

To the Graduate Council:

I am submitting herewith a dissertation written by Ramona Lainhart Miller entitled "A Comparative Study of School Accident Frequencies in Integrated and Non-Integrated Safety Instruction." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Health Education.

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A COMPARATIVE STUDY OF SCHOOL ACCIDENT FREQUENCIES
IN INTEGRATED AND NON-INTEGRATED SAFETY
INSTRUCTION

A Dissertation
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ABSTRACT

The purpose of this study was to compare integrated vs. non-integrated methods of safety instruction to determine differences in subsequent school accidents. The study was designed to answer the following major question: Is there a difference in the frequency of school accidents between students completing integrated safety instruction and those completing non-integrated safety instruction?

A selected Tennessee city school system (elementary K-6 grades) was utilized in this study. All K-6 students in the selected city school system were given either the integrated safety education program or the non-integrated safety education program for academic school year 1979-1980. Accident reports were then collected from the participants of the programs for academic school year 1980-1981.

The findings as a result of analysis of the data supported the following conclusions:

1. The integrated method of safety instruction had a lower frequency of accidents for students in K-6 grades (students 5-14 years of age) than the non-integrated method of safety instruction.
2. Of the variables examined for their relationship to frequency of accident by type of instructional program, these were found

significant: sex of the student (males had a higher accident frequency than did females in either program but the significance was more pronounced in the non-integrated program), place of accident occurrence (non-integrated students had a higher frequency of accidents in areas other than playground/physical education), injury sustained (non-integrated students had a higher frequency of serious injury accidents than integrated students), how the accident occurred (non-integrated students had a higher frequency of accidents that were play related than did integrated students), and accident seriousness (non-integrated students had a higher frequency of serious treatment accidents than integrated students). The following variables showed no significant relationship: grade level (K-6), age of the student (5-14 years), and month of accident occurrence (August through June).

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
The Need for the Study	3
The Purpose of the Study	4
Statement of the Problem	4
Research Hypothesis	5
Delimitations	6
Limitations	6
Basic Assumptions	6
Definition of Terms	7
II. REVIEW OF THE LITERATURE	9
Philosophies of Safety Education	9
Methods of Teaching Safety	11
The Need for Safety Education	14
Communications and Safety Education	20
Accident Reports as a Measuring Instrument	22
Summary	23
III. RESEARCH DESIGN AND METHODOLOGY	25
Introduction	25
The Instructional Program	25
The Subjects	27
Data Collection	28
Statistical Design	29
IV. ANALYSIS OF THE DATA	30
Introduction	30
Subject Distribution	31
Data Analysis	33
Summary	49
V. SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS	52
Summary	52
Findings	54
Conclusions	57
Recommendations	59

CHAPTER	PAGE
VI. COMMENTS	61
Safety and Education	61
Communications and Safety	63
Personal Comment	66
LIST OF REFERENCES	67
APPENDICES	72
A. KNOXVILLE CITY SCHOOLS CONSENT FORM	73
B. KNOXVILLE CITY SCHOOLS ACCIDENT REPORT	75
VITA	77

LIST OF TABLES

TABLE	PAGE
1. Distribution of Sample Subjects By Grade Level and Sex for Integrated and Non-Integrated Safety Instruction Program for a Selected City School System, Academic Year 1979-1980	32
2. Distribution of Subjects By Classroom for Integrated and Non-Integrated Safety Instruction Program for a Selected City School System, Academic Year 1979-1980	34
3. Frequency of Accidents By Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981	36
4. Frequency of Accidents By Grade Level for Integrated and Non-Integrated Instructional Program in a Selected City School System for Academic Year 1980-1981	37
5. Frequency of Accidents By Age for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981	38
6. Frequency of Accidents By Sex for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981	40
7. Frequency of Accidents By Month for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981	41
8. Frequency of Accidents By Place of Occurrence for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981	43
9. Frequency of Accidents By Injury Description Classification for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981	45

TABLE

PAGE

10. Frequency of Accidents By How Accident Occurred
for Integrated and Non-Integrated Instructional
Program in a Selected City School System (K-6)
for Academic Year 1980-1981 46
11. Frequency of Accidents By Injury (Accident
Seriousness) for Integrated and Non-Integrated
Instructional Program in a Selected City School
System (K-6) for Academic Year 1980-1981 48

CHAPTER I

INTRODUCTION

For many years statistics have reflected the important role that accidents play in the lives of children in 5-14 year old age groups. In the 1981 edition of Accident Facts, accidents were shown as the number one cause of death in children ages one to fourteen years old. The overall death rate for that age group due to accidents was 42.9 per 100,000 population (25:9).

During the 1977-78 school year, more than 22,000 school jurisdictions in the United States reported their accidents to the National Safety Council. The rates were per 100,000 school days. The highest incidence of accidents in grades K-6 occurred on school grounds for both boys and girls during playground activities (such as apparatus related, ball playing, and running) (25:90). Over one-half of all school jurisdictional accidents were related to physical education, athletics, or recreation (25:90-91).

Yost stated that every year, accidents claim the lives of thousands of children and many thousands more are injured (42:4). This was evident in the facts and figures, but behind the data lie untold human suffering. This is a costly way to learn (42:7-10).

Tennessee Motor Vehicle Accident Facts, 1978

indicated that the total number of children (5-14 age group) killed by all accidents was 65; the total injured was 3,724 (36:14). Tennessee Motor Vehicle Accident Facts, 1979 indicated 71 killed and 3,724 injured by all accidents for the same age group (37:14). It was noted that the number of deaths increased in 1979 while the number injured remained identical to 1978.

In the development and utilization of countermeasures for the prevention of accidents, examination of alternatives and selection of the most effective measures should be made. "Accidents don't happen . . . they are caused (42:7)."

Accidents may be controlled by approaching the task by the use of the three E's: Education, Engineering, and Enforcement (42:3-10).

Sparks called for safety education to be brought into the curriculum of the schools and integrated with the existing curriculum for the most effective method of utilization (34:6).

The National Safety Council formulated several philosophies concerning the teaching of safety. Among these philosophies were the basic ideas contending that safety education was most effective when integrated with other student curricula (26). Various research has been conducted in the field of education concerning integration and non-integration of subject matter. This research has been

conducted in different areas as far as subject matter is concerned. Results of this research vary with opinions that one method or the other is better for the students.

In light of this research it becomes beneficial to compare methods of instruction (integrated and non-integrated) in order to ascertain the more effective teaching method for specified subject areas.

I. THE NEED FOR THE STUDY

In 1981, accidents ranked fourth as a cause of death in the United States (25). Heart disease, cancer, and stroke preceded accidents as the leading causes of death for all ages. (25:8). However, accidents were the number one cause of death for children ages five to fourteen years (25:8). This qualified accidents as a serious public health problem.

Approaching the problem through education seemed a plausible long range benefit alternative. A high quality safety education program in the elementary school may, and often does, have an attitudinal effect on a child for the remainder of his/her life. Children form life-long habits during their elementary school years. A safety lesson involves more than just teaching children how to perform specified acts safely, it is a lesson in building self-reliance and safety attitudes that follow the child throughout life (28:13). The ramifications of early childhood attitudinal development are often evidenced in the mental and emotional behavior in adulthood (33:396).

Before the child safety movement began, far more children died from accidents than they do today. To determine specifically where the thrust of future elementary safety education should lie, the examination of the effectiveness of integrated vs. non-integrated safety instruction in relation to accident occurrence was essential.

During the 1979-80 school year, the Knoxville City School System recognized the need to evaluate their school safety education programs. In an attempt to evaluate and make adjustments in the safety education programs, they instituted both integrated and non-integrated methods of safety instruction. The integrated safety education was carried out by teachers in their everyday encounters with the students. The non-integrated safety education utilized speakers, not under the employment of the Knoxville City Schools (i.e., Knoxville Police Department Education Specialists, Fire Department personnel, etc.).

II. THE PURPOSE OF THE STUDY

The purpose of this study was to compare integrated vs. non-integrated methods of safety instruction to determine differences in subsequent school accidents.

III. STATEMENT OF THE PROBLEM

Conflicting opinions existed concerning the effectiveness of integrated vs. non-integrated methods of instruction.

In view of the fact that accidents were the number one cause of death for children, an attempt was made to determine the difference in method of safety instruction and frequency of school accidents. Therefore, this study was designed to answer one major question: Is there a difference between the frequency of school accidents of students completing integrated vs. non-integrated methods of safety instruction?

In the process of data assimilation, selected student and accident characteristics were examined for specific relationship between the method of instruction and the frequency of school accidents. These variables were:

2. Grade level of the student.
3. Age of the student.
4. Sex of the student.
5. Month of accident occurrence.
6. Place of accident occurrence.
7. Type of injury sustained from the accident.
8. How the accident occurred.
9. The seriousness of the accident.

IV. RESEARCH HYPOTHESIS

It was hypothesized that there will be a difference in the frequency of school accidents for students completing integrated vs. non-integrated methods of safety instruction in the Knoxville City Schools K-6 grade levels.

V. DELIMITATIONS

The parameters for this study were as follows:

1. Children in Knoxville City Schools K-6 grade levels who were 5-14 years old, who completed either integrated or non-integrated safety instruction programs during the 1979-80 school year, and enrolled in the 1980-81 school year were included in the study.
2. Those accidents occurring on school property during the school day for the 1980-81 school year were studied.

VI. LIMITATIONS

The accuracy of assessing the injury of the student for the seriousness of the accident may have been a limiting factor.

Extraneous variables relating to individual school profiles (such as socio-economic level, etc.) may have been a limiting factor concerning census comparisons. However, confounding variables were minimized by using the total population.

VII. BASIC ASSUMPTIONS

For the purpose of this study, the following basic assumptions were made:

1. The respondents to the accident reporting instrument were truthful and honest in their report.
2. That all accidents occurring during the school day on school grounds were reported.
3. The instructor for the integrated safety program and the non-integrated safety program were equal in all respects except that of method of instruction.

VIII. DEFINITION OF TERMS

The following terms are defined as they relate to this study:

Accident: An unexpected, unwanted, unplanned event that may result in injury, death, or property damage (24:97).

Accident Report: A standard form used by the Knoxville City School System to report accidental injury or death sustained by a student while on school property.

Categories of Accident Seriousness: Category one includes those injuries not requiring immediate medical attention (does include those students receiving first aid from the school nurse); Category two includes injuries requiring immediate medical attention (i.e., hospitalized, requiring aid of a physician, transported to emergency room, etc.); and, Category three includes those injuries resulting in the death of a student.

Integrated Instruction: The desegregation of specific subjects; combined subjects taught in a whole unit. In this study, integrated instruction is the combination of safety education material with that of other subject matter being taught by the regular classroom teacher.

K-6 Grade Levels: Kindergarten through sixth grade students enrolled in the elementary school level (students 5-14 years of age).

Knoxville City Schools: A school system in Knoxville, Tennessee consisting of approximately 15,154 K-6 grade level students and including thirty six schools and 546 classrooms.

Non-Integrated Instruction: Dividing or segregating subjects so that each one is taught separately in a unit. In this study, non-integrated instruction was the separation of safety education material from that of other subject matter being taught. The safety education material was presented to the class by an educational specialist, rather than by the regular classroom teacher.

School Accident: An accident occurring on school property during school hours that involves a student.

CHAPTER II

REVIEW OF THE LITERATURE

The review of the literature sought to identify the major topics of concern for safety education in the school setting. Of particular concern were those theories and studies on safety education and the communication process. This review was concerned with the following five areas:

1. Philosophies of Safety Education
2. Methods of Teaching Safety
3. The Need for Safety Education
4. Communications and Safety Education
5. Accident Reports as a Measuring Instrument

I. PHILOSOPHIES OF SAFETY EDUCATION

The National Safety Council has long recognized the need for safety education within the school curriculum. In 1941, when the Committee on Curriculum Planning for Safety of the National Safety Council first met, they formulated statements of philosophy concerning the teaching of safety (26). These statements were to be of value to the teachers of the United States in that it became a part of the thinking and acting of those teachers. These statements on the point of view of the National Safety Council also provided interesting material for school safety classes. Whitney, dean of safety education philosophers, was the National Safety Council's first Vice-President for Education for twenty-five

years. He provided guidance for the formulation of these statements. Although these philosophies were set forth in 1941, the National Safety Council continued to reprint them as a guide to safety education. Items germane to this study are:

Safety is one of the major social and economic problems of the day. The home, alone, can no longer deal adequately with the safety problem.

The school is strategically situated to make a major contribution to the teaching of safety.

Safety is a life problem peculiarly fitted for consideration by the school pupil and is bound up intrinsically with the objectives of modern education for democracy.

Safety must become an important element of the curriculum of every school, and the entire school personnel should contribute continuously to the realization of the objectives of safety education (26).

Statements adhered to by the National Safety Council concerning the school safety curriculum included the following:

Safety education should be concerned with worthwhile activities rather than negative prescriptions and should thereby contribute to the enrichment rather than the impoverishment of living.

The field of safety education is broad as life itself. The problem should be approached from every relevant angle.

The safety curriculum should be closely related to community needs - community being defined as the area in which the pupil lives - but ability to meet the problems of a new environment safely should also be developed.

The safety curriculum should emphasize pupil growth in safety responsibility.

There are marked limitations in the use of personal first-hand experience in safety education, but this method should be used, as in all other fields, in so far as practical and possible.

The safety curriculum should be developed in the light of the best practices of mental hygiene which place emphasis on the development of personal security.

The safety curriculum should be evaluated in the light of each of its objectives, including the so called intangibles as well as the tangibles. The Standard Student Accident Reporting System is to be an essential part in the evaluation of the tangibles. Safety instruction, to be effective, must be an integrated part of the curriculum. Certain areas of safety education, however, may best be provided for by special "courses" or "units." Safety can well be used as a spearhead in the development of current curricular trends (26).

II. METHODS OF TEACHING SAFETY

Yost, in his publication Teaching Safety in the Elementary School, supported the National Safety Council position by stating that practically every safety fact in the elementary school curriculum was needed by the child before he reached the third grade and that certainly the safety foundation at the primary level was of utmost importance (42:4). Yost also stated that safety needed in day-by-day living in classrooms, laboratories, halls, gymnasiums, auditoriums, playgrounds, and on the way to and from school was a prime concern (42:4). He emphasized the need for expanding and deepening safety understanding as a continual process through the elementary school years (42:4).

The National Safety Council examined several aspects of safety education in Teaching About Safety, published in 1972 (27). They cited several reasons why safety education was important. For example, accidents in the United States was the leading cause of death in children ages 1-14; they were also the leading cause of disability for those over the age of one year. Furthermore, these accidents cost the United States more than 500,000 dollars every ten minutes (27:1-5). Safety education reduces this toll by helping the child to confront specific safety problems and helping them to develop "safety consciousness" or "safe attitudes" that provided a frame of reference for safe behavior in any situation. Such a program can have widespread repercussions. One person acting safely has a positive effect on the safety and the safety-mindedness of the people around him (27:1-5).

Safety education can be approached in a myriad of ways from a well-planned program to a once-a-year assembly. One approach highly recommended by experts in the field was that of integrating safety into regular curriculum subjects. Safety lends itself quite naturally to studies of weather, shelter, clothing, combustion, transportation, history, ecology, perception, and many other common topics. Indeed, safety cannot be ignored in the presentation of a complete picture in subject matters such as these. It surely would make more sense to organize the teaching of safety around something that is more meaningful to the child (27:1-5).

The National Education Association (N.E.A.) lended support to the philosophy that safety education should be an integral part of the school curriculum. The N.E.A. specifically stated that safety should be accented in every subject area, all through the day, all through the year, and all through the primary grades (23). The N.E.A. also suggested that daily behavior was an evaluation of whether one was proficient in safety education (23:9-23). The N.E.A. stated that the schools have both the opportunity and the responsibility to educate youth in safe participation in a variety of activities, and in injury prevention in public places. Webster, in this N.E.A. publication, stated that this was essential if we were to meet the needs of children, youth, and adults for healthful and safe recreation (1:19-20).

Johnson, in his article "A New Era in Child Safety Education," lended his support to the belief that safety education should be focused on during early childhood and teens (14:13-14).

In two separate reports Kirk called for a comprehensive K-12 safety education program (16;15). These studies spurred a number of discoveries concerning safety. Parental models and teacher relationships with students have an effect on safety instruction.

III. THE NEED FOR SAFETY EDUCATION

A survey conducted by Keegan which obtained data from the fifty states, District of Columbia, and Puerto Rico showed where the states stood in their concern for childhood safety education. Findings of the survey were:

Elementary safety was given a slightly higher priority than driver education, however, all respondents believed that safety education should be initiated at the kindergarten level. None of the respondents stated that safety received a great deal of emphasis. Twenty five percent of the respondents believed that there should be a specifically trained teacher for safety education. More than seventy-five percent believed all teachers should be trained in safety and that safety education should be integrated into existing subject matter areas. Teacher-led lessons and television were believed to be the best method of reaching children under nine years of age. Children's achievement in safety should be measured by actual performance. The major reasons for children's accidents were seen to be misconceptions about safety, lackluster attitudes, and dangerous environment conditions. It was generally agreed that elementary safety education programs should be comprehensive in scope (14:40).

According to Johnson, it was time to move significantly in childhood safety education as education, as a whole, was becoming more oriented to attempting to help people solve their problems (14:13-14).

The White House Conference on Children, held in 1970, recommended that safety education be an integral part of the school curriculum. The Conference stated that opportunities needed to be provided for children to learn, grow, and live by re-ordering national priorities and that education be

redesigned to achieve individualized, humanized, child-centered learning (14:13-14).

Johnson stated,

If we feel valued, we will not devalue ourselves. . . Health and safety decisions are made according to our value system and that is where I believe the new era for safety education will be (14:40).

Dodge, former member of the National Commission on Safety Education for the National Education Association, set forth guidelines for teaching safety within the school.

These guidelines included:

1. The need to integrate safety with other school subjects.
2. The importance of using real experiences when possible.
3. The need to develop concern for the safety of others.
4. The need to involve the home in the safety education program.
5. The importance of teaching safety in a wholesome, positive way.
6. The need to use teaching methods to help the child develop skills in solving safety problems in increasingly mature ways.
7. The need to utilize community resources.
8. The need to utilize incidental experiences to further safety instruction.
9. The need to teach safety in a functional way.
10. The importance of developing favorable attitudes concerning safety (8:16-17).

Dodge felt that the teacher should develop a plan for implementation of a safety program to teach concepts and attitudes - not only as integrated segments - but as a part of the total curriculum (8:16-17).

Authors supportive of previously stated attitudes concerning curricular integration of safety education

included Strasser, Aaron, Bohn, and Eales (35:117-118, 405-421); Florio and Stafford (10:63, 66-67, 74-77, 250-251); Hoover (12); Hubbard (13); Wood (41:8-10); Williams, of the National Safety Council (40:45); and, Frost and Henniger (11:23-30).

Accidents were the number one cause of death in children ages 1-14 years according to the 1981 edition of Accident Facts (25:8). The overall death rate for that age group due to accident causes was 42.9 per 100,000 population (25:9).

In the 1977-78 school year, over 22,000 school jurisdictions reported their accidents to the National Safety Council. The rates were accidents per 100,000 school days. Accidents were those causing the loss of one-half day or more of 1) school time or 2) activity during non-school time, and/or property damage as a result of a school jurisdictional accident. The highest incidence of accidents occurred on school grounds for both boys and girls during playground activities (such as apparatus related, ball playing and running) (25:90-91).

Injuries in school bus related accidents totaled 7,500 of which 4,400 were students during the year 1979 (36:14). More than one-half of all school jurisdictional accidents were related to physical education, athletics, or recreation. For all grades combined, boys had 1.7 times as many accidents as girls. Almost one-half of all accidents

in K-3 and more than two-fifths of all accidents in 4-6 occurred in unorganized activities on the playground (25:90-91).

Yost stated that every year accidents claim the lives of thousands of children - and many thousands more are injured (42:7). This was evident in the facts and figures, but behind the data lie untold human suffering. This is a costly way to learn (42:7).

By teaching children how to live safely, the classroom teacher could prevent many of these accidents. Safety teaching in the elementary school should not be left to chance; it is vital for the future of every boy and girl. "Accidents don't happen. . . they are caused (42:8-10)." Accidents may be controlled by approaching the task by the use of the three E's: Education, Engineering, and Enforcement (42:8-10).

Research studies, experience, and teacher reactions indicated the major causes of accidents to include:

1. Insufficient knowledge.
2. Lack of supervision and poor leadership.
3. Improper attitudes (disregard of rules and regulations, lack of courtesy, failure to obey parents and teachers).
4. Desire of the child to accomplish something overriding caution (running into the street to get a ball).
5. Unsafe environment.
6. Personal causes (physical handicap, emotional instability, rebelliousness adventuresomeness, etc.).
7. Insufficient skill (42).

Yost stated that hazards were observable and accidents could be predicted, therefore one could develop a safety

sensitivity; accidents resulted not so much from the danger of operation, but from the skill of the operator; good house-keeping (including maintenance) was a component of safe living and that one's ability to avoid accidents varied with different physical and mental conditions (42:17).

The National Safety Council considered seven processes involved in the exercise of safe behavior:

1. Identifying the hazard.
2. Assessing the risk.
3. Deciding what to do.
4. Performing the tasks.
5. Evaluating.
6. Modifying previous ideas.
7. Applying the new knowledge gained (26:7).

All these processes were dependent on each other (decision making being the most crucial and the most difficult).

Strasser, Aaron, Bohn, and Eales examined the types of accidents that occurred within the school jurisdiction for children. They found that most accidents occurred as a result of play or game activities (26:117-118). Strasser, et.al. recommended that the organization and supervision of accident prevention programs be based upon sound planning (26:117-118).

Frost and Henniger recommended the use of standards for playground equipment and materials be utilized to reduce the incidence of accidents during early childhood (11:23-30). In 1981, the National Consumer Product Safety Commission published a two volume edition for playground safety. The first volume was a handbook for public playground safety.

Volume two dealt with the technical guidelines for playground equipment and surfacing (3;4).

These particular publications were invaluable for pinpointing specific areas of concern and hazards that existed on the playground. These publications were an effort to reduce the incidence and the seriousness of playground accidents that have occurred in the past.

Research indicated that certain considerations had an effect on the accidents that children become involved. Research studies (such as those by Craig, Fraser, and Jacobziner) assessed the incidents, as well as countermeasures, for the trends of accidents related to poison was of concern when childhood accidents were examined (4:111-127, 21:111-127).

Marcus, Wilson, Kraft, Swander, Southerland, and Schulhofer conducted a four year study on accident patterns in children. The subjects were white children ages 6-11 years old. The results of this study supported the maladjustment theory as a causation factor for early childhood accidents (21:313-326).

Krall conducted a study on the personality characteristics of accident repeating children. Major results of Krall's study found that accident repeating children:

1. Tended to be more aggressive in play activities.
2. Showed less inhibitions.
3. Showed less delay in expressing aggressions.
4. Showed more verbal aggression.
5. Showed greater increases in aggression and a lesser decrease in anxiety.

6. Tended to express more commands and threats but also showed more instances of affection and solicitation of affection.
7. Showed more activity in play.
8. Came from larger families.
9. Came later in birth order.
10. More often came from broken homes than the accident-free children examined (19:427-437).

IV. COMMUNICATIONS AND SAFETY EDUCATION

Methods of instruction differ, as does the flow of communication. Instruction in itself comprises a large area of communication. This class includes the teacher's actions within class, as well as, the students. Instruction provides the exposition, guidance practice and problem solving (31:34-47).

There are several methods in which information on safety education may be imparted to the student. The two methods of concern were integration and non-integration of safety information. The integration of information with other subject matter being taught to the student was utilized by the regular classroom teachers (if the method was selected). The non-integrated method of instruction was utilized by the education specialist to teach safety (if this method was selected). There are several general characteristics of communications that are important when information is transferred. The process of communication involves three components of vital concern (the provider of the information, the method of information transferal, and the receiver of

information). Numerous characteristics of these components play an active role in the learning process.

Most communication arises because someone's image of his environment or of his own need changes (31:47). The teacher played a major role in the quest for knowledge or communication. An important part of the teachers role was to motivate the pupil. The student then may enter into communication with expectancies of a reward of relevant information to satisfy the motivational forces applied.

Therefore, motivational forces applied for immediate reward (such as direct use of information) may prove a stronger motivational factor than some reward held in the distant future. Integration of instruction lends itself more readily to immediate rewards than does non-integrated instruction. In this sense, integrated instruction may be seen as more relevant than non-integrated instruction (29;31;38).

Research in the area of communications found the audience an active body rather than passive one (17). Therefore, it would follow that given the choice, an audience prefers to participate. Incidental learning (unintentional learning of facts, attitude and ideas) account for a large portion of many learning processes (29;30). The context of the message (integrated vs. non-integrated) may have an effect on the learning process (5;6;7).

Lasarsfeld contended that a potential adopter of a new idea or innovation was more likely to seek information

from informed and respected people. This two-step process occurs in the process as a stage of information and decision rather than temporally (earlier or later) (20;30:236-242). Therefore, an education specialist may have been more effective in view of this hypothesis. Conflicting opinions existed concerning penetration in varying behavior settings. In many studies, the regular classroom teacher was more likely seen as the key individual exerting the strongest influence on group to group linkages and the chain of command (5;17;20;31). Whereas, the educational specialist (non-integrated) may have been seen as an outsider.

V. ACCIDENT REPORTS AS A MEASURING INSTRUMENT

Most school systems require the utilization of accident report forms when an accident occurs on school property during school hours when a student is involved. These accident report forms generally include student characteristics (i.e., age, sex, grade level, injuries sustained, etc.) and accident characteristics (i.e., place of accident occurrence, circumstances of accidents, etc.). Therefore, the accident report provides a convenient, ready data base for analyzation of elementary school accidents.

Marshall called for further studies of accidents involving K-12 school students be conducted and analyzation

be made for frequency of accidents in relation to method of safety instruction. He hoped this research would establish a definite link between the accident causation factor and the educational methodology. By review and analysis of the frequency of accidents and contributory factors, he suggested that more effective safety instruction programs could be developed. He suggested accident reports as a measuring instrument for this analysis (22:13).

Sparks suggested that further research be conducted concerning integrated and non-integrated safety instruction. This research should examine elementary school students' statistics and accident characteristics to identify possible accident contributory factors. He suggested that research to determine the most beneficial subject matter for integration with safety instruction be conducted. Sparks also reported that accident reports used by school systems provide a viable means of accident analysis (34:90).

Hence, the methodology for this study reflected the recommendations of experienced researchers in the field of elementary school accidents.

VI. SUMMARY

This review of literature attempted to discuss areas of particular importance to the study of school accidents for integrated and non-integrated safety instruction programs.

Two major topics were discussed: the safety education area and the communications process.

Accidents have long been a problem, especially for the younger population. Various proposals have been made but the ultimate goals have yet to be achieved. Research is useless unless it is utilized.

Determination of the better method of instruction for safety education may provide a means for reduction of the accidents that plague the youth of the nation.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

I. INTRODUCTION

For many years, statistics have reflected accidents as the number one cause of death in children ages 1-14 years old. In view of the seriousness of this problem different concepts for the reduction or elimination of accidents have been formulated. Of major importance was the concept of safety education as a countermeasure for these accidents. This concept had two possible avenues of approach: integrated safety instruction and non-integrated safety instruction. Previous researchers have presented evidence favoring integrated instruction in some cases and non-integrated in other cases. Therefore, this study analyzed accident reports of participants in integrated and non-integrated safety instruction programs to determine whether there was a difference in the resulting frequency of school accidents. The participants were children completing the integrated or non-integrated method of safety instruction program for grades K-6 (5-14 years of age).

II. THE INSTRUCTIONAL PROGRAM

The instructional program implemented was aimed specifically at reducing accidents of the pupils. The program was developed by education specialists to cover areas

pertaining to self-protection (accident prevention). The four major topics were "stranger danger," fire safety, playground safety, and pedestrian-traffic safety. All elementary schools in the Knoxville City School System were included. The program was divided by the techniques of instruction (i.e., integrated or non-integrated). The same safety material was covered in each instructional technique (teachers in both programs were supplied with identical material for the safety topics to be taught).

The integrated techniques of instruction utilized the regular classroom teacher in presenting the material to the student. The teacher taught fifteen minutes of safety education per week (on basis of minimum amount of time required by Tennessee State law). This technique utilized the "teachable moment" or presented the material in conjunction with the other curricula being taught to the students and was recorded on the teacher's daily class outline.

The non-integrated technique of instruction utilized an education specialist (Crime Prevention Bureau, Fire Department personnel, etc.) in the teaching of safety material. This method was taught as a single subject and not integrated with other subjects in the students's curriculum.

Prior to the initiation of the program, all classroom teachers for K-6 grades were supplied with the material to be utilized in the teaching process. The program duration was one academic year (1979-1980). The individual classroom

teacher was free to choose the method of instruction for his/her own class. When the teacher chose the integrated technique, he/she was responsible for teaching the material to the student. When the teacher chose the non-integrated technique, an education specialist was responsible for teaching the material to the students.

Records of the technique employed in each individual classroom were maintained for future reference for the academic year (1979-1980). Accidents for the 1980-1981 year were reported to the Knoxville Board of Education within 24 hours after the occurrence for use in this study (this is a mandatory procedure for the Knoxville City School System and not strictly done for this study).

III. THE SUBJECTS

There were approximately 15,154 students in a total of 546 classrooms. Since each individual classroom teacher chose the technique of instruction employed with his/her students, 11,820 students (78%) in 426 classrooms were given the non-integrated technique of safety instruction; and, 3,334 students (22%) in 120 classrooms were given the integrated technique of instruction.

Accident reports were collected from all elementary schools reporting accidents for the academic year 1980-1981 (K-6 grade levels, ages 5-14 years old) in the Knoxville City School System.

IV. DATA COLLECTION

At the end of the 1980-1981 academic school year, all accident reports (Appendix II) for the elementary schools for that year were collected from the Knoxville Board of Education. These accident reports had been completed by the student's teacher or principal and sent to the Knoxville Board of Education within 24 hours of the accident occurrence.

The information from the accident report included the student's grade level, the month of the accident, the place of accident occurrence, a description of the injury, how the accident occurred, and disposition of the case (i.e., first aid, hospital, returned to classroom, etc.). Other information on the accident report (student's name, address, etc.) was not utilized in the analysis.

Only those accident reports involving participants in the safety instructional program were utilized. Records were then checked to determine which technique of safety instruction was employed for the student during the previous academic year (1979-1980). If the child was not in either program, not enrolled in K-6 grades of Knoxville City School System, or not within the 5-14 year old age bracket, the accident report was deleted from the analysis. If the accident did not occur during school hours while on school property, the accident report was deleted from the analysis.

V. STATISTICAL DESIGN

After the accident reports were collected for the school year 1980-1981, they were separated by the method of instruction experienced by the individual student. The data were taken from these reports and tabulated for statistical analysis.

The Kolmogorov-Smirnov two-tailed test for two independent samples and the test for hypothesis that two proportions are equal (z) were utilized in the data analysis (9;18;32). The significance level for both tests was set at 0.05. The z test was used when classes were not sufficient for the Kolmogorov-Smirnov test (39:77-102). Yates Correction for Continuity was used with the z formula to remove small expected frequency errors (9;18;32).

CHAPTER IV

ANALYSIS OF THE DATA

I. INTRODUCTION

The purpose of this study was to compare integrated vs. non-integrated methods of safety instruction to determine differences in subsequent school accidents. In order to conduct this research, the two instructional methods (integrated and non-integrated) were implemented to teach safety education in the selected city school system (K-6) for academic year 1979-1980. Each classroom teacher was allowed to choose the desired method of instruction for his/her classroom.

By analyzing the accident reports for academic year 1980-1981, on the basis of method of instruction chosen, the answer to the following question was sought: Is there a difference in the frequency of school accidents between students completing integrated safety instruction and those completing non-integrated safety instruction?

In the process of data assimilation, selected student and accident characteristics were examined for specific relationship between the method of instruction and the frequency of school accidents. These variables were:

2. Grade level of the student.
3. Age of the student.

4. Sex of the student.
5. Month of accident occurrence.
6. Place of accident occurrence.
7. Type of injury sustained from the accident.
8. How the accident occurred.
9. The seriousness of the accident.

II. SUBJECT DISTRIBUTION

Table 1 shows the distribution of sample subjects by grade level and sex for integrated and non-integrated safety instruction programs. The distribution is by percent of the total number of students. Non-integrated instruction students numbered 11,820 of the total sample (78%). Whereas, integrated instruction students numbered 3,334 of the total sample (22%). The sample distribution per grade level for both integrated and non-integrated tended to increase by a very small percentage as the grade level increased (non-integrated = 10.2% to 12.5%; integrated = 2.9% to 3.4%; K-6 grade levels). The sample distribution by sex shows the largest discrepancy at the kindergarten (K) grade level (males = 5.6%; females = 7.5%). However, generally the sample by sex remained relatively constant with males numbering 7,274 (48%) and females numbering 7,880 (52%).

The total number of subjects in this study amounted to 15,154 students in grades K-6 comprising 546 classrooms.

Table 1. Distribution of Sample Subjects By Grade Level and Sex for Integrated and Non-Integrated Safety Instruction Program for a Selected City School System, Academic Year 1979-1980 (percents by total)

Grade Level	Sex	Integrated Program		Non-Integrated Program		Total	
		N	%	N	%	N	%
K	Male	107	0.7	750	4.9	857	5.6
	Female	329	2.2	796	5.3	1125	7.5
	Total	436	2.9	1546	10.2	1982	13.1
1	Male	291	1.8	792	5.3	1083	7.1
	Female	170	1.2	840	5.5	1010	6.7
	Total	461	3.0	1632	10.8	2093	13.8
2	Male	151	1.0	824	5.4	975	6.4
	Female	323	2.1	857	5.7	1180	7.8
	Total	474	3.1	1681	11.1	2155	14.2
3	Male	234	1.6	776	5.1	1010	6.7
	Female	252	1.7	898	5.9	1150	7.6
	Total	486	3.3	1674	11.0	2160	14.3
4	Male	355	2.4	888	5.8	1243	8.2
	Female	167	1.0	963	6.4	1130	7.4
	Total	522	3.4	1851	12.2	2373	15.6
5	Male	228	1.5	833	5.5	1061	7.0
	Female	262	1.7	903	6.0	1165	7.7
	Total	490	3.2	1736	11.5	2226	14.7
6	Male	234	1.6	811	5.3	1045	6.9
	Female	231	1.5	889	5.9	1120	7.4
	Total	465	3.1	1700	11.2	2165	14.3
Total	Male	1600	10.6	5674	37.4	7274	48.0
	Female	1734	11.4	6146	40.6	7880	52.0
	Total	3334	22.0	11820	78.0	15154	100.0

Since each classroom teacher chose the desired method of instruction for their students, 11,820 students (78%) in 426 classrooms received non-integrated instruction and 3,334 students (22%) in 120 classrooms received integrated instruction (Table 2).

There were 585 accident reports collected from the total sample of 15,154 at the end of academic year 1980-1981. The reports were taken from only those students who participated in either the integrated or non-integrated instructional program; were enrolled in both 1979-1980 and 1980-1981 academic school years; and were 5-14 years of age (K-6 grade level). Of the 585 accident reports collected, thirteen were rejected leaving 572 reports for analysis. Nine of the thirteen rejected were accident reports from students who did not participate in either instructional program for the previous year. The remaining four reports did not contain adequate information to identify and classify the accident victim as a student of either instructional program.

III. DATA ANALYSIS

Research Question #1: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED SAFETY INSTRUCTION AND THOSE COMPLETING NON-INTEGRATED SAFETY INSTRUCTION?

Table 2. Distribution of Subjects By Classroom for Integrated and Non-Integrated Safety Instruction Program for a Selected City School System, Academic Year 1979-1980

Criteria	Integrated Program		Non-Integrated Program		Total	
	N	%	N	%	N	%
Number of Classrooms	120	22.0	426	78.0	546	100.0
Number of Students	3334	22.0	11820	78.0	15154	100.0

As the data in Table 3 indicate, a greater proportion of non-integrated students had accidents than integrated students (.0395 to .0315). The resulting z value (2.20) is significant at the 0.05 level for a two-tailed test ($z > 1.96$). Therefore, students completing integrated safety instruction experienced a significantly lower number of school accidents than those students completing non-integrated safety instruction.

Research Question #2: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND THE GRADE LEVEL OF THE STUDENT?

Table 4 shows an analysis of accidents by grade level for integrated and non-integrated instructional programs. The maximum absolute difference occurred at the fourth grade level (.1182). This Kolmogorov-Smirnov value is not significant at the 0.05 level. Hence, there was no significant difference between accident frequencies of integrated and non-integrated students in accordance to student grade level.

Research Question #3: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND THE AGE OF THE STUDENT?

Table 5 shows the Kolmogorov-Smirnov maximum difference for students by age level in the ten year old age

Table 3. Frequency of Accidents By Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

Criteria	Instructional Program			
	Integrated		Non-Integrated	
	N	Proportion	N	Proportion
Students With Accidents	105	.0315	467	.0395
Students With No Accidents	3229	.9685	11353	.9605
Total	3334	1.0000	11820	1.0000

$z = 2.20$

Significant at 0.05 level ($z > 1.96$)

Table 4. Frequency of Accidents By Grade Level for Integrated and Non-Integrated Instructional Program in a Selected City School System for Academic Year 1980-1981

Grade Level	Total Student Accidents	Integrated Program		Non-Integrated Program		K_D
		N	Proportion	N	Proportion	
K	55	13	.1238	42	.0899	.0339
1	87	25	.2381	62	.1328	.1053
2	92	24	.2286	68	.1456	.0830
3	91	21	.2000	70	.1500	.0500
4	77	4	.0381	73	.1563	.1182*
5	123	13	.1238	110	.2355	.1117
6	47	5	.0476	42	.0899	.0423

Integrated Program N = 105

Non-Integrated Program N = 467

Total Accident N = 572

* K_D = .1182 Non-Significant at 0.05 level ($K_D < .1469$)

Table 5. Frequency of Accidents By Age for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

Age	Total Student Accidents	Integrated Program N	Integrated Program Proportion	Non-Integrated Program N	Non-Integrated Program Proportion	K _D
5	44	9	.0857	35	.0750	.0107
6	57	9	.0857	48	.1028	.0171
7	69	14	.1333	55	.1178	.0155
8	67	10	.0952	57	.1221	.0269
9	85	16	.1524	69	.1478	.0046
10	115	24	.2286	91	.1949	.0337*
11	70	12	.1143	58	.1242	.0099
12	40	6	.0571	34	.0728	.0157
13	16	3	.0286	13	.0278	.0008
14	9	2	.0190	7	.0150	.0040

Integrated Program N = 105
Non-Integrated Program N = 467
Total Accident N = 572

*K_D = .0337 Non-Significant at 0.05 level (K_D < .1469)

group (.0337), which is not significant at the 0.05 level. Therefore, no significant difference was found to exist between the age of the student and the frequency of school accidents by instructional program.

Research Question #4: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND THE SEX OF THE STUDENT?

Table 6 shows the results of the z test for school accident frequency by instructional program and sex of the student. The z test values for integrated and non-integrated programs were both significant at the 0.05 level. The integrated z value was 3.00 and the non-integrated z value was 6.27. Male students in both integrated and non-integrated instructional programs had a higher frequency of school accidents than female students.

Research Question #5: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND THE MONTH OF OCCURRENCE OF THE ACCIDENT?

Table 7 for analysis of accidents by month of occurrence for integrated and non-integrated instruction programs showed the Kolmogorov-Smirnov maximum difference in the month of March (.0335), which is not significant at the 0.05 level. Therefore, there was no significant difference between the frequency of accidents by month and type of instructional program.

Table 6. Frequency of Accidents By Sex for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

Sex	Accident Criteria	Integrated		Non-Integrated		Total	
		N	Proportion z	N	Proportion z	N	Proportion
Male	Accident	66	.6286	291	.6231	357	.6241
	No Accident	1534	.4751	5383	.4741	6917	.4744
	Total	1600	.4799	5674	.4800	7244	.4780
Female	Accident	39	.3714	176	.3769	215	.3759
	No Accident	1695	.5249	5970	.5259	7665	.5256
	Total	1734	.5201	6146	.5200	7880	.5220
Total	Accident	105	1.0000	467	1.0000	572	1.0000
	No Accident	3229	1.0000	11353	1.0000	14582	1.0000
	Total	3334	1.0000	11820	1.0000	15154	1.0000

*Significant at 0.05 level ($z > 1.96$)

Table 7. Frequency of Accidents By Month for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

Month	Total Student Accidents	Integrated Program		Non-Integrated Program		K_D
		N	Proportion	N	Proportion	
August	0	0	.0000	0	.0000	.0000
September	67	11	.1048	56	.1199	.0151
October	77	17	.1619	60	.1285	.0334
November	51	11	.1048	40	.0857	.0191
December	43	6	.0571	37	.0792	.0221
January	34	4	.0381	30	.0641	.0260
February	52	12	.1143	40	.0857	.0286
March	81	12	.1143	69	.1478	.0335*
April	70	14	.1333	56	.1199	.0134
May	79	16	.1524	63	.1349	.0175
June	18	2	.0190	16	.0343	.0153

Integrated Program N = 105

Non-Integrated Program N = 467

Total Accident N = 572

* K_D = .0335 Non-Significant at 0.05 level ($K_D < .1469$)

Research Question #6: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND THE PLACE OF ACCIDENT OCCURRENCE?

Table 8 shows the frequency of accidents by instructional program and the place of accident occurrence. Originally, there were four classifications of place: classroom, hall, playground (or physical education), and cafeteria or other. Classroom, hall, and cafeteria or other were collapsed into one category (other accident) because of the relatively small frequencies of accidents in these areas. The final classification of place of occurrence was playground/physical education accidents and other accidents.

Table 8 shows a significant z value occurring in the other accident classification category (3.23). The non-integrated students had a significantly higher frequency of accidents in areas other than playground/physical education than the integrated students. There was a significant difference in accident frequency by place of occurrence between instructional programs and areas other than playground/physical education.

There was no significant difference between methods and the playground/physical education category.

Research Question #7: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND THE TYPE OF INJURY SUSTAINED FROM THE ACCIDENT?

Table 8. Frequency of Accidents By Place of Occurrence for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

Place of Occurrence	Accident Criteria	Integrated		Non-Integrated		Total	
		N	Prop.	N	Prop.	N	Prop.
Playground/ P.E.	Accident	73	.0219	263	.0223	336	.0222
	No Accident	3261	.9781	11557	.9777	14818	.9778
	Total	3334	1.0000	11820	1.0000	15154	1.0000
Other Area ¹	Accident	32	.0096	204	.0173	236	.0156
	No Accident	3302	.9904	11616	.9827	14918	.9844
	Total	3334	1.0000	11820	1.0000	15154	1.0000

¹Classroom, Hall, Cafeteria, etc.

*Significant at 0.05 level ($z > 1.96$)

Table 9 shows the frequency of accident by instructional program by injury description classification (type of injury sustained). There were four original categories of injury: minor scratch, bruise, bump, or sprain; serious laceration or bump; broken bone; and, death. There were no resulting deaths and the classification was deleted. The injury classification was further collapsed into two classification categories: minor injury and major injury. Minor injuries included minor scratch, bruise, bump or sprain. Major injuries included serious laceration or bump and broken bone.

The z test value for minor injuries was 0.95 which is not significant at the 0.05 level. The z test value for major injuries was 3.39 which is significant at the 0.05 level.

There was a significant difference in the major injury classification between integrated and non-integrated students. Non-integrated students had a significantly higher frequency of major injury accidents than integrated students.

Research Question #8: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND HOW THE ACCIDENT OCCURRED?

Table 10 shows the frequency of accidents by type of instruction and how the accident occurred. There were four categories of how the accident occurred: during play

Table 9. Frequency of Accidents By Injury Description Classification for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

Injury Classification	Accident Criteria	Integrated		Non-Integrated		Total		z
		N	Prop.	N	Prop.	N	Prop.	
Minor ¹	Accident	98	.0294	384	.0325	482	.0318	
	No Accident	3236	.9706	11436	.9675	14672	.9682	0.95
	Total	3334	1.0000	11820	1.0000	15154	1.0000	
Major ²	Accident	7	.0021	83	.0070	90	.0059	
	No Accident	3327	.9979	11737	.9930	15064	.9941	3.39*
	Total	3334	1.0000	11820	1.0000	15154	1.0000	

¹Scratch, Bruise, Bump, Sprain, etc.

²Serious Laceration or Bump, Broken Bone, etc.

*Significant at 0.05 level ($z > 1.96$)

Table 10. Frequency of Accidents By How Accident Occurred for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

How Accident Occurred	Accident Criteria	Integrated		Non-Integrated		Total	
		N	Prop.	N	Prop.	N	Prop.
Play Related ¹	Accident	62	.0186	289	.0245	351	.0232
	No Accident	3272	.9814	11531	.9755	14803	.9768
	Total	3334	1.0000	11820	1.0000	15154	1.0000
Not Play ² Related	Accident	43	.0129	178	.0151	221	.0146
	No Accident	3291	.9871	11642	.9849	14933	.9854
	Total	3334	1.0000	11820	1.0000	15154	1.0000

¹P.E., etc.

²Classroom, Cafeteria, Recess, etc.

*Significant at 0.05 level ($z > 1.96$)

or physical education (P.E.), during daily classroom schedule, during lunch or recess (not play related), and other. These four classification categories were collapsed into two which are play related accidents and non-play related accidents. Play related accidents included accidents occurring during play and physical education. Non-play related accidents included accidents occurring during classroom schedule, lunch, recess, and other.

The resulting z test values show play related accidents significant at the 0.05 level ($z = 2.05$). The z test value for non-play related accidents was 1.00 which is not significant at the 0.05 level ($z < 1.96$).

There was a significant difference in the play related classification of accidents. Non-integrated students had a higher frequency of play related accidents than integrated students.

Research Question #9: IS THERE A DIFFERENCE BETWEEN THE FREQUENCY OF SCHOOL ACCIDENTS OF STUDENTS COMPLETING INTEGRATED VS. NON-INTEGRATED SAFETY INSTRUCTION AND THE SERIOUSNESS OF THE ACCIDENT?

Table 11 shows the frequency of accidents by type of instruction and the seriousness of the accident. There were two categories of accident seriousness (treatment wise): first aid and physician/hospital. Death was originally included but since there were no resulting deaths, this category was omitted.

Table 11. Frequency of Accidents By Injury (Accident Seriousness) for Integrated and Non-Integrated Instructional Program in a Selected City School System (K-6) for Academic Year 1980-1981

Accident Seriousness	Accident Criteria	Integrated		Non-Integrated		Total		z
		N	Prop.	N	Prop.	N	Prop.	
First Aid Required	Accident	99	.0297	396	.0335	495	.0327	1.15
	No Accident	3235	.9703	11424	.9665	14659	.9673	
	Total	3334	1.0000	11820	1.0000	15154	1.0000	
Physician/Hospital	Accident	6	.0018	71	.0060	77	.0051	3.16*
	No Accident	3328	.9982	11749	.9940	15077	.9949	
	Total	3334	1.0000	11820	1.0000	15154	1.0000	

*Significant at 0.05 level ($z > 1.96$)

The z test values for accident seriousness show that in the first aid required classification category, the z value was 1.15 which is not significant at the 0.05 level. However, for the classification physician and or hospital required, the z test value was 3.16 which is significant at the 0.05 level. There was a significantly higher number of non-integrated students who had accidents requiring physician/hospitalization treatment than integrated students.

IV. SUMMARY

The analysis of the data provided on the accident reports found that, of the variables examined, six showed a significant relationship between the frequency of accidents by instructional program and the particular variable being tested.

Statistical analysis of the data with variables, characterized by instructional program, depicted the following:

1. For frequency of accidents by type of instructional program, non-integrated students had a significantly higher frequency of accidents than integrated students.
2. For frequency of accidents by grade level, there was no significant difference between integrated and non-integrated students.

3. For frequency of accidents by age, there was no significant difference between integrated and non-integrated students.
4. For frequency of accidents by sex, males had a significantly higher frequency of accidents in both integrated and non-integrated programs.
5. For frequency of accidents by month of occurrence, there was no significant difference between integrated and non-integrated students.
6. For place of accident occurrence, there was a significant difference between integrated and non-integrated students for accidents in the other than playground/physical education classification. Non-integrated students had a significantly higher frequency of school accidents in areas other than playground/physical education.
7. For frequency of accidents by injury sustained, there was a significant difference between instructional programs. Non-integrated students had a significantly higher frequency of major injuries than integrated students.
8. For frequency of accident by how accident occurred, non-integrated students had a significantly higher frequency of play related accidents than integrated students.

9. For frequency of accident by accident seriousness, non-integrated students had a significantly higher frequency of accidents requiring physician/hospitalization treatment than integrated students.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

The purpose of this study was to compare integrated vs. non-integrated methods of safety instruction to determine the difference in subsequent school accidents. The study sought to answer one major question: Is there a difference in the frequency of school accidents between students completing integrated safety instruction and those completing non-integrated safety instruction? In the process of data assimilation, selected student and accident characteristics were examined for the specific relationship between the method of instruction and the frequency of school accidents. These variables were:

2. Grade level of the student.
3. Age of the student.
4. Sex of the student.
5. Month of occurrence of the accident.
6. Place of occurrence of the accident.
7. Type of injury sustained from the accident.
8. How the accident occurred.
9. The seriousness of the accident.

The hypothesis was: There will be a difference in the frequency of school accidents for students completing

integrated safety instruction programs vs. non-integrated safety instruction programs in the Knoxville City Schools K-6 grade level.

The instructional programs (integrated and non-integrated) were developed by education specialists and were aimed specifically at the reduction of accidents. The programs covered these areas of self-protection: "stranger danger," fire safety, playground safety, pedestrian, and traffic safety. These were the four broad topics in each instructional method.

The integrated method of instruction utilized the student's regular classroom teachers, whereas, the non-integrated method of instruction utilized an education specialist in teaching the safety material.

The actual instructional process was implemented for the academic year 1979-1980. The accident reports were then collected for those participating in the program for academic year 1980-1981.

The classroom teachers were at liberty to choose the method of instruction utilized in his/her classroom. Records of participants in both programs were maintained for future reference.

There were approximately 15,154 students in a total of 546 classrooms who participated in this study.

Results of teacher selection of instructional program found 11,820 students (78%) in 426 classrooms were

given the non-integrated technique of safety instruction; and 3,334 students (22%) in 120 classrooms were given the integrated technique of instruction.

Accident reports were collected from participants of the program for the 1980-1981 academic school year. There were a total of 585 accident reports collected. Of these 585 reports, thirteen were rejected leaving 572 accident reports on which to perform an analysis.

The data from the accident reports were tabulated and separated into integrated and non-integrated instructional program participant categories. The total number of accidents for the integrated category was 105, and the total for the non-integrated category was 467.

After the data were collected and tabulated, the Kolmogorov-Smirnov two-tailed test for independent samples, and the z test for proportion were utilized for the analysis. The significance level was set at 0.05 for the tests.

II. FINDINGS

From the results of the statistical analysis of the data, the following findings were evident:

1. There was a significant relationship found between the frequency of accidents and the type of instructional program. This significance was attributed to the type of instructional program employed since the non-integra-

ted participants exhibited a greater proportion of the frequency of accidents than did the integrated participants (.0315 to .0395, integrated to non-integrated).

2. The variable grade level of the accident victim was non-significant in relation to the type of instructional program.
3. The variable of age of the accident victim in relation to the type of instructional program was non-significant.
4. The difference between accidents by sex and type of instructional program was significant. Males for both programs had a higher frequency of accidents than did the females. This difference was more pronounced for the non-integrated method than for the integrated method.
5. The variables of month of accident occurrence and type of instructional program were non-significant.
6. The difference between accidents by place of occurrence and the type of instructional program was significant in the other than playground/physical education classification. There was no

significant differences found in the playground/physical education classification. This phenomena may be due in part to the fact that students conducted playground type of activities in places other than on the playground. If this did occur, the students were more than likely without supervision.

7. The analysis of accidents by injury description classification and type of instructional program was significant. The significance was attributed to the type of instructional program since a greater proportion of the non-integrated participants had more major injuries than did the integrated participants. This was evident in that the major classification category displayed a significant difference. Whereas, the minor injury classification category difference was not significant.
8. The analysis of accidents by how the accident occurred and type of instructional program showed a significant difference in the play related classification. However, there was no significant difference

found in the not play related classification.

9. The analysis of accidents by injury/accident seriousness and type of instructional program was significant. The significance was attributed to the type of instructional program since the non-integrated participants sustained more serious injuries or had more serious accidents than did the integrated participants. The classification of accidents requiring physician and/or hospitalization displayed a significant difference. However, the classification of accidents requiring first aid was not found significant.

III. CONCLUSIONS

Based on the findings, the following conclusions were drawn:

1. The students in integrated method of safety instruction had a lower frequency of accidents than students (K-6, 5-14 years of age) in the non-integrated method of safety instruction.
2. The integrated method of safety instruction students had a lower frequency of accidents

for males than was the non-integrated method of instruction.

3. The integrated method of instruction students had a lower frequency of accidents by place of occurrence in areas other than playground/physical education than the non-integrated instruction method.
4. The integrated method of instruction had less major injuries during accidents for K-6 students (5-14 years of age) than did the non-integrated method of instruction.
5. The integrated instruction students experienced lower frequencies of play related accidents than did the non-integrated instruction students. Non-integrated students had a higher frequency of play related accidents yet these accidents occurred in areas other than playground/physical education designated areas. This phenomena may be due to the tendency for the student to engage in play related activities in other areas not specified for playground/physical education activities (i.e., stairwells, streets, etc.).

6. The K-6 students (5-14 year of age) participating in the integrated method of safety instruction had less serious accidents (treatment wise) than did those students participating in the non-integrated method of instruction.
7. The variables grade level, age, and month of accident occurrence were unrelated to the type of instructional program received and the accident frequency.

IV. RECOMMENDATIONS

These recommendations are based on the correlation of certain variables under study and the accident frequency. They do not imply a cause and effect relationship between a certain characteristic and accidents.

The following recommendations are based upon the data analysis in the study and the review of the related literature:

1. Teachers should, as much as possible, integrate safety education with subject matter normally covered in the classroom.
2. In an effort to reduce accident frequency for students (K-6), high priority should be given to playground safety because of the high incidence of play related accidents.

3. Safety education and health education should be presented to the students for practical application and meshed with everyday activities. This should improve the physical health and well-being of the student.
4. Further research in the area of integrated and non-integrated subject matter should be conducted and evaluated on the basis of effectiveness.
5. Lines of communication to improve the prospect of greater student learning should be investigated so as to improve the overall educational process.
6. Teacher training should be implemented by school systems in the area of safety integration and education.

CHAPTER VI

COMMENTS

I. SAFETY AND EDUCATION

In the process of conducting this study, several comments were warranted in addition to the actual study as designed.

First of all, some mention should be made in reference to the use of education specialists or other authoritarian figures in the teaching of the safety material. Although the education specialist presented the same material to the student as did the teacher, it is highly probable that the students reacted differently to them as instructors. Students may have been inclined to give the education specialists more attention than the regular classroom teacher because they were alien. However, this does not imply that they learned more from them than from their regular teacher.

In an attempt to ensure the absence of this added attention, research using rigid control and experimental design should be implemented. This would place tighter constraints on any confounding variable and enable the researcher to attribute any difference to the type of instruction alone.

Research has shown that children form their attitudes concerning safety at an early age. Therefore, particular

attention should be given to safety for the younger students. However, this attention should be maintained throughout the education of a child. Safety taught for practical application during preschool and elementary school, as well as during junior high, senior high and college level, would serve to provide the student with a common sense approach of safety for utilization in his/her daily living.

By meshing safety at an effective level with other subject matter, the student may be taught proper usage and concern of safety. Health education, this researcher feels, should be integrated as should safety education. Safety and health are generally two activities that are performed in conjunction with other activities. For example, safety rules are applied in performing numerous physical activities (skiing, bicycling, etc.). Many principles of health and safety are applied automatically and without conscious thought. In as much as they are applied automatically, students should be taught to apply these principles automatically -- hence, integrated safety and health education. Subjects of health and safety should not be integrated to the point of being lost in other subject matter, but simply as being an important integral part of the learning experience.

II. COMMUNICATIONS AND SAFETY

The use of certain communication conducive hardware and software is an area often overlooked by instructors in nearly all fields. Perhaps unfamiliarity with this area add to its proclulsion from use by many. This, however, is generally relatively simple to modify. In many instances, accomplishment of media as a communicative tool reaps great rewards for the student.

Teachers, given their lack of preparation time, often omit the use of mediated instruction. In recent years the use of mediated instruction has increased substantially. The effectiveness of this type of instruction is shown in numerous ways. Many educational institutions have at their disposal a media or teacher's center that offers those interested assistance and information in this area. Additional training for teachers in the use of these tools offered during in-service training for these teachers may be one avenue of approach to familarize them with the appropriateness of media usage.

Certainly in the coming years we will see increased usage of audio-visual communication as a teaching tool. Perhaps even to the extent of "school at home." We already have been introduced to educational programs broadcast on national and public television. In the future, certain students (handicapped, etc.) may qualify for home instruction

by broadcast television or prerecorded tapes and discs. Marketing for response required games has been introduced commercially and has gained wide acceptance by the younger population. In the future, it may not be uncommon for a student to have access to a response required terminal either in or out of their homes on which they will complete prepared instructional programs. This may then lead to their ultimate completion of elementary, junior high, and high school. This particular setup would provide an easy means of standardization of educational areas deemed for standardization. It would also be quite feasible for educational packages to be individualized to a great degree for each student. Consequently, educational programs could be nationalized yet individualized to a great extent.

Certainly, this would prevent much misuse of instructional aid materials (hardware and software) by teachers who either lack the skill, knowledge or conscious to perform correctly. Often when an instructor is rushed for time, a videotape, film, or slides provides an easy out whether it serves as a teaching aid or not.

Certainly there are disadvantages as well as advantages to a nationalized educational programs as explained. One clear advantage in the area of safety instruction (as well as many other areas) is that one would not have to rely on state law requirements being met by school systems

and teachers in particular. The question would not lie in whether or not safety was taught, rather whether or not it was learned. The learning of the material is more conducive to measurement than is the teaching.

Of particular concern to many is whether there will be personal teacher-pupil contact in an automated instruction situation. It may be that students would report one day per school week to an assigned place to participate in this personal contact. This would also enable the teachers to remediate on points the student is found lacking.

The development of attitudes for safety consciousness lies more toward the realm of reality and practice than simple information receiving. However, often the student is simply presented with a volume of information for which he/she must respond correctly. In view of the possible advancements in the area of educational communications, it seems piteous not to correctly utilize what is presently available. Awareness of educators in all fields of study (not just health and safety) should be enhanced. Often as not, educators are not aware of the resources providing instructional aid that are available to them - many are available at minimal or no cost. As long as the student has been briefed on the biased nature of certain instructional aids (i.e., insurance films on safety that advertise the insurance company, etc.) they may often provide a very good instructional purpose. Therefore, they may be a valuable resource for the teacher. More safety programs

should be produced for use by educators. These audio-visual programs could be designed for specific objectives as well as general goals set forth in safety education.

III. PERSONAL COMMENT

Most people contend that adventure is first, safety second in the pursuit of life's enjoyment. Each person has individual priorities that is considered throughout life. Based upon these priorities, it is the responsibility of each individual to decide wherein his/her life safety lies. Safety education offers a chance to gain the knowledge and understanding that assists individuals in forming their day to day attitude concerning not only safety -- but health as well.

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APPENDICES

APPENDIX A

KNOXVILLE CITY SCHOOLS CONSENT FORM

Knoxville City Schools

Research and Public Relations

101 East Fifth Avenue - Knoxville, Tennessee 37917 - Telephone (615) 546-2251

May 6, 1981

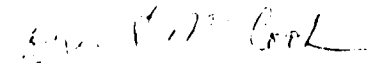
JAMES A. NEWMAN, Superintendent
JOHN E. MCCOOK, ED.D., Coordinator

Ms. Romona Miller
6505 Cadbury Drive
Knoxville, Tennessee 37921

Dear Ms. Miller:

The purpose of this letter is to give written confirmation of my approval of your request to make an analysis pertaining to accident reports.

Sincerely,



John E. McCook, Ed.D.
Director

JEM:ncd

APPENDIX B

KNOXVILLE CITY SCHOOLS ACCIDENT REPORT

KNOXVILLE CITY SCHOOLS
101 East Fifth Avenue
Knoxville, Tn. 37917

REPORT OF STUDENT ACCIDENTS AND INJURIES

Name of Injured: _____ School: _____

Birthdate: _____ Grade: _____ Address: _____

Date of Accident _____

Place Where Accident Occurred: _____

Description of injury: (Be specific) _____

How did accident occur? _____

Witnesses: _____

Disposition of case — By Whom? (First aid, hospital, returned to classroom, etc.) _____

Parent or Guardian notified? _____

Does Injured have school insurance? _____

Insurance report made: _____ Date filed: _____

**NOTE: Report should be filed with the Special Services
Office AS EARLY AS POSSIBLE.**

White Copy — Administrative Assistant's Office
Yellow Copy — Employee's Copy
Pink Copy — School Office

F 106 (9/79)

Signature of person filing report _____ Date _____

Phone Number of person filing report _____

Signature of Principal _____

VITA

Ramona Iris Lainhart Miller was born on January 25, 1956, the daughter of Dewey Lainhart and Bertella Madden Lainhart of Gray Hawk, Kentucky. She was educated in the Gray Hawk and McKee Elementary Schools and graduated from Jackson County High School on June 1974. She attended Cumberland College in Williamsburg, Kentucky between her junior and senior years in high school and directly following her graduation. She then attended Eastern Kentucky University, where she completed her requirements for the Bachelor of Arts degree in Fashion Merchandising in December 1976. After a brief period of employment in this field, she attended East Tennessee State University, where she received her Master of Arts degree in Instructional Communication in August 1979. During employment as an educational specialist and media expert, she attended The University of Tennessee at Knoxville from March 1980 to March 1982, when she received her Doctor of Philosophy in Health Education. She is married to Dr. Larry Scott Miller of Kingsport, Tennessee.