback of a student instructor's lesson to supplement supervisory critique would improve the performance of the student instructor who was learning to teach in the in-car phase of driver education. The video tape models provided a visual and verbal picture of teaching in-car lessons which the student instructors could emulate. The video tape replay of the student instructor's lesson provided elements to help him internalize the critique by the university instructor.

The student instructors were twenty-three University of Wisconsin-Whitewater students enrolled in the Safety Education course, Techniques of Laboratory Instruction. They were randomly divided into two groups, a control group which did not use either form of video tape recordings and an experimental group which viewed video tape models in preparing their lessons and were critiqued while viewing a video tape replay of their in-car lesson.

Each student instructor taught two Whitewater High School students to drive in the in-car phase of driver education. All student instructors taught eighteen 52-minute lessons and were critiqued on three selected in-car lessons: left and right turns, highway driving, and parallel parking. At the conclusion of the lessons, each student instructor was evaluated for each high school trainee on the lesson one-way streets and angle parking. The Driver Education Teacher Performance Inventory and the In-Car Instructor Rating Scale were used to evaluate the effectiveness of the student instructor's teaching performance. The scores from the evaluation of the two trainees were then combined for each student instructor. From these scores, percentage scores were calculated for each student instructor on the Driver Education Teacher Performance Inventory, and average scores were calculated for each student instructor on the In-Car Instructor Rating Scale.

The experimental design was described as the Posttest-Only Control Group Design. Randomization provided equality between groups prior to the treatment. The t-test was used to test the significance of the difference between the means for both instruments. Specific areas of the evaluation instruments were examined with the aid of tables and graphs.

The findings of this study were:

1. The experimental group which viewed video tape models of in-car lessons and were critiqued by a university instructor while viewing a video tape replay of their in-car lesson scored significantly higher on the Driver Education Teacher Performance Inventory than the control group which did not view either form of video tape recordings. On the

Driver Education Teacher Performance Inventory, the experimental group scored higher in the following areas: Demonstrations, Directions, Verbal Cues and Reminders, Comments on Correct Performance, Comments on Incorrect Performance, and Takes Control. The control group scored slightly higher on Descriptions. Both groups had a 100 percent effective rating on the Uses Special Technique area, although the experimental group had two additional effective actions. The experimental group was more active than the control group, as they accumulated more specific actions on the Driver Education Teacher Performance Inventory.

2. No significant differences were found between the experimental and control groups on the In-Car Instructor Rating Scale.

A STUDY TO DETERMINE THE EFFECTIVENESS OF VIDEO TAPE MODELS AND OF SUPERVISORY CRITIQUE SUPPLEMENTED BY VIDEO TAPE REPLAY AS A MEANS OF IMPROVING THE PERFORMANCE OF STUDENT INSTRUCTORS IN THE IN-CAR PHASE OF DRIVER EDUCATION

By

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CHAPTER I

THE NATURE OF THE PROBLEM

Introduction

Traffic accidents in the United States continue to take a tremendous number of lives each year. In 1970, 54,800 people were killed, and 2 million people were injured at a cost of 13.6 billion dollars.[1]

The Federal government, in passing the Highway Traffic Safety Act of 1966, identified School Traffic Safety Education as one of the program areas designed to reduce traffic accidents and resulting deaths, injuries, and property damage. Section 402 of Title 23 of the Act stated:

> The Secretary shall not approve any State highway safety program under this section which does not . . . provide for comprehensive driver training programs, including (1) the initiation of a State program for driver education in the school systems or for a significant expansion and improvement of such a program already in existence, to be administered by appropriate school officials under the supervision of the Governor as set forth in subparagraph (A) of the paragraph; (2) the training of qualified school instructors and their certification; . . . (5) adequate research, development and procurement of practice driving facilities, simulators, and other similar teaching aids for both school and other driving training use.[2]

In recent years driver education has come under attack as being too expensive and unable to prove success in reducing accidents and

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[1] Accidents Facts (Chicago: National Safety Council, 1971), p. 40.

[2] United States Code, 1964 Edition Supplement II (Washington, D.C.: U.S. Government Printing Office, 1967), pp. 1004-1005.

violations among those taking the course. In the Report of the Secretary's Advisory Committee on Traffic Safety, the Committee stated:

> Although there is no conclusive proof as to the comparative effectiveness of various driver education techniques or, for that matter, the whole of present driver education practice, there is even less proof of the efficacy and value of any alternatives to present practices for communicating to the young person the rudiments of how to handle a car in modern traffic, and the associated social responsibilities. But operational driver education programs must continue. The problem is no different in principle than that for education in general. We have to continue with present systems even while recognized needed improvements are being studied. One would hardly advocate a moratorium on all schooling while looking for proof of better methods.[3]

Initially, driver education consisted of classroom instruction and laboratory instruction behind the wheel of the automobile. Innovations over the years have resulted in other laboratory phases, such as simulation and multiple car off-street driving areas, to supplement basic programs. In-car instruction, however, remains paramount in the education of drivers, as it is recommended that "the minimum program consist of 6 clock hours of behind-the-wheel instruction, part of which may be undertaken utilizing ranges and/or simulators."[4] The Fourth National Conference on Driver Education in its publication, Policies and Practices for Driver and Traffic Safety Education, recommended that under all circumstances the laboratory phase should include supervised practice in a dual-control car under real traffic conditions.[5]

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[3]Report of the Secretary's Advisory Committee on Traffic Safety (Washington, D.C.: U.S. Government Printing Office, 1968), p. 63.

[4]National Highway Safety Bureau, Highway Safety Program Manual (Washington, D.C.: U.S. Government Printing Office, 1969), p. 8.

[5]Policies and Practices for Driver and Traffic Safety Education, developed by the Fourth National Conference on Driver Education (Washington, D.C.: National Commission on Safety Education, 1964), p. 9.

The in-car phase of driver education presents a unique teaching environment in that it is a classroom moving within an unpredictable traffic environment. Teaching in such a classroom requires somewhat more complex teaching skills than in the conventional classroom phase as the teacher has the ultimate responsibility for safe movement of the vehicle in addition to normal teaching duties.

Now that driver education has been successful in expanding into most high school curricula, the challenge today is to improve the quality of the programs. Anderson stated:

> Now attention should be focused on improving existing programs. To do so will require, among other things, improvements in the recruitment and training of teachers and the better use of available information in the design and conduct of high school courses.[6]

Several studies have been completed in recent years investigating the relative effectiveness of various combinations of classroom and laboratory programs. Few studies have investigated teaching performance, and experts in education generally agree that in the end the effectiveness of the driver education program will be determined by the capabilities of the teacher. Rothwell described the value of the teacher when he stated:

> Obviously, weaknesses in the preparation and certification of teachers have a profound and detrimental effect upon the performance of the high school teacher. And, as educators and laymen both know, the teacher's performance affects the student's performance. Any weakness in this chain inevitably carries to the learner and deprives him of needed knowledges, skills, and understandings.[7]

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[6]William G. Anderson, In-Car Instruction: Methods and Content (Reading, Massachusetts: Addison-Wesley Publishing Company, 1968), p. 4.

[7]Angus B. Rothwell, "The High School Teacher," in Policies and Guidelines for Teacher Preparation and Certification in Driver and Traffic Safety Education, recommendations of National Safety Education Conference on Teacher Preparation and Certification in Driver and Traffic Safety Education (Washington, D.C.: National Commission of Safety Education, March, 1965) p. 34.

Teacher education institutions in the process of preparing driver education teachers have been expanding programs to meet the needs of continued technological advancements in the field. In the area of in-car instruction, however, little has been done to improve upon the methods used for many years.

One of the most important aspects of teacher education is the practice teaching experience which the student receives. Teacher education institutions must attempt to provide the most meaningful experiences possible. Through the use of systematic and thorough supervision and evaluation of pre-service instruction by competent personnel, the quality of teacher preparation programs can be improved.[8]

Purpose of the Study

The purpose of this study is to determine whether the use of video tape models of in-car instruction and video tape replay as a means of feedback of a student instructor's lesson to supplement supervisory critique will improve the performance of the student who is learning to teach in the in-car phase of driver education. The video tape models will provide a visual and verbal picture of teaching in-car lessons which the student instructor can emulate. The video tape replay of the student instructor's lesson will provide additional elements to the critique of the lesson, helping the student to internalize the critique.

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[8]Policies and Guidelines for Teacher Preparation and Certification in Driver and Traffic Safety Education, recommendations of National Safety Education Conference on Teacher Preparation and Certification in Driver and Traffic Safety Education (Washington, D.C.: National Commission of Safety Education, March, 1965) p. 17.

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A secondary purpose of this study is to develop video tapes which model effective and ineffective in-car instruction and can be used for pre-teaching observation.

Basic Assumptions

Psychologists concerned with learning have studied the principle of feedback for many years. Armons provided several tentative hypotheses about feedback which are generally agreed upon by those in the field:

1. The performer usually has a hypothesis about what he is to do and how he is to do it, and these interact with knowledge of results. If as is frequently the case, the performer's hypothesis is incorrect the interaction will ordinarily lead to below-optimum performance.

2. For all practical purposes there is always knowledge of his performance available to the human performer. The person will select areas, but they may not be valid ones leading to correct interpretation.

3. Knowledge of performance affects rates of learning and levels of performance reached by learning.

4. Knowledge of performance affects motivation.

5. The more specific the knowledge of performance the more rigid the improvement and the higher the level of performance.

6. The longer the delay in giving knowledge of performance, the less effect the information has.[9]

Video tape recordings can be used to provide needed feedback of a student instructor's in-car lessons so he will be able to improve his performance.

Hypothesis

Pre-service student instructors in driver education viewing video tape models of in-car lessons and through the use of supervisor

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[9]A. Armons, "Effects of Knowledge of Performance: A Survey and Tentative Theoretical Formulation," Journal of General Psychology, 54, 1956, 279-299.

critique supplemented by video tape replay as feedback of their lessons will perform better than those student instructors receiving conventional modeling and supervisory critique. Performance will be determined by scores on the Driver Education Teacher Performance Inventory[10] and the In-Car Instructor Rating Scale, which was developed for this study.

Definition of Terms

Video Tape Models

The models are video taped in-car lessons taught by an experienced driver education teacher which demonstrate correct teacher performance. The video tape models are viewed by the student instructors prior to their practice teaching experience.

Conventional Modeling

The university instructor verbally describes an in-car lesson in the Techniques of Laboratory Instruction lecture section using sketches, role playing, and other techniques to explain how a lesson is best taught.

Conventional Critique

The university instructor rides in and observes an in-car lesson, and at the conclusion of the lesson, verbally describes the correct and incorrect teaching behavior. Sketches and diagrams may supplement verbal remarks where applicable. This critique takes place immediately following the lesson.

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[10]William G. Anderson and James L. Malfetti, Driver Education Teacher Performance Inventory (New York: Columbia University, Teachers College Press, 1963.)

Critique Supplemented by Video Tape Feedback

The university instructor rides in the car and observes an in-car lesson. At the same time a video tape recording is made of the lesson. The university instructor and student instructor take the video tape of the lesson to a laboratory room for critique and playback of approximately twenty minutes of the lesson as soon as possible after the lesson. In no case will the delay exceed twenty-four hours. While critiquing the lesson, the video tape replay provides a partial visual and verbal feedback of correct and incorrect teaching behavior.

Driver Education Teacher Performance Inventory

The Inventory is an instrument to be used in evaluating a driver education teacher's in-car performance in eight critical areas. One area of the Inventory was modified for use in this study. When used in the standard way, the Inventory yields a single numerical score indicative of the teacher's performance.

In-Car Instructor Rating Scale

This rating scale is an instrument developed for the purposes of this experiment to measure specific in-car teaching performance not measured by the Driver Education Teacher Performance Inventory.

Trainee

A trainee is a Whitewater High School student (usually a 15- or 16-year-old sophomore) enrolled in driver education at the high school and receiving in-car instruction through the University of Wisconsin-Whitewater Department of Safety Education.

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Student Instructor

A student instructor is a University of Wisconsin-Whitewater student enrolled in the course Techniques of Laboratory Instruction in which practice teaching experiences in in-car instruction are required.

University Instructor

A university instructor is a member of the faculty at the University of Wisconsin-Whitewater who teaches the lecture sections and supervises the student instructors enrolled in Techniques of Laboratory Instruction.

Treatment

Treatment is the preparation and supervision of the student instructors during the Techniques of Laboratory Instruction course. The course consists of lecture sections which help student instructors plan their lessons and the evaluation and critique of selected lessons.

Theory

Experts in teacher education agree that the most positive aspect of professional education is the student teaching experience.[11] Supposedly, the student teacher translates into practice the philosophy, curriculum, learning theory, and teaching principles obtained in previous professional education courses. Beggs, Koerner, Sarason and others, and the National Commission on Teacher Education and Professional

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[11]Seymour B. Sarason, Kenneth S. Davidson, and Burton Blatt, The Preparation of Teachers: An Unstudied Problem in Education (New York: John Wiley and Sons, Inc., 1962), p. 116; James B. Conant, The Education of American Teachers (New York: McGraw-Hill Book Company, 1963), p. 142.

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Standards suggest that improvements need to be made in student teaching which will relate theory and practice.[12] If this is the case, teacher education must provide within student teaching, experiences which will help the student teacher analyze his own behavior in relationship to his professional education preparation. To accomplish this, the supervisor must have a means of helping the student teacher internalize his behavior so he can understand how he performed and how he can improve his performance. The use of small, compact, relatively inexpensive video tape recorders provides many possibilities for improvement of practice teaching activities.

In some of the early experimentation with video tape recorders, Finney and Miltz indicated:

> Teachers do profit from viewing their own teaching performance. . . . the advantages to the educator interested in research and development in teacher education or classroom observation are limited only by his imaginative consideration of the media's potential. . . .
> . . . . . .
> The current question is not whether to use it but how to maximize its effectiveness.[13]

Previous research on the use of video tape recording in teacher education has resulted in wide acclaims by those using it but few significant results in controlled experimental studies. Lack of adequate "teacher

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[12]Walter K. Beggs, The Education of Teachers (New York: The Center for Applied Research in Education, Inc., 1965), p. 43; James D. Koerner, The Mis-Education of American Teachers (Boston: Houghton Mifflin Co., 1963), pp. 94-95; Seymour B. Sarason, Kenneth S. Davidson, and Burton Blatt, The Preparation of Teachers: An Unstudied Problem in Education (New York: John Wiley and Sons, Inc., 1962), p. 35; Margaret Lindsey, ed., New Horizons for the Teaching Profession Washington, D.C.: National Education Association, 1961), pp. 66-67.

[13]Robert H. Finney and Robert J. Miltz, Television Recordings and Teacher Education--New Directions (Stanford: Stanford University, 1963) pp. 2, 3, 9.

models," time, and inadequate evaluation instruments were cited as reasons for failure.

This study attempts to refine previous research methods by using a series of model tapes and controlled supervision and critique sessions. The study also tests the adaptability of the video tape recorder to a moving classroom, the driver education vehicle.

Organization of the Study

Chapter II contains a review of the literature in which video tape recordings were used in teacher preparation programs and other settings. Chapter III describes the experimental setting and methods used in the study. The analysis of the data and results are contained in Chapter IV. Chapter V contains the summary, findings, conclusions, discussion, and recommendations for the use of video tape recording in driver education teacher preparation programs.

CHAPTER II

REVIEW OF THE LITERATURE

This study investigated the effects of video tape modeling and teacher critique supplemented by video tape recordings in changing teaching performance in the in-car phase of driver education. An investigation of the literature revealed no studies in which video taping techniques were used in teacher preparation of driver education. Research studies and reports reviewed for this study utilized video tape recordings as observational and supervisory tools in micro-teaching, teacher preparation, and in-service teacher education. In these studies and reports, the video tape was used in a conventional classroom setting, whereas this study adapted the video tape techniques to a moving classroom, the driver education vehicle.

Video Tape Recordings as an Observational Tool

Prior to student teaching experiences, teacher preparation programs provide observational experiences which enable pre-service teachers to observe realistic teaching situations involving students and teachers in classroom activities.

Conventional observation consists of having students in teacher preparation programs visit classrooms, observing a lesson or lessons, returning to their college classes, and occasionally discussing the memories of their observational experiences. Many problems results from this type of program. First, the increasing numbers of students in

teacher preparation programs make it difficult to arrange sufficient observation time for all students. As more students are assigned to cooperating classrooms, the likelihood of disruption is increased. Second, since more cooperating classrooms are needed, the geographic area of cooperating schools is increased, thereby making travel time and expense between the cooperating schools and the college or university significant. Third, there is less chance of scheduling time to observe the type and content of the lesson or method of teaching desired. Fourth, since observation experiences differ widely from student to student, post-observation discussion lacks a common base. Fifth, the administrative problems covering the points above require much attention to scheduling and arranging transportation; this time could be spent more effectively with the college students.

A possible solution to these problems was suggested by Schueler and Lesser as they reported on new media:

> The new sight-and-sound media--in their ability to transcend space in "live" use, and both space and time in recorded use--provide the opportunity to extend in number, and refine in function and scope, the many kinds of observational experiences desired. With these media, a large number and variety of realistic examples of child and adolescent individual and group behavior can be made available.[1]

There are many reported uses but few studies of this new media, television and video tape, used as an observational tool. In one study Clemens indicated the need for combinations of observation methods. His study reported that live television observation conducted before in-person observation was significantly more effective than live television

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[1]Herbert Schueler and Gerald Lesser, Teacher Education and the New Media (Washington, D.C.: American Association of Colleges for Teacher Education, 1967), p. 28.

only, in-person observation only, or television observation after in-person observation.[2] Since video tape recording is similar to television with the additional advantages of interruption, replay, and scheduling, it would seem that similar or better results would be obtained using video tape observations.

Stoller and Lesser found that while media observation of classroom behavior did not improve objective test scores of gain in subject knowledge, it did improve the student's ability to understand and critically assess an observed lesson.

It was also significant to note that the differential effect of observational condition when used by certain instructors could be even more important than general scholastic ability in determining the student's gain in learning.[3]

At the University of Wisconsin-Madison, video tape recordings were used to help future teachers study the interaction of teachers and students in real classroom situations without leaving the campus. Classes at area schools were taped and brought back to the University for viewing. The tapes provided broad observational exposure to a variety of classes as well as techniques of effective evaluation of classroom teaching. Favorable reaction resulted in the collection of a library of video tapes for class and individual viewing.[4]

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[2]C. D. Clemens, T.V. and Teacher Education (San Jose: San Jose State College, 1956), p. 18.

[3]N. Stoller and G. S. Lesser, A Comparison of Methods of Observation in Pre-Service Teacher Training (New York: Hunter College, 1963), p. 73.

[4]"Video-Tapes Teach Teachers," Catholic School Journal, LXVIII (April, 1968), 86.

In another report Peterson at Oberlin College described an attempt to improve the power of observation of perspective teachers. It was the belief at Oberlin that beginning teachers were often unaware of many of the activities of their students and unable to interpret adequately those they did observe. The author assumed that the ability to observe classroom behavior was a skill which would be improved through practice.

In the Oberlin study Peterson also assumed that the tape recording represented a relatively complete and accurate record of classroom behavior. Tape recordings were made of a variety of classroom sessions which were used to practice observation skill. Small segments were isolated and repeated until an acceptable level of performance was achieved without changing the actual classroom behavior in any way.[5]

The recordings at Oberlin were used in these ways:

1. As an introduction to and practice in observational techniques.
2. As a supplement to live observations by providing a wide range of teachers, pupils and subjects.
3. As raw data for the analysis of classroom behavior (both teacher and students).
4. As illustrations of specific teaching methods (both effective and ineffective).[6]

The Stanford Center for Research and Development under a grant from the United States Office of Education developed a means of facilitating instruction of social studies teacher education utilizing video tape observation. A series of video tapes was obtained from classrooms of

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[5]Harold W. Peterson, "To Look, and Look Again," Journal of Teacher Education, 18 (Summer, 1967), 206-210.

[6]Ibid., 209.

intern and experienced teachers portraying key elements in the process of teaching social studies. The tapes were then used in the teacher education classes to demonstrate the various behaviors, situations, and methods being discussed at the time. The video tapes were shown to have the following advantages:

> On the video-tape, a real teaching situation in an actual classroom is observed. This proves far superior to the usual "hit and miss" observation, as the excellent or poor model, demonstrating the exact behavior which has just been discussed in the methods course, is readily available.[7]

About twenty-five tapes ranging in length from ten minutes to one hour were developed and classified into ten areas. These areas included: (1) small group work, (2) motivation of students, (3) teacher-led discussions, (4) lecturing, (5) handling of controversial issues, (6) unit work, (7) use of resource materials, (8) treatment of current affairs, (9) student oral presentations, and (10) use of audio visual equipment.[8] As the professor lectured on the techniques of instruction, the tapes were used to illustrate points and provide models. The authors stated: "We believe we have developed a significant tool for perfecting the performance of both beginning and experienced teachers of the new social studies."[9]

Students majoring in elementary education at the University of Massachusetts had been required to complete two sequences of direct observation through an observation corridor in the laboratory school,

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[7]Richard E. Gross and Richard C. McCormac, "Video Tapes in the Preparation of the Social Studies Teacher," Educational Screen and Audiovisual Guide, 46 (September, 1967), 30.

[8]Ibid., 31.

[9]Ibid.

twelve hours during the freshman year and fifteen hours during the sophomore year. Increased enrollment made it difficult to accommodate all the students, and the observation was broad and general in nature. To make the program more meaningful for sophomores and to relieve observation congestion, video tapes were used as follows:

> . . . to focus the attention on more specific teaching activities: the role of the classroom teacher, classroom facilities, curriculum considerations, and a structured overview of grade levels from one through six.[10]

When the tapes were shown to the teacher education classes, the laboratory teacher was present to make comments and ask questions about the lesson. The staff pointed out the following advantages:

1. A more flexible sequence of observations is possible.
2. Special school activities can be taped and stored for viewing at an opportune time.
3. The laboratory teacher can plan for taping in the classroom specific activities which she feels will make an important contribution to the observation classes.
4. The video tapes make it possible to conduct effective observation in a large group setting.[11]

Although formalized evaluation had not been attempted, feedback by students and staff had been favorable. "The members of the elementary staff are enthusiastic about videotapes as a supplement to the observation corridor, not as a replacement for it."[12]

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[10]Robert C. Jones, "Using Videotapes in Directed Observations," in Television and Related Media in Teacher Education, ed. by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), p. 3.

[11]Ibid., p. 4.

[12]Ibid.

Winters and McHenry reported on the use of video tape in the Multi-State Teacher Education Project. Tapes were made throughout the state of Utah depicting the following sequences:

> (1) at elementary and high school levels on the opening day of school, (2) in a fifth-grade classroom of an integrated school (Indian and white children) in isolated southeastern Utah, (3) in an economically deprived area--prekindergarten education in an Ogden City elementary school, (4) in a rural, two-room school in western Tooele County near the Nevada border, (5) in a continuous-progress laboratory school at Brigham Young University, (6) in a nongraded rural high school, (7) and (8) in a typical urban and a typical rural elementary school, and (9) on team teaching at first grade and at junior high school levels--coordinated with the Weber County Exemplary Team Teaching Center.[13]

These episodes were being used and evaluated by teacher education institutions in Utah and several other states. The advantages over direct observations included: (1) the ability to view, stop, repeat, discuss, continue, and study episodes, (2) all people can be cued to seeing the same thing, (3) the instructor can preview and point out specific segments of importance, (4) the tapes can be shown to large groups, and (5) the instructor can edit, combine, and sequence episodes to suit his purpose.[14]

The use of video tape for observation of arithmetic classes was reported by Moody at the University of Delaware. A library of significant lessons and activities had been developed to be used with different classes and individuals. Moody reported:

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[13]N. Blaine Winters and Vere A. McHenry, "Use of Videotaped Materials as a Substitute for Classroom and Child Group Observations," in Television and Related Media in Teacher Education, ed., by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), pp. 12-13.

[14]Ibid., p. 11.

> The key to the success of viewing videotapes is the effective utilization in the presentation. Unless the student is aware of specific goals for viewing the tape and is made to feel a part of the presentation, he or she will rapidly become bored. The writer has found that videotapes have a definite advantage over live telecasts. If one knows in advance the critical aspects of the lesson, then he may prepare the class for the observation and be certain that the class will observe a particular aspect of the presentation.[15]

Cooper believed that training protocols must be established in order to develop teaching skills. Several ten- to fifteen-minute films or video tape recordings could demonstrate a teaching skill much better than describing them by the lecture method.[16]

Video Tape in Supervision of Teaching

Another major use of video tape recordings is in the supervision of student teaching. Most educators and students agree that the student teaching experience is one of the most valuable of their professional preparation experiences. They also agree that in many cases supervision has been less than adequate. With increasing numbers of students in teacher education programs, supervisors are unable to travel throughout the enlarged geographical area to adequately supervise their student teachers. Even when supervisors are able to observe student teachers, they are often unable to effect the behavior changes desired.

Schueler and Lesser described potential uses of video tape by stating:

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[15]William B. Moody, "The Use of Videotapes in the Preparation of Elementary School Teachers of Arithmetic," in Television and Related Media in Teacher Education, ed. by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), p. 19.

[16]James M. Cooper, "Developing Specific Teaching Skills Through Micro-Teaching," The High School Journal, 51 (November, 1967), p. 82.

> Video tape shares the same properties and potentialities as sound tape; but with the addition of a moving visual image, it opens an even wider field of applications than does sound tape. In language recording, it provides a more multidimensional communication image, since facial expression and gesture are as much a part of speed as sound production. For the function of self-appraisal, it provides not simply the mirror image that one has learned to accept but the image that others see. In theory at least, it can provide learning applications in any situation in which the projection of one's own sound and sight image is desirable. The act of teaching is an obvious example.[17]

They made specific reference to the teaching environment when they said:

> Any medium usable for self-appraisal will serve for appraisal of self by others or evaluation of student performance. An obvious example is appraisal of student performance in imitating, either by direct monitoring in a language laboratory or subsequent analysis through playback. A further extension of this use of recordings, both sound and video, is for research into any human phenomenon involving observable and audible behavior. Before the advent of sound-and-sight recording, such research was limited to living manifestations observed in action, and therefore subject to the fallibility in human recall and a tendency to introduce variations dependent on the nature, bias, and ability in expression of the observer. The sight-and-sound recording of an event, however, can be replayed often, and can be heard and seen by many witnesses. This quality of capturing visible and audible images of human behavior and making them instantly available for use and reuse renders these media spectacularly fitted for research into any problem that has to do with human action and interaction.[18]

One of the first research projects investigating television and video tape recordings in teacher education was the Hunter College Research Project. Phase I of the project sought to answer these questions:

> To what extent can a video-recording (in this case a kinescope) of a student teacher's performance provide a record that will (1) assist in describing, interpreting, and assessing the quality of a teaching performance, (2) improve the student teacher's self-awareness of his strengths and weaknesses and accelerate his progress

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[17]Schueler and Lesser, Teacher Education, p. 23.

[18]Ibid., pp. 22-23.

> as a teacher, and (3) assist the objectives of the supervisory process by providing a superior concrete basis of recall of a student teacher's performance for supervisory analysis and conferences.[19]

Three treatment groups were organized for this study. The O group was the control group receiving only supervisory aid in conventional direct observation. The K group supervision was by kinescope recordings without the supervisor present at the time the recording was made. The supervisor did view the lesson from the television control room and directed the recording procedure. The OK group received supervision by kinescope recordings in the presence of the supervisor. The post-performance conference was based on five kinescope recordings made of the K and OK groups.[20] Evaluation was made through a series of OScARs (observation schedule and records). The first two OScARs contained about 90 items emphasizing emotional climate and social organization. OScAR 3 measured the verbal behavior of the teacher and was revised after the first semester of use.[21] In addition, subjective measurements of supervisors and student teachers were made regarding the supervisory treatment.

The researchers assumed that television recordings had a potential place in student teaching; however, the results of the study

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[19]Milton J. Gold, "Rationale of the Project," Improvement of Student Teaching (New York: Hunter College, 1962), p. 1.

[20]Milton J. Gold, "Design and Operation of the Research Project," Improvement of Student Teaching (New York: Hunter College, 1962), pp. 10-11.

[21]Harold E. Mitzel and Donald M. Medley, "Development of the Observation Schedules," Improvement of Student Teaching (New York: Hunter College, 1962), pp. 22-25.

indicated no statistically significant differences between the treatment groups. The subjective reactions of student teachers and supervisors supported the utilization of television recording techniques. Supervisors indicated a preference of some direct observations and some kinescope recordings made on days when they weren't observing. Schueler and Gold stated:

> The cooperating teacher, the class, and environmental factors in the classroom are of critical importance in the experience of the student teacher. As one observes a kinescope of student teachers with a given class, these factors seem to outweigh the influence of the supervisor and the supervisory method [kinescope (K), observation (O), kinescope plus observation (OK)] he employs.[22]

The researchers also indicated that supervisors need to be trained to make effective use of such recordings in post-performance conferences. Recommendations were made to research self-appraisal through recordings, particularly with in-service teachers.

Olivero sought to determine if video tape recordings would improve the effectiveness of the supervisor of student teachers. He found that trainees who received feedback made greater changes than trainees who did not receive feedback and that video tape plus verbal feedback produced greater changes in selected behaviors than verbal feedback alone. Behavior change was significant for organization, meaning of content, and total reaction to the lesson. Olivero also noted that certain behaviors were more susceptible to immediate change.[23]

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[22]Herbert Schueler and Milton J. Gold, "Interpretation and Recommendations," Improvement of Student Teaching (New York: Hunter College, 1962), p. 123.

[23]James L. Olivero, The Use of Video Recordings in Teacher Education (Stanford: Stanford University, 1965), p. 14.

McDonald, Allen, and Orme divided intern teachers in English, Social Studies, and Math into four groups for supervision to determine the effectiveness of self-feedback and reinforcement in acquisition of a teaching skill. The control (C) group was video taped and self-evaluated on the aims of the lesson, use of examples, effectiveness of teacher questions, amount of pupil participation, pacing of the lesson, and student teacher rapport. The Self-Feedback (SF) group was taped and self-evaluated with written instructions discussing pupil participation as observable verbal and non-verbal responses and providing examples of such pupil participation. The Reinforcement (R) only group received the same instructions as the SF group. The experimenter viewed three video tapes with the R group and reinforced all observable instances of pupil participation (positive reinforcement only). In the Reinforcement plus Discrimination training (R and D) group, the instructions were the same as R and SF groups. In addition, the experimenter provided discrimination training, pointing out salient cues to which reinforcement should be attached and the types of reinforcement the teacher could use to effect such behavior.[24]

Each group was taped for the first twenty minutes of their lesson four different times. The dependent measurement was the relative frequency in which the teacher positively reinforced pupil participatory responses during teacher-pupil interaction in the classroom. Reinforcement was divided into four categories: positive, negative, interaction,

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[24]Frederick J. McDonald, Dwight W. Allen, Michael L. Orme, The Effects of Self-Feedback and Reinforcement on the Acquisition of a Teaching Strategy (Stanford: Stanford University, 1966), pp. 3-4.

and information giving. The tapes were evaluated by trained evaluators recording frequency of reinforcement and the relevant behaviors and lesson characteristics.

The results indicated that the R and D group outperformed all others when the two positive reinforcements were taken together. All three experimental groups consistently emitted fewer negative reinforcing responses.

Although self-feedback was attractive because it was less costly, it was relatively ineffective. Rate increases were not likely to occur unless the intern knew when to emit desired responses.[25]

Further studies of the effects of self-viewing teaching performance on video tape measuring attitude and cue-selection patterns were performed by McDonald and Salomon. The findings indicated that

> When no model of "good teaching" is presented, no guidance is given, and no new and common standards are adopted, reactions to self-viewing of one's teaching performance on video tape are determined largely by the viewer's predispositions. That is, his satisfaction with his own performance determines what will be noticed on the screen, how it will be evaluated, and to what attitudinal change it will lead.[26]

Since the results were not compared with a control group which received guidance in self-viewing, one must use care in generalizing the results of this study. The authors did suggest that if the results were to be supported by empirical evidence, supervision procedures may need to vary for student teachers with different predispositions of their teaching performance.

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[25] Ibid., pp. 9 and 13.

[26] Gavriel Salomon and Frederick J. McDonald, "Pretest and Posttest Reactions to Self-Viewing One's Teaching Performance on Video Tape," Journal of Educational Psychology, 61 (No. 4, 1970), p. 285.

Woodward used two college staff members in teacher education, two public school teachers, and two public school administrators to rate the effectiveness of teaching. He found that planned supervision via video tape and less in-person supervision was as effective as in-class supervision only.[27]

De Genaro investigated the video tape recorder as a tool for supervision of student teachers of physical education. The results of his tests tended "to indicate implementing the Video Tape Recorder into programs of teacher preparation for supervisory functions."[28]

Video tape techniques were used at the University of Nebraska to supervise student teachers of social studies during a summer school session. Harder used a modified Flanders Interaction Analysis System and Nebraska Skill Analysis System in measuring student teacher performance. He found:

1. The video-tape supervisory technique is effective in changing teacher behavior.

2. The video-tape recording is not a complete recording of teacher behavior necessary for the subjective analysis of teacher effectiveness. Judgments and evaluations made from the video-tape recordings were at least predictive of student achievement and attitude.

3. Discriminatory measures were Flanders regular I/D ratio and revised I/D ratio.

4. All of the teachers became more indirect in teacher influence as a result of the video-tape recording supervision.

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[27]John C. Woodward, "The Use of Television in Teacher Education," The Journal of Teacher Education, XV (March, 1964), pp. 56-60.

[28]Paul De Genaro, "Experimental Use of the Video Tape Recorder as an Evaluative Instrument and Observational Tool in the Supervision of Student Teachers of Physical Education" (unpublished Ph.D. dissertation, Ohio State University, 1969), p. 54.

5. Use of video-tape recording as a supervisory technique caused high anxiety in both the teacher and students.[29]

Harder indicated that one student teacher never did recover once he saw himself as a crude teacher with a harsh voice. This student teacher became more nervous, and Harder stated, "It would seem at times the video tape replay is the wrong supervisory technique to use and, therefore, the supervisor must show disgression in the employment of this tool.[30]

The College of Education at the University of Delaware utilized video tape recordings in their elementary teacher education program. Moody reported that student teachers' lessons were recorded on video tape and then analyzed with the University professor during a subsequent conference. The value of this experience was indicated by the following statement:

> There is no more effective means of self-evaluation in a teaching situation than being able to observe oneself on tape, and students who have had this opportunity claim it was one of the most worthwhile experiences in their training.[31]

Syracuse University School of Education video taped 30-minute segments of each intern twice in his classroom. In some cases the tapes were viewed with only a technician present, in others a supervisor was present, and in some cases other interns observed the playback, also. Clayton stated:

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[29]Robert John Harder, "A Study in the Supervision of Social Studies Student Teachers Utilizing Video Tape Techniques" (unpublished Ed.D. dissertation, University of Nebraska, 1968), pp. 197-204.

[30]Ibid., p. 204.

[31]Moody, "Preparation of Elementary School Teachers of Arithmetic," p. 19.

> By and large, interns have appreciated the opportunity to see themselves in action. Their reactions have ranged all the way from self-condemnation through quite objective analysis to defensiveness and self-justification. Some have tended to focus on the pupils and their behavior and to see things happening in the classroom that they had not been aware of while teaching.[32]

Syracuse also used video tapes for training in interaction analysis, illustration of teaching, role playing supervisory conferences, demonstrations, initial teaching and micro-teaching, planning for science instruction, and samples of special classes.

Clayton emphasized the use of television and video tape in "personal" and "individualized" directions.

> To capture spontaneous behavior and to see myself (in classroom recording); to perform, observe myself, try again (in micro-teaching); to react to another on a one-to-one basis (in supervisory role-playing); to analyze interaction among students and teacher in a particular situation--these all have peculiarly personal impacts. No other medium has quite the intimacy for self-analysis that videotape, used in particular ways, can have.[33]

Since 1966, Michigan State University has been experimenting with portable video tape recorders for recording and playback to student teachers. Gustafson reported that video tape recordings can be made of student teachers in their own school, and although obstacles existed, they were not insurmountable. He reported favorably on the use of video tape when he stated:

> Interaction is greatly improved. All reports indicate that by having an actual record of what occurred the student teacher,

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[32]Thomas E. Clayton, "Using Videotape Activities in Teacher Education," in Television and Related Media in Teacher Education, ed. by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), p. 14.

[33]Ibid., p. 17.

supervising teacher, and coordinator can talk more specifically about parts of the lesson.[34]

Hoops investigated the effects of video tape feedback on verbal behavior of in-service teachers in classes for the mentally handicapped. He used three groups for comparison: (1) a control-tape group which was video taped but received playback of a standard prepared tape, (2) video-tape playback without prompting, and (3) video tape playback with prompting. The measures used were Flander's Interaction Analysis Scale, biographical data sheet, and teacher questionnaires. The results indicated that the video tape with the prompting group was most successful in use of praise and changing teacher indirectness and least successful in recognizing, accepting, and sustaining the use of pupil ideas.[35]

Alexander and Davis reported on a training program used at Michigan State University for graduate teaching assistants. Thirty volunteer graduate teaching assistants participated in the program as trainees. The trainees were responsible for determining their own weaknesses and developing means to attain skill in weak areas. The training staff, consisting of a training leader and four graduate research assistants, were to assist in the development of teaching skills.

The trainees taught lessons in a laboratory designed for research in instructional systems with one-way-vision glass and video tape recording and monitoring capabilities. At the end of each lesson

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[34]Kent L. Gustafson, "Portable VTR's for Student Teachers," Audiovisual Instruction, December, 1967, p. 1071.

[35]M. Dean Hoops. "A Study of the Effects of Video-Tape Feedback upon the Verbal Behavior of Teachers in Classes for the Mentally Handicapped" (unpublished Ph.D. dissertation, University of Michigan, 1969), pp. 74-74.

the trainee viewed his performance and selected short segments illustrating events of interest to him. The segments of all trainees were put on one tape and used in a weekly debriefing session. The trainees assisted each other in identifying and classifying instructional problems, determining underlying causes, and suggesting behavior changes to eliminate problems.

While results of objective measurements were not available at this time, interviews and evaluations indicated that the program was more beneficial in learning new teaching skills than in acquiring information or changing attitudes. "Almost all GTA's stressed the value of video feedback."[36]

Video Tape and Micro-Teaching

Micro-teaching is a scaled-down version of a teaching lesson. The lesson is usually short, five to ten minutes in length, and is taught to fewer students than are in a typical classroom. The lesson usually centers around a single concept. Micro-teaching does not always include video tape recording, but the two are often used together. Much of the research and reporting on video tape use in teacher preparation has been in micro-teaching situations, the video tape providing supervision, self-evaluation, and/or feedback.

Finney and Miltz reported on the early use of video tape recordings combined with micro-teaching at Stanford University. During the

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[36]Lawrence T. Alexander and Robert H. Davis, "Developing a System Training Program for Graduate Teaching Assistants," Michigan State University, East Lansing, Michigan, February 1970, pp. 15-16. (Mimeographed)

intern program at their cooperating schools, students were video taped two or three times during the first three weeks. Following a critique session with the supervising teacher, the same lesson was retaught to a new group of students, taped, and critiqued again. Then three weeks were spent taping from four to six twenty-minute lessons with the same critique process. During the last week a five-minute lesson and forty-minute lesson were taped and compared with the initial diagnostic and future classroom recordings. Through an interview evaluation of the program, the authors concluded that teachers profit from viewing their own teaching performance.[37]

The use of video tape and micro-teaching at Brigham Young University was reported on by Belt and Baird. During playback, the instructor made suggestions as to what the trainee was to watch for in the replay. Before the lesson was retaught, the instructor and trainee chose one or two areas of major difficulty to concentrate on during the reteach phase. Evaluation forms helped the other trainees look at and judge specific behaviors. Model tapes which demonstrated specific behaviors were suggested to reduce the time involved by professional supervisors.[38]

McHenry, in describing the work at Brigham Young University, stated:

> One of the dramatic results of the microteaching experiments so far at BYU has been the student's intense reaction to viewing himself

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[37]Finney and Miltz, Television Recordings, p. 2-3, 6.

[38]Dwayne Belt and Hugh Baird, "Micro-Teaching in the Training of Teachers: Progress and Problems," in Television and Related Media in Teacher Education, ed. by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), pp. 20-22.

> on videotape and receiving immediate feedback relative to his performance. The combining of these tools with that of interaction analysis could be a behavior-changing force of powerful influence. Timid, diffident trainees can be reinforced by the instructor in microteaching in ways that will build self-confidence. Conversely, cocky, over-confident trainees can quickly be shown reality.[39]

Students in the Peace Corps Training Program at Brigham Young University in 1965 and 1966 went through a micro-teaching video tape program. The conclusions recommended that the micro-teaching lessons be preplanned by the student and the professor, be short, and that a critique session follow immediately. Student teachers should participate in the critique session as it synthesized them to analysis and behavior reconstruction.[40]

Cooper recommended video tape as a part of the supervisory process in micro-teaching. He stated:

> It is so much easier to obtain behavior change if the supervisor and the trainee agree as to what the trainee's behavior was in the first place. The video-tape enables them to reach agreement by providing a common frame of reference in the supervisory conference. The lesson is recreated on the T.V. monitor instead of in their individual minds. It has also been my finding that the trainee is less apt to take constructive criticism personally when it is directed at his image on the monitor rather than at his person. Use of the T.V. takes some of the sting out of the supervisor's suggestions by depersonalizing the criticism and makes the trainee less defensive.
>
> Another advantage of video-tape recordings is that they help the trainee to supervise himself, i.e., to analyze his own performance in terms of its strengths and weaknesses. A trainee should be encouraged to diagnose his own difficulties and plan alternative actions.[41]

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[39]Vere A. McHenry, The Use of Video Processes in Teacher Education (Salt Lake City: Utah State Board of Education, in cooperation with the Multi-State Teacher Education Project, Baltimore, Maryland), p. 8.

[40]Ibid., pp. 28-29.

[41]Cooper, "Specific Teaching Skills," p. 83.

The value of video taping was similarly expressed by Allen and Young when they said, "The videotape provides the teacher and the supervisor with a common frame of reference for their discussion rather than recall alone."[42] They also indicated advantages of being able to stop, reverse the tape, and replay certain sections, pointing out positive instances of teaching behavior and pointing out where corrections could be made and what the corrections could be.

Each of the micro-teaching lessons emphasized a technical skill of teaching such as probing, reinforcement, silence, and skills in lecturing. Modeling tapes were developed for each skill. The teacher could focus on a specific skill without distraction or confusion of other skills. On some of the model tapes, a parallel sound track with comments focused on the skills, and on other tapes, visual prompts were developed for use at the times where the behavior occurred.[43]

Childs and associates at Wayne State University made extensive use of video tape in both micro-teaching and self-appraisal activities. These activities received increased interest of student teachers, supervising teachers, and University faculty members. Childs reported that the student teachers "see it as a method for developing their confidence in themselves as teachers before entering the classroom."[44] Student

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[42]D. W. Allen and David B. Young, "Videotape Techniques at Stanford University," in Television and Related Media in Teacher Education, ed. by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), p. 23.

[43]Ibid., p. 24.

[44]John W. Childs and Associates, "The Use of Videotape Recording in Teacher Education," in Television and Related Media in Teacher Education, ed. by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), p. 25.

teachers and supervisors both reported that they had a common perceptual base on which to discuss the student's teaching performance.

The 1966 NDEA Institute for Advanced Studies in French at the University of Michigan used a modified version of micro-teaching with 39 in-service French teachers. Through a questionnaire at the conclusion of the session, 38 of the participants said that video tape micro-teaching was definitely helpful. Many indicated they wished they could have gone through more taping sessions. Dugas reported that the staff also gave positive reactions to the use of micro-teaching, and he felt the evaluator was more likely to be fair in his critique after reviewing the tapes. "If the evaluator is willing to admit his own fallibility, he has paid a small price in exchange for the teacher's confidence."[45]

Meier described a project at the Child Study Institute at Colorado State College. One hundred early childhood teachers throughout the United States received in-service training by watching a filmed learning episode which varied from three to nine minutes in length. After reading materials and recording and evaluating their own attempts, the teachers mailed a representative tape to the Institute where a critique team evaluated the tape and returned it along with their evaluation to the teachers. When the teachers were satisfied with their understanding and behavior, they went on to the next episode. The teachers were evaluated by comparing their pretraining and posttraining skills with specific terminal behavior. Meier promoted self-analysis with video tape.

> Self-critiquing with no one present may be desirable, and it is usually sufficient for the gross corrections that are felt necessary

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[45]Donald G. Dugas, "Micro-Teaching: A Promising Medium for Teacher Retraining," The Modern Language Journal, 51 (March, 1967), p. 165.

> in the early stages of microteaching. . . . The motivation to improve oneself certainly seems to arise from within as a function of the disequilibrium often created in an individual's life space as he ponders the discrepancy between his ideal self-concept as a teacher and his real teaching behavior as it is replayed on the television monitor.[46]

The effects of previous video tape recorded micro-teaching lessons on subsequent student teaching performance of elementary teachers was investigated by Davis. The control group received no video tape and micro-teaching while the experimental group received both just prior to student teaching. A panel of three raters used an eight-item scale to rate video tapes made during student teaching assignments. The experimental group performed significantly better than the control group.[47]

On a questionnaire, 33 of 35 (94.3%) students felt the opportunity to analyze their teaching performance in the micro-teaching class by means of the video tape playback was extremely helpful (54.3%) or very helpful (40%). The other two indicated it was helpful.[48]

Davis implied the need for guidance in the following statement:

> The novice teacher needs help to achieve his own synthesis of the many disciplines contributing to teaching, and to analyze and improve his own teaching behavior. Improved feedback can be a major advantage for the use of micro-teaching and video recording. However, one of the necessary conditions for improved feedback through observation is the trained observer.[49]

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[46]John Meier, "Rationale for Approval of Microtraining to Improve Teaching," Journal of Teacher Education, XIX (Summer, 1968), pp. 150-151.

[47]Arnold Ralph Davis, "The Effectiveness of Micro-Teaching and Video-Tapes in Training Prospective Elementary Teachers in Specific Technical Skills of Teaching" (unpublished Ph.D. dissertation, Ohio State University, 1969), p. 178.

[48]Ibid., p. 172.

[49]Ibid., p. 190.

Kinerk listed small sample size, inadequate measuring instruments, and shortness of the course as possible reasons for failure to get significant results with the research of video tape recordings.[50] She used four groups. Group one received interaction analysis and feedback by teacher tally and video tape, Group two received interaction analysis and feedback from interaction analysis only, Group three received no interaction analysis and feedback from video tape, and Group four participated with no feedback. Student opinion favored the use of video tape and interaction analysis procedures as feedback methods.[51]

In the College of Engineering at the University of Illinois, Perlberg and O'Bryant used video tape and micro-teaching to improve instruction. Faculty members who volunteered for the project responded favorably to the techniques. The authors reported:

> The video recordings provided an authentic feedback of classroom interaction and the micro-teaching technique provided a systematic method for analysis of these tapes and the acquisition of new teaching skills. The authenticity, practicality, and effectiveness of the media and technique were instrumental in perpetuating the favorable attitudes and in modifying classroom teaching styles. Teachers were highly motivated to pursue these activities when observing these modifications and their impact on classroom interaction via tapes.[52]

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[50]Nedra Kay Swart Kinerk, "A Study of the Effects of Videotaping in the Development of Teaching Behavior Among a Select Group of Participating Students" (unpublished Ed.D. dissertation, Ball State University, 1969), pp. 109-111.

[51]Ibid., pp. 83-84.

[52]Arye Perlberg and David C. O'Bryant, The Use of Video-Tape Recording and Micro-Teaching Techniques to Improve Instruction on the Higher Education Level (Urbana, Illinois: University of Illinois, August, 1968), p. 27.

Other Uses of Video Tape Recordings

The video tape recorder has many uses. In education, it has been used extensively in speech instruction and in the guidance and counseling areas. In business and industry, it has been used as a tool in training programs. The police have used video tape recording equipment in recording the reactions of suspected drunken drivers when they are brought into the station for psychophysical testing and questioning.

The Connecticut State Police adapted video tape recordings to traffic enforcement. A camera with remote push-button controls was mounted on the dash of the State Police Vehicle, a recorder placed in the back seat, and a lavaliere microphone was around the trooper's neck. When the trooper saw drivers weaving, cutting in and out of traffic, tailgating, or speeding, he turned on the recorder, aimed the camera at the violator with one hand, and narrated the conditions into the microphone. When the violators were stopped, the trooper replayed their driving performance for them. Although few courts admitted the video tape as evidence, many drivers pleaded guilty for they were able to see how bad their driving appeared to others from a different vehicle.[53]

The Bell Telephone Company of Pennsylvania used video tape recordings in their safety programs. Accidents occurring to workers were investigated and reenacted on video tape. Then the correct ways to do the job were taped. The tapes were used in safety programs throughout the state.[54]

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[53]E. D. Fales, Jr., "Watch It! You're on Trooper TV," Popular Mechanics, October, 1968, pp. 85-87, 201, 204.

[54]Thomas A. Brown, Jr., "Closed Circuit Television as a Training Tool," National Safety Congress Transactions: Public Utilities (Chicago: National Safety Council, 1969) pp. 17-18.

Video tape recordings have also been used in the preparation of counselors. Sharp and Mayer reported that video tapes were made of students assuming the role of counselee and counselor and used for class discussion. This method provided experiences very near that of actual counseling. The authors reported on three uses made in counseling practicum:

> (1) the use of tapes in actual counseling sessions by practicum students, (2) actual taping of the supervisory session, and (3) allowing the practicum student to role play the part of his client in an effort to gain insight into the dynamics of his client's behavior.[55]

The authors concluded: "The supervisory role of the counselor educator has gained a new perspective as a result of video recordings The counseling experience is more adequately preserved and available during video replay."[56]

Video tape recordings were used at Michigan State University to determine specific skills and mental processes involved in medical diagnosis. Tapes were made of a doctor's diagnosis of a patient's ailments, and after the session, the doctor and an interrogator reviewed the tapes. "If we can identify the problem-solving skills employed by the master physician, then we should be able to teach these skills to medical students," said Dr. Arthur S. Elstein.[57]

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[55]Bert L. Sharp and W. K. Mayer, "Videotapes in Simulated Experiences and Supervision in Counselor Education," in Television and Related Media in Teacher Education, ed. by Howard E. Bosley and Harold E. Wigren (Baltimore: Multi-State Teacher Education Project, 1967), p. 33.

[56]Ibid., p. 34.

[57]Charles R. Downs, "Scared Coed, Concerned Doctor Star in 'Play,'" The State Journal, October 14, 1970, Sec. F-1.

Ochs used video taping techniques with advanced public speaking students at the University of California-Davis. Eight- to ten-minute ungraded speeches were taped with other class members serving as the audience. A student questionnaire evaluated the program revealing the following responses:

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

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

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

4. Students felt that viewing the video-tapes did lend greater objectivity to their own self-analysis.[58]

Evaluating Teacher Performance

Studies evaluating the effectiveness of video tape recordings in teacher education indicated a need for an improved "teacher model" and more precise instruments for measuring teacher performance.

Some authors used existing instruments to measure personality differences. Hatch used the Edwards Personal Preference Schedule which measured fifteen personality traits;[59] Kinerk used the Cattell Sixteen Personality Factor Questionnaire;[60] and Salomon and McDonald used an

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[58]Donovan J. Ochs, "Videotape in Teaching Advanced Public Speaking," The Speech Teacher, 17 (March, 1968), pp. 110-112.

[59]James Cordell Hatch, "Television Performance Effectiveness: A Study of Related Variables and the Effects of Inservice Training and Evaluative Feedback" (unpublished Ph.D. dissertation, University of Wisconsin, 1968), p. 116.

[60]Kinerk, "Effects of Videotaping in the Development of Teaching Behavior," pp. 73-79.

eight concept attitude questionnaire.[61] However, many authors not satisfied with available instruments, developed measuring devices specifically for their study. At Stanford University, eighteen specific technical skills of teaching were identified, and a scale was developed and tested by Bush and Allen.[62] Using the Stanford system as a guideline, the Nebraska Micro-Teaching Skill Analysis System was developed. Harder used the Nebraska Micro-Teaching Skill Analysis System and further modified it by adding three "non-skill" behavior categories.[63] Most authors used a questionnaire either as the evaluation tool or in combination with some other evaluation instrument.

Hoops reported changes in certain areas of teacher behavior using Flander's Interaction Analysis Scale.[64] Harder also indicated changes using a modified version of Flander's Scale.[65]

The Driver Education Teacher Performance Inventory was the only known instrument designed to measure teacher performance in the in-car phase of driver education.[66] The Inventory was developed through a

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[61]Salomon and McDonald, "Self-Viewing One's Teaching Performance on Video Tape," p. 282.

[62]Robert N. Bush and Dwight W. Allen, "Micro-Teaching: Controlled Practice in the Training of Teachers," in Micro-Teaching, a Description, Stanford, California: Stanford University, Secondary Education Program, 1966.

[63]Harder, "Supervision of Social Studies Teachers," p. 53.

[64]Hoops, "Effect of Video-Tape Feedback upon the Verbal Behavior of Teachers in Classes for the Mentally Handicapped," pp. 41-59.

[65]Harder, "Supervision of Social Studies Teachers," p. 202.

[66]Anderson and Malfetti, Driver Education Teacher Performance Inventory.

study of more than one thousand high school teachers, high school students, supervisors, and college teachers of driver education using the Critical Incident Technique. With the Inventory, an evaluator rated specific actions of the student instructor in eight areas as the student instructor taught an in-car lesson. The Inventory seemed appropriate for this study as the rating of specific actions was similar to the rating of teacher behavior on Flander's Scale.

The instruments previously mentioned and others, such as the Tennessee Self Concept Scale and the Minnesota Teacher Attitude Inventory, were examined for use as additional instruments for this study; however, none seemed appropriate. Consequently, the In-Car Instructor Rating Scale was developed to supplement the Driver Education Teacher Performance Inventory.

Summary of Review of Literature

There were few controlled research experiments into the effectiveness of video tape in teacher education, and results often showed no significant differences. When significant differences were reported, they were usually on specific skills or characteristics rather than overall teacher performance. Most often the difficulties reported were in measurement and evaluation, with size of groups and control of conditions also reported as reasons for failure.

In contrast, most experimental studies and reports of usage indicated great potential and considerable success where subjective evaluations were made. Students, supervising teachers, and cooperating teachers were enthusiastic about video tape programs of observation and supervision.

The advantages most often cited for using video tape recording in teacher preparation observation programs were the ease in scheduling group observation sessions; the ability to schedule models or specific methods and techniques which corresponded to the unit under discussion in the methods course; the ability to play, reverse, replay, and discuss specific techniques or segments of the tape; the ability to have the entire class or many classes view the same teaching segment for discussion; the ability to make many immediate comparisons of methods and techniques, effective and ineffective teaching; and the ability to have observation classes view classrooms in many environmental settings without leaving the teacher preparation institution.

In using video tape recordings in the supervision of student teachers, the literature indicated a major advantage was that the student teacher and supervisor could view the lesson from a common perceptual base. Other advantages included the ability for immediate replay, the ability to provide visual feedback, and the ability to improve interaction between the student teacher and the supervisor.

Reports on self-viewing conflict as some studies reported success and others indicated little value. Most reports indicated a need for supervisory feedback while viewing the replay of a lesson.

Reports on micro-teaching indicated that video tape replay of micro-lessons was extremely valuable in focusing on specific teaching behaviors which needed to be improved during the reteach phase.

Previous studies investigating the effectiveness of video tape recordings in teacher education indicated a need for improved "teacher models" and instruments to measure teacher performance. Researchers

often developed instruments for their study, and in many cases these instruments were questionnaires.

Hersch summarized the value of video tape in an analytic approach to the preparation of teachers by saying:

> Video-tape would be quite valuable throughout the intent - action - feedback process for personal discovery, raising questions by the prospective teacher, and the opportunity it provides for the analysis and evaluation process. . . . If we wish to maximize the prospective teacher's questioning of his own behavior then video-tape is invaluable. Video-tape enables the student and faculty to be more aware of particular behavior, a prerequisite to the process of change.[67]

The literature indicated infinite possibilities for use of video tape recorders, limited only by the imagination of the user.

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[67]Richard Howard Hersch, "An Analytical Approach to the Professional Education of Teachers" (unpublished Ed.D. dissertation, Boston University School of Education, 1969), p. 140.

CHAPTER III

DESIGN OF THE STUDY

This study was designed to investigate the effectiveness of video tape models and video tape replay as a means of feedback to supplement supervisory critique in improving the performance of student instructors in the in-car phase of driver education.

The procedures used in this study are explained as they relate to the hypotheses, design, sample, group assignments, administration of treatment, control of variables, video tape vehicle, measuring instruments, evaluation procedures, pilot studies, and analysis.

Hypotheses

The hypotheses tested were:

1. There will be no significant difference in performance between the student instructors who did not view video tape models and video tape replay of their in-car lessons and the student instructors who viewed video tape models and received supervisory critique supplemented by video tape replay of the lesson as measured by the Driver Education Teacher Performance Inventory.

2. There will be no significant difference in performance between the student instructors who did not view video tape models and video tape replay of their in-car lessons and the student instructors who viewed video tape models and received supervisory critique supplemented by

video tape replay of the lesson as measured by the In-Car Instructor Rating Scale.

Symbolically: $H_o: \mu_1 = \mu_2$

Design

The experimental design used for this study was described in Campbell and Stanley as the Posttest-Only Control Group Design and was described as a true experimental design.[1] Its form is shown as follows:

R	X	O_1
R		O_2

Randomization provided for equality between groups prior to the treatment. Student instructors were evaluated after the treatment was administered using the Driver Education Teacher Performance Inventory and the In-Car Instructor Rating Scale.

Sample

The sample used for this study was twenty-three University of Wisconsin-Whitewater students enrolled in the Safety Education course Techniques of Laboratory Instruction during the fall semester of 1971.

Of the twenty-three student instructors, eight were seniors, fourteen were juniors, and one was a second-semester sophomore. The student instructors ranged in age from twenty years five months to thirty years of age with the mean age being twenty-one years ten months. All of the student instructors had taken or were concurrently taking the courses designated as prerequisites for the Techniques of Laboratory

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[1]Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand McNally & Company, 1963), p. 25.

Instruction course. These prerequisites were Introduction to Safety, Behavioral Aspects of Safety Education, Basic Traffic Safety, and Problems and Materials in Safety Education. Therefore, the background of course preparation in Safety Education for the class was similar. In addition, none of the student instructors participating in the study had completed their student teaching assignment.

Fifty-two percent, twelve of twenty-three, had declared Safety Education as their major area. The remainder were majoring in some other subject area of education.

The grade point average of the sample for all courses completed at the University of Wisconsin-Whitewater was 2.63. This compared with a grade point average of 2.64 for all juniors and seniors attending the University of Wisconsin-Whitewater, $p>.05$. The sample did not differ significantly from all juniors and seniors at the University. The American College Test composite scores for twenty of the twenty-three students resulted in a mean of 20.45; the University of Wisconsin-Whitewater student body mean was 21.2, $p>.05$, for freshmen entering in 1969, the same time most of the sample entered the University. The mean of other freshmen entering universities in the United States during this time was 20.9, $p>.05$. Therefore, the student instructors in the sample were similar to other students at the University of Wisconsin-Whitewater and in universities throughout the nation.

Group Assignments

The student instructors each taught two high school trainees the in-car phase of driver education. The student instructors were scheduled for laboratory teaching depending upon free time in their class schedules

and the availability of high school trainees. In all except three instances where a sufficient number of trainees were not available, two student instructors were assigned to each teaching period. These two student instructors were then randomly assigned, one to the control group and one to the experimental group. The random selection process assigned two of the remaining student instructors to the experimental group and one to the control group.

The trainees were Whitewater High School sophomores enrolled in a driver education class. The trainees were assigned a practice driving time according to free periods in their class schedules. In the periods when two student instructors were assigned to teach, four high school trainees were assigned to the same period. Random assignment was then used to determine which trainees were assigned to the experimental and control groups. In the case of the three student instructors teaching individually, trainees were assigned strictly by free periods in their schedules. A schedule of student instructors and their trainees is included as Appendix A.

Administration of Treatment

All student instructors taught eighteen 52-minute in-car lessons during a period of nine and one-half weeks. To help them prepare for these lessons, student instructors attended lecture sections in which lesson content and methodology was explained. An outline of the lesson sequence is included as Appendix B.

The control group and the experimental group attended different lecture sections. During the lecture section for the control group, the

university instructor utilized the blackboard and other aids as a means of describing each in-car lesson. During the lecture section for the experimental group, the university instructor used the video tape models to help in describing how each lesson was to be taught. The video tape models were made during the summer of 1971. In preparing the video tape models, the researcher taught two high school trainees how to drive following the same lesson format that the student instructors were to use for the study. Each of the lessons was video taped and then edited to provide ten- to twenty-minute tapes depicting the key segments of each lesson. Both lecture sections for the control group and the experimental group were taught by the researcher in his capacity as the university instructor and lasted an equal amount of time.

All student instructors used a booklet, "Practice Driving Lessons," for the planning of the in-car lessons.[2] Each trainee also had a copy of this booklet.

Three in-car critique sessions and an evaluation were administered to each group by a university instructor. Left and right turns on city streets, the third lesson, was selected for the first critique session, as previous video tape studies indicated the need for video tape recording and replay early in the practice teaching experience. At least two lessons prior to the critique sessions were needed for the student instructor to gain rapport with his trainees, and those sessions were mainly devoted to orientation to the vehicle and basic control of movements in a parking lot. The initial session taught primarily on city streets involved material from the third lesson.

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[2]Frederick C. Hoffmeister, "Practice Driving Lessons," University of Wisconsin-Whitewater, 1971. (Mimeographed.)

The other two critique sessions were selected by placing the remaining skill lessons on one list and the remaining on-the-road lessons on another list. One lesson was randomly selected from each list to determine the other two critique sessions. Through this process, the second critique session occurred at the time of the highway driving lesson, Lesson 8, and the third critique session at the time of the parallel parking lesson, Lesson 12. Since the university instructor conducted the critique session with both groups, it was necessary to schedule critique sessions for two lesson periods. Randomization was used to determine which one of the two student instructors in each period would be critiqued first. The other student instructor in that period had to reverse the content for teaching; for example, backing and turning as Lesson 3 and left and right turns as Lesson 4. Once the randomization process was completed for the first critique session, the same schedule was followed for the remaining two critique sessions covering Lessons 8 and 9 (highway driving) and Lessons 12 and 13 (parallel parking). This procedure was also used to determine the order of evaluation. Appendix C contains a schedule for critique sessions and evaluation.

Each critique session was strictly controlled for both groups. In the left and right turn lesson, the student instructors were required to remain within a specific residential area of the city. For the highway driving lesson, a specific route consisting of several types of roads was required. The parallel parking lesson was conducted on a parking lot using traffic cones to designate the parking spaces. All procedures used in each lesson were specified in the "Practice Driving Lesson" booklet.

During the three selected in-car lessons, the student instructors in the control group were instructed in the conventional method in which

the university instructor observed the lesson and made notations on the Driver Education Teacher Performance Inventory form. After the lesson, the university instructor conducted critique sessions with the student instructor, aided by his notes and sketches. The critique sessions were held, when possible, immediately after the lesson. However, due to scheduling problems and the fact that student instructors were involved in other classes, it was necessary to hold some critique sessions during the evening following their lessons, and in a few cases critique sessions had to be held early the next day.

During the time the experimental group was in the car for the three selected lessons, the university instructor again rode in the driver education vehicle and observed and made notes on the Driver Education Teacher Performance Inventory form. In addition, a video tape recording of the lesson was made. As with the control group, critique sessions were held as soon after the lessons as possible; however, comparable delays occurred. The critique sessions were similar to the control group sessions with the exception that segments of the video tape recordings of the lessons were used by the university instructor to aid in his critique.

The video tape recordings of the student instructor's lessons provided him with the opportunity to see and hear himself, thereby internalizing any remarks made by the university instructor. The notes taken by the university instructor while in the vehicle aided him in selecting segments of the tape which would best depict both positive and negative aspects of the student instructor's in-car instructions upon which reinforcement and improvement of teaching could be emphasized.

Control of Vitiating Variables

During the three selected in-car lessons, the critique sessions were conducted by the researcher, thereby eliminating possible variations by different university instructors. The length of the critique sessions was held relatively constant for both groups, each session lasting between twenty and twenty-five minutes.

Both groups were equally affected by traffic and weather conditions. With three exceptions, a member of each group was driving at the same time during any in-car lesson.

Video Tape Vehicle

The driver education vehicle used for video taping the experimental group's lessons was a 1972 Chevrolet Station Wagon. It was equipped like other driver education vehicles with the exception that the back part of the station wagon contained the video tape equipment. The equipment consisted of an inverter to change 12-volt direct current to 110-volt alternating current, a videocorder, a camera mounted on a tripod with a 12.5 mm lens, and a 9-inch monitor. The microphone was placed in the ashtray located in the dashboard between the trainee and student instructor. A diagram of the video tape equipment is shown in Figure 1.

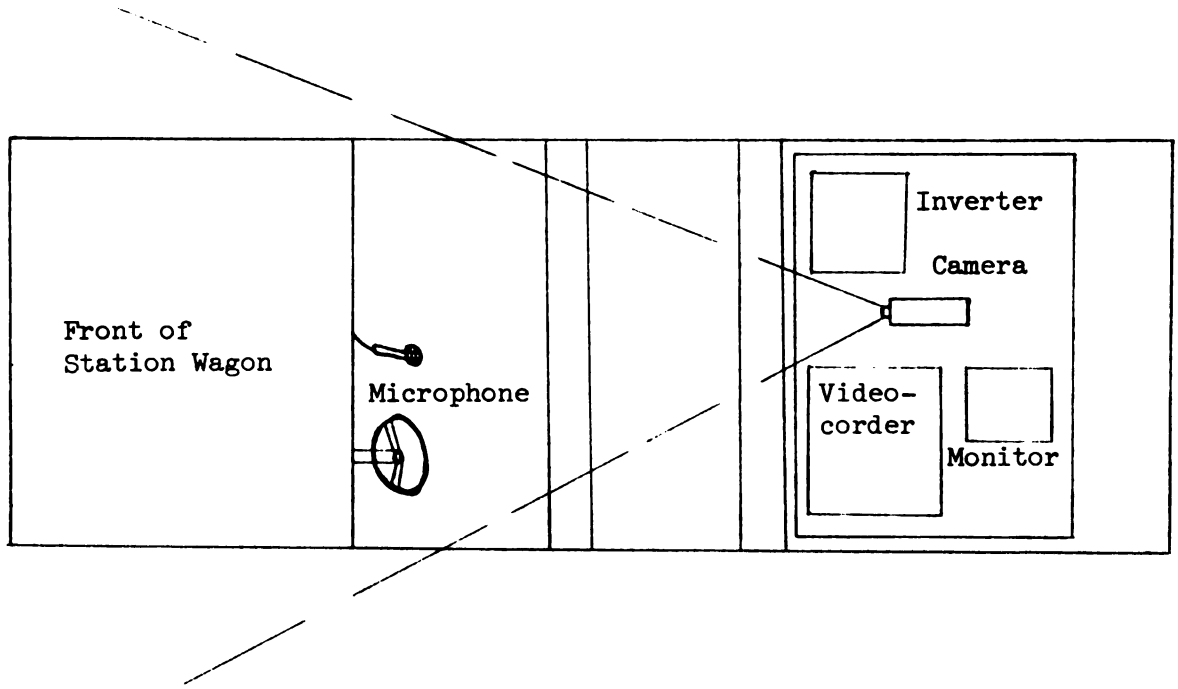
Pictures of the vehicle are included as Appendix D.

Measuring Instruments

The Driver Education Teacher Performance Inventory (See Appendix E) was used to evaluate post-treatment performance of the student instructors. The Inventory was designed as a rating instrument for use in evaluating a driver education teacher's performance in behind-the-wheel

FIGURE 1

LOCATION OF THE VIDEO TAPE EQUIPMENT
IN THE DRIVER EDUCATION VEHICLE



instruction. The Inventory was divided into eight areas of teacher performance and was developed as a result of a two-year study of high school teachers, high school students, supervisors, and college teachers of driver education.[3]

Studies have shown that when pairs of qualified observers simultaneously rate teachers instructing beginning drivers and then rank the teachers in terms of their final scores, the correlation between the ranks assigned the teachers ranges from .612 to .805.[4]

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[3]William G. Anderson and James L. Malfetti, Manual for the Administration of the Driver Education Teacher Performance Inventory (New York: Teachers College, Columbia University, 1963), p. 1.

[4]Ibid., pp. 6-7.

The validity of the instrument was supported by the fact that the "teacher actions" on which the score was based were derived from an extensive study of effective and ineffective instruction using the Critical Incident Technique. Also, studies have shown that more experienced teachers tend to achieve higher final scores than less experienced teachers.

The eight areas of the Driver Education Teacher Performance Inventory were: Descriptions, Demonstrations, Directions, Verbal Cues and Reminders, Comments on Correct Performance, Comments on Incorrect Performance, Takes Control, and Uses Special Technique.

The Descriptions area measured the student instructor's ability to tell the student how to perform a skill. Only the initial description prior to the first practice attempt was considered a "Description." Subsequent descriptions during continued practices were considered Verbal Cues and Reminders.

The Demonstrations area was modified for this study. Anderson and Malfetti referred to the Demonstrations area as "teacher performance of driving skill."[5] Since the evaluation for this study took place near the end of the in-car lessons when trainees were quite proficient at driving, the Demonstrations area was expanded to include the direct instruction approach whereby the student instructor verbally guided the trainee through the first attempt of a new skill or manipulation. Verbal aids in subsequent practices of the skill were categorized as Verbal Cues and Reminders.

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[5] Ibid., p. 8.

Directions were the student instructor's verbal commands which told the trainee which skill to perform and where to perform it. Directions had to be clear and timely so the trainee knew exactly what he was to do and where it was to be done.

Verbal Cues and Reminders were the guiding remarks that the student instructor used to help the trainee perform a skill or maneuver. They told the trainee how to perform a skill, reminded him of previous procedures, guided him through a skill, or warned him about a dangerous situation.

Comments on Correct Performance referred to comments made by the student instructor which related to correct trainee performance. The comments identified a correct action or explained why the action was correctly performed. They also commended the student on his general performance. The comments were often used when the student needed encouragement.

Comments on Incorrect Performance were remarks made by the student instructor when the trainee had performed incorrectly. The comments identified the incorrect performance and may also have explained why the action was incorrect. It was necessary to identify incorrect performance so that improvements could be made.

Takes Control included two types of student instructor actions. It referred to the physical assistance given by the student instructor to help the trainee in performing a skill. The assistance could have been in the form of guiding the steering wheel or keeping the vehicle moving at a slow rate of speed. Takes control also referred to the student instructor taking full control of the vehicle from the trainee by grasping the steering wheel or using the instructor's brake. This action

could have been taken when danger was near or when the trainee was about to violate a law. The effectiveness or ineffectiveness of this action depended on its timing and immediate conditions.

Uses Special Technique referred to a variety of teaching techniques the student instructor could have used other than the techniques described in the areas above. Special techniques might have been needed for slow trainees who did not respond well to conventional methods or to challenge the abilities of proficient trainees.

More complete details and examples of effective and ineffective student instructor performance may be found in the Manual for the Administration of the Driver Education Teacher Performance Inventory.[6]

The instrument was used by the evaluator sitting in the back seat of the driver education vehicle where he had a clear view of both the student instructor and the trainee. Each time the student instructor performed a specific action, the evaluator located the appropriate area on the Driver Education Teacher Performance Inventory form and tallied it as either effective (+), ineffective (-), or unable to judge (0). If a student instructor failed to perform a specific action that was clearly required by the situation, it was tallied as a failure to take action (-). At the conclusion of the evaluation session, all the positives and negatives were totaled for each area. Summation of all eight areas provided total positive and total negative student instructor actions. The ratio of positive actions to total actions provided a single percentage score indicative of the student instructor's performance.[7]

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[6]Anderson and Malfetti, Manual for the Administration of the Driver Education Teacher Performance Inventory, pp. 7-13.

[7]Ibid., pp. 1-4.

The In-Car Instructor Rating Scale was developed for this study to cover aspects of in-car teaching performance not specifically measured by the Driver Education Teacher Performance Inventory. It contained five areas: Appropriateness of Content Comments, Preparation for Lesson, Student Instructor Observations of Trainee and Environment, Sensitivity to Trainee Needs, and Motivation of Student Instructor to Change Trainee Behavior.

The area of Appropriateness of Content Comments was designed to measure the effectiveness of the student instructor's "content" remarks. While teaching on-the-road lessons, the traffic environment presented various opportunities to provide depth to the lesson through content comments, but the effectiveness of the comments depended on their appropriateness and timing and were most effective when they could be related to the immediate driving environment. During skill lessons, remarks were most appropriate when directed to safe driving practices which related to the skill but were not included as a part of the procedures for executing the skill.

Preparation for Lesson referred to the planning done by the student instructor prior to the lesson. The rating was determined by the student instructor's knowledge of the proper procedures, his familiarity with the route, and his ability to properly set up traffic cones for skill lessons.

Student Instructor Observations of Trainee and Environment measured the ability of the student instructor to be watching the proper location at the proper time. For example, the student instructor must check the blind spot prior to a lane change as well as observe to see if

the trainee has checked his blind spot. In addition, the student instructor must determine if the trainee has signaled and if traffic conditions ahead permit a safe lane change.

The area Sensitivity to Trainee Needs was designed to evaluate the ability of the student instructor to provide instruction, taking into consideration the abilities and needs of the trainees. Weak trainees needed more help and encouragement than trainees who drove well. Likewise, some trainees required understanding and patience while others needed a stern approach.

Motivation of Student Instructor to Change Trainee Behavior was designed to evaluate whether the student instructor attempted to determine the trainee's attitude. If the attitude was not fitting today's traffic environment, the student instructor was expected to try to modify the attitude of the trainee through reason, logic, value clarification, or other means.

In scoring the In-Car Instructor Rating Scale, the evaluator rated the student instructor on a scale of one to five in each area for each trainee at the end of the lesson. On the scale, one was considered unsatisfactory and five was considered excellent. The scale and descriptions of each rating are contained as Appendix F.

Evaluation Procedures

To provide stability to the evaluation, each student instructor was evaluated twice, once with each trainee. The student instructor took one trainee and taught him angle parking and then one-way streets. Another instructor took the second trainee and, at a prearranged meeting place, exchanged trainees with the student instructor. The student

instructor being evaluated then repeated the entire lesson to the second trainee. Each part of the lesson took twenty-six minutes. This procedure provided two separate and complete evaluations on each student instructor. These two scores were combined to provide a single score for each student instructor.

The final evaluation was made on the sixteenth or seventeenth lesson, the content of which was one-way streets and angle parking. The content of this lesson allowed for more thorough use of the areas of the Driver Education Teacher Performance Inventory. These two activities, one-way streets and angle parking, were also compatible in location and time for this evaluation.

The entire evaluation lesson was rigidly controlled; the route to and through the one-way streets was specified, and the angle parking was done in a parking lot with traffic cones. In the Descriptions area and the Demonstrations area of the Driver Education Teacher Performance Inventory, each student instructor was scored on five "specific actions" taught to each of his trainees. The actions specified for these two areas were angle parking, exiting from angle parking, right turn onto a one-way street, left turn from a one-way street to a two-way street, and left turn from a two-way street to a one-way street. A description and demonstration of each action was required, and each student instructor was scored on each action as he taught each trainee. In the other six areas of the Driver Education Teacher Performance Inventory, the number of specific actions varied depending upon the activity of each student instructor. Further details for scoring may be found in the Manual for

the Administration of the Driver Education Teacher Performance Inventory.[8]

The person administering the final evaluation to all student instructors was an experienced driver education instructor and also experienced in driver education teacher preparation. He had used the Driver Education Teacher Performance Inventory with student instructors during the past four years.

Pilot Studies

Pilot studies of this research were conducted during the spring semester of 1971 and during the summer session of 1971.

In the pilot study during the spring semester of 1971, much difficulty occurred with the video tape equipment. Rain and snow provided troubles with the videocorder when threading it from the rear of the station wagon. Consequently, a plywood platform was built to hold the video tape equipment, and the videocorder was moved up to a spot directly behind the rear seat. This made possible the threading of the videocorder from inside the vehicle. This pilot study provided an opportunity for other safety education staff members to work with the video tape recorder as an aid to the in-car supervisory process and to make the critique sessions uniform.

At this time, a decision was made to develop and use a series of modeling tapes which would show student instructors how each lesson should be taught. These tapes were used in lecture sections for the experimental group prior to the preparation of lesson plans for the teaching of the in-car lessons.

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[8] Ibid., pp. 2-7.

With many problems corrected, the summer session provided an opportunity to conduct a full pilot study and further refine procedures. During this pilot study, the researcher and other members of the department simultaneously evaluated the student instructors at the end of the in-car instruction program. As a result, the decision was made that the chairman of the department should administer the final evaluations as he rated more consistently with the researcher in using the Driver Education Teacher Improvement Inventory and also had more experience using the instrument.

Analysis

Significance of the difference between the mean of the two independent groups was evaluated by use of the t-test. On the Driver Education Teacher Performance Inventory, the t-test was used on the total percentage score, and on the In-Car Instructor Rating Scale, it was used on the total average score. The ratio is shown by the formula

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{S^2/N_1 + S^2/N_2}}$$

This ratio has a distribution of t with $N_1 + N_2 - 2$ degrees of freedom.[9]

Graphs were used to display the differences between the two groups in each area of the Driver Education Teacher Performance Inventory.

Summary

In this study the control group of student instructors received conventional lecture preparation for in-car lessons and were critiqued by

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[9]George A. Ferguson, Statistical Analysis in Psychology and Education (New York: McGraw-Hill, Inc., 1966), p. 167.

a university instructor who rode with them during their lessons and verbally discussed each lesson at its conclusion. The other group of student instructors viewed video tape models of each in-car lesson in preparing for their lessons and were critiqued by a university instructor utilizing a video tape recording of their lesson.

The subjects were University of Wisconsin-Whitewater students in the course Techniques of Laboratory Instruction who taught two Whitewater High School trainees how to drive in eighteen 52-minute lessons. A critique session was conducted with each student instructor on the same three lessons, left and right turns, highway driving, and parallel parking.

The Driver Education Teacher Performance Inventory and In-Car Instructor Rating Scale were used to measure the post-treatment performance of both groups. The t-test was used to measure the significance of the difference between the means.

CHAPTER IV

ANALYSIS OF RESULTS

Introduction

This study compared the performance of student instructors who viewed video tape models prior to teaching in-car lessons and then viewed video tape replays of their lessons during a critique session conducted by a university instructor with the performance of student instructors who had no contact with video tape recordings.

Performance was measured by the Driver Education Teacher Performance Inventory and the In-Car Instructor Rating Scale, which was designed for this study.

Results of the Driver Education Teacher Performance Inventory

The first hypothesis tested was: There will be no significant difference in performance between student instructors who did not view video tape models or a video tape replay of their in-car lessons during the critique sessions and student instructors who did view video tape models prior to teaching and were critiqued by a university instructor while viewing a video tape replay of their in-car lesson as measured by the Driver Education Teacher Performance Inventory. The level of significance was set at .05.

Symbolically H_o: $\mu_1 = \mu_2$

The Driver Education Teacher Performance Inventory yielded an accumulation of effective specific actions (+) and ineffective specific

actions (-) in the following areas: Descriptions, Demonstrations, Directions, Verbal Cues and Reminders, Comments on Correct Performance, Comments on Incorrect Performance, Takes Control, and Uses Special Technique. For interpretation purposes, a percent effective score, correct actions divided by total actions, was used to determine a score for each student instructor. The scores of the student instructors were summed for each group. The total scores for effective and ineffective actions, mean, standard deviation, and t-value are reported in Table 1.

TABLE 1

EFFECTIVE AND INEFFECTIVE ACTIONS, MEAN, STANDARD DEVIATION, AND T-VALUE ON THE DRIVER EDUCATION TEACHER PERFORMANCE INVENTORY

Groups	N	Effective Actions	Ineffective Actions	Mean	Standard Deviation	t-Value
Experimental	12	1161	203	85.09%	8.03	2.22[a]
Control	11	885	278	76.20%	11.08	

[a]Significant at the .05 level.

The twelve student instructors in the experimental group accumulated 1161 effective specific actions and 203 ineffective specific actions. The eleven student instructors in the control group accumulated 885 effective specific actions and 278 ineffective specific actions. The percent effective ratio for each student instructor was used to calculate the mean, 85.09 percent for the experimental group and 76.20 percent for the control group.

The t-value required for significance at the .05 level with 21 degrees of freedom was 2.08. Analysis of the data and a t-value

of 2.22 indicated that the experimental group which viewed video tape models prior to teaching and viewed video tape recordings of their in-car lessons during the critique sessions scored significantly higher on the Driver Education Teacher Performance Inventory than the control group which did not view video tapes either as models or during the critique sessions.

Results of the In-Car Instructor Rating Scale

The second hypothesis tested was: There will be no significant difference in performance between student instructors who did not view video tape models or a video tape replay of their in-car lesson during the critique sessions and student instructors who did view video tape models prior to teaching and were critiqued by a university instructor while viewing a video tape replay of their lesson as measured by the In-Car Instructor Rating Scale. Significance was set at the .05 level.

Symbolically H_o: $\mu_1 = \mu_2$

The In-Car Instructor Rating Scale yielded scores ranging from one (unsatisfactory) to five (excellent) on the following areas: Appropriateness of Content Comments, Preparation for Lesson, Observations of Trainee and Environment, Sensitivity to Trainee Needs, and Motivation to Change Trainee Behavior. Scores were summed to provide a mean score for each student instructor. The mean, standard deviation, and t-value are reported in Table 2.

The mean of the experimental group was 3.27 compared to the control group mean of 3.12. The t-value required for significance at the .05 level with 21 degrees of freedom was 2.08. The null hypothesis was not rejected since the t-value was calculated at 0.69. There was no significant

difference between the two groups on the In-Car Instructor Rating Scale.

TABLE 2

MEAN, STANDARD DEVIATION, AND T-VALUE ON THE IN-CAR INSTRUCTOR RATING SCALE

Groups	N	Mean	Standard Deviation	t-Value
Experimental	12	3.27	.48	0.69[a]
Control	11	3.12	.60	

[a]Not significant at the .05 level.

Areas of Difference in the Driver Education Teacher Performance Inventory

The data was examined to determine in which areas of the Driver Education Teacher Performance Inventory the video tape modeling and critique procedures were most effective. The total scores in each of the eight areas, the average score for each student instructor for each area, and the percent effective ratio for each area are reported in Table 3. Average scores were used because the number of student instructors in the two groups were not equal. Figures 2 and 3 graphically display average effective and average ineffective scores for both groups.

The data indicated that the control group performed slightly higher in the Descriptions area than the experimental group. This is the only area in which the control group performed better, and the differences in the averages were very small, 8.91 effective actions for the control group compared to 8.83 for the experimental group and 1.09 ineffective actions for the control group compared to 1.17 for the

TABLE 3

SCORES, AVERAGE SCORES, AND PERCENTAGES FOR THE AREAS OF THE DRIVER EDUCATION TEACHER PERFORMANCE INVENTORY

Area	Experimental Group N=12					Control Group N=11				
	+	Average	-	Average	Percent	+	Average	-	Average	Percent
Descriptions	106	8.83	14	1.17	88.33%	98	8.91	12	1.09	89.09%
Demonstrations	99	8.25	21	1.75	82.50%	66	6.00	44	4.00	60.00%
Directions	454	37.83	25	2.08	94.78%	373	33.91	35	3.18	91.42%
Verbal Cues & Reminders	316	26.33	43	3.58	88.02%	210	19.09	64	5.82	76.64%
Comments on Correct Performance	99	8.25	13	1.08	88.39%	76	6.91	19	1.73	80.00%
Comments on Incorrect Performance	77	6.42	87	7.25	46.95%	57	5.18	96	8.73	37.25%
Takes Control	4	.33	0	0.00	100.00%	1	.09	8	.73	11.11%
Uses Special Technique	6	.50	0	0.00	100.00%	4	.36	0	.00	100.00%
Total	1161	96.75	203	16.92	85.09%	885	80.45	278	25.27	76.20%

Key: +, effective specific actions; -, ineffective specific actions.

FIGURE 2

AVERAGE EFFECTIVE TEACHER ACTIONS FOR EACH AREA OF THE DRIVER EDUCATION TEACHER PERFORMANCE INVENTORY

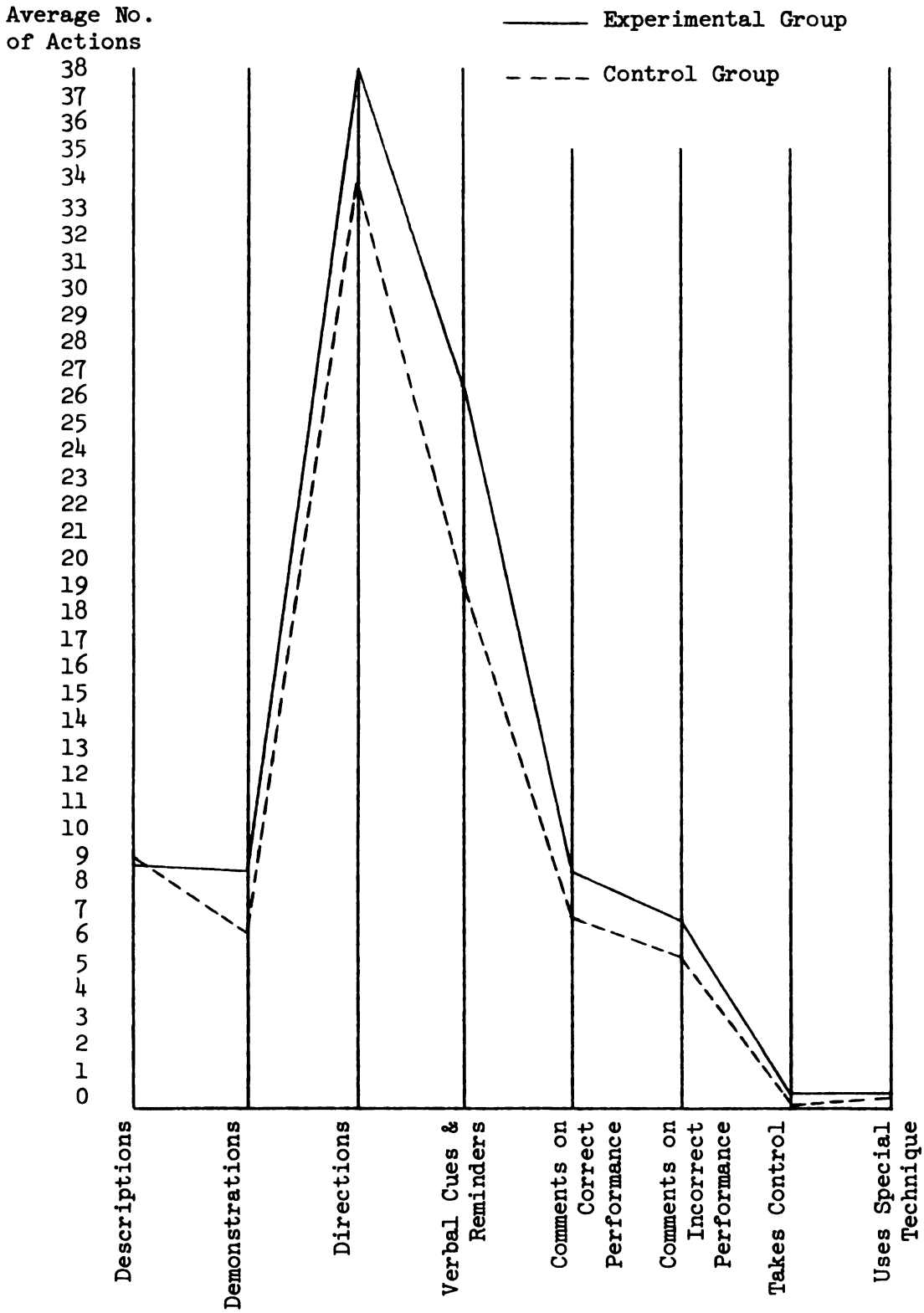
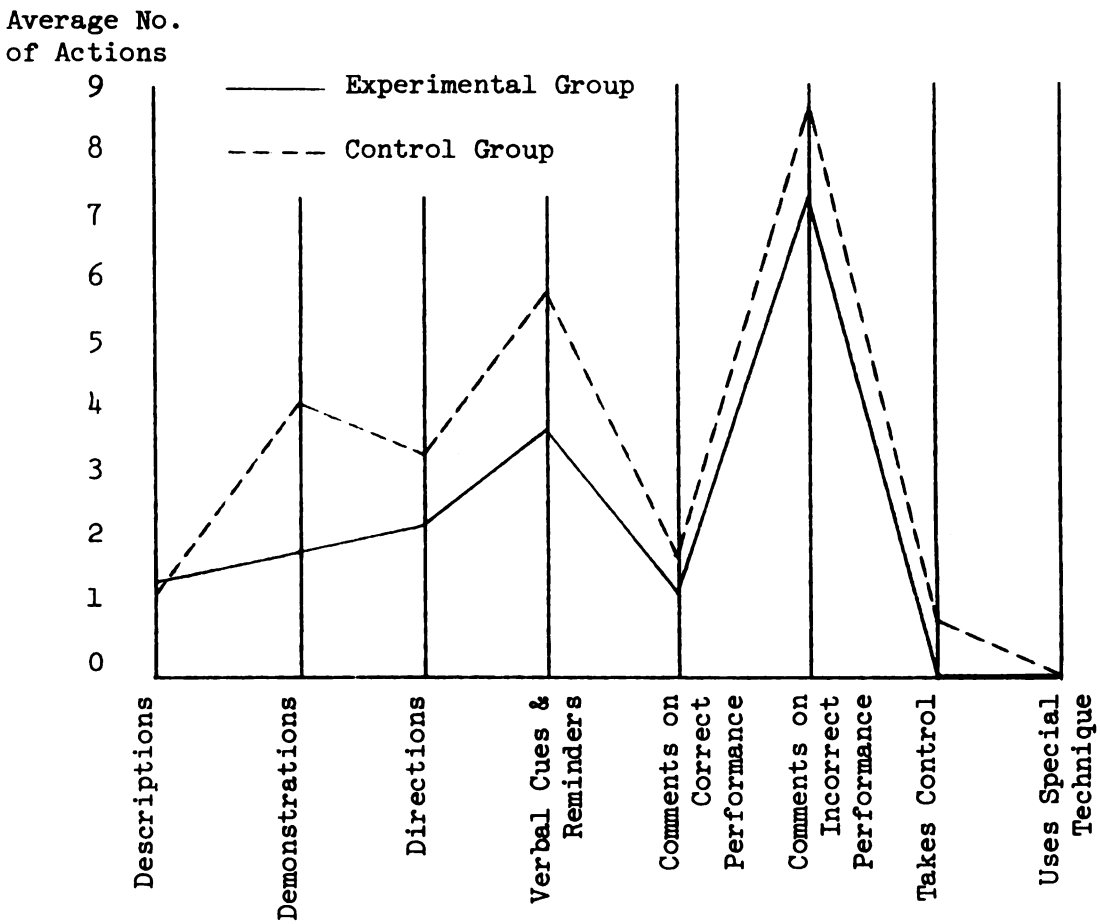


FIGURE 3

AVERAGE INEFFECTIVE TEACHER ACTIONS FOR EACH AREA OF THE DRIVER EDUCATION TEACHER PERFORMANCE INVENTORY



experimental group. The control group had an effective ratio of 89.09 percent, and the experimental group ratio was 88.33 percent.

In the Demonstrations area, the experimental group averaged 8.25 effective actions compared to 6 for the control group and only 1.75 ineffective actions compared to 4 for the control group. This resulted in an 82.50 percent effective ratio compared to a 60 percent effective ratio for the control group.

The experimental group also scored higher in the area of Directions with an average of 37.83 effective actions and 2.08 ineffective

actions compared to the control group average of 33.91 effective actions and 3.18 ineffective actions. The experimental group effective ratio was 94.78 percent, and the control group ratio was 91.42 percent.

In the area of Verbal Cues and Reminders, the experimental group averaged 26.33 effective actions compared to only 19.09 for the control group. The experimental group averaged 3.58 ineffective actions compared to 5.82 for the control group. The effective ratio favored the experimental group, 88.02 percent compared to 76.64 percent.

The experimental group scored higher in Comments on Correct Performance, averaging 8.25 effective actions and 1.08 ineffective actions compared to 6.91 effective actions and 1.73 ineffective actions for the control group. The differences in the averages appeared to be small; however, the effective ratio for the control group was 88.39 percent compared to 80.00 percent for the control group.

The area of Comments on Incorrect Performance provided the lowest percent effective ratio of any area for both groups; however, the experimental group percentage was higher, 46.95 percent compared to 37.25 percent for the control group. The experimental group averaged 6.42 effective actions and 7.25 ineffective actions compared to 5.18 effective actions and 8.73 ineffective actions for the control group.

In the Takes Control area, the experimental group scored 4 effective actions (an average of .33 actions per student instructor) and no ineffective actions. The control group had 1 effective action (an average of .09 actions per student instructor) and 8 ineffective actions (an average of .73 actions per student instructor). The greatest effective

ratio occurred in this area, 100 percent for the experimental group and 11.11 percent for the control group.

In the area of Uses Special Technique, both groups had a 100 percent effective ratio; however, the experimental group had 6 effective actions (an average of .50 actions per student instructor), and the control group had 4 effective actions (an average of .36 actions per student instructor).

In addition to obtaining a higher mean on the total score, the experimental group was more active while teaching their lessons as they averaged 113.67 effective and ineffective specific action scores as compared to an average of 105.72 effective and ineffective actions scores by the control group.

Areas of Difference in the In-Car Instructor Rating Scale

The scores on the In-Car Instructor Rating Scale were summed and averaged to provide a mean score in each of the five areas and are reported in Table 4.

Appropriateness of Content Comments provided the largest difference between the mean of the two groups; the experimental group mean was 3.63 compared to the control group mean of 3.27. In the area of Preparation for Lesson, the experimental group mean was 3.63 compared to 3.41 for the control group. The two groups were almost identical in the area Student Instructor Observations of Trainee and Environment; the experimental group mean was 2.96 and the control group mean was 2.95. The experimental group mean was slightly higher in Sensitivity to Trainee Needs, 3.08 for the experimental group compared to 2.95 for the control

group. In the area of Motivation of Student Instructor to Change Trainee Behavior, the experimental group mean was 3.03 compared to 3.00 for the control group.

TABLE 4

MEAN SCORES FOR THE AREAS OF THE IN-CAR INSTRUCTOR RATING SCALE

Area	Experimental Group N=12	Control Group N=11
Appropriateness of Content Comments	3.63	3.27
Preparation for Lesson	3.63	3.41
Student Instructor Observations of Trainee and Environment	2.96	2.95
Sensitivity to Trainee Needs	3.08	2.95
Motivation of Student Instructor to Change Trainee Behavior	3.03	3.00
Total Mean Score	3.27	3.12

The experimental group scored slightly higher in each area; however, there was no significant difference in any area or in the total mean score.

Summary

The results of this study indicated that the experimental group of student instructors who viewed video tape models of in-car instruction and were critiqued by the university instructor using a video tape replay of the in-car lesson performed significantly better on the Driver Education

Teacher Performance Inventory than the control group of student instructors who did not view video tape models or video tape replays of their in-car lesson during the critique sessions.

The experimental group scored higher in the following areas of the Driver Education Teacher Performance Inventory: Demonstrations, Directions, Verbal Cues and Reminders, Comments on Correct Performance, Comments on Incorrect Performance, and Takes Control. The control group scored slightly higher in the Descriptions area. Both groups had a 100 percent effective ratio in the Uses Special Technique area, although the experimental group had two additional effective specific actions. The experimental group averaged more total effective and ineffective actions than the control group.

Significant differences were not found between the two groups as measured by the In-Car Instructor Rating Scale.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was to determine whether the use of video tape models of in-car instruction and video tape replay as a means of feedback of a student instructor's lesson to supplement supervisory critique would improve the performance of the student instructor who was learning to teach in the in-car phase of driver education. The video tape models provided a visual and verbal picture of teaching in-car lessons which the student instructors could emulate. The video tape replay of the student instructor's lesson provided elements to help him internalize the critique by the university instructor.

The student instructors were twenty-three University of Wisconsin-Whitewater students enrolled in the Safety Education course Techniques of Laboratory Instruction. They were randomly divided into two groups, a control group which did not use either form of video tape recordings and an experimental group which viewed video tape models in preparing their lessons and were critiqued while viewing a video tape replay of their in-car lesson.

Each student instructor taught two Whitewater High School students to drive in the in-car phase of driver education. All student instructors taught eighteen 52-minute lessons and were critiqued on three selected in-car lessons: left and right turns, highway driving, and parallel parking. At the conclusion of the lessons, each student

instructor was evaluated for each high school trainee on the lesson one-way streets and angle parking. The Driver Education Teacher Performance Inventory and the In-Car Instructor Rating Scale were used to evaluate the effectiveness of the student instructor's teaching performance. The scores from the evaluation of the two trainees were then combined for each student instructor. From these scores, percentage scores were calculated for each student instructor on the Driver Education Teacher Performance Inventory, and average scores were calculated for each student instructor on the In-Car Instructor Rating Scale.

The experimental design was described as the Posttest-Only Control Group Design. Randomization provided equality between groups prior to the treatment. The t-test was used to test the significance of the difference between the means for both instruments. Differences between groups in specific areas of the evaluation instruments were described with the aid of tables and graphs.

Major Findings

The findings of this study were:

1. The experimental group which viewed video tape models of in-car lessons and were critiqued by a university instructor while viewing a video tape replay of their in-car lesson scored significantly higher on the Driver Education Teacher Performance Inventory than the control group which did not view either form of video tape recordings. On the Driver Education Teacher Performance Inventory, the experimental group scored higher in the following areas: Demonstrations, Directions, Verbal Cues and Reminders, Comments on Correct Performance, Comments on Incorrect

Performance, and Takes Control. The control group scored slightly higher on Descriptions. Both groups had a 100 percent effective rating on the Uses Special Technique area, although the experimental group had two additional effective actions. The experimental group was more active than the control group, as they accumulated more specific actions on the Driver Education Teacher Performance Inventory.

2. No significant differences were found between the experimental and control groups on the In-Car Instructor Rating Scale.

Conclusions

The findings indicated that the use of video tape models to provide a model behavior for student instructors to emulate and video tape replay to supplement the university instructor's critique of selected lessons was effective in improving the performance of the student instructor in the in-car phase of driver education as measured by the Driver Education Teacher Performance Inventory. Performance improved in the areas of Demonstrations, Directions, Verbal Cues and Reminders, Comments on Correct Performance, Comments on Incorrect Performance, and Takes Control. The use of video tape also seemed to increase the activeness of student instructors.

The video tape techniques as used in this study did not improve performance on the In-Car Instructor Rating Scale.

Recommendations

This study indicated that the use of video tape recordings could improve the quality of teacher preparation in driver education. The

following statements present some recommendations for variations in the use of video tape recordings.

In addition to using modeling tapes in lecture sections, study guides which describe key teaching behavior to be modeled could be developed, and the video tapes could be used individually by student instructors in study carrels. Before student instructors attempt to use the video tapes on their own, it is recommended that the university instructor use several video tapes in a lecture setting to be sure the student instructors know how to look for desired teacher behavior.

In this study, the first taping of a student instructor's lesson was during the third and fourth driving sessions. Early taping is recommended, preferably by the third session if scheduling permits, so the student instructors will be helped before incorrect performances are too firmly instilled. It is recommended that the university instructor be present during the early taping sessions to give him complete knowledge of the lesson so he could make the critique session more meaningful.

The second and third critique sessions in this study were conducted on the lessons, highway driving and parallel parking, which were selected randomly; therefore, it is not necessary to restrict the critique sessions to these lessons. Scheduling can be more flexible and cover different lessons.

Student instructors may tape additional lessons without the university instructor present. These tapes may be replayed with the aid of the university instructor or without the university instructor present if the proper base has been set for self-viewing.

It is possible that the performance of in-service teachers could be improved by viewing video tape recordings of their lessons. As with student instructors, initial sessions should be viewed with supervisory assistance. Later sessions could be self-analyzed.

Trainees might benefit from viewing their driving performance. Driver education instructors could replay lessons with the trainees to help point out poor driving techniques and procedures and aid them in improving their performance.

Implications for Future Research

Significant results were obtained in this study by using a combination of video tape models and critique sessions supplemented by video tape replay of the lessons. Future studies may investigate the degree that each method contributed to the improvement of the student instructor's performance.

A follow-up study could be conducted to determine if the student instructors in the experimental group who performed better on the Driver Education Teacher Performance Inventory as a result of video tape techniques would continue to perform better at a later time. The student instructor's performance could be measured during the student teaching experience and/or several years later as certified teachers.

Other studies indicated little success utilizing self-evaluation techniques. Combining self-evaluation on some lessons with supervisory evaluation on other lessons would save the university instructor's time. If the performance of the student instructors could be improved through this approach, the combination would benefit teacher education programs.

In this study, the university instructor rode in the driver education vehicle at the time the student instructor's lesson was being video taped. Future studies may determine whether or not it is necessary for the university instructor to be present during the taping. Student instructors could tape themselves but view the replay of their lesson with the university instructor present to provide relevant comments.

Video tape recordings of driving performance may also be used as a means of feedback to the trainees. Studies may be designed to determine the effectiveness of video tape feedback in improving the driving performance of beginning drivers.

Discussion

The results of this study supported the findings of Olivero; McDonald, et al.; and Harder which indicated that the video tape supervisory technique was effective in changing specific teaching skills. In contrast to most other studies, this study went farther and reported significant results in total teacher performance.

Most previous studies which failed to report significant differences indicated weaknesses in the measuring instruments. The results of this study suggested that the Driver Education Teacher Performance Inventory was effective in measuring student instructor performance as the Inventory indicated that the video tape modeling and supervisory techniques produced changes in performance. Although the In-Car Instructor Rating Scale seemed effective in the summer session pilot study, the person evaluating the student instructors for this study indicated

dissatisfaction with it. The In-Car Instructor Rating Scale seemed too general and was not sufficiently sensitive to measure changes, as the session in which the student instructors were evaluated was highly controlled.

Various authors reported on the importance of student instructors' viewing video tape models of correct and incorrect teaching skills. Similarly, the video tape models used in this study seemed to be beneficial in aiding the performance of the student instructors by providing an image of correct performance of in-car instruction. Authors also reported that in the normal classroom settings the value of video tape recordings of a student instructor's lesson replayed during the supervisory critique provided a common perceptual basis upon which the supervisor and the student instructor could view the performance and effect changes. This study seemed to confirm that the performance of student instructors could be improved through a critique session by a university instructor using a video tape recording of a student instructor's in-car lesson. The picture recorded in the driver education vehicle, although not a complete coverage of the driving environment, provided elements necessary to improve the critique sessions. Care, however, must be taken not to generalize that the video tape modeling alone or critique supplemented by the video tape replay alone produced significant results in the performance of the student instructors. This study was designed to capitalize on the strengths of combining both uses of video tape to obtain maximum results.

The use of both video tape modeling and video tape replay during the critique sessions seemed to improve the performance of the student instructors in many areas of in-car instruction as measured by the Driver Education Teacher Performance Inventory.

In the Descriptions area, the experimental and control groups performed at nearly the same level. The lessons with procedures and sketches were thoroughly described in the booklet, "Practice Driving Lessons," used by both groups. This booklet seemed to have a greater influence on the student instructor's ability to describe lessons than either video tape technique.

The differences shown in the Demonstrations area seemed to indicate that both video tape techniques were effective. The modeling tapes viewed by the experimental group in the lecture sections provided a visual and verbal presentation which showed exactly how the demonstrations were to be conducted. This method seemed to be more effective than a verbal description of the demonstrations by the university instructor. Through the video tape replay of the student instructor's lessons, the university instructor was able to show student instructors in the experimental group how they were behind in the verbal guidance of their trainees. With the university instructor explaining where each step should occur, the student instructors were able to improve their direct instructional approach on subsequent lessons. During the critique sessions with the control group, the university instructor told the

student instructors that they were behind with their guidance, but without the video tape replay it was more difficult to effect change.

Both groups were quite effective in the Directions area. When directions were ineffective, it was usually because improper words were used or the directions were given too late for the trainee to make the proper signals and checks. The video tape recording during the critique sessions provided the university instructor with the actual words used and the timing of the directions. The experimental group was somewhat more precise in giving directions, as their errors in early lessons were made obvious to them through the video tape replay.

The experimental group seemed more effective in providing Verbal Cues and Reminders to their trainees. The video tape models provided examples of cues and reminders not contained in printed material, such as "Practice Driving Lessons." The models also showed proper timing of such remarks. The video tape replay during the critique session disclosed periods of silence, and the university instructor was able to provide examples of appropriate cues and reminders. The experimental group also scored fewer ineffective actions in this area, as the university instructor was better able to improve the wording of remarks when the student instructor actually heard what he had said.

The emphasis during the critique sessions in the area of Comments on Correct Performance was directed toward the need for student instructors to give encouragement to their trainees. The experimental group performed slightly better in this area, as the university instructor and

student instructor could count the times encouragement was given and review the appropriateness of the encouraging remarks during the critique session.

The poorest performance occurred in the area of Comment on Incorrect Performance as both groups had more ineffective than effective actions. It is doubtful that the video tape models or video tape replay provided much assistance to student instructors in this area. It was thought that the video tape replay would have provided more improvement. New approaches during critique sessions are needed in this area of in-car instruction.

In the area of Takes Control, the control group had eight ineffective actions compared to none for the experimental group. Through the video tape replays during the critique sessions, the university instructor was better able to explain to the experimental group how, in many cases, early verbal remarks would eliminate the need to grasp the steering wheel or use the instructor's brake. The video tape models provided examples of how the student instructor could facilitate learning of skill maneuvers by taking control of the vehicle.

Uses Special Technique was an area not widely used by student instructors, and the closeness of the scores indicated that video tape techniques did little to improve the experimental group's performance. The tight controls on the evaluation lesson reduced the possibility of student instructors attempting special techniques.

Through the use of video tape recordings as used in this study, the quality of teacher preparation in driver education can be improved. The better teachers are prepared, the more likely high school driver education will fulfill its role in education.

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APPENDICES

APPENDIX A

STUDENT INSTRUCTOR IN-CAR SCHEDULE

Day	Group	Per. 1	Per. 2	Per. 3	Per. 5	Per. 6	Per. 7	Per. 8
Mon.	Exp. Group	**Stradinger** Pence McCulloch	**Hankes** Lowrey Sukowski		**Barron** Erdman Garlock	**Ackerman** Roi Schinners	**Bedessem** Lasch Meyer	**Dickart** Kowalski Sweet
	Control Group				**Huebner** Holst Mattison	**Indra** Heth Krebs	**Duckart** Kraus Kruchowski	**Schlichter** Parks Jackson
Tues.	Exp. Group	**Kincaid** Brady Rehrauer	**Tuszynski** Alverado Walton	**Sweeney** Kincaid Meadows		**Zarletti** Miller Pickering	**Zizzo** Manley Olson	**Baumgartner** Hull Lein
	Control Group	**DeDolph** Bailey Gage	**Flach** Smith Watters	**Busch** Hartzler Miakowski	**Jungbluth** Millard Pagel	**Schenkenberg** Leastman Westrick	**Meixl** Henry Weil	**Chiapette** Duerst Trewyn
Wed.	Exp. Group	**Stradinger** Pence McCulloch	**Hankes** Lowrey Sukowski		**Barron** Erdman Garlock	**Ackerman** Roi Schinners	**Bedessem** Lasch Meyer	**Dickart** Kowalski Sweet
	Control Group				**Huebner** Holst Mattison	**Indra** Heth Krebs	**Duckart** Kraus Kruchowski	**Schlichter** Parks Jackson
Thurs.	Exp. Group	**Kincaid** Brady Rehrauer	**Tuszynski** Alverado Walton	**Sweeney** Kincaid Meadows		**Zarletti** Miller Pickering	**Zizzo** Manley Olson	**Baumgartner** Hull Lein
	Control Group	**DeDolph** Bailey Gage	**Flach** Smith Watters	**Busch** Hartzler Miakowski	**Jungbluth** Millard Pagel	**Schenkenberg** Leastman Westrick	**Meixl** Henry Weil	**Chiapette** Duerst Trewyn

The underlined name in each group is the student instructor; the other two in the group are the trainees.

APPENDIX B

IN-CAR LESSON SEQUENCE

Mon.-Wed.	Lesson--Content	Tues.-Thurs.
October 4	(1) Orientation to switches, instruments, and other controls. Pre-drive procedures, starting, moving, steering, stopping, and shutdown.	October 5
October 6	(2) Smooth starting and stopping, left and right turns (on lot).	October 7
October 11	(3) Left and right turns (on residential streets) and curbing procedures.[a]	October 12
October 13	(4) Backing: left and right.	October 14
October 18	(5) Y-turns and city practice.	October 19
October 20	(6) City driving; lane changes.	October 21
October 25	(7) Passing.	October 26
October 27	(8) Highway driving.[a]	October 28
November 1	(9) U-turns and city practice.	November 2
November 3	(10) Starting and parking on a hill.	November 4
November 8	(11) Turning around in driveways.	November 9
November 10	(12) Parallel parking.[a]	November 11
November 15	(13) Perpendicular parking.	November 16
November 17	(14) Expressway driving.	November 18
November 22	(15) Emergency procedures.	November 23
November 29	(16) Review.	November 30
December 3	(17) One-way street--angle parking.[b]	December 2
December 6	(18) Review	December 7

[a]Supervision lessons.

[b]Evaluation lesson.

APPENDIX C

SUPERVISION AND EVALUATION SCHEDULE

Oct. 11, 27, Nov. 10, 29 — Oct. 13, Nov. 1, 15, Dec. 3

Period	Person	Group	Period	Person	Group
1			1	Stradinger	E
2	Hankes	E	2		
5	Barron	E	5	Huebner	C
6	Ackerman	E	6	Indra	C
7	Duckart	C	7	Bedessem	E
8	Schlichter	C	8	Dickart	E

Oct. 12, 28, Nov. 11, 30 — Oct. 14, Nov. 2, 16, Dec. 2

Period	Person	Group	Period	Person	Group
1	DeDolph	C	1	Kincaid	E
2	Flach	C	2	Tuszynski	E
3	Sweeney	E	3	Busch	C
5			5	Jungbluth	C
6	Zarletti	E	6	Schenkenberg	C
7	Meixl	C	7	Zizzo	E
8	Baumgartner	E	8	Chiapette	C

Lesson content for the first supervision is left and right turns on residential streets. Lesson content for the second supervision is strategic highway driving. Lesson content for the third supervision is parallel parking.

The content of the evaluation lesson is angle parking and one-way streets and will be evaluated by Dr. Pease. The lesson will begin at the high school. Only one trainee will start with each instructor.

Follow this order for the evaluation lesson:

1. Describe angle parking procedure and one-way street turns at the high school.

2. Demonstrate angle parking at space provided in drive at high school by talking the trainee through the procedure. Do the same for leaving angle parking place.

3. Practice angle parking two or three more times depending on time available. (Probably two)

4. Drive to one-way street area by turning left on Elizabeth Street, left on Walworth, left on Janesville, and right on Main Street.

5. Demonstrate one-way street turns by talking trainees through the first set of turns. Route: Right on Church then change lanes, left on Center (one-way to two-way), left on Fourth (two-way to one-way).

6. Practice one-way street driving. Route: Left on Main (one-way to two-way), left on Church (two-way to one-way), left on Center (one-way to two-way), left on Fourth (two-way to one-way). Curb vehicle and change trainees on Fourth Street. Another Driver Education car will bring the other trainee to you.

7. Describe one-way street turns and angle parking.

8. Demonstrate one-way street turns by talking trainee through first set of turns. Route: Turn left on Main Street (one-way to two-way), turn left on Church Street (two-way to one-way), turn left on Center Street (one-way to two-way).

9. Practice one-way street turns. Route: Turn left on Fourth Street, turn left on Main Street, turn left on Church Street, change lanes, turn right on Center Street.

10. Return to high school; left on Franklin, right on Janesville Street, right on Walworth, right on Elizabeth Street.

11. Demonstrate angle parking as in 2 above.

12. Practice angle parking as in 3 above until the end of the period.

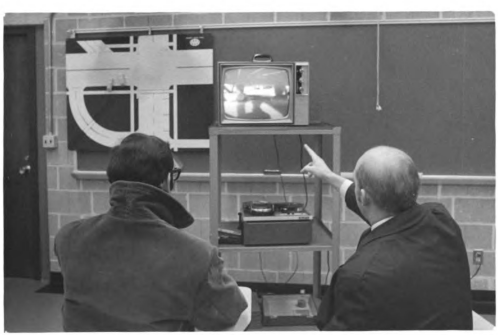
Each instructor will have one trainee at a time for approximately 26 minutes each. A complete description and demonstration of both angle parking and one-way street turns must be given to each trainee. Make it quick (short and concise) as time will be limited. Use sketches and quickly point out the procedures for angle parking and proper lane usage for one-way streets. Additional content about either can be given in route between the high school and the one-way street area.

APPENDIX D

Driver Education Vehicle Used
by Experimental Group

Microphone Mounted on Dash
between Trainee and Student Instructor

View through Rear of Station Wagon
Showing Video Equipment



Critique Session Viewing Replay
of Student Instructor's Lesson

APPENDIX E

To be filled out after the observation period:

GENERAL COMMENTS ON TEACHER EFFECTIVENESS

1. What are the teacher's strong points? (See scores for each teacher action.)

2. What are the teacher's week points? (See scores for each teacher action.)

3. Suggestions for improving teacher's performance:

4. Other comments:

TEACHER ACTIONS

	(+)	(-)
1. DESCRIPTIONS		
2. DEMONSTRATIONS		
3. DIRECTIONS		
4. CUES		
5. COMMENTS		
6. COMMENTS		
7. CONTROL		
8. TECHNIQUES		
TOTAL		

FINAL SCORE = $\frac{\text{Total (+)}}{\text{Total (+) and (-)}}$ = [ ] %

REVISED FORM (1963)

DRIVER EDUCATION TEACHER PERFORMANCE INVENTORY

SAFETY RESEARCH AND EDUCATION PROJECT
Teachers College, Columbia University

TEACHER: _____
Last name First

Driver education teaching experience: No. Years _____
or Currently enrolled in teacher preparation course _____

OBSERVER: _____
Last name First

Relation to teacher: Instructor in teacher preparation course _____

Supervisor _____ Other (specify) _____

BEGINNING DRIVER:

Content of previous driving lessons: _____

_____

Quality of previous performance: _____

_____

Content of lesson being taught (specify): _____

New: _____ Review: _____

The observer should not attempt to use this inventory until he is thoroughly familiar with the Manual for Administering the Driver Education Teacher Performance Inventory.

William G. Anderson and James L. Malfetti

TEACHERS COLLEGE PRESS
TEACHERS COLLEGE, COLUMBIA UNIVERSITY

TEACHER'S ACTION OR FAILURE TO TAKE ACTION	RATING	FREQUENCY Check (√) appropriate box each time teacher performs or fails to perform action	NOTATIONS
1. DESCRIPTIONS A. Teacher describes how to perform maneuver B. Teacher fails to give description	Effectively (+) Ineffectively (–) *because:* *Unclear* *Wordy* *Incorrect* *Unnecessary* *Other* Unable to judge (+) (o)		TOTALS + | –
2. DEMONSTRATIONS A. Teacher demonstrates driving skills and maneuvers for student B. Teacher fails to demonstrate	Effectively (+) Ineffectively (–) *because:* *Not expertly performed* *Unlawful* *Explanatory comments omitted* *Unnecessary* *Other* Unable to judge (o) (–)		TOTALS + | –
3. DIRECTIONS A. Teacher tells student which action to perform and where and when to perform it B. Teacher fails to give directions	Effectively (+) Ineffectively (–) *because:* *Unclear* *Wordy* *Untimely* *Incorrect* *Unnecessary* Unable to judge (o) (–)		TOTALS + | –
4. VERBAL CUES & REMINDERS A. Teacher reminds the student how to perform a skill or maneuver while the student is driving B. Teacher fails to give reminders	Effectively (+) Ineffectively (–) *because:* *Incorrect* *Unnecessary* *Wordy* *Unrelated to task* *Other* Unable to judge (o) (–)		TOTALS + | –

TEACHER'S ACTION OR FAILURE TO TAKE ACTION	RATING	FREQUENCY Check (√) appropriate box each time teacher performs or fails to perform action	NOTATIONS
5. COMMENTS ON CORRECT PERFORMANCE A. Teacher comments on student's correct driving performance B. Teacher fails to comment	Effectively (+) Ineffectively (–) *because:* *Not accurate* *Unnecessary* *Not meaningful* *Other* Unable to judge (o) (–)		TOTALS + | –
6. COMMENTS ON INCORRECT PERFORMANCE A. Teacher comments on student's incorrect driving performance B. Teacher fails to comment	Effectively (+) Ineffectively (–) *because:* *Not accurate* *No indication of how to correct error* *Sarcastic, harsh or threatening* *Other* Unable to judge (o) (–)		TOTALS + | –
7. TAKES CONTROL A. Teacher takes partial or full control of vehicle from student by using dual controls or grabbing the steering wheel B. Teacher fails to take control	Effectively (+) Ineffectively (–) *because:* *Action was unnecessary* *Verbal cues would have been more appropriate* *Other* Unable to judge (o) (–)		TOTALS + | –
8. USES SPECIAL TECHNIQUE A. A special technique is any method different from the basic techniques of description, direction, etc. (Items 1-7) (Indicate technique under notations) B. Teacher fails to use special technique	Effectively (+) Ineffectively (–) *because – the technique used was not well suited to:* *The skill being taught* *The student's needs* *The driving environment* Unable to judge (o) (–)		TOTALS + | –

APPENDIX F

IN-CAR INSTRUCTOR RATING SCALE

Appropriateness of Content Comments

/ 1 / 2 / 3 / 4 / 5 / _____
Rating

1. Unsatisfactory
   a. Inappropriate
   b. Not related to lesson
   c. Not related to environmental area
   d. Incorrect, illegal
2. Poor
   a. Vague relationship to lesson, better in another lesson
   b. Vague relationship to environment, better in another area
   c. Not clearly stated
   d. Not completely stated
3. Satisfactory
   a. Appropriate
   b. But not stated as completely as desirable
   c. Not completely clear, students question to understand concept
   d. More clear if given under more realistic environment
4. Good
   a. Appropriate
   b. Related to lesson and environment
   c. Clearly stated but no rationale and legal ties
   d. Student understands concept
5. Excellent
   a. Directly relevant to lesson
   b. Directly relevant to environment
   c. Completely stated, including rationale for statement and laws covering it
   d. Clearly stated, leads to student understanding or further questions pertaining to similar topic or example
   e. Instructor gets at affective domain

Preparation for Lesson

/ 1 / 2 / 3 / 4 / 5 / _____
Rating

1. Unsatisfactory
   a. Unprepared
   b. Student instructor does not know route
   c. Not aware of what trainee is expected to do (performance requirements)
2. Poor
   a. Is not aware of hazards and other teaching situations along route
   b. Gives directions late because instructor needs to use road signs in determining route

3. Satisfactory
   a. Prepared for basic instruction
   b. No depth preparation for enrichment
4. Good
   a. Knows route, gives directions in plenty of time
   b. Aware of obvious hazards, not prepared for unexpected
   c. Relates trainee strengths and weaknesses to environment
5. Excellent
   a. Complete preparation
   b. Knows route, knows and directs turns well in advance
   c. Aware of hazards and other areas where relationships and content can be given (makes best use of them)
   d. Has planned timing according to route
   e. Aware of performance requirements relative to route

Student Instructor Observations of Trainee and Environment

/ 1 / 2 / 3 / 4 / 5 / _____
Rating

1. Unsatisfactory
   a. Fails to check conditions majority of the time
   b. Fails to observe trainee to analyze errors at crucial time
2. Poor
3. Satisfactory
4. Good
5. Excellent
   a. Makes thorough check of environmental conditions all the time
   b. Observes visual checks made by trainee
   c. Observes trainee during maneuvers so problems can be analyzed

Sensitivity to Trainee Needs

/ 1 / 2 / 3 / 4 / 5 / _____
Rating

1. Unsatisfactory
   a. Improper evaluation of trainee capabilities
   b. Activity much too difficult for trainee
   c. Activity much too easy for trainee
2. Poor
   a. Activity not challenging enough
   b. Activity too challenging
   c. Evaluation of trainee capabilities partially faulty
3. Satisfactory
4. Good
   a. Evaluation of capabilities satisfactory
   b. Adjusted to trainees but too easy
   c. Adjusted to trainees but still too difficult
5. Excellent
   a. Exact evaluation of trainee capability
   b. Activities challenging but not too difficult
   c. Adjusted activities to weak and capable trainees

Motivation of Student Instructor to Change Trainee Behavior

/ 1 / 2 / 3 / 4 / 5 / _____
Rating

1. Unsatisfactory
   a. Not interested in improving
2. Poor
   a. Rationalized weaknesses
3. Satisfactory
   a. Indicates desire but puts forth little effort
   b. Effort directed toward laboratory experiences only
4. Good
5. Excellent
   a. Indicates desire to improve
   b. Asks for help on specific problems and weaknesses