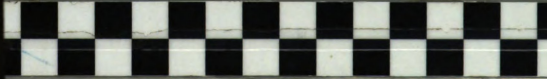


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AN EVALUATION OF SELECTED OHIO PUBLIC
SCHOOLS DRIVER EDUCATION PROGRAMS

By

Joe Steven Shrader

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
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and Curriculum

1979

ABSTRACT

AN EVALUATION OF SELECTED OHIO PUBLIC SCHOOLS DRIVER EDUCATION PROGRAMS

By

Joe Steven Shrader

Statement of the Problem

The funding of driver education in the high schools is being questioned as budgets become tighter and school systems search for ways to reduce operating costs. If the funding of driver education is to continue, evaluation of high school driver education programs is a necessity.

The state of Ohio has not conducted an evaluation of its driver education programs in recent years, and the State Department of Education, Driver Education Section, recognized the importance of such an evaluation.

The purpose of this study was to measure cognitive knowledge of those students who had completed or were just completing a recent driver education course in randomly selected high schools in Ohio. Specifically, this study had a three-fold purpose. The first was to evaluate cognitive knowledge of driver education students. The second was to attempt to determine if one

of six types of driver education programs was providing more cognitive knowledge under present conditions than the others. The third purpose was to attempt to identify those variables which may have had an influence on student success in acquiring cognitive knowledge.

Methods of Procedure

The Program Research in Driver Education (PRIDE) fifty question multiple-choice test was selected as the measure of cognitive knowledge for this study.

A random sample of twelve schools in Ohio was made. These twelve schools fit into six different programs. One class per school was then selected for the evaluation. Students were randomly selected from each class in order to achieve equal cell size for the three analyses of variance (ANOVA) tests for significance which were conducted.

The Major Findings

1. Students tested in Ohio were significantly deficient on an 80 percent success criterion. Sixty-three percent of the 326 students achieved 80 percent or more correct. This deficiency was significant at the .95 level.
2. In none of the three programs were 80 percent of the students achieving 80 percent success. Program one (two-phase), program two (three-phase simulation), and program three (four-phase) had 56 percent, 66 percent, and 70 percent respectively. All three were significantly deficient at the .95 level of confidence.

3. Student scores were significantly deficient on questions their instructors indicated had been covered in their classes. Seventy-one percent of the students achieved 80 percent or more correct. This was significantly deficient at the .95 level of confidence.
4. Program three (four-phase) was significantly better than program one (two-phase) or program two (three-phase simulation). Significance was measured at the .95 level of confidence.
5. No significant difference was found between programs with multimedia and those programs without multimedia. Significance was measured at the .95 level of confidence.
6. None of the three programs was significantly better with high, middle, or low GPA students. Significance was measured at the .95 level of confidence.
7. Student score was moderately correlated with cost of the program. A correlation coefficient (r) of .1737 was found. An " r " of .40 was needed to determine a significant relationship.
8. Student score was not significantly correlated with hours of instruction in the program. An " r " of -.0978 was found, when an " r " of .40 was necessary for significance.
9. Student score was not significantly correlated with class size. An " r " of .0340 was found when an " r " of .40 was needed for significance.
10. Student score was not significantly correlated with the instructors' education in driver education. An " r " of -.0729 was found when an " r " of .40 was needed for significance.
11. Student score was not significantly correlated with the instructors' age. An " r " of .0103 was found, when an " r " of .40 was necessary in order to be significant.
12. Student score was not significantly correlated with the number of years their instructor had taught driver education. An " r " of .0043 was found, when an " r " of .40 was necessary for significance.

The author would like to dedicate this study to his parents. His father's dedication to the field of traffic safety has been an inspiration to all who have come in contact with him. To follow in his footsteps is a rewarding challenge.

To his mother, a special thanks for typing, editing and moral support, without which, this study may never have been completed.

Thank you for being parents who taught your children to set their sights high and to realize that "all things are possible."

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CHAPTER I

THE PROBLEM

Formal driver education programs have existed in the United States for more than forty-five years, and some form of education for drivers has been utilized since soon after the invention of the automobile. Perhaps one of the earliest forms of education for drivers occurred when the first car salesman taught their prospective customers to drive the automobile, frequently a prerequisite of purchase.

The popularity, and the availability, of the "horseless carriage" increased the number of vehicles more rapidly than road conditions and education of drivers could accommodate. By the 1930s, schools were beginning to respond to the need to educate the automobile driver, and the first formal driver education courses were inaugurated. In 1930, Amos Neyhart, the "father of driver education," began teaching students behind the wheel on a voluntary basis. In 1934, Neyhart taught at Pennsylvania State College the first complete classroom and laboratory course in driver education.

Another early name in driver education was Herbert Stack who offered the first classroom driver education course (81, p. 25).

The 1930s further saw the development of the simulator, the range, the combination of classroom, simulation, and behind-the-wheel instruction, as well as the publication of textbooks for driver education (85, pp. A3, 60-62).

World War II brought many of these programs to a halt except as training could be used for wartime driving. Car production gave way to airplanes and war materiel. Gasoline was rationed, and replacement parts for existing automobiles were limited to necessary emergencies (85, pp. 75-79).

The war had barely ended when the first President's Conference for Highway Safety was held in 1945. Four years later the National Conference on High School Driver Education was conducted by the National Commission on Safety Education (81, p. 26).

By the early 1950s, post World War II production of automobiles was rapidly accelerating to meet the demands of the people who were intent on loosening the wartime restrictions on travel and the use of the automobile (57, p. 25). Money was more accessible, new highways and super highways were becoming a reality, and mobility became a way of American life. Cars

became larger, more powerful, and capable of greater speeds.

Vehicle accidents, and the resulting deaths, injuries, and property damage soared, as did the number of drivers and vehicles on the roads (59, p. 59).

More and more high schools began offering driver education. The Allstate Insurance Company substantiated its belief in the worth of high school driver education by being the first insurance company to provide insurance reductions for students completing high school driver education. Colleges became more involved in safety programs, and in 1956, The American Driver and Traffic Safety Education Association was organized (81, p. 26).

The Driver Education Evaluation Program (DEEP) Study Report to Congress of July 1975 stated that:

Basically, the idea of training persons to operate motor vehicles stems from the assumption that trained or experienced persons will perform better in most traffic situations than untrained or inexperienced persons. The beginning of driver and safety education was based primarily on this assumption, and most programs were implemented on the basis of their validity for accident prevention. In addition to the common sense emphasis placed on the skills required for driving, a similar emphasis was placed on the development of assumed safe-driving attitudes, with the belief that such attitudes would result in fewer crashes and that such attitudes could be manipulated or developed.

The report continued:

Unfortunately, it was not until very recently that an attempt has been made to determine scientifically which behavioral variables (including

attitudes and skills) have a causal relationship with crashes. Recent efforts have also sought to determine whether such variables can be manipulated or developed by means of effective training. Measurement of the extent to which a curriculum meets such instructional objectives and various performance requirements has also been emphasized recently. Furthermore, serious attempts are now being made to assess the degree to which such programs are successful in meeting their ultimate goal of crash prevention (81, p. 25).

The DEEP Study called the 1960s "the critical period" in high school driver education. It stated that, "Beginning with studies by independent researchers in the early 60's and continuing with the Moynihan and McGuire and Kersh reports in 1968, high school driver education came under severe attack with regard to its claimed effectiveness in crash prevention" (81, p. 28).

The study further quoted R. Kaywood as suggesting for the most part that "these voices went unheeded, for during this period HSDE was expanded from providing training for approximately 1 million students to providing training for more than 2 million students" (81, p. 28).

If the 60s were the critical period in high school driver education, then the 1970s might be called "the hopeful period." The DEEP Study explained that after the Fifth National Conference for Traffic Safety Education in December of 1973:

It was apparent that four primary thrusts were underway in the traffic safety education area, as follows:

Qualitative improvement was being emphasized above the need for quantitative expansion.

HSDE was becoming an integrated component of a much larger traffic safety education program for various driver groups.

Increasing emphasis was being placed on cost-effective safety education with built-in evaluation based on measurable objectives.

Instructional management was moving more toward criterion-referenced courses for students as opposed to time-based instruction (81, p. 28).

The state of Ohio has long been active in traffic safety programs. (The first driving simulator, and the first range were developed at Ohio State University in 1930) (80, p. 26). Since 1953, driver education programs have been available in the public schools in the state of Ohio. In 1969, the state recognized the importance of the driver education program in the school curriculum and began subsidizing a part of the cost of the program to the local school districts. In 1969, thirty dollars per pupil was made available to local school districts for the instruction of driver education. This money was derived from driver license fees. By 1972, costs of the programs had risen sharply and the state raised the subsidy to the local school districts to fifty dollars per pupil enrolled in a school-sponsored driver education program. This now amounts to over eight

million dollars per year for state support of driver education. In addition, each district may assess a maximum ten dollar fee to each student for program improvement.

The death rate per 100 million vehicle miles was enviably lower in Ohio (2.68) than the national average (3.38) in 1977. A supposition might be drawn that there is a correlation between the pertinent interest in driver education programs in the state of Ohio and in the lower number of traffic deaths in the state.

There is a trend across the nation to challenge the funding of driver education, and consideration is being given to the possibility of eliminating funding for local high school programs. Partly, this has been brought about because of tightening budgets, but perhaps to an even greater degree, it has been the failure of schools to adequately evaluate their programs to substantiate that students are gaining what they are supposed to gain from driver education classes.

The Problem

Statement of the Problem

To offset this trend of challenge to the funding of driver education, program evaluation will be a necessity in each state if legislatures are to continue funding programs. The state of Ohio had not conducted such

an evaluation of its driver education programs in recent years, and recognized the need for an updated evaluation. This study attempted to isolate and evaluate several variables which have an effect on driver education students in Ohio.

Purpose of the Study

The purpose of this study was to measure the level of cognitive knowledge of those students who had completed or were just completing a recent driver education course.

Specifically, this study had a threefold purpose. The first was to evaluate cognitive knowledge of driver education students. The second was to attempt to determine if one of three types of driver education program was providing more cognitive knowledge under present conditions than the others. The third purpose was to attempt to identify those variables which may have had an influence on student success in acquiring the cognitive knowledge.

Importance of the Study

The former tradition of believing that driver education must be good has been challenged. High school driver education has come under question from several sources in recent years. The most critical of these has been the Insurance Institute for Highway Safety's study

on driver education which concluded that driver education causes 2,000 teenage deaths each year (66). Although conclusions of this study have been highly criticized by competent highway safety research personnel, and have since been revised by the IIHS, these negative research conclusions have been damaging to traffic safety programs. Presently, knowledge of driver education effectiveness was best described in a statement in the DEEP Study.

". . . No such study has succeeded in producing unequivocal results concerning high school driver education effectiveness (or the lack of it)" (81, p. 84).

State and federal agencies which helped fund driver education in the high school have questioned the worth of these programs in terms of the money being spent. Many state legislatures and/or departments of education have requested studies to determine the effectiveness of current driver education programs in reducing accidents and the resulting deaths and injuries on the nation's highways.

The Driver Education Section of the Ohio Department of Education has been interested in conducting such an evaluation of high school programs in that state; hence, the conducting of this study.

It was believed that this study could make the following contributions to the driver education programs in the state of Ohio and to the field of traffic safety:

1. Promote better understanding of current driver education programs in Ohio.
2. Give input to the Ohio Department of Education on their future assistance to driver education programs.
3. Supply information to persons in the traffic safety field in regards to driver education evaluation, both in terms of the results of this study, and its recommendations for similar types of evaluation studies.

The Research

Research Questions

The following research questions were considered in the investigation of selected high school driver education programs in Ohio:

1. Is driver education in Ohio effective in teaching students cognitive knowledge?
2. Is any of three program types effective in teaching students cognitive knowledge?
3. Is driver education in Ohio effective in teaching what teachers believe they are teaching?
4. Is one of three program types more effective in teaching cognitive knowledge?

5. Is one program more effective than another with higher, middle, or lower GPA students in teaching cognitive knowledge?
6. Is multimedia in the classroom a major factor in terms of students' success?
7. Is multimedia in the classroom more effective in teaching cognitive knowledge to high, middle, or low GPA students than those classrooms without multimedia?
8. Is the cost of a program a factor in terms of students' success?
9. Is the number of years of teaching experience in driver education a factor in terms of students' success?
10. Are the total hours of the program related to students' success?
11. Is class size related to students' success?
12. Is teacher age a major factor in terms of students' success?
13. Are teacher preparation hours a major factor in terms of students' success?

Research Hypotheses

The following research hypotheses were analyzed and tested in this study:

1. Driver education in Ohio is effective in teaching students cognitive knowledge.
2. One of the three programs is effective in teaching cognitive knowledge.
3. Driver education in Ohio is effective in teaching what teachers believe they are teaching.
4. One of the three programs is more effective in teaching cognitive knowledge.
5. One program is more effective than another with higher, middle, or lower GPA students in teaching cognitive knowledge.
6. Multimedia in the classroom is a major factor in terms of students' success.
7. Multimedia in the classroom is more effective in teaching cognitive knowledge to high, middle, or low GPA students than those classrooms without multimedia.
8. Cost of a program is a factor in terms of students' success.
9. The number of years teaching driver education is a factor in terms of students' success.
10. The total hours of the program are related to students' success.
11. Class size is related to students' success.

12. Teacher age is a major factor in terms of students' success.
13. Teacher preparation hours are a major factor in terms of students' success.

Methods and Procedures

Three teacher variables, one pupil variable, and four program variables were selected to be evaluated. The teacher variables were teacher age, their hours of education in driver education, and their years teaching driver education. The pupil variable was the student GPA. The four program variables were program type, the cost per pupil, total hours of instruction, and number of students in the class.

With these program types and variables selected, twelve schools in Ohio were randomly selected and an evaluation was conducted.

Evaluation Instrument

The evaluation instrument used in the evaluation was a 50 item knowledge test used by the Program Research in Driver Education (PRIDE) project in Iowa. It was developed from class "C" questions developed by Pollack and McDole. These questions were selected from those which covered the critical and most critical subject areas as defined by the HumRRO report (62; 75, p. 131).

The test seemed to be the shortest test available which was considered valid and reliable. The test limited reading level as a major factor for student success by using only those questions which had a correlation of .25 or less with reading ability, and further used only those questions which had a reliability coefficient of between .50 and .95 (75, p. 132).

Scope of the Study

There were several factors which determined the scope of this study. The students were only from the state of Ohio and most of them were selected from the southwest quadrant of the state when programs were available in that area. Not all programs were evaluated, just three types: two-phase, three-phase simulation, and four-phase. In each of the three programs, the programs with multimedia and two programs without multimedia within each of the three programs were selected.

Only cognitive knowledge was evaluated. Accident and violation records, driving ability or attitude measures were not used. These evaluation criteria may or may not be better evaluation tools.

The results of this study, therefore, are limited to these three programs in Ohio and further, only with regards to levels of cognitive knowledge.

Generalizability

Since the pupils involved in the study were from within normal classrooms in the state of Ohio and since there was no reason to believe that there was any difference between the southwest quadrant, from which most of the schools were selected, and the rest of the state, it can be assumed that the findings of this study will hold for all similar driver education programs in the state.

There was also no reason to believe that the school selected was greatly different from other schools with similar programs. Therefore, the results of this study can be generalized to those similar programs.

Limitations of the Study

There are several means to evaluate driver performance. This study, however, did not attempt to evaluate or to predict driver performance, but only to look at one aspect of the driver--his/her cognitive knowledge as measured by a 50 question written exam. Cognitive knowledge cannot predict safe and efficient operation of an automobile.

Due to the cost of the Driver Performance Measurement on-road evaluation of driver performance developed at Michigan State University, it or a similar measure was ruled out as a viable alternative for use in this study (30). The years involved in the study of accident and

violation records made the evaluation of such records undesirable. Further, some questions have also been raised in regard to accident and violation records because of the inconsistency of both reporting and convictions. The main objection to this type of evaluation is the extremely small percentage of the driving population involved each year.

The use of only 50 questions on the written exam might be considered too few to measure adequately the students' knowledge of critical and most critical driving knowledge as defined in the Human Resources Research Organization (HumRRO) report. However, the 246 questions (Special Test Set) suggested by Pollack and McDole in the University of Michigan Study, if used, would have increased the number of schools needed as well as make reading level a major concern (64, p. 6).

The 50 questions were selected from Pollack and McDole's class "C" item bank. Although the 50 questions were not all directly taken from the 246 questions in the Special Test Set, they were similar in content area covered.

This study was not an experimental study, but rather an evaluation of cognitive knowledge of existing programs. Thus, the results of the study are limited to what was determined to be the best program under present

conditions. Recommendations on which program should be used in the future could not be made.

Although objectivity is stressed throughout this study, it was impossible to eliminate the author's bias towards driver education--not so much in the conducting of the study, but in terms of what was studied and what questions were asked. These reflected the author's ideas and thoughts.

Definition of Terms

Class "C" Test Items

Class "C" referred to test items developed by Pollack and McDole to measure cognitive knowledge needed for operation of an automobile (64).

Cognitive Knowledge

"Cognitive knowledge involves the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting. For measurement purposes, the recall situation involves little more than bringing to mind the appropriate material" (9, p. 201).

GPA

Grade point average was the average of all grades received at the high school level. Low GPA as used in

this study was 0.0 to 1.5, middle GPA was 1.6 to 2.5, and high GPA was 2.6 to 4.0.

Multimedia

Multimedia integrates audio and visual materials into a teaching/learning unit to produce a more complete teaching system. It makes use of instructional materials incorporating immediate feedback to and from the student.

Program One

A basic driver education course consisting of at least 36 hours of classroom instruction and six hours of in-car behind-the-wheel instruction.

Program Two

A three-phase driver education program consisting of at least 36 hours of classroom instruction, six to twelve hours of simulation instruction, and four to six hours of in-car behind-the-wheel instruction.

Program Three

A four-phase driver education program consisting of at least 36 hours of classroom instruction, six to twelve hours of range (multiple-car, off-street driving facility) instruction, six to twelve hours of simulation, and two to six hours of in-car behind-the-wheel instruction.

Range

"An off-street area designed and built to incorporate a variety of realistic traffic situations where a number of cars are used simultaneously, under the supervision of one or more teachers" (2, p. 247).

Simulation

"An electromechanical device designed to represent the driver's compartment of the automobile, including typical controls and gauges. A programmed, group instructional system which employs student interaction with filmed driving environments" (2, p. 152).

Special Test Set

Two hundred and forty-six test questions chosen by Pollack and McDole as ideal questions for measurement of critical automobile driving knowledge test items, as defined by the HumRRO report (64, 46).

Organization of Remaining Chapters

The succeeding chapters are organized in the following manner: Chapter II is a review of related literature. Chapter III deals with the procedure and methodology used in this study. Chapter IV presents the analysis of data, and Chapter V summarizes the study and discusses the conclusions and recommendations of this study.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter presents a review of the literature related to this evaluation of driver education programs. The review of the literature was divided into four areas which dealt with evaluation measures in driver education and training, educational evaluation in other subject areas which used similar formats, driver education evaluation studies, and evaluation measures used in the evaluation of driver education effectiveness.

Driver Education Evaluation Measures

The use of a written test for evaluation and prediction of driver performance has been discussed since evaluation of driver education began.

The concept of driver education has been to provide knowledge, skills, and proper attitudes to those participants, which would in turn make them safer drivers.

The major problem has been the evaluation of these three areas. There were varied ideas about which form of evaluation should be utilized. The federal government has mandated that state driver education programs be evaluated

on the bases of reduction of accidents, and the resulting deaths and injuries of those drivers completing the program. Although reduction of accidents is one of the rationales for driver education, evaluation on these criteria alone cannot be valid. William Lybrand stated:

Prior studies using accident data as criteria have been conducted ex post facto, and in that situation there are no completely valid statistical techniques for separating the influence of driver education from the independent influence of the personal characteristics of the drivers studied.

With few exceptions, official accident records were used as criteria in prior evaluative studies and these are known to be incomplete, but that further, there are serious questions about the adequacy of accident data as comprehensive, reliable, and valid measures of driving performance proficiency, as distinguished from their obvious validity as one measure of highway transportation system effectiveness (41, p. vi).

Although accident records should not be used as a sole measure of driver education effectiveness, they can be a useful tool in the overall evaluation. According to R. L. Tack:

An important measure of the effectiveness of driver education is a student's record of accidents and violations. Although driving records may be the most significant measure of driver education's effectiveness, they are only one index of a student's driving behavior. A substantial portion of a student's driving behavior is not measured if only the variables obtained from driving records are considered. Such variables as knowledge gain, the student's perception of the course, classroom and behind-the-wheel activities and total hours of instruction received, as well as various pre-driver education, driver

education and post-driver education factors should be considered when examining the effectiveness of driver education (75, p. 3).

LeRoy Dunn felt that reduction of crashes must be a goal of driver education. He stated that:

In order to survive as a viable highway safety countermeasure, rather than just a training service for society, traffic safety education programs must meet the challenge of reducing crashes or their negative consequences (27, p. 18).

William Mann felt that "knowledge of both manmade and natural laws are important to a driver, but, the most important area of concentration and evaluation is on the driver's attitude" (42). Richard Bishop reiterated the "we drive as we are" concept. His emphasis was also on developing the attitudes of the young drivers to make them safer vehicle operators (6).

Bishop further stated that knowledge alone would not insure safe driving:

Any perceptive driver education teacher realizes the distinction between knowing and behaving. For example, a student may learn the traffic laws and score 100 percent on a written test covering this topic, and then violate many of the same laws following completion of the course. This does not mean that learning facts is not useful in developing proper attitudes and sound judgment. Exposing students to factual information is an excellent beginning when attempting to modify behavior. However, facts alone will not change behavior, so our challenge lies in using facts to influence the understandings, perceptions, emotions, attitudes, values, and motivations which determine behavior (7).

For evaluation of programs and students' learning, written tests can be useful. According to Bishop:

Pencil and paper tests, although possessing many weaknesses as an evaluation instrument can (1) stimulate learning; (2) furnish useful information for counseling individual pupils; and (3) evaluate teaching and learning. Test responses and erroneous thinking that may involve the learner in an accident if not corrected (5).

Francis Kenel further stated regarding knowledge evaluation:

The attitude approach must be replaced by acceptance of the fact that the primary objective of driver education is to assist students in acquiring those abilities needed to travel efficiently and effectively from one point to another with minimal risk of collision, within the highway transportation system.

The accomplishment of this objective involves providing students with the required tools and knowledge to perform the driving task.

What are we talking about when we say driver error--poor attitudes, social disabilities? Not really. Research indicates that of those cases in which the driver contributed the primary cause, 72% resulted from inappropriate decisions. Drivers did not know what to do. They did not know relevant factors to consider when processing information. Perceptual failure contributed to over 66 percent of the cases. Either the driver did not want to see, or did not know what or how to look for information in the first place. In an additional 33 percent of the cases, drivers took inappropriate evasive action. Inappropriate evasive action includes everything from locking the brakes to absolutely no response at all.

It is generally agreed that the prevention of such failure is possible through education or training.

If one believes that accident reduction is a realistic goal of driver education, then it is essential that we assist drivers to develop those abilities needed to drive in an efficient-effective manner. It is critical that they develop the

ability to make decisions necessary to adequate management of time and space within a stream of moving traffic. This necessitates that they be taught how and what to look for and how to classify information into meaningful data. This must be based on knowledge and anticipation of what to expect (39, pp. 7, 8).

Does knowledge produce safer drivers? There was a consensus that it did. W. Worick said:

Knowledge is the foundation for understanding and the springboard for the development of desirable attitudes toward safe behavior. Ideally every individual should learn and appreciate safety rules; unfortunately this is not always the case. The dramatic reduction in industrial accidents in recent years is the direct result of safety programs designed to educate the worker and, in turn, develop good habits and attitudes. We are realizing similar results with driver education programs. Every technological advance brings new hazards with which man must cope; thus education and the development of knowledge are a never ending process. Adequate knowledge enables the individual to recognize and evaluate dangerous situations (89, p. 24).

Richard Kaywood commented that:

Some young drivers place too much emphasis on the physical part of the driving task. They think skillful car-handling is good driving. These basic skills must be learned well enough to become almost automatic. But it is the mental part of the driving task that gets most drivers into trouble.

To make decisions, drivers use their stored knowledge and the facts gathered from the present traffic situation. . . .

Knowledge and skill are essential in the safe operation of motor vehicles.

The prediction is based on this information and also on the driver's stored knowledge (38, pp. 7, 8).

Kenel again observed:

The driving process would be impossible if every time we drive were the first time. What saves us is our ability to store information. We develop a "memory bank" of driving facts which help us predict correctly (39, p. 9).

James Aaron gave further credence to the consensus that knowledge produces safer drivers:

Experience and information stored in one's memory can have a profound influence on what is perceived, how it is interpreted and therefore what decision is made. In the operation of motor vehicles there are two classes of stored or retained information. These are the long-term and short-term retention of information. . . .

To estimate or predict relationships to other highway users, stored memory banks of traffic laws, rules and regulations, vehicle dynamics, and driver behavior must be called upon. Concepts and strategies are recalled for the more complex decision-making problem-solving situation. Further, the performance of life-saving evasive actions under emergency conditions is based on stored information (2, p. 37).

Aaron further stated:

Essentially the question must be asked, what does a safe driver really need to know? Further, how can young drivers be taught so that behavioral patterns can be influenced to the point they will become reliable and competent drivers? A systems-analysis approach may be used to define the scope and breadth that driver education must take in order to meet the challenge it faces. Using such an approach, the content of the driver education curriculum should be selected on the basis of those perceptions, judgments, decisions, and actions required to perform the driving task safely and efficiently (2, p. 43).

One study conducted in California by Dell Dreyer asserted:

Only the written test appears to have some predictive validity. . . . Better performance on the written test tended to be associated with fewer accidents and convictions.

The relationship between written test score and subsequent driving record for first time applicants showed that as the number of errors increases, the frequency of accidents and convictions increase moderately. Those with seven

or more errors had more than twice as many accidents as those with no errors (25, p. 6).

These findings seemed to be consistent with other research. In another study, conducted by Carpenter in California, similar results were found:

For all DMV test forms combined, correlations of total test scores with driving record variables were all significant, indicating renewal applicants with better prior driving records obtained higher test scores (14, p. 2).

Although written knowledge tests are only one means of evaluating driver performance, it is an important and useful tool for evaluating the success of driver education.

Educational Evaluations

In reviewing evaluations of educational programs, Michigan's Educational Assessment Program seemed to be similar, if not better than other states' evaluations. In the introduction to the program it was stated that, "For the purpose of the Michigan Assessment Program, assessment will be defined as the gathering of information about student achievement which is useful for educational decision making" (55, p. 1). Obtaining copies of evaluation or assessment reports from Ohio, as well as from other states, however, was a problem.

Michigan's evaluation reports which were studied were more in terms of results of the evaluations, or the rationale for them, than in the methodology of the

evaluation; therefore, not pertinent to this design (48, 49, 51, 51, 52, 53, 54, 55). All the programs evaluated were as a total program. They were not divided into different teaching methods to determine if one method was better than another. Although this idea was suggested for evaluation of science programs (55, p. 25) the evaluation was not conducted in this manner.

Several means were employed in Michigan's Educational Assessment Program to evaluate these programs. Written tests were used in vocabulary, reading comprehension, English usage, and arithmetic. In each case, standardized, norm-referenced tests were used. In addition, an attitude survey and a questionnaire of the child's home environment were used (55, p. 3).

The method used in these evaluations was to select or develop objectives for each subject and grade level, and to evaluate accomplishment of those objectives by students (55, p. 11). Although the goal was to evaluate all students, where tests had to be individually administered, samples of approximately 500 students were used (55, p. 23).

Individual student success rate ranged from 48 percent to 87 percent accomplishment in all subject areas (52). The success rate on successful completion

of the objectives ranged from 60 percent to 80 percent (51, 52, 54).

Driver Education Evaluation Studies

Several methods have been employed over the years to evaluate driver education. Usually, these evaluations were ex post facto type studies, where data gathered for a different purpose was later used to evaluate the effectiveness of the driver education program. In some instances, these evaluations took place many years later.

Until recently, experimental research in driver education had not been attempted. The reason for this was that it was too serious a matter to have a true control group. If the hypothesis of the experimental research was to validate driver education as a viable means of accident reduction, then conversely, the hypothesis would postulate that a control was being subjected to greater risks of being involved in a vehicle accident with resultant death, injury, or property damage. The DeKalb County, Georgia, program fell short of being a true experimental study, but it was an attempt to meet the requirements of an experiment (85).

The following driver education evaluation studies were reviewed on two factors, format and criterion (or

criteria) used to measure success. Results applicable to this study were noted.

The Program Research in Driver Education (PRIDE) was conducted in Iowa. The scope of the study was state-wide. The purpose was to evaluate programs in Iowa utilizing different phases.

The study looked at three different program types: two-phase, three-phase simulation, and four-phase. Two other factors included were (1) when the program was offered (summer, fall, or spring) and (2) whether or not the school was urban or rural.

The study used a 50 question pre-post test to evaluate the cognitive knowledge of students. (The same test used in this Ohio evaluation study.) The students were also tested on the Driving Attitude Survey developed by Schuster and Guilford, success on the driver license exam, and accident and violation records for the two-year period following completion of driver education (75).

Some conclusions and recommendations in the PRIDE study relative to this evaluation study were (1) regular school programs showed significant gains in knowledge over summer programs, (2) GPA was highly correlated with knowledge test success, and (3) two-phase programs seemed to be superior to the three- and four-phase programs in

reduction of accidents. Overall, as in most studies of a behavioral science, no clearcut conclusions were made other than a need for increased parental involvement (75).

The California Driver Training Evaluation Study by Margaret Hubbard Jones looked at two programs: two-phase and three-phase simulation taught by both commercial and the public schools.

Evaluation of programs was conducted by using three criteria: teacher evaluation, license exam records, and accident and violation records. No significant difference was found on any of the three variables. The three-phase simulation program cost an average of eighteen dollars more per pupil than the two-phase with no significant differences over the two-phase programs (12, p. 11).

Several criticisms of this study were noted: (1) All simulation programs were conducted during the regular school day, whereas the two-phase programs were conducted after school, and (2) of the population of 158 schools selected, 34 refused to participate and 13 were finally used (12, p. 11). Further, neither pupils nor instructors were randomly selected (12, p. 9).

Michigan's Driver Education Evaluation Project, conducted under the direction of Kara Schmitt, was also

an evaluation of existing programs in the state of Michigan.

The study examined five different programs: two-phase, two-phase range, three-phase range, three-phase simulation, and four-phase. All students in the state who took driver education during the 1976-77 school year were tested. Evaluation was conducted by use of 75 question written tests developed from Michigan's driver education performance objectives. Some schools were randomly selected for administration of a pre-test as well as the post-test (30).

Findings indicated that the after-school and summer programs were significantly better in producing cognitive knowledge than were the regular school-day programs. Teacher age was correlated with test scores. The older the teacher, the lower the scores. Part-time teachers had better results than full-time teachers, and three-phase simulation and three-phase range programs were the best of the five.

A driver education evaluation study directed by William Cole at Texas A&M University used an experimental approach to his evaluation. He developed a five-phase program using multimedia as the first phase. The comparison was based on several variables of the students

participating. A written test and an on-road evaluation (The McGlade Road Test) were used (45).

The study concluded that there were no significant correlations between any of the variables such as length of programs or IQ test score. The only variable which significantly correlated was entry-level skills of the students in both cognitive and psychomotor learning. The recommendation was to assure better assessment of entry level skills and to build upon them.

In a study conducted by Charles E. McDaniel, four selected programs were evaluated. They were two-phase, three-phase simulation, three-phase range, and four-phase. The study also examined program length as well as sex of drivers.

Three criterion measures were employed: driving knowledge, driving performance (45), and a traffic analysis written test. Significant gains were noted in knowledge test scores for all programs.

Robert E. Gustafson conducted a comparison between a three-phase range program and a four-phase. Three measures of success were used: knowledge, attitude, and skill.

Although all groups showed significant improvement in knowledge, there was no significant difference between groups on the measure. No significant improvement was shown for either group on the Mann Personal

Attitude Survey (43), although improvement was shown on the Siebrecht Attitude Scale (70, pp. 2-4). There was a significant correlation between IQ and success on the knowledge test and on the Siebrecht Attitude Scale.

The DeKalb County, Georgia, project under the direction of Jack Weaver was the first real effort at an experimental study using a control group in driver education.

The groups were randomly assigned from 18,000 students (volunteers) into three different programs. One was the control group with no formal training. The second group received the Safe Performance Curriculum (86, p. 18) of 72 clock hours, and the third group, the Pre-Driver Licensing curriculum of 20 clock hours of instruction.

This entire project was designed to provide ideal conditions for the instruction of the Safe Performance Curriculum. The evaluation has not yet been completed, but will be conducted by using accident and violation records, as well as intermediate criteria of knowledge and attitudes.

Driver Education Phases

This section deals with some of the phases which are used in different driver education programs. It is sometimes difficult to separate these methods of teaching

into distinctively separate phases. Any teacher, in any given subject area, uses more than one method of instruction for his/her pupils. Driver education methods of instruction have been so divided because the laws governing driver education have set the format of instruction by hours for each of the methods of phases. Further, evaluation of total programs was often used to infer the worth of a particular phase (or phases) used in that program. Therefore, this section is somewhat of a continuation of the preceding section which dealt with driver education evaluation studies as a whole.

This section will briefly look at three methods of instruction in the context of the driver education program--simulation, range, and the use of the multimedia response system.

The use of driving simulators in high school driver education programs in Ohio was increasing despite the high initial cost to purchase a unit. One obvious reason was the rising cost of vehicles, insurance, gasoline, and instructors. A simulator can save a school (or schools) money if scheduled properly.

Even though simulation can reduce the cost of driver education, one must still consider whether they were better for instruction of students than another method or methods.

In a study conducted in California, there was no significant difference in student performance between those students who were instructed with simulation and those who were not (12).

One significant difference was that the cost of simulation was \$18 per pupil. One explanation for this might be that all the simulation programs were in-school programs, whereas the others were all after-school instruction.

A leading authority on the use of simulators, Richard Bishop, had several comments on simulation for high school driver education programs:

A simulator is a laboratory device that enables the operator to reproduce under test conditions phenomena likely to occur in actual performance.

Simulators are helping to meet the quality-quantity cost challenge facing driver education.

Research with both aircraft and driving simulators used for education purposes strongly supports the premise that a transfer of learning occurs from the simulator environment to the actual task (8).

Richard A. Meyerhoff, Chairman, Driver Education Department of Waterloo Public Schools, Waterloo, Iowa, explained that simulation can be effective as a tool in helping the student take in and process data from the driving environment. He also called for updated simulation films:

I am firmly convinced that a new generation of simulation films can save valuable in-car time and at the same time produce more competent drivers (47, p. 12).

He further put the burden on the teacher for making simulation successful:

In the simulator setting much teacher intervention is needed to make things fly (47, p. 12).

Vernon P. Sample pointed out that the idea of simulation was not unique to driver education and that it was very successful in other fields as well:

The U.S. Air Force and all commercial airlines have for years capitalized on the simulator as a training aid in preparing their pilots. Submarine and tug boat crews receive simulator training. Atomic power plant personnel, diesel locomotive engineers and, of course, astronauts all have received simulator training, to name but a few, and all with very positive results. Why then has the driver training simulator alone been singled out from all others and subjected to so many challenges as to its value as a training aid and its cost effectiveness? (68, p. 29)

Sample also noted that two areas must be closely examined: the instructor and equipment utilization.

Sample added:

A poorly prepared and motivated instructor teaching in a simulator that has been poorly scheduled leads the most objective observer to the obvious conclusion that this type of training is ineffective and costly, and the simulator takes the bum rap (68, p. 29).

Glenn Winningham pointed out the difficulty of trying to separate one phase of a program as the cause of success or failure of that program:

Simulation represents only one phase of a multi-phase curriculum and must be coordinated with other instructional phases if optimum benefits are to be realized. Therefore, communication between all driver education staff members is vitally important to assure consistency and positive transfer throughout multiple-phase learning activities (88, p. 28).

Ming H. Land explained that some of the teaching methods used in simulators are the same as those used in the instruction of industrial arts (or other subject areas) and have been for some time (40).

One of these techniques was to have the students "drill" a procedure or skill. Land observed that John Locke once proposed the method of teaching in habit formation which was a matter of repetition. "In other words," Land elaborated, "it was a matter of 'drill' in the time-honored sense of the term."

Land went on to indicate the various uses of technological advances:

One of the concomitant benefits of the technological developments in the area of educational methodology has been the development of media and techniques to improve the teaching-learning process. A representative sample of the recent innovative practices that incorporate media and teaching methodology to achieve specified behavioral goals are reported by Buffer to include simulation, micro-teaching, video tape, programmed learning, cybernetics, and computer assisted instruction (40, p. 27).

There appears to be a continually expanding interest in programmed instruction. Programmed texts and lessons presented via a teaching machine are used in a variety of programs and courses.

Some schools already have programmed learning centers and some have developed multimedia programs. . . . Programmed instruction which utilizes multimedia instructional materials and diversified methods of teaching will become an important feature in American education . . . (40, p. 79).

There were further benefits from the use of simulation in a teaching program, according to Land:

Simulation and games also may have special values for motivating low achieving students as they add a new dimension of reality to teaching. . . .

The climate today favors educating capable students more than was done a few years ago; also slower learners are provided greater assistance with their learning problems than ever before. Various individualized instruction plans and approaches on all levels of education have been tried . . . (40, p. 54).

Rummel and Pine studied the effectiveness of simulation against non-simulation in teaching numerical control concepts. Experience indicated that games have high potential for stimulating interest and for motivating students. Plans for capitalizing on this motivation need to be developed and put into practice (40, p. 68).

Land went on to caution that simulation or any other teaching method was not a panacea:

Susskind fears that education may prove to be one of the fields in which the province of technology has been oversold. He advises educators to take advantages of technology in every field of human endeavor and, at the same time, to recognize the limitations of it (40, p. 2).

The application of new media and advance technology to educational method will be developed gradually into a large scale in the future. The process, however, will be an evolution one controlled by rational decisions. It is not and will not become a revolution in teaching methods . . . (40, p. 78).

Another phase of driver education instruction used sparingly in Ohio was the off-road driving facility or range. Similar to simulation, it can reduce cost over a long period of time, but the high initial cost prohibited many schools from utilizing this learning tool. Further, teachers who were properly trained in the use of a range were at a premium.

Several studies have attempted to determine if the inclusion of the range program was as effective or more effective than another form of teaching.

A study was conducted in North Carolina to determine if range programs resulted in a better score on driver license exam than did non-range programs (19). The conclusion was that they did not. In fact, it appeared that the non-range programs did better than the range programs.

Although the study was relatively well designed, it did have two problems. Driver license examiners were used to evaluate a driver education program, and in the analysis of variance test, equal variance was assumed but cell size was not equal. Further, two- and three-way interactions were also significant. To attempt to draw any conclusions from this form of analysis was not warranted.

In a study of range and simulation programs conducted by Robert O. Nolan at Michigan State University,

no significant differences were found between the two methods of instruction in driving skill, attitude, or knowledge (60).

In a study discussed elsewhere in this chapter, Robert E. Gustafson found that a range program was better than a combination range and simulation program on driving skill. No significant differences were found between general driving knowledge, specific driving knowledge, driving attitudes, or on the traffic problems and road problems sections of the final read test (35).

In a literature search conducted by Forrest M. Council, et al. (2), several studies were noted in the use of range facilities for advanced driver education programs:

In a small but well controlled evaluation of their program, the GM staff used 60 patrol officers from the Oakland County Michigan Sheriff's Department. One group received the 8 hour training program and one group was the control. The trained group exhibited a 50% reduction in accidents and an 80% reduction in cost per accident (20, p. 17).

Peevey (1975) suggests that, "The goal of any emergency instructional program should be to give the student cognitive and manipulative information and skills, experience to reduce the trauma of the emergency, skills related to his general driving performance (some may prefer defensive driving), and optimum vehicle maintenance procedures (20, p. 17).

Existing literature concerning advanced driver education programs which include training in emergency skill indicates that there is (1) a set of consensus maneuvers which are employed, with some

modification, almost universally and (2) there is a lack of well controlled evaluation and conclusive findings concerning the effectiveness of these programs (20, p. 17).

There seems to be no conclusive proof that the range phase of driver education was either beneficial or harmful to driver education students in high school driver education programs (20, p. 17).

The last method of instruction to be covered is the use of a multimedia response system. The state of Ohio has been installing more and more of these systems each year.

R. Samuel Parker stated that there were many advantages to the use of multimedia in the driver education classroom (63):

Advantages to the teacher:

- Provides uniformity and flexibility to the classroom curriculum.

- Provides immediate feedback on individual student and group performance.

- Captures real life traffic situations and attitudinal role-playing sequences which generate good group discussion opportunities.

- Brings scientific equipment and experiments via photography to the driver education classroom.

- Gives the teacher an opportunity to concentrate on the highest functions of his profession--to counsel, guide, and tutor according to the identified individual and group needs.

- Provides a communication system that has almost limitless applications. It can be used to administer tests, take roll, receive and reflect opinions, value judgments and feelings, test levels of comprehension, etc.

Advantages for the student:

- Provides continuous opportunities to interact with the programmed lessons and through peer group discussions.

- Provides learning experiences in a dynamic way that is challenging, yet holds attention.

- Provides immediate reinforcement for correct responses.

- Provides for active participation rather than passive, "told what to do" observations.

- Provides private response communication with the teacher (63, p. 16).

Parker emphasized that multimedia use was only effective when used by a competent instructor. As did Land, Parker noted that multimedia was not a panacea.

Gail H. Silver expressed the same basic feelings about the use of multimedia in the classroom. "The system is flexible; the only restriction is the teacher's creativity."

Silver also pointed out that multimedia was not skill oriented as was a simulator; it was knowledge oriented:

When it comes to developing actual skill, our simulators are more effective, and naturally some amount of on-street driving is needed. However, it is hard to evaluate just how effective a multimedia response system is because of simulation (71, p. 11).

Further, according to Silver, the biggest advantage was the number of students who could be instructed at one time:

The biggest advantage, in my estimation, would be the number of students that can be taught effectively at one time. We know from our evaluation that it is an effective means of providing large

group instruction, and that in this approach, each student is attentive and responsive. He has to be. The system is structured that way (71, p. 11).

The only study found which tried to isolate the effect of multimedia instruction on driver education instruction was conducted by Charles E. McDaniel at Michigan State University. He found no significant difference attributable to the AETna Drivocator (multimedia) instruction (44).

Summary

This chapter presented a review of the literature related to this evaluation of driver education programs.

A major problem in driver education has been the evaluation of its programs. It has been difficult to reach a consensus as to which type of evaluation was more valid and reliable. While the federal government mandated that state driver education programs be evaluated on the basis of reduction of accidents, and the resulting deaths and injuries of those drivers completing the program, most experts in the field asserted that evaluation on these criteria alone cannot be valid.

There was a general consensus that knowledge produced safer drivers, and that written knowledge tests were an important tool for evaluating the success of driver education.

Evaluation measures cannot minimize the importance of attitude, of the "we drive as we are" concept as stated by Bishop.

Michigan's Educational Assessment Program used written tests to evaluate students in vocabulary, reading comprehension, English usage, and arithmetic. In each case, standardized, non-referenced tests were used, as well as an attitude survey and a questionnaire on the child's home environment.

Until recently, most driver education evaluation studies were ex post facto type studies. More recently, the Program Research in Driver Education PRIDE conducted a statewide study in Iowa. The purpose was to evaluate programs in Iowa utilizing different phases. Some conclusions and recommendations of the PRIDE study were pertinent to this evaluation study.

Other studies and evaluations looked at a variety of program types, attempting to ascertain if one program was more effective in driver education than another or others. Findings and conclusions varied, as did the methods of evaluations. General summarization of these evaluations was not possible.

Jones' study found no significant difference in driver education taught by commercial and by public schools.

Schmitt found that summer programs were significantly better in producing cognitive knowledge, that older teachers were less effective than younger ones, that part-time teachers had better results than full-time teachers, and that three-phase simulation and three-phase range programs were best of the five tested.

Cole's study recommended better assessment of entry level skills for driver education.

McDaniel conducted a study of four programs and concluded that significant gains were noted in knowledge scores for all programs.

The study by Gustafson found a significant correlation between IQ and success on the knowledge test and on the Siebrecht Attitude Scale.

The DeKalb County, Georgia, project has not been completed, but was using accident and violation records to test three groups of students.

Simulation, range, and the use of multimedia response systems have been used and evaluated by numerous teachers of driver education. Generally, studies concluded that simulation was beneficial when scheduled and used by a competent instructor, and that multimedia had many advantages for students of various ability and learning levels. Conclusions as to the effectiveness of the range in driver education were varied. There seemed to be no conclusive proof that the range phase of driver

education was an effective teaching/learning tool--or that it was not.

The next chapter will describe the design and methodology used to complete the study. It will describe in detail the selection of Ohio, data collection, contact letters, telephone contacts, testing procedures, methods of data analysis, and organization of data.

CHAPTER III

DESIGN AND METHODOLOGY

This chapter outlines the design and methodology used in the study. Topics described in detail are selection of Ohio as the location for the study, selection of specific schools in Ohio, data collection, contact letters, telephone contacts, testing procedures, methods of data analysis, and organization of data.

Selection of Ohio

The state of Ohio had not evaluated its driver education programs in recent years and recognized the need for such a procedure. When personnel in the state were contacted concerning an evaluation of the state's driver education program, the cooperation and assistance from the state Department of Education were excellent. Further, the author was from the state of Ohio and was familiar with driver education in that state. The state of Michigan was considered because of the author's immediate proximity, but was eliminated because of recent studies which had been conducted by the Michigan Department of Education.

Selection of Schools

Seventeen schools were selected for use in this study. Twelve schools were selected for the evaluation, and five schools were selected as alternates. These seventeen schools were randomly selected from a list supplied by Mr. Larry Cathell of the Ohio Department of Education, Driver Education Section. The schools selected had driver education programs which fit into the six categories selected for evaluation in this study. When possible, the schools on the list were in the southwest quadrant of Ohio. Of the schools selected, fourteen were in the southwest quadrant, three were not. Further, of the twelve schools evaluated, ten were from the southwest quadrant and two were not. Use of schools not in the southwest quadrant was necessitated by the insufficient number of suitable programs in the southwest quadrant.

Data Collection

The collection of data for this study consisted of three phases: initial contact with the school by letter; telephone contact with the principal, driver education supervisor, and/or the driver education teacher; and the school visitation for testing.

Contact Letters

Three different letters were sent to the schools which participated in this study. The first letter was

sent to each superintendent, explaining the study, how the school was selected, and requesting his cooperation in completing the study (see Appendix A for a sample form).

The second letter was sent to the building principal, explaining the study and asking his cooperation. The letter informed him that he would be contacted by telephone to arrange the details of the visitation (see Appendix B for a sample of the form sent to the principal).

The third letter was sent to the building principals of the alternate schools selected, informing them of their selection, and that they would be contacted if their school was needed for the completion of the study (see Appendix C for a sample form).

A letter from Mr. Larry Cathell of the Ohio Department of Education was to be included in the letter to the school principal. However, this communication was not received, and thus was not used. This omission caused some confusion as to whether the state of Ohio or the author was conducting the study. Contact was made by telephone to each building principal. The author clarified that this study was conducted for a doctoral dissertation with the cooperation of the Ohio Department of Education. There were no further problems in this regard.

Telephone Contacts

Approximately one week after the contact letters were mailed, a telephone call was made to each principal to determine a convenient date and time for the visitation and testing procedure. Two of the schools contacted had changed programs, necessitating the use of alternate schools. Dates and times for the administration of the test were determined by the telephone contact (see Appendix D for a sample form).

The principals were asked to have ready at the time of the visitation the GPA's for the students to be tested, and the cost per pupil of the driver education program.

Two schools requested and received further information before the administration of the test.

In a few instances, further contact had to be made with the classroom teacher, driver education supervisor/coordinator, or supervisors of instruction to obtain information. These contacts were made as necessary by telephone.

Two of the schools contacted had completed their spring programs, and arrangements were made to administer the test at the completion of the summer term.

Testing Procedure

The testing procedure was consistent at all schools. Students at each school were informed of the reason for the evaluation. They were asked to do their best on the test, even though the results would not be used for grading purposes. The students were given a test booklet and an answer sheet. They were asked to put their name on the answer sheet in order to match the GPA and the test score of each student. The GPA and the test score were the only items of information kept by the author for the purposes of data analysis (see Appendix E for test and answer sheet).

The tests were scored and the scores were recorded with GPA's, when available. Two schools did not have a record of student GPA's (see Appendix F for sample form).

While the students were taking the test, the teachers were asked to read the test and to indicate the items which had been taught during the current term, as well as those which had not been taught at the time of the testing, but would be covered. They were also requested to indicate those items which they did not plan to teach by the completion of the current term. These data were also tabulated for later analyses (see Appendix G for sample form).

Instructor and program data information were requested for use in the data analysis. Instructors

completed this information form while the students were taking the test (see sample form in Appendix H).

Methods of Analysis

Two methods of data analysis were used. One method, t-tests, were hand scored and analyzed based on an 80 percent success criterion.

The other analyses were done by computer. These included three analyses of variance and six Pearson correlations. All analyses were conducted using a .05 alpha level when applicable.

Organization of Data

The dependent variable for the study was cognitive knowledge as measured by the PRIDE fifty question multiple-choice test.

Three analyses were conducted to determine program effectiveness. In each of the three analyses a t-test was used in which the number of students who achieved 80 percent or more correct was compared to an 80 percent success criterion.

In the first of these three analyses, all 326 student scores were used to determine if students tested in Ohio were achieving 80 percent success. The hypotheses to be tested were:

$$H_0: \mu \geq 80\%$$

$$H_1: \mu > 80\%.$$

For the second analysis, program one (two-phase) used 102 student scores, program two (three-phase simulation) used 114 student scores, and in program three (four-phase) 110 student scores were used. Three separate t-tests were compared to an 80 percent success criterion. Hypotheses tested were:

$$H_0: \mu P1 \geq 80\%$$

$$H_1: \mu P1 < 80\%$$

$$H_0: \mu P2 \geq 80\%$$

$$H_1: \mu P2 < 80\%$$

$$H_0: \mu P3 \geq 80\%$$

$$H_1: \mu P3 < 80\%.$$

The third analysis compared all 326 adjusted student scores. To determine each student's adjusted score, each test question that the individual instructors indicated not having covered in his class was eliminated from the total possible for his/her students. The percentage correct for each student was then tabulated, compiled for all 326, and the percentage achieving 80

percent was again compared to the 80 percent success criterion. Hypotheses tested were:

$$H_0: \mu A \geq 80\%$$

$$H_1: \mu A < 80\%.$$

Three different analyses of variance (ANOVA) were used to analyze the data.

The first ANOVA was a one-way, planned comparison, to determine if one of the three programs tested was significantly better than another. Program one (two-phase) was contrasted with program two (three-phase simulation), and program two was contrasted with program three (four-phase). The hypotheses were:

$$H_0: \psi_1 = \mu P2 - \mu P3 = 0$$

$$H_0: \psi_2 + \mu P1 - \mu P2 = 0.$$

For this ANOVA, eighteen students were randomly selected from each of the twelve schools in order to achieve equal cell size (see Figure 3.1).

The second ANOVA conducted was to determine the relationship of programs and GPA's. The purpose was to see if one program was better than another for low, middle, or high GPA students. A two-way ANOVA was used with the following hypotheses:

P1				P2				P3			
M1		M2		M1		M2		M1		M2	
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
R=	R=	R=	R=	R=	R=	R=	R=	R=	R=	R=	R=
18	18	18	18	18	18	18	18	18	18	18	18

M1 = With Multimedia
 M2 = Without Multimedia
 P = Program Type
 C = Classroom
 R = Replications per cell

Figure 3.1.--ANOVA Design.

$$H_0: \alpha_i = 0 \text{ GPA}$$

$$H_0: \beta_j = 0 \text{ Program}$$

$$H_0: \alpha\beta_{ij} = 0 \text{ Interaction.}$$

For this ANOVA, seven students in each of the nine cells were selected. The small number was due to the availability of these students (see Figure 3.2).

The third ANOVA also used a two-way design to determine the relationship of multimedia and programs. Specifically to see if multimedia worked better in one program than in another. The hypotheses were:

$$H_0: \alpha_i = 0 \text{ Multimedia}$$

$$H_0: \beta_j = 0 \text{ Program}$$

$$H_0: \alpha\beta_{ij} = 0 \text{ Interaction.}$$

A total of 174 student scores were used for this analysis, 29 in each cell (see Figure 3.3).

A fourth ANOVA which was to be conducted was eliminated because the data did not allow for equal cell size. Several cells would have had no student scores in them, so it was decided not to attempt to analyze this research question.

	P1	P2	P3
G1	R= 7	R= 7	R= 7
G2	R= 7	R= 7	R= 7
G3	R= 7	R= 7	R= 7

P = Program Type
 G1 = GPA 0.0 - 1.5
 G2 = GPA 1.6 - 2.5
 G3 = GPA 2.6 - 4.0
 R = Replications per cell

Figure 3.2.--Two-way ANOVA Design.

P1		P2		P3	
M1	M2	M1	M2	M1	M2
R= 29	R= 29	R= 29	R= 29	R= 29	R= 29

P = Program Type
 M1 = With Multimedia
 M2 = Without Multimedia
 R = Replications per cell

Figure 3.3.--Two-way ANOVA Design.

Six correlations were studied to determine the relationship of variables to students' success as measured by the written test.

Student scores were correlated with cost of the program, education in driver education of the teacher, total hours of instruction in the program, number of students in the class, age of the teacher, and years of teaching experience in driver education. For these correlations, all 326 student scores were used.

Summary

This chapter outlined the design and methodology used in the study. Topics described were the selection of Ohio for the study, selection of schools to be used, data collection, contact letters, telephone contact, test procedures, methods of data analysis, and organization of data.

The data and the results found in the study are organized and displayed in the following chapter.

CHAPTER IV

ANALYSIS OF RESULTS

Chapter III described the design and methodology used in the study. This chapter reports the findings of the twelve analyses which were conducted.

The Sample Data

Total Student Achievement

The first analysis conducted was a t-test to determine if 80 percent of the students were achieving 80 percent or more correct on a test of cognitive knowledge. The t-test used was designed for dichotomous data where $t = (\bar{x} - \mu) / (s / \sqrt{n})$. Table 4.1 displays the data for this analysis.

Of 326 students tested, 208 achieved 80 percent or more correct. This was 63 percent of the students who had satisfactory achievement. When this 63 percent was compared to an 80 percent success criterion, it was found to be significantly deficient. The results of the analysis indicated a t of 12.6. A t of 1.658 was needed at the .05 alpha level to reject. Therefore, the hypothesis was rejected.

TABLE 4.1.--Student Distribution for t Analysis.

Percent Correct	N	%
90-99	76	23
80-89	131	40
70-79	73	22
60-69	34	10
50-59	8	2
40-49	4	1
30-39	0	0
20-29	0	0
10-19	0	0
0- 9	0	0
Total	326	100*

$$H_0: \mu \geq 80$$

$$H_1: \mu < 80$$

Critical t = 12.6

Tabled t = 1.658 @ .05

*May not add to 100 percent due to rounding.

Individual Program Analysis

The second analysis conducted consisted of three separate t-tests. These tests also used a t-test for dichotomous data. Each of the three programs was separately tested to determine if any one of the three was achieving the goal of 80 percent or more correct.

Table 4.2 displays the data for program one (two-phase). This table indicates that 56 of 102 students, or 54 percent, achieved 80 percent or more. When 54 percent was compared to the 80 percent success criterion, it was determined to be significantly deficient. A t of 10.40 was found compared to a tabled t of 1.671 needed to reject at the .05 alpha level. The hypothesis was, therefore, rejected.

Program two (three-phase simulation) had 75 of 114 (66 percent) of the students achieve 80 percent or better. When 66 percent was compared to 80 percent, it was found to be significantly deficient. A t of 6.67 was determined when a t of 1.671 was needed to reject at the .05 alpha level. Therefore, the hypothesis was rejected. Table 4.3 displays the data for this analysis.

Table 4.4 displays the data for program three (four-phase). This table indicates that in program three (four-phase), 77 of 110 students, or 70 percent, achieved 80 percent or better. When 70 percent was compared to 80 percent, it was also significantly deficient. A t of

TABLE 4.2.--Analysis of Program One.

Percent Correct	N	%
90-99	13	13
80-89	43	43
70-79	34	34
60-69	8	8
50-59	3	3
40-49	1	1
30-39	0	0
20-29	0	0
10-19	0	0
0- 9	0	0
Total	102	100*

$$H_0: \mu \geq 80$$

$$H_1: \mu < 80$$

Critical $t = 10.40$

Tabled $t = 1.671 @ .05$

*May not add to 100 percent due to rounding.

TABLE 4.3.--Analysis of Program Two.

Percent Correct	N	%
90-99	26	23
80-89	48	42
70-79	25	22
60-69	12	11
50-59	2	2
40-49	1	1
30-39	0	0
20-29	0	0
10-19	0	0
0- 9	0	0
Total	114	100*

$$H_0: \mu \geq 80$$

$$H_1: \mu < 80$$

Critical $t = 6.67$

Tabled $t = 1.671 @ .05$

* May not add to 100 percent due to rounding.

TABLE 4.4.--Analysis of Program Three.

Percent Correct	N	%
90-99	37	34
80-89	40	36
70-79	14	13
60-69	14	13
50-59	3	3
40-49	2	2
30-39	0	0
20-29	0	0
10-19	0	0
0- 9	0	0
Total	110	100*

$$H_0: \mu \geq 80$$

$$H_1: \mu < 80$$

Critical $t = 5.0$

Tabled $t = 1.671 @ .05$

*May not add to 100 percent due to rounding.

5.0 was tabulated when a t of 1.671 was needed to reject at the .05 alpha level. The hypothesis was, therefore, rejected.

Teacher Item Analysis

The third analysis, which also used a dichotomous data t -test, was to determine if students were successfully learning what teachers indicated they were covering in the class. Table 4.5 displays the data for this analysis. Of 326 students tested, 231 achieved 80 percent or more correct. This figure computed to 71 percent. The 71 percent was compared to 80 percent and was found to be significantly deficient. The results of the analysis indicated a t of 7.89. A t of 1.658 was needed to reject at the .05 alpha level; therefore, the hypothesis was rejected.

TABLE 4.5.--Analysis of Teacher Covered Material.

	N	%
Achievement 80% or greater	231	71
Achievement less than 80%	<u>95</u>	<u>29</u>
Total	326	100
$H_0: \mu \geq 80$		
$H_1: \mu < 80$		
Critical $t = 7.89$		
Tabled $t = 1.658 @ .05$		

Comparison of Programs

The fourth analysis was to determine if any one of three programs was significantly better than any of the other programs. A one-way, planned comparison, analysis of variance (ANOVA) was utilized. A significant difference was found between program two (three-phase simulation) and program three (four-phase) in favor of program three. A t of -2.504 was found when a t of ± 1.980 was needed for significance at the .05 alpha level. Table 4.6 presents the data for contrast one.

TABLE 4.6.--Contrast One: Program Two Contrasted with Program Three.

Estimated Population Value	Standard Error	t Value	DF	t Probability
-1.9444	.7765	-2.504	213	.013

Tabled $t = \pm 1.980 @ .05$

Contrast 1*

$$H_0: \mu_{P2} - \mu_{P3} = 0$$

$$H_1: \mu_{P2} - \mu_{P3} \neq 0$$

$$\text{Critical } t = -2.504$$

$$\text{Tabled } t = +1.985 @ .05$$

$$H_0: \text{rejected}$$

*P2 = Program Two; P3 = Program Three.

No significant difference was found between program one (two-phase) and program two (three-phase simulation). A t of .0972 was found when a t of ± 1.980 was needed for significance at the .05 alpha level.

Table 4.7 presents the data for contrast two.

TABLE 4.7.--Contrast Two: Program One Contrasted with Program Two.

Estimated Population Value	Standard Error	t Value	213 DF	t Probability
.0972	.7765	.125	213	.900

Tabled $t = \pm 1.980 @ .05$

Contrast 2*

$$H_0: \mu_{P1} - \mu_{P2} = 0$$

$$H_1: \mu_{P1} - \mu_{P2} \neq 0$$

$$\text{Critical } t = .125$$

$$\text{Tabled } t = \pm 1.980 @ .05$$

$$H_0: \text{not rejected}$$

*P1 = Program One; P2 = Program Two.

GPA/Program Effect

The second ANOVA was conducted to measure if one of the three programs was significantly better than another with low, middle, or high GPA students.

explained in the first ANOVA conducted which concluded that program three was better than program one or program two.

Two-way interaction ($\alpha\beta_{ij}$) was not significant. An F of 1.192 was tabulated when an F of 3.07 was needed for significance at the .05 alpha level.

Data for the two-way ANOVA where $H_0: \beta_j = 0$ was rejected is presented in Table 4.9.

Variable Correlations

The final six research questions were correlations between student score and six variables. The data for these correlations are contained in Table 4.10. Three program variables and three teacher variables were selected to be correlated. The three program variables were the cost per pupil, total hours of instruction, and number of students in the class. The teacher variables were teacher age, their hours of education in driver education, and their years of teaching driver education.

Student score was moderately correlated with cost of the program. A correlation coefficient (r) of .1737 was found. An "r" of .40 was needed to determine a significant relationship.

Student score was not significantly correlated with hours of instruction in the program. An "r" of

TABLE 4.9.--Two-way ANOVA Table.

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Multimedia	42.618	1	42.618	2.057	.153
Program	358.259	2	179.129	8.645	.001
Interaction	49.380	2	24.690	1.192	.306
Error	3501.959	169	20.722		
Total		174	22.706		

$H_0: \alpha_i = 0$ Multimedia
 H_0 not rejected

$H_0: \beta_j = 0$ Program
 H_0 rejected

$H_0: \alpha\beta_{ij} = 0$ Interaction
 H_0 not rejected

Tabled F Multimedia = 3.92

Tabled F Programs = 3.07

Tabled F Interaction = 3.07

TABLE 4.10.--Correlations Between Student Scores and Related Variables.

Variable	*Value of r_{xy}
Cost of Program	.1737
Hours of Program	-.0978
Class Size	.0340
Teacher Education	-.0729
Teacher Age	.0103
Years Teaching	.0043

*Significant $r = .40$.

-.0978 was found, when an "r" of .40 was necessary for significance.

Student score was not significantly correlated with class size. An "r" of .0340 was found when an "r" of .40 was needed for significance.

Student score was not significantly correlated with the instructors' education in driver education. An "r" of -.0729 was found when an "r" of .40 was needed for significance.

Student score was not significantly correlated with the instructors' age. An "r" of .0103 was found, and an "r" of .40 was necessary in order to be significant.

Student score was not significantly correlated with the number of years their instructor had taught driver education. An "r" of .0043 was found, when an "r" of .40 was necessary for significance.

Summary

This chapter reported the results of the data as analyzed. Several significant findings were discovered, and these will be discussed in Chapter V. Chapter V will also include a brief summary of the study, conclusions, recommendations, recommendations for further research, and a discussion.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Chapter IV contained the findings of this study. This chapter contains a brief summary of the study, a brief description of the research design, findings, conclusions, recommendations, recommendations for further research, and a discussion.

Summary of the Study

The primary purpose of this study was to measure the level of cognitive knowledge of those students who had completed or were just completing a high school driver education course. Additional information concerning program type, use of multimedia, instructors, and pupils that could have a significant effect on student achievement was also gathered. The following research questions were examined:

1. Is driver education in Ohio effective in teaching cognitive knowledge?
2. Is any one of the three programs effective in teaching students cognitive knowledge?

3. Is driver education in Ohio effective in teaching what teachers believe they are teaching?
4. Is one of three programs more effective in teaching cognitive knowledge?
5. Is one program more effective than another with higher, middle, or lower GPA students in teaching cognitive knowledge?
6. Is multimedia in the classroom a major factor in terms of students' success?
7. Is the cost of a program a factor in terms of students' success?
8. Is the number of years teaching driver education a factor in terms of students' success?
9. Are the total hours of the program related to students' success?
10. Is class size related to students' success?
11. Is teacher age a major factor in terms of students' success?
12. Are teacher preparation hours a major factor in terms of students' success?

Research Design

Twelve schools from Ohio were randomly selected for use in this evaluation study. The names of schools which fit into the six categories selected were obtained

from Mr. Larry Cathell, Section Chief, Driver Education Section, Ohio Department of Education. A total of 326 students were tested at the twelve schools, using the 50 question PRIDE driver education cognitive knowledge test. Five separate t-tests were conducted as well as three ANOVA and six correlations to best analyze the data collected.

Findings

1. Sixty-three percent of the students in Ohio scored 80 percent or better in cognitive knowledge. This was significantly below the hypothesized 80 percent at the .95 level of confidence.

2. Program one had 56 percent achieving 80 percent or more correct. Program two had 66 percent achieving 80 or more correct and program three had 70 percent of the students achieving 80 percent or more correct. All three of these programs were significantly below the hypothesized 80 percent success criterion at the .95 level of confidence.

3. Seventy-one percent of the students achieved 80 percent or more correct in cognitive knowledge on the material which instructors said they had taught. Overall improvement was noted (from 63 percent to 71 percent achieving 80 percent or more correct) when items which had not been covered were eliminated. This was

significantly below the 80 percent hypothesized at the .95 level of confidence.

4. Program three (four-phase) was significantly better (.95 level) than program one (two-phase) or program two (three-phase simulation). There was no significant difference at the .95 level between programs one and two.

5. None of the three programs was significantly better at the .95 level with any of the three GPA groups. However, the higher the GPA, the higher the student score. This produced a significant GPA main effect in the ANOVA test.

6. Multimedia had no significant effect on students' cognitive knowledge at the .95 level of confidence. There was a significant main effect for program, again suggesting program three to be more effective than program one or program two.

7. Cost of the program had a moderate correlation (.17) with students' score. This moderate correlation was not significant and cannot be considered a major reason for student success. A correlation "r" of .40 was needed for significance.

8. No significant correlation "r" was found between students' score and their instructor's experience teaching driver education. An "r" of -.0978 was found when an "r" of .40 was needed for significance.

9. Hours of the program were not significantly correlated with student scores. An "r" of .0340 was found when an "r" of .40 was needed for significance.

10. Class size was not significantly correlated with student scores. An "r" of .0103 was found when an "r" of .40 was needed for significance.

11. There was no significant correlation found between student scores and the hours of teacher preparation. An "r" of -.0729 was found when an "r" of .40 was needed to be significant.

12. Instructor years teaching driver education showed no significant correlation with student scores. An "r" of .0043 was found when an "r" of .40 was necessary for significance.

Conclusions

The following conclusions are based upon the findings of the study.

1. Driver education students in the state of Ohio have a deficient level of cognitive knowledge when tested on an 80 percent success criterion.

2. In none of the three programs were students achieving 80 percent mastery. Three separate t-tests concluded a significant deficiency in each program.

3. Students were significantly deficient of 80 percent correct on those items which their instructors indicated had been taught.

4. The four-phase program (program three) was significantly better than the three-phase simulation (program two) or the two-phase (program one).

5. No program was significantly better than another with any of the three GPA groupings. Students with higher GPA in each program did score higher as a group than lower GPA groupings, as should be expected on a written cognitive knowledge test.

6. Multimedia had no significant effect on student achievement.

7. The cost of the program had no significant effect on student success.

8. The number of hours in the driver education program did not have a significant effect on student success.

9. Class size had no significant effect on student scores.

10. Teacher age did not have a significant effect on student scores.

11. Instructor hours of teacher preparation had no significant effect on student scores.

12. The number of years instructors had been teaching driver education had no significant effect on student scores.

Recommendations

The following recommendations are based on the observations, findings, and conclusions of the study.

1. Ohio teachers of driver education should have made available to them a set of specific instructional objectives for their driver education students. Testing could then be conducted on accomplishment of those objectives. There were no such set of objectives available in Ohio at the time of this study.

2. Four-phase programs should be utilized when schools have access to a range and simulator, and when these can be made available to students without significant cost increase.

3. A close examination needs to be made on the use of multimedia in driver education classrooms. The use of multimedia showed no significant gain over those programs without multimedia.

Recommendations for Further Research

The following are recommendations for further research based on the observations, findings, conclusions, and recommendations of this study.

1. A study should be conducted to determine what type of teacher preparation, and how much, can increase student achievement.

2. This study should be replicated after the teachers of Ohio are provided objectives.

3. This study should be replicated using other criteria such as an attitude scale and an in-car performance test.

4. A study should be conducted to determine if students can learn an acceptable level of information in 36 hours of classroom instruction, or if increased hours of instruction can significantly improve student achievement.

5. A study should be conducted to compare three-phase range programs with four-phase programs, three-phase simulation, and two-phase programs. This would help determine if range instruction can improve student achievement when not in combination with simulation, as this study indicated.

6. A study should be conducted to determine the relationship of students' IQ or GPA and achievement on a knowledge test, achievement on an on-road BTW evaluation, and subsequent accident and violation involvement.

7. A study should be conducted to determine the effectiveness of multimedia instruction in the driver education classroom.

Discussion

The t-tests conducted showed the students tested in Ohio, as a whole, to be deficient on an eighty percent or more correct criterion. Although an eighty percent criterion is the standard which is most used, it may have been too stringent for this evaluation. A large segment of the students were in the 75 to 80 percent correct category. Although computation placed these students in a deficient grouping, most teachers would agree that 75 percent correct would be a passing score. Driver license examiners also set their criteria at 70 to 75 percent to "pass."

If the criterion was 75 percent, the number of students making acceptable scores would increase to 75 percent for all the test questions. Further, 83 percent of the students achieved 75 percent or more correct of the questions which teachers indicated they had covered in the driver education class. These figures tend to show that, in general, the students were achieving relatively well in learning that material which the teachers were teaching.

One might question if the teachers are teaching what needs to be taught. As previously stated, a set of objectives should be developed, adopted, and made available to the driver education teachers in Ohio. This could help to insure more uniform and complete instruction

for the students. Beyond that, evaluation of driver education would be easier and more accurate. The end result might be better drivers.

Multimedia as a method of instruction showed no significant improvement in student scores. This may have been due to mechanical problems or to an overuse of packaged instruction. Students may be tired of watching just films or packaged units which can leave the teacher out of teaching.

Clarification of service contracts of state-owned multimedia units, as well as provisions for replacement of worn-out equipment, needs to be studied. Most of the schools which the author visited had experienced problems with mechanical failure of the multimedia equipment.

It was the author's opinion that the most important variable was the teacher and his/her dedication to the students. A well prepared, enthusiastic teacher will teach students adequately regardless of the program type which he/she has available. The added phases make instruction easier, quicker, more complete, and can be less expensive. They can make an effective teacher more effective.

The number of questions that instructors indicated that they had not covered in class was relatively small. A trend not to teach all of the natural forces affecting driving was noted. Other questions frequently

not covered were methods of insuring compliance with the posted speed limits. Once again, it should be noted that if a set of objectives was available and utilized this situation could be improved, providing the objectives were designed to cover these areas.

Several programs were taught one phase at a time. Teachers were not informed as to what other teachers in the same school were doing in other phases. This lack of communication between programs can only be a detriment to the programs' effectiveness, as well as to the students within these programs.

The state should mandate integration of all phases of any driver education program. This might insure coordination and communication between teachers who are teaching the same students.

APPENDICES

APPENDIX A

SAMPLE LETTER TO SUPERINTENDENTS

May 1, 1979

Room 70 Kellogg Center
Highway Traffic Safety Center
Michigan State University
East Lansing, MI 48824

Mr. C. M. Roush, Superintendent
Madison Local Schools
601 Hill Street
Middletown, OH 45042

Dear Sir:

Madison High School is one of eighteen schools randomly selected for an evaluation of selected driver education programs in Ohio.

This study is under the guidance of the Ohio Department of Education, Mr. Larry Cathell, Section Chief.

Your cooperation for this evaluation is essential and greatly appreciated.

The evaluation will consist of a brief knowledge test which I will administer at your school's convenience.

I will make arrangements directly with the high school for the evaluation, but I wanted to inform you of it.

If you have any questions, please contact me at the above address or Mr. Larry Cathell, Section Chief, Driver Education Section, Ohio Department of Education, (614) 466-4230.

Thank you for your cooperation.

Sincerely,

Joe Shrader
Ph.D. Candidate
Graduate Assistant

JS:lj1

APPENDIX B

SAMPLE LETTER TO PRINCIPALS
OF SELECTED SCHOOLS

April 30, 1979

Room 70 Kellogg Center
Highway Traffic Safety Center
Michigan State University
East Lansing, MI 48824
(517) 353-1790

Mr. Jack Davis, Principal
Madison High School
1368 Middletown-Eaton Road

Dear Mr. Davis:

Madison High School is one of 18 schools randomly selected for an evaluation of selected driver education programs in Ohio.

This study is under the guidance of the Ohio Department of Education headed by Mr. Larry Cathell, Section Chief. Your cooperation for this evaluation is essential and greatly appreciated.

The evaluation will consist of a brief knowledge test which I will administer at your school's convenience. The test should not take more than 50 minutes.

I will need two items of information from your school which I will discuss with you when I call next week. They are Grade Point Average for those pupils tested (to remain anonymous) and the approximate cost per pupil for driver education.

Thank you very much for your cooperation.

Sincerely,

Joe Shrader
Ph.D. Candidate
Graduate Assistant

APPENDIX C

SAMPLE LETTER TO PRINCIPALS
OF ALTERNATE SCHOOLS

April 30, 1979

Highway Traffic Safety Center
Room 70 Kellogg Center
Michigan State University
East Lansing, MI 48824

Mr. Larry E. Irwin, Principal
Lakota High School
5050 Tylersville Road
West Chester, OH 45069

Dear Mr. Irwin:

Lakota High School was one of 18 schools, in a random selection, to be selected as an alternate for an evaluation of selected driver education programs in Ohio.

This study is under the guidance of the Ohio Department of Education, headed by Mr. Larry Cathell, Section Chief. Your cooperation is essential and greatly appreciated.

Since your school was selected as an alternative, I may not have to contact you, but I wanted to inform you in case your school was needed.

Thank you for your cooperation.

Sincerely,

Joe Shreader
Ph.D. Candidate
Graduate Assistant

APPENDIX D

SAMPLE FORM OF TELEPHONE QUESTIONS

TELEPHONE QUESTIONS

Principal's Name _____

Teacher's Name _____

of Driver Education Classes _____

Class Period _____ Time of Class _____

Approximate Class Completion Date ____ / ____ / ____

Approximate Number of Students in Class _____

Date for Evaluation ____ / ____ / ____

Type of Class Procedure:

Days per week _____ Hours per day _____

Information Needed

1. Approximate cost per pupil
2. GPA of each pupil in class (coded)

APPENDIX E

SAMPLE DRIVER EDUCATION KNOWLEDGE TEST
AND ANSWER SHEET

DRIVER EDUCATION KNOWLEDGE TEST

Instructions: Read the statement and all possible answers. Select the best answer and mark the corresponding letter on the answer sheet provided. Please do not write on the test booklet. Put your social security number on the answer sheet only. If you do not have a social security number available, put your name on the answer sheet.

1. The most effective devices for protecting passengers when in an accident are:
 - a. Seat belts
 - b. Safety door latches
 - c. Padded instrument panels
 - d. Deep center steering wheels
2. You need not obey a traffic control device when:
 - a. Other vehicles ignore the device
 - b. No other traffic is present
 - c. A police officer directs you to do otherwise
 - d. If is safe to ignore it
3. It is important to drive slower at night than you do during the day because:
 - a. There is more traffic
 - b. You may get sleepy
 - c. You cannot see as far ahead
 - d. Drivers tend to be more careless at night
4. When driving in an area where there are many pedestrians it is most important to:
 - a. Put your headlights on so they can see you better
 - b. Keep your speed down to 15 mph
 - c. Watch for an indication that they will enter the road
 - d. Stop at every intersection and proceed when safe

5. If you miss your exit on a freeway you should not:
 - a. Proceed to the next exit where you can reenter the freeway and return to your proper exit
 - b. Back up on the road or on the shoulder
 - c. Continue on the freeway and find an alternate route
 - d. Resume normal speed until you approach next exit
6. If you are about to drive away from the curb, you should:
 - a. Sound your horn and go ahead
 - b. Signal and pull into the street
 - c. Signal, yield right-of-way and pull into the street
 - d. Signal, wait for the first vehicle to pass and pull into the street
7. If you are backing up and want the rear of your vehicle to go left turn the:
 - a. Top of the steering wheel to the right
 - b. Bottom of the steering wheel to the left
 - c. Top of the steering wheel to the left
 - d. Left side of the steering wheel to the right
8. When driving you should stay at least:
 - a. 1/2 of a second behind the vehicle in front of you
 - b. 3/4 of a second behind the vehicle in front of you
 - c. 1 second behind the vehicle in front of you
 - d. 2 seconds behind the vehicle in front of you
9. You should drive in the right lane of a 6-lane highway when:
 - a. Driving slower than the traffic in the other lanes
 - b. You are preparing to exit on the left
 - c. When you see traffic entering the highway from the right
 - d. You want to pass other vehicles on the highway
10. The most important reason for passing a truck traveling at 45 miles per hours in a 55 miles per hour zone is:
 - a. To improve your ability to see
 - b. To advance your position in traffic
 - c. To reduce your travel time
 - d. To avoid exhaust fumes

11. As your speed increases it is most important to:
 - a. Put on your headlights
 - b. Look farther ahead
 - c. Drive with both hands on the wheel
 - d. Roll up all the windows
12. It is unsafe to:
 - a. Glance at the outside mirror
 - b. Check your controls
 - c. Focus on the road just in front of the hood
 - d. Look along the left and right side of the road
13. You should signal a turn:
 - a. Well in advance of the turn
 - b. Right before the turn
 - c. Upon turning
 - d. Only at controlled intersections
14. If 1 or 2 of your wheels drop off the edge of the pavement:
 - a. Hold the steering wheel loosely
 - b. Ease back onto the road after slowing down
 - c. Slow down quickly by braking hard
 - d. Increase your speed and drive back on the road
15. You should be most careful when turning or stopping:
 - a. Just before it starts to rain
 - b. During the first half hour of rain
 - c. After it has been raining all day
 - d. A half hour after it stops raining
16. When driving in heavy fog during the day you should use:
 - a. High beam headlights
 - b. Low beam headlights
 - c. Parking lights
 - d. No lights
17. If the rear of your vehicle is skidding to the left you should:
 - a. Move the steering wheel back and forth in a zig-zag pattern
 - b. Turn the top of your steering wheel to the left
 - c. Hold your steering wheel from moving until out of skid
 - d. Turn the top of your steering wheel to the right

18. When there is a strong wind coming from your left or right you should:
 - a. Slow down and steer away from the wind
 - b. Steer into the wind being careful not to oversteer
 - c. Let the steering wheel slip through your hands
 - d. Stay in the right lane as close to the shoulder as possible
19. In order to get out of a skid you should:
 - a. Keep your foot off the brake
 - b. Turn the front wheels towards the edge of the road
 - c. Let the steering wheel slip through your hands
 - d. Keep a constant pressure on the gas pedal
20. When nearing the top of a hill on a narrow road:
 - a. Keep far to the right
 - b. Speed up
 - c. Avoid blowing your horn
 - d. Get ready to pass any slow vehicles in front of you
21. If a speed limit is not posted before a curve:
 - a. Continue at the same speed
 - b. Assume that it is better to take this curve at a higher speed
 - c. Slow down to 35 to 40 mph
 - d. Judge how sharp the curve is and change your speed accordingly
22. If you cannot see around a curve you should:
 - a. Slow down more than you normally would
 - b. Continue as you would through any curve
 - c. Speed up to get out of that hazardous area quickly
 - d. Drive around the curve at 5 to 10 mph
23. Because there is often slow-moving traffic on country highways you should:
 - a. Stay in the left lane and drive at the speed limit
 - b. Be ready to adjust your speed to the speed of traffic
 - c. Pass slower vehicles on turns if they are slowing down
 - d. Generally drive 10 to 15 mph under the speed limit in order to be safe

24. When driving around a curve your vehicle will tend to:
 - a. Speed up
 - b. Move to the outside of the curve
 - c. Stay in the center of the lane
 - d. Move to the inside of the curve
25. If you know that you will soon be making a turn you should:
 - a. Look well ahead to locate the turning point
 - b. Blow the horn several hundred feet before the turn
 - c. Flash your bright lights to warn other traffic
 - d. Speed up so as to avoid making other vehicles wait
26. If there is a change in the legal speed limit you should first:
 - a. Quickly slow down
 - b. Slow down and proceed cautiously
 - c. Look in your rearview mirror
 - d. Check your speedometer
27. To avoid spinning the tires on a slippery surface you should:
 - a. Alternately use the brake and gas
 - b. Increase speed slowly
 - c. Shift from drive to neutral
 - d. Start in second gear with fast but steady power
28. When coming to an intersection it is most important to:
 - a. Stay in the same lane
 - b. Look for and follow traffic controls
 - c. Flash your brake lights
 - d. Open a window and turn down the radio
29. Cross traffic should be checked before entering an intersection:
 - a. When traffic has been heavy
 - b. Only when you have a stop sign
 - c. Where there is a traffic light
 - d. At all times
30. When you come to an intersection where there are no traffic controls you should:
 - a. Speed up and blow your horn
 - b. Slow down so you can stop before the intersection
 - c. Come to a stop before you come to a crosswalk
 - d. Continue at the same speed and watch for traffic

31. When about to pass you should generally:
- Move up very close to the lead vehicle, then change lanes
 - Drop back and change lanes far behind lead vehicle
 - Maintain usual following distance until you change lanes
 - Move up close to lead vehicle and drop back to warn him you are about to pass
32. On a 2-lane road, do not:
- Pass moving traffic on the left
 - Pass vehicles making a left turn from the right lane
 - Look in front of the vehicle you want to pass
 - Change your speed in order to pass
33. After passing a vehicle on a 2-lane road you should generally:
- Turn sharply back to the right lane
 - Gradually turn back into the right lane
 - Stay in the left lane until you see oncoming traffic
 - Slow down and then move into the right lane
34. As you approach a freeway on an entrance you should:
- Keep checking traffic ahead on the entrance and behind on the freeway
 - Not take your eyes off the vehicle ahead of you on the entrance
 - Begin to pick up speed and pass other vehicles on the entrance if necessary
 - Drive around the vehicle in front of you if it is taking too long to enter the freeway
35. If you freeway exit has a deceleration lane you should:
- Slow down as much as possible on the main road before entering the deceleration lane
 - Drive alongside and pull in front of slower moving traffic in the deceleration lane
 - Move into the deceleration lane as soon as possible
 - Keep your speed constant once you enter the deceleration lane
36. When entering a freeway from an entrance with an acceleration lane, you should:
- Stop to check for traffic at the end of the entrance
 - Enter the freeway at top speed and slow down to the speed limit afterward
 - Use the acceleration lane to get up to the speed of the freeway traffic
 - Use the shoulder to gain speed before you enter

37. If you get sleepy while driving it is best to:
 - a. Take anti-sleep pills
 - b. Stop for a cup of coffee
 - c. Stop and exercise until you wake up
 - d. Rest or change drivers if possible
38. If you are taking medicine for a cold you should:
 - a. Know the effects of the medicine before you drive
 - b. Not drive with anyone else in the vehicle
 - c. Not drive at night or just after taking the medicine
 - d. Only drive if it is an emergency
39. When possible pedestrians walking along the road should walk:
 - a. On the left side facing traffic
 - b. On the right side with traffic
 - c. On the edge of the road rather than on the shoulder
 - d. On the side with the least traffic
40. Before you change lanes or turn you must:
 - a. See if it can safely be done and then signal
 - b. Check traffic by using your sideview mirror
 - c. Blow the horn before pulling into traffic
 - d. Move into the far left lane
41. Under normal conditions the top speed limit for driving in a business district is:
 - a. 15 mph
 - b. 20 mph
 - c. 25 mph
 - d. 30 mph
42. You must stop at a railroad crossing when:
 - a. A train is stopped less than 200 feet from the crossing
 - b. The crossing does not have a gate or a signal on it
 - c. There is more than 1 set of tracks at the crossing
 - d. The crossing signal is on or a train is close and approaching
43. If you must leave the road at high speeds, you should:
 - a. Head toward oncoming moving objects
 - b. Drop to the floor
 - c. Apply the brakes as hard as possible
 - d. Steer away from large, rigid objects

44. If an oncoming vehicle crosses the center line and drives into your lane you should:

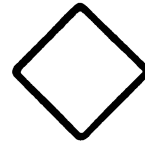
- a. Speed up and drive on the shoulder
- b. Stop as quickly as you can
- c. Drive into his lane if it is empty
- d. Slow down and steer to the right

45. If you drive off the road when traveling at a high speed you should:

- a. Turn the wheels sharply toward the road and apply the brakes
- b. Straighten the wheels gradually and pump the brakes
- c. Step hard on the brake and straighten the wheels
- d. Speed up and turn the wheels toward the road

46. The message on this sign might be:

- a. Stop Ahead, Side Road, Reverse Turn
- b. One Way, Keep Right, No U-Turn
- c. Pass With Care, Slower Traffic Keep Right, Do Not Pass
- d. Trucks Use Right Lane, Yield Right-of-Way, Reduce Speed Ahead



47. When you see this sign at a corner you should first come to a stop:

- a. Out far enough to see cross traffic
- b. Before the crosswalk
- c. Within the crosswalk
- d. After crossing the crosswalk



48. This sign means:

- a. Slow down to 35 mph and prepare to enter curve
- b. Exit ahead, exit speed 35 mph
- c. Construction area, slow down to 35 mph and use right lane only
- d. Vehicles turning right must reduce speed to 35 mph



49. This sign means:

- a. Barricade ahead, prepare to detour
- b. Slow down, pavement ends
- c. Right lane ends, prepare to merge
- d. Construction ahead, caution, no shoulder



50. The message on this sign might be:

- a. Stop Ahead, Detour 1000 feet, Pedestrian Crossing
- b. Speed Limit 30 mph, Reduce Speed Ahead, No U-Turn
- c. Soft Shoulder, Bump, Dip
- d. Divided Highway, Hill Road Narrows



Go back and answer any questions you may have skipped over.

Check your answer sheet to make sure all your answers are clearly marked and that any erasures are completed.

Check your answer sheet to make sure your social security number or name is on it.

ANSWER SHEET

Social Security Number

	A	B	C	D		A	B	C	D
1.	0	0	0	0	26.	0	0	0	0
2.	0	0	0	0	27.	0	0	0	0
3.	0	0	0	0	28.	0	0	0	0
4.	0	0	0	0	29.	0	0	0	0
5.	0	0	0	0	30.	0	0	0	0
6.	0	0	0	0	31.	0	0	0	0
7.	0	0	0	0	32.	0	0	0	0
8.	0	0	0	0	33.	0	0	0	0
9.	0	0	0	0	34.	0	0	0	0
10.	0	0	0	0	35.	0	0	0	0
11.	0	0	0	0	36.	0	0	0	0
12.	0	0	0	0	37.	0	0	0	0
13.	0	0	0	0	38.	0	0	0	0
14.	0	0	0	0	39.	0	0	0	0
15.	0	0	0	0	40.	0	0	0	0
16.	0	0	0	0	41.	0	0	0	0
17.	0	0	0	0	42.	0	0	0	0
18.	0	0	0	0	43.	0	0	0	0
19.	0	0	0	0	44.	0	0	0	0
20.	0	0	0	0	45.	0	0	0	0
21.	0	0	0	0	46.	0	0	0	0
22.	0	0	0	0	47.	0	0	0	0
23.	0	0	0	0	48.	0	0	0	0
24.	0	0	0	0	49.	0	0	0	0
25.	0	0	0	0	50.	0	0	0	0

APPENDIX F

SAMPLE RECORD OF TEST SCORES

	Social Security Number	Name
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____
13.	_____	_____
14.	_____	_____
15.	_____	_____
16.	_____	_____
17.	_____	_____
18.	_____	_____
19.	_____	_____
20.	_____	_____
21.	_____	_____
22.	_____	_____
23.	_____	_____
24.	_____	_____
25.	_____	_____
26.	_____	_____
27.	_____	_____
28.	_____	_____
29.	_____	_____
30.	_____	_____
31.	_____	_____
32.	_____	_____
33.	_____	_____
34.	_____	_____
35.	_____	_____
36.	_____	_____
37.	_____	_____
38.	_____	_____
39.	_____	_____
40.	_____	_____

High School # _____

	Social Security Number	GPA
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
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25.	_____	_____
26.	_____	_____
27.	_____	_____
28.	_____	_____
29.	_____	_____
30.	_____	_____
31.	_____	_____
32.	_____	_____
33.	_____	_____
34.	_____	_____
35.	_____	_____
36.	_____	_____
37.	_____	_____
38.	_____	_____
39.	_____	_____
40.	_____	_____

APPENDIX G

SAMPLE OF ITEMS TAUGHT

School _____

School # _____

Program Type _____

Instructors: Please read all the test questions and mark all questions in the appropriate column. The evaluation will be on those questions covered in your class.

1 = Subject has been covered

2 = Subject has not been covered but will be before completion of the course

3 = Subject has not and will not be covered in this course

- | | | | |
|--|---|---|---|
| 1. The most effective devices for protecting passengers in an accident are: | 1 | 2 | 3 |
| a. Seat belts | | | |
| b. Safety door latches | | | |
| c. Padded instrument panels | | | |
| d. Deep center steering wheels | | | |
| 2. You need not obey a traffic control device when: | 1 | 2 | 3 |
| a. Other vehicles ignore the device | | | |
| b. No other traffic is present | | | |
| c. A police officer directs you to do otherwise | | | |
| d. It is safe to ignore it | | | |
| 3. It is important to drive slower at night than you do during the day because: | 1 | 2 | 3 |
| a. There is more traffic | | | |
| b. You may get sleepy | | | |
| c. You cannot see as far ahead | | | |
| d. Drivers tend to be more careless at night | | | |
| 4. When driving in an area where there are many pedestrians it is most important to: | 1 | 2 | 3 |
| a. Put your headlights on so they can see you better | | | |
| b. Keep your speed down to 15 mph | | | |
| c. Watch for an indication that they will enter the road | | | |
| d. Stop at every intersection and proceed when safe | | | |

5. If you miss your exit on a freeway you should not: 1 2 3
- a. Proceed to the next exit where you can reenter the freeway and return to your proper exit
 - b. Back up on the road or on the shoulder
 - c. Continue on the freeway and find an alternate route
 - d. Resume normal speed until you approach next exit
6. If you are about to drive away from the curb, you should: 1 2 3
- a. Sound your horn and go ahead
 - b. Signal and pull into the street
 - c. Signal, yield right-of-way and pull into the street
 - d. Signal, wait for the first vehicle to pass and pull into the street
7. If you are backing up and want the rear of your vehicle to go left turn the: 1 2 3
- a. Top of the steering wheel to the right
 - b. Bottom of the steering wheel to the left
 - c. Top of the steering wheel to the left
 - d. Left side of the steering wheel to the right
8. When driving you should stay at least: 1 2 3
- a. 1/2 of a second behind the vehicle in front of you
 - b. 3/4 of a second behind the vehicle in front of you
 - c. 1 second behind the vehicle in front of you
 - d. 2 seconds behind the vehicle in front of you
9. You should drive in the right lane of a 6-lane highway when: 1 2 3
- a. Driving slower than the traffic in the other lanes
 - b. You are preparing to exit on the left
 - c. When you see traffic entering the highway from the right
 - d. You want to pass other vehicles on the highway
10. The most important reason for passing a truck traveling at 45 miles per hour in a 55 miles per hour zone is: 1 2 3
- a. To improve your ability to see
 - b. To advance your position in traffic
 - c. To reduce your travel time
 - d. To avoid exhaust fumes

11. As your speed increases it is most important to: 1 2 3
- a. Put on your headlights
 - b. Look farther ahead
 - c. Drive with both hands on the wheel
 - d. Roll up all the windows
12. It is unsafe to: 1 2 3
- a. Glance at the outside mirror
 - b. Check your controls
 - c. Focus on the road just in front of the hood
 - d. Look along the left and right side of the road
13. You should signal a turn: 1 2 3
- a. Well in advance of the turn
 - b. Right before the turn
 - c. Upon turning
 - d. Only at controlled intersections
14. If 1 or 2 of your wheels drop off the edge of the pavement: 1 2 3
- a. Hold the steering wheel loosely
 - b. Ease back onto the road after slowing down
 - c. Slow down quickly by braking hard
 - d. Increase your speed and drive back on the road
15. You should be most careful when turning or stopping: 1 2 3
- a. Just before it starts to rain
 - b. During the first half hour of rain
 - c. After it has been raining all day
 - d. A half hour after it stops raining
16. When driving in heavy fog during the day you should use: 1 2 3
- a. High beam headlights
 - b. Low beam headlights
 - c. Parking lights
 - d. No lights
17. If the rear of your vehicle is skidding to the left you should: 1 2 3
- a. Move the steering wheel back and forth in a zig-zag pattern
 - b. Turn the top of your steering wheel to the left
 - c. Hold your steering wheel from moving until out of skid
 - d. Turn the top of your steering wheel to the right

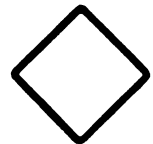
18. When there is a strong wind coming from your left or right you should: 1 2 3
- a. Slow down and steer away from the wind
 - b. Steer into the wind being careful not to oversteer
 - c. Let the steering wheel slip through your hands
 - d. Stay in the right lane as close to the shoulder as possible
19. In order to get out of a skid you should: 1 2 3
- a. Keep your foot off the brake
 - b. Turn the front wheels towards the edge of the road
 - c. Let the steering wheel slip through your hands
 - d. Keep a constant pressure on the gas pedal
20. When nearing the top of a hill on a narrow road: 1 2 3
- a. Keep far to the right
 - b. Speed up
 - c. Avoid blowing your horn
 - d. Get ready to pass any slow vehicles in front of you
21. If a speed limit is not posted before a curve: 1 2 3
- a. Continue at the same speed
 - b. Assume that it is better to take this curve at a higher speed
 - c. Slow down to 35 to 50 mph
 - d. Judge how sharp the curve is and change your speed accordingly
22. If you cannot see around a curve you should: 1 2 3
- a. Slow down more than you normally would
 - b. Continue as you would through any curve
 - c. Speed up to get out of that hazardous area quickly
 - d. Drive around the curve at 5 to 10 mph
23. Because there is often slow-moving traffic on country highways you should: 1 2 3
- a. Stay in the left lane and drive at the speed limit
 - b. Be ready to adjust your speed to the speed of traffic
 - c. Pass slower vehicles on turns if they are slowing down
 - d. Generally drive 10 to 15 mph under the speed limit in order to be safe

24. When driving around a curve your vehicle will tend to: 1 2 3
- a. Speed up
 - b. Move to the outside of the curve
 - c. Stay in the center of the lane
 - d. Move to the inside of the curve
25. If you know that you will soon be making a turn you should: 1 2 3
- a. Look well ahead to locate the turning point
 - b. Blow the horn several hundred feet before the turn
 - c. Flash your bright lights to warn other traffic
 - d. Speed up so as to avoid making other vehicles wait
26. If there is a change in the legal speed limit you should first: 1 2 3
- a. Quickly slow down
 - b. Slow down and proceed cautiously
 - c. Look in your rearview mirror
 - d. Check your speedometer
27. To avoid spinning the tires on a slippery surface you should: 1 2 3
- a. Alternately use the brake and gas
 - b. Increase speed slowly
 - c. Shift from drive to neutral
 - d. Start in second gear with fast but steady power
28. When coming to an intersection it is most important to: 1 2 3
- a. Stay in the same lane
 - b. Look for and follow traffic controls
 - c. Flash your brake lights
 - d. Open a window and turn down the radio
29. Cross traffic should be checked before entering an intersection: 1 2 3
- a. When traffic has been heavy
 - b. Only when you have a stop sign
 - c. Where there is a traffic light
 - d. At all times

30. When you come to an intersection where there are no traffic controls you should: 1 2 3
- a. Speed up and blow your horn
 - b. Slow down so you can stop before the intersection
 - c. Come to a stop before you come to a crosswalk
 - d. Continue at the same speed and watch for traffic
31. When about to pass you should generally: 1 2 3
- a. Move up very close to the lead vehicle, then change lanes
 - b. Drop back and change lanes far behind lead vehicle
 - d. Maintain usual following distance until you change lanes
 - d. Move up close to lead vehicle and drop back to warn him you are about to pass
32. On a 2-lane road, do not: 1 2 3
- a. Pass moving traffic on the left
 - b. Pass vehicles making a left turn from the right lane
 - c. Look in front of the vehicle you want to pass
 - d. Change your speed in order to pass
33. After passing a vehicle on a 2-lane road you should generally: 1 2 3
- a. Turn sharply back to the right lane
 - b. Gradually turn back into the right lane
 - c. Stay in the left lane until you see oncoming traffic
 - d. Slow down and then move into the right lane
34. As you approach a freeway on an entrance you should: 1 2 3
- a. Keep checking traffic ahead on the entrance and behind on the freeway
 - b. Not take your eyes off the vehicle ahead of you on the entrance
 - c. Begin to pick up speed and pass other vehicles on the entrance if necessary
 - d. Drive around the vehicle in front of you if it is taking too long to enter the freeway
35. If your freeway exit has a deceleration lane you should: 1 2 3
- a. Slow down as much as possible on the main road before entering the deceleration lane
 - b. Drive alongside and pull in front of slower moving traffic in the deceleration lane
 - c. Move into the deceleration lane as soon as possible
 - d. Keep your speed constant once you enter the deceleration lane

36. When entering a freeway from an entrance with an acceleration lane, you should: 1 2 3
- a. Stop to check for traffic at the end of the entrance
 - b. Enter the freeway at top speed and slow down to the speed limit afterward
 - c. Use the acceleration lane to get up to the speed of the freeway traffic
 - d. Use the shoulder to gain speed before you enter
37. If you get sleepy while driving it is best to: 1 2 3
- a. Take anti-sleep pills
 - b. Stop for a cup of coffee
 - c. Stop and exercise until you wake up
 - d. Rest or change drivers if possible
38. If you are taking medicine for a cold you should: 1 2 3
- a. Know the effects of the medicine before you drive
 - b. Not drive with anyone else in the vehicle
 - c. Not drive at night or just after taking the medicine
 - d. Only drive if it is an emergency
39. When possible pedestrians walking along the road should walk: 1 2 3
- a. On the left side facing traffic
 - b. On the right side with traffic
 - c. On the edge of the road rather than on the shoulder
 - d. On the side with the least traffic
40. Before you change lanes or turn you must: 1 2 3
- a. See if it can safely be done and then signal
 - b. Check traffic by using your sideview mirror
 - c. Blow the horn before pulling into traffic
 - d. Move into the far left lane
41. Under normal conditions the top speed limit for driving in a business district is: 1 2 3
- a. 15 mph
 - b. 20 mph
 - c. 25 mph
 - d. 30 mph

42. You must stop at a railroad crossing when: 1 2 3
- a. A train is stopped less than 200 feet from the crossing
 - b. The crossing does not have a gate or a signal on it
 - c. There is more than 1 set of tracks at the crossing
 - d. The crossing signal is on or a train is close and approaching
43. If you must leave the road at high speeds, you should: 1 2 3
- a. Head toward oncoming moving objects
 - b. Drop to the floor
 - c. Apply the brakes as hard as possible
 - d. Steer away from large, rigid objects
44. If an oncoming vehicle crosses the center line and drives into your lane you should: 1 2 3
- a. Speed up and drive on the shoulder
 - b. Stop as quickly as you can
 - c. Drive into his lane if it is empty
 - d. Slow down and steer to the right
45. If you drive off the road when traveling at a high speed you should: 1 2 3
- a. Turn the wheels sharply toward the road and apply the brakes
 - b. Straighten the wheels gradually and pump the brakes
 - c. Step hard on the brake and straighten the wheels
 - d. Speed up and turn the wheels toward the road
46. The message on this sign might be: 1 2 3
- a. Stop Ahead, Side Road, Reverse Turn
 - b. One Way, Keep Right, No U-Turn
 - c. Pass With Care, Slower Traffic Keep Right, Do Not Pass
 - d. Trucks Use Right Lane, Yield Right-of-Way, Reduce Speed Ahead
47. When you see this sign at a corner you should first come to a stop: 1 2 3
- a. Out far enough to see cross traffic
 - b. Before the crosswalk
 - c. Within the crosswalk
 - d. After crossing the crosswalk



48. This sign means:

1 2 3

- a. Slow down to 35 mph and prepare to enter curve
- b. Exit ahead, exit speed 35 mph
- c. Construction area, slow down to 35 mph and use right lane only
- d. Vehicles turning right must reduce speed to 35 mph



49. This sign means:

1 2 3

- a. Barricade ahead, prepare to detour
- b. Slow down, pavement ends
- c. Right lane ends, prepare to merge
- d. Construction ahead, caution, no shoulder



50. The message on this sign might be:

1 2 3

- a. Stop Ahead, Detour 1000 feet, Pedestrian Crossing
- b. Speed Limit 30 mph, Reduce Speed Ahead, No U-Turn
- c. Soft Shoulder, Bump, Dip
- d. Divided Highway, Hill, Road Narrows



Go back and answer any questions you may have skipped over.

Check your answer sheet to make sure all your answers are clearly marked and that any erasures are completed.

Check your answer sheet to make sure your social security number or name is on it.

APPENDIX H

SAMPLE OF TEACHER INFORMATION

School # _____ Name _____

Class # _____ # of Students _____

Program 1 2 3 4 Multi-media ____ Yes ____ No

Teacher Information

1. Age _____
2. Years teaching driver education _____
3. # of quarter hours driver education teacher preparation _____

Program Information

1. Total hours of the program _____
2. Cost per pupil _____

Student Information

Student #	Test Score	GPA	Student #	Test Score	GPA
1.	_____	_____	16.	_____	_____
2.	_____	_____	17.	_____	_____
3.	_____	_____	18.	_____	_____
4.	_____	_____	19.	_____	_____
5.	_____	_____	20.	_____	_____
6.	_____	_____	21.	_____	_____
7.	_____	_____	22.	_____	_____
8.	_____	_____	23.	_____	_____
9.	_____	_____	24.	_____	_____
10.	_____	_____	25.	_____	_____
11.	_____	_____	26.	_____	_____
12.	_____	_____	27.	_____	_____
13.	_____	_____	28.	_____	_____
14.	_____	_____	29.	_____	_____
15.	_____	_____	30.	_____	_____

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