A COMPARISON OF THE TRADITIONAL METHOD AND MULTI-MEDIA METHOD OF TEACHING FIRST AID TO NINTH GRADE FEMALE STUDENTS

A Thesis

Presented to

the Division of Health, Physical Education,

Recreation, and Athletics

Emporia Kansas State College

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

---

by

Joan Rene Krack

August 1976

Jeanne C. Galley

Approved for the Major Department

Harold E Durst

Approved for the Graduate Council

ACKNOWLEDGMENTS

The author wishes to express sincere appreciation to her advisor, Professor Jeanne C. Galley, for her generous time and comments in the writing of this thesis and guidance in graduate work.

Special appreciation is extended to Dr. Harry J. Waters, Dr. Ron Slaymaker, Dr. Dorothy Martin for their guidance and assistance during this study, to Mr. Bill Wyckoff for his valuable help with the statistical handling of the data, and to Ms. Margaret A. Hawk for the typing of this thesis.

Acknowledgment is extended to the students and the American Red Cross Aides who gave their time to help make this study a success.

A sincere and special thanks is conveyed to Ms. Wanda L. Ecker, Ms. Margaret A. Hawk, and Ms. R. Rose Lamb who gave support and encouragement which aided in the completion of graduate study.

July 16, 1976 J.R.K.

Emporia, Kansas

TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

Chapter 1

INTRODUCTION

Within Chapter One, the reader can expect to find the theoretical formulation and explanation of the problem, statement of the problem, statement of the hypothesis, and the significance of the study. Also included in Chapter One are definitions of terms and the limitations of the study.

THEORETICAL FORMULATION

In recent years, studies have indicated the multi-media approach to teaching has definite advantages. Frazier and Zaslav found a statistically significant difference which favored automated systems of teaching reading improvement as compared to non-automated systems of teaching reading improvement (5). A study was conducted to test the relative effectiveness of a multi-media instruction system. The teachers participating in this study indicated, through subjective evaluations, that the multi-media instruction was superior to any basal program they had used (17).

Teachers also found the Listen Look Learn (LLL) Multi-Media Communication Skills System to be extremely effective with children at all ability levels, from all community sizes, and from every socioeconomic status (17). In light of the

above studies, learning ability was improved through the use of multi-media teaching systems.

THE PROBLEM

The Wichita Public Schools require all ninth grade students to take the American Red Cross Standard First Aid Course within physical education class time. Because students do not like to give up activity time for first aid, a method for teaching this class in the shortest amount of time and for producing effective results was definitely needed.

Statement of the Problem

It was the purpose of this study to determine if there is a significant difference in the retention rate of ninth grade female students taking first aid taught through multi-media techniques and ninth grade female students instructed in the traditional first aid course method.

Statement of the Hypothesis (Null)

There is no significant difference in the retention rate of first aid materials by ninth grade students taught by the multi-media method and those instructed by the traditional method.

SIGNIFICANCE OF THE STUDY

The significance of the study was to produce a reliable method of teaching first aid to ninth grade students in the shortest amount of time. The multi-media system requires

eight hours of instruction; the traditional method requires fifteen hours. In terms of days spent in the class room, the multi-media system is limited to two days with four hours each day. The traditional method is taught in fifteen days with one hour each day.

The investigator used both methods under similar conditions in an effort to determine the strengths and weaknesses of both systems. The method used to determine the statistical significance of the study was the Fisher t-test, for a comparison of group means (9). The findings may help future instructors of first aid to be more efficient and effective in their instruction.

ASSUMPTIONS OF THE STUDY

It was assumed that the two groups tested were homogeneous. Another basic assumption was the sincere effort of the students tested to answer test questions to the best of their ability.

DEFINITIONS OF TERMS

The following were definitions of terms used in this study:

Multi-media Method

The multi-media method is a method of teaching in which films, practice sessions, and programmed learning test booklets are used to develop skills and knowledges. There

are twenty film segments, seventeen practice sessions, and thirteen workbook lessons included in the Red Cross Multimedia Course.

Traditional Method

The traditional method is a method of teaching in which lecture, discussion, practice sessions, unit tests, and final test are designed by the instructor in collaboration with the Standard First Aid and Personal Safety textbook and are used to develop skills, knowledges, and personal judgment (1).

Standard First Aid Course

The Standard First Aid Course is a basic first aid course which was developed by the American National Red Cross and is taught to ninth grade students in the Wichita Public Schools.

Iowa Test of Basic Skills (I.T.B.S.)

The Iowa Test of Basic Skills provides for a comprehensive and continuous measurement of growth in the fundamental skills: reading, writing, mathematics, and vocabulary.

Audio-Tutorial (A-T)

Audio-tutorial is a method of teaching using tape recorders and other mechanical audio devices to promote individualized learning.

Lecture-Recitation

Lecture-recitation is a method of teaching in which a teacher verbally instructs students and then seeks responses from those students in the form of questions, answers, and discussion.

LIMITATIONS OF THE STUDY

The investigation was made between February, 1975, and May, 1976. A total of fifty students was randomly selected from ninety-seven female students taking the multi-media method of first aid in 1975. Fifty students were also randomly selected in November, 1975, from a group of one hundred students taught first aid by the traditional method. The random selection was done by drawing fifty test papers from each group following the first test, which was given at the completion of each course. The same fifty female students from each group were retested one hundred and five days later to determine if there was a significant difference in the retention rate. The test given to all students was the National Standardized Multi-media Test (3). This test was required for students taking the multi-media course and was given to the students who took first aid by the traditional method in order to have a common factor with which to compare the two groups. A student receiving 70 percent or above passed the test. The 70 percent standard was determined by the National Chapter of the American Red Cross.

The course content for each method involved follows the Standard First Aid and Personal Safety book by the American National Red Cross. The goal of the American National Red Cross in writing this book was to develop knowledge and skills that could be used by the general public in meeting its needs in situations requiring emergency first aid care, when medical assistance is not immediately available. The objectives of the first aid program are to provide information concerning the prevention of accidents and personal safety in order that the general public live a safer life (2).

Other limitations of the study were that the sample included only female students and was conducted at one school, Mayberry Junior High School in Wichita, Kansas. Teacher Aides and instructors from the Mid-Way Kansas Chapter of the American National Red Cross were used in the multi-media method but were not used in the traditional method. Students were dismissed from morning classes to participate in the multi-media program, thus producing a four-hour time block for two days. Traditional method students took the first aid course in place of physical education activity classes, and met one hour a day, five days a week for three weeks. At the completion of each course, all students were given the National Standardized Multi-media Test.

SUMMARY

Chapter One dealt with the theoretical formulation, explanation of the problem, statement of the problem, state-

ment of the hypothesis and the significance of the study. Definitions of terms and the limitations of the study were also included in this chapter. The reader can expect to find the review of related literature, methods and procedures, the analysis of data, summary, conclusions and recommendations in the following chapters.

Chapter 2

REVIEW OF RELATED LITERATURE

There have been a number of studies conducted that compare the common traditional lecture method of instruction to the newer multi-media method of instruction. Very few studies deal directly with the retention rate of the two methods involved in this study.

Lavine (12) compared the achievement and attitudes of non-science-oriented students in a college chemistry course. The experimental group was taught by closed-circuit television, and the controlled group was taught by lecture and recitation. He found no significant difference in achievement with either method of instruction. The interaction between ability level of his students and methods of instruction produced no significant differences. The closed-circuit method of instruction was more effective for students of higher and lower ability than the lecture and recitation method of teaching.

"An Investigation of the Relative Effectiveness of Two Techniques of Teaching a Transitional Course in Physics on the College Level" (21) was conducted by Weise in 1971. He compared the effectiveness of the multi-media programmed method and the lecture-discussion method of instruction in

promoting achievement in a college physics course. The experimental group was instructed in physics for three hours by using programmed tests and audiovisual materials along with a one-hour weekly review lecture using computer feed back as a management modality. The controlled group received three one-hour lectures each week with no assistance other than a one-hour lecture review with questions from students and home work problems. As a result of this investigation, a higher level of achievement by the experimental group was statistically significant at the .02 level.

A similar study involving two methods of instruction, traditional and lab method films, was conducted by Hughes (10) with nontechnical college physics students. Six experiments were taught using these methods with the experimental group taught by the lab method films and the controlled group taught by the traditional method. Laboratory achievement tests were given to each group. The means of the groups were subjected to Fisher's t-test for the significant difference between the means. Without exception, the experimental group had higher mean scores. Students with previous background in physics favored the lab method films. This was statistically significant in the study.

In a similar type of teaching, audio-tutorial methods of instruction have been studied and compared to lecture-recitation methods of instruction. In a study conducted by Muzio (13), the audio-tutorial method was found to be statistically significant over the lecture-recitation when deal-

ing with students who have experienced academic difficulty. He found the A-T method ideal for individualized learning.

Male and female students enrolling in physical science courses at Pensacola Junior College during the second semester of 1974 were allowed to choose the audio-tutorial group or the conventional lecture-discussion group. One hundred and forty-four students chose the A-T method which was divided into two sections. Seventy-six students chose the lecture-discussion method which was also divided into two sections.

To compare the teaching methods, all students were given achievement tests in physics and astronomy. Brantley (4) found the achievement test scores significantly higher in the lecture-discussion group. The smaller class size of the lecture method was shown to produce greater achievement than the larger class size of the audio-tutorial method. Both methods were equally effective when students were grouped according to age and sex.

In a similar study, Rowsey (16) analyzed two methods of instruction used in an animal biology course, audio-tutorial and lecture-laboratory forms of instruction. Pretest and post-test data were collected from attitude and achievement instruments. His major findings included the following:

1. The experimental group taught by A-T were significantly higher in achievement but did not differ significantly in attitude on course content.

2. Results of the opinion questionnaire showed a favorable reaction by the experimental group to the A-T method of teaching.

3. The controlled group taught by the lecture-laboratory method did not spend as much time in formal study as did the experimental group.

Another study by Ott (15) involving physics showed the A-T and lecture-recitation groups had similar levels of achievement. However, students with lower math ability did better using the A-T method and students with higher math ability did better under the L-R method of instruction.

Quick (19) designed a study to evaluate the effectiveness of a self-developed audio-tutorial system in a biology class on the college level. The controlled group was instructed by lecture-laboratory method and the experimental group was taught by the audio-tutorial method. Students' understanding of science and factual achievement were used to measure the effectiveness of the study. On the Test of Understanding Science (TOUS), the audio-tutorial group achieved higher scores. There were no differences between the groups according to scores from the pretest to posttest for the TOUS. Quick found a positive relationship between reading ability and academic achievement under the two methods of instruction.

Long-term retention was compared in two methods of instruction by Gimmel (7), audio-tutorial and lecture-discussion. He found no significant differences in retention

or learning gain between the groups. As an indirect result of the study, no significant learning loss was observable in subject matter.

In the studies reviewed, attitude and achievement tests for specific subjects were used to measure the significance between the multi-media, audio-tutorial, and lecture-discussion methods of instruction. The majority of the findings indicated the multi-media and/or audio-tutorial method had significant value over the traditional lecture method of instruction. A few studies indicated no significant difference between the two methods of instruction with regard to achievement in subject areas. When retention rate was used to determine the value of each method, the study indicated no significant difference between methods. Retention seems to be influenced more by initial level of learning than by the method used.

In conclusion, studies have shown the multi-media method and/or audio-tutorial method of instruction to be beneficial to most students. The programmed material helps students learn on their own (14). These methods also provide for individual differences (8). It is believed that, regardless of the type of teaching method, people with higher aptitude will experience greater achievement (18).

Chapter 3

METHODS AND PROCEDURES

It was the purpose of this study to determine if there is a significant difference in the retention rate of ninth grade female students taking first aid taught through multi-media techniques and ninth grade female students instructed in the traditional first aid course method. A description of the methods and procedures used to investigate the retention rate of two methods of instruction can be found within Chapter Three. The design of the study and the testing instruments used in this research are also included, as well as the population, sampling procedures, and data collection used in the study.

DESIGN OF THE STUDY

This study was designed to investigate the retention rate between the traditional method and multi-media method of teaching first aid to ninth grade female students. An experimental method of teaching first aid to ninth grade students was conducted for four days, February 10-13, 1975. Mayberry Junior High School received a mini-grant with which to buy the necessary supplies for the multi-media course. Previously all first aid was taught by the traditional lec-

ture method. Male ninth grade students received instruction on February 10-11, and the female ninth grade students received instruction on February 12-13. Students took the Multi-media First Aid Course during the morning and then attended their two regular afternoon classes. Red Cross instructors stated that students taking first aid by this method would retain more information than by taking first aid taught by the traditional lecture method.

The researcher became interested in the retention factor of the multi-media method. Therefore, female students from the multi-media course were retested after one hundred and five days in order to compare the results to the traditional lecture method which was to be taught to ninth grade female students the following year. The traditional lecture method would be used to teach first aid for one hour a day for fifteen days. During this time the students would take first aid during their physical education activity class and would attend their five other regular classes.

INSTRUMENTATION

The National Standardized Multi-media First Aid Test was used in order to obtain data for this comparative study. The questions were designed to assess the students' knowledge and skill of first aid. Students receiving 70 percent or higher on the national test received a passing grade. No letter grades were given. The test was repeated one hundred

and five days later to determine the retention rate of the students involved.

Another instrument used in this study was an achievement test, the Iowa Test of Basic Skills. This test is given to all students in the Wichita Public Schools some time during their ninth grade year. The composite scores of the individuals involved in this study were compared to determine if the groups were homogeneous. This test provides for a comprehensive measurement of growth in the fundamental skills of vocabulary, reading, writing, and mathematics.

POPULATION AND SAMPLING

A total of 100 ninth grade female students from the 197 enrolled in first aid at Mayberry Junior High during the school terms of 1975 and 1976 were selected as subjects for this study. The selection was made on the basis of the number of females enrolled in physical education class in the ninth grade, the grade level in which first aid is taught in the Wichita Public Schools. The age of the students ranged from fourteen to sixteen years. Female students were selected because the multi-media method was taught to them as a group and the researcher was involved with the female group and was not involved with the male group. Another factor concerning this selection was that the traditional lecture classes were limited to female students since they were taken out of physical education activity classes. Co-

education classes in the physical education department were not in existence when the study was undertaken.

The random sampling occurred by the researcher drawing fifty test papers from each of the two methods groups upon completion of each course. In order to produce a random sample and provide an adequate population in which to compare the means of the populations under the study, fifty was the number chosen by the researcher. One hundred and five days later, students whose papers were drawn from the first testing in both methods of instruction were retested using the same test. The time lapse between the first and second testing in the multi-media method was simply the number of days between the first testing and the end of school. Students had to be retested before school was out because they would be entering high school in August. In order to compare the retention rate, it was necessary to use the same number of days between tests in the traditional method of instruction.

PROCEDURE

The multi-media method of instruction was taught by the Director of Safety Services from the Mid-Way Kansas Chapter of the American National Red Cross. Teacher aides from the Mid-Way Kansas Chapter and two physical education instructors from Mayberry (one male and one female) assisted with this method of instruction. The multi-media course was taught to ninety-seven female ninth grade students in a

two-day period. The multi-media course was divided into four units of instruction:

1. Introduction to Course; Wounds; Shock; Artificial Respiration

2. Poisoning; Burns; Ill Effects of Heat and Cold; Bandaging; Head Injury, Internal Injury, Gunshot Wounds

3. Infection, Tetanus, Animal Bites; Immobilization; Heart Attack, Apoplexy, Simple Fainting, Epilepsy

4. Foreign Objects in the Eye, Air Passages, Food Passages; Rescue and Transfer; Review; Final Test

See Appendix A, page 33, for a complete course outline and procedures used in the multi-media method of instruction (3).

The traditional lecture method of teaching first aid was taught by the researcher of this investigation. Teacher aides were not used in this method. Due to the method of instruction, points covered and length of time spent with the various subject material was left up to the instructor. Five classes of female ninth grade students were taught using the traditional method of first aid instruction. Class sizes ranged from twelve to twenty-one students. Films were not used in this method. The traditional course included the following seven units of instruction:

1. Introduction to First Aid; Shock; Respiratory Emergencies; and Artificial Respiration

2. Swallowed Objects and Choking; Wounds; Poisoning

3. Specific Injuries

4. Drugs and Their Abuse; Burns; Frostbite and Cold Exposure; Heat Stroke, Heat Cramps, and Heat Exhaustion; Sudden Illness; Dressings and Bandages

5. Bone and Joint Injuries

6. Emergency Rescue and Short-Distance Transfer

7. Final Examination

See Appendix B, page 37, for a complete course outline and procedures used in the traditional method of instruction (1).

The achievement test, Iowa Test of Basic Skills, was used to determine if the groups involved were homogeneous. A composite score from vocabulary, reading, language skills, work study skills, and mathematics skills was used for each of the one hundred individuals involved in the study. The grade equivalent (G.E.) score was subjected to Fisher's t-test for a comparison of group means. The grade equivalent of a given raw score on any test indicates the grade level at which the typical student makes this score. For example, if a student makes a grade equivalent of 5-7, his raw score on the test is the same as that made by the typical or median pupil in the fifth grade at the end of the seventh month. Grade equivalents below 3-1 and above 8-1 may not be interpreted literally as indicating grade and month. The average yearly growth is ten points by definition. Just as talented students should be expected to gain more than ten points in one year, it is unreasonable to expect students below average in ability to achieve a full year's growth in that time.

See Appendix C, page 43, for composite scores of students involved in this study.

DATA COLLECTION

The instruments for testing found to be appropriate for this investigation were the National Standardized Multi-media First Aid Test and the Iowa Test of Basic Skills. The multi-media test of twenty questions administered by the researcher to the students selected for the study was completed within the twenty minute time limit. This limit is also a national standard. The same general directions and information were given to all students taking the test prior to answering the questions.

The Iowa Test of Basic Skills was administered in the same fashion with the exception of the time limit. Math teachers gave this test to their ninth grade math classes over a period of several days during the month of February. Class periods averaged one hour each day. Composite scores of the grade equivalent were collected for this investigation.

Chapter 4

ANALYSIS OF DATA

This study was designed to investigate the retention of first aid material when taught by two different methods of instruction, the multi-media method and the traditional lecture method. The results of this study have been discussed in this chapter. Fisher's t-test for a comparison of group means was used in the I.T.B.S. composite scores, scores from the first testing, and scores from the second testing. The .05 level of significance was selected for this study to test the null hypothesis.

IOWA TEST OF BASIC SKILLS ANALYSIS

The composite scores of grade equivalent for the individuals involved from the achievement test, I.T.B.S., were used in order to determine if the two groups were homogeneous. The t-test for a comparison of group means was applied to determine the significance of any difference between the groups. A t of .25 was found. Table 1 shows the comparison analysis of the I.T.B.S. scores.

A t-value of .25 is not significant at the .05 level of significance. This analysis verified the basic assumption

that the traditional and multi-media groups were homogeneous. The t-value of .25 between the means was simply due to chance.

Table 1

A Comparison of Iowa Test of Basic Skills Scores

Group	Number	Standard Deviation	Mean Score	t
Traditional	50	173.25	80.8	.25*
Multi-media	50	217.76	81.5	

*A t-value of 1.96 was needed to be significant at the .05 level.

ANALYSIS OF FIRST TESTING

The American National Red Cross Standardized Multi-media First Aid Test was given to both groups at the completion of each course. The results of this test are shown in Table 2.

Table 2

A Comparison of the Multi-media Test at First Testing

Group	Number	Standard Deviation	Mean Score	t
Traditional	50	616.00	64.0	2.24*
Multi-media	50	420.56	74.2	

*A t-value between 1.96 and 12.7 is significant at the .05 level.

A t-value of 2.24 was found to be significant at the .05 level. The t-value at 2.24 indicates the immediate learning of first aid material by the multi-media method was greater than the traditional method of instruction.

ANALYSIS OF SECOND TESTING

The American National Red Cross Standardized Multi-media First Aid Test was administered to the same fifty students one hundred and five days after they had taken the first test. This was done in order to test the null hypothesis: there is no significant difference in the retention rate of first aid materials by ninth grade students taught by the multi-media method and those instructed by the traditional method. Table 3 shows the results of the second testing.

Table 3

A Comparison of the Multi-media Test at Second Testing

Group	Number	Standard Deviation	Mean Score	t
Traditional	50	548.6	51.3	.42*
Multi-media	50	285.4	49.6	

*A t-value of 1.96 was needed to be significant at the .05 level.

A t-value of .42 was found which is not significant at the .05 level of significance. The t-value range at the

.05 level is 1.96 to 12.7. It may therefore be concluded that the null hypothesis was accepted in this study.

ANALYSIS OF RESULTS

Results of data collected involving the composite scores of the I.T.B.S. achievement test indicate the groups were homogeneous. A t-value of .25 was found not to be significant at the .05 level. To be significant at this level, a t-value of 1.96 was needed.

Results of the first testing using the Multi-media Test found a t-value of 2.24 which was significant at the .05 level. The range of t-values for the .05 level are 1.96 to 12.7.

A t-value of .42 was found on the second testing which is not significant at the .05 level. It was therefore concluded that the null hypothesis was accepted for this study.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter is divided into three sections. The first section contains a summary of the study which investigated the retention of first aid material by ninth grade female students which were taught by the multi-media method and traditional lecture method of instruction. Conclusions drawn from the statistical analysis will be found in the second section of this chapter. Recommendations for additional research which might be conducted in relation to this study are found in the last section.

SUMMARY

The purpose of this study was to determine if there was a significant difference in the retention rate of ninth grade female students taking first aid taught through multi-media techniques and ninth grade female students instructed in the traditional first aid course method. The retention of first aid material was investigated to determine which method of instruction produced the greater amount of retention over a period of one hundred and five days. It was hypothesized that there would be no significant difference in the retention of first aid material between the two methods of instruction.

Test papers from fifty ninth grade female students were randomly selected from a group of ninety-seven female students taking the multi-media method of instruction in February, 1975. Test papers from fifty ninth grade female students were also randomly selected from a group of one hundred female students taking the traditional lecture method of instruction in November, 1975. The one hundred students involved were tested over first aid material using the American National Red Cross Standardized Multi-media First Aid Test. The first test was administered following the completion of each course. The second testing, using the same test, was given one hundred and five days later to test the retention of the subject matter. The t-test for a comparison of group means was used to determine any difference found between the two groups of the study. The I.T.B.S. Achievement Test was administered to all subjects. A comparison of the composite scores from this test indicated that the groups were homogeneous.

Results of the data collected indicated the multi-media method of instruction was superior to the traditional method in the initial learning that took place. There was no significant difference in the retention of first aid material between the two methods of instruction used in this study after the second testing. However, the mean scores of the second testing reversed themselves indicating more information was retained by the traditional group, although not significant at the .05 level.

CONCLUSIONS

Within the limitations of the study, the test results indicated that a concentrated course of mass learning in first aid over a two day period of time produced a higher level of initial learning. However, the distributed learning of the traditional lecture method in a three week period of time produced a slightly higher retention rate, although it was not significant at the .05 level.

RECOMMENDATIONS

The following recommendations for additional studies are made with regard to the results of this investigation:

1. A replication of the study could be conducted using all male students, or both male and female students for the sample.

2. A replication of the study could be conducted using other age levels for the sample.

3. Similar investigations involving first aid material could be conducted using the following variations:

   a. A longer period of time to test retention.

   b. A different subject area of the curriculum for teaching first aid.

   c. I.T.B.S. reading scores to obtain homogeneous groupings.

   d. A larger population for the sample.

   e. The same instructor for teaching both methods.

f. Multi-media sessions of two hours for four days with this age group.

g. A combination of both methods.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. The American National Red Cross. Instructor's Manual, Standard First Aid and Personal Safety. Washington, D.C.: The American National Red Cross, 1973, p. 1.

2. The American National Red Cross. Standard First Aid and Personal Safety. Garden City, New York: Doubleday and Company, Inc., 1973, p. 5.

3. The American National Red Cross. Standard First Aid Course, Multi-media System, Instructor's Outline. Washington, D.C.: The American National Red Cross, 1966, 1969, p. G1, T1-T6.

4. Brantley, William Thomas, A Comparison of the Audio-Tutorial Method with the Lecture-Demonstration Method for Producing Student Achievement in College Level Physical Science Survey Classes Covering Physics and Astronomy, U.S., Educational Resources Information Center, ERIC Document ED 107 322, October, 1975.

5. Frazier, Robert I., and Susan Zaslav, "An Automated and Non-Automated System of Teaching", Reading Teacher, V24, N2 (November, 1970).

6. Gambel, Budd L., "Standards for School Media Programs, 1920: A Lesson from History", American Libraries, (May, 1970).

7. Gimmel, Duane R., and Others, Long-term Retention from Audio-Tutorial Teaching, U.S., Educational Resources Information Center, ERIC Document ED 100 846, May 1975.

8. Hempstead, John Orson, Media and the Learner: The Influence of Media-Message Components on Students' Recall and Attitudes toward the Learning Experience, U.S., Educational Resources Information Center, ERIC Document ED 095 827, January 1975.

9. Hodgman, Charles D., Editor. C.R.C. Standard Mathematical Tables. Cleveland, Ohio: Chemical Rubber Publishing Company, 1959, p. 251.

10. Hughes, James, A Comparison of Lab Method Films with Traditional Instruction in the Introductory Physics Laboratory, U.S., Educational Resources Information Center, ERIC Document ED 107 455, October 1975.

11. Hurst, M.E. Eliot, and M. Hoskins, Multimedia on Multimedia: Educational Environments, U.S., Educational Resources Information Center, ERIC Document ED 081 673, April 1973.

12. Lavine, Martin Paul, A Comparative Study of the Achievement and Attitudes of Non-Science Oriented Community College Students Instructed by Closed Circuit Television and Lecture Recitation, U.S., Educational Resources Information Center, ERIC Document ED 096 109, January 1975.

13. Muzio, Joseph N., and Others, Audio-Tutorial Project: An Audio-Tutorial Approach to Human Anatomy and Physiology, U.S., Educational Resources Information Center, ERIC Document ED 097 911, March 1975.

14. Niedzielski, Henri, Rationalizing Individualized Instruction, U.S., Educational Resources Information Center, ERIC Document ED 107 153, October 1975.

15. Ott, Mary Diederich, The Evaluation of Two Methods of College Physics Instruction: Final Report, U.S., Educational Resources Information Center, ERIC Document ED 100 360, May 1975.

16. Rowsey, Robert E., Audio-Tutorial Versus Conventional Lecture-Laboratory Instruction in a University Animal Biology Course, U.S., Educational Resources Information Center, ERIC Document ED 097 022, February 1975.

17. Senter, Donald R., An Experimental Study Designed to Test the Relative Effectiveness of a Multi-Media Instructional System, U.S., Educational Resources Information Center, ERIC Document ED 032 205, February 1969.

18. Simons, Leonard, A Comparison of the Relative Effectiveness of Written Scripts and Audio Tapes in Teaching Biology, U.S., Educational Resources Information Center, ERIC Document ED 100 622, March 1975.

19. Quick, Charles Leonard, An Analysis of Evaluation of an Audio-Tutorial Approach in the Biology Laboratory at the University Community and Technical College, the University of Toledo, U.S., Educational Resources Information Center, ERIC Document ED 107 458, October 1975.

20. Weinberg and Schumaker. Statistics An Intuitive Approach. Belmont, California: Wadsworth Publishing Company, Inc., 1962, pp. 325-327.

21. Weiss, Edward, An Investigation of the Relative Effectiveness of Two Techniques of Teaching a Transitional Course in Physics on the College Level, U.S., Educational Resources Information Center, ERIC Document ED 103 191, July 1975.

APPENDIX A

Multi-Media Method

MULTI-MEDIA METHOD

The multi-media method was taught by the Director of Safety Services of the Mid-Way Kansas Chapter of the American National Red Cross. He read from the multi-media instructor's book throughout the course. Six adult volunteers from the Mid-Way Chapter and two physical education teachers from Mayberry Junior High were used as aides for this course.

Ninety-seven female students met in the boys' gym for instruction. They were seated at two long tables using both sides of the table. Each trainee had workbooks for Unit I and Unit II, two pencils, and a name tag.

Additional materials used for the first day were: one blanket, one 4" gauze pad, one triangular bandage, one 1" wide strip of cloth, one stick, one 2" roller bandage, one 1" roller bandage, and one 1" gauze pad. Trainees worked in pairs during practice sessions. The aides assisted the students during the practice sessions by checking their practical skills and giving help when needed.

TIME SCHEDULE FOR FIRST DAY

Unit I	Time
Film: Introduction to the Course	5 min.
Film: Direct Pressure, Elevation and Pressure Points	17 min.
Practice Session #1 -- First Aid for Wounds	10 min.
Film: Tourniquet	4 min.
Practice Session #2 -- First Aid for Wounds	10 min.
Written Lesson	
Film: Shock	2 min.
Written Lesson	9 min.
Film: Basic Procedures of Mouth to Mouth Artificial Respiration	5 min.
Practice Session #3 -- Artificial Respiration	10 min.
Film: Clearing Obstruction, Deflating the Stomach, Artificial Respiration - Infant	5 min.
Practice Session #4 -- Artificial Respiration	8 min.
Film: Manual Methods of Artificial Respiration	7 min.
Written Lesson	18 min.
Break	15 min.

Unit II	Time
Film: Poisoning; Burns; Ill Effects of Heat and Cold	3 min.
Written Lesson	10 min.
Written Lesson	10 min.
Written Lesson	8 min.
Film: Closed Spiral and Open Spiral Bandages	7 min.
Practice Session #5 -- Bandaging	11 min.
Film: Figure Eight and Recurrent Turn Bandages	5 min.
Practice Session #6 -- Bandaging	18 min.
Film: Cravat Bandage, Triangular Head Bandage, Arm Sling	5 min.
Practice Session #7 -- Bandaging	18 min.
Written Lesson	10 min.

The following materials were used in practice sessions for the second day: one blanket, one newspaper, one triangular bandage, two 4' strips of cloth, two 18" splints, four 2' strips of cloth, padding for splints, two 3' splints, and workbooks for Unit III and Unit IV.

TIME SCHEDULE FOR SECOND DAY

Unit III	Time
Written Lesson	8 min.
Film: Introduction to Splinting and Upper Arm Splint	5 min.
Practice Session #8 -- Immobilization	20 min.
Film: Forearm Splint	3 min.
Practice Session #9 -- Immobilization	20 min.
Film: Collar Bone Fracture, Ankle Splint, Kneecap Splint	5 min.
Practice Session #10 -- Immobilization	15 min.
Film: Splinting an Open Fracture	4 min.
Practice Session #11 -- Immobilization	10 min.
Written Lesson	15 min.
Written Lesson	15 min.
Break	15 min.

Unit IV	Time
Written Lesson	8 min.
Film: Emergency Rescue	3 min.
Practice Session #12 -- Drag by Shoulders and Blanket Drag	10 min.
Film: Two-Man Carry and Carry by Extremities	3 min.
Practice Session #13 -- Transportation Carries	5 min.

Unit IV (continued)	Time
Film: Chair Carry and Improvised Litter	3 min.
Practice Session #14 -- Transportation Carries	4 min.
Film: Three-Man Hammock Carry	2 min.
Practice Session #15 -- Transportation Carry	5 min.
Film: Eight-Man Lift and Litter Carry	4 min.
Practice Session #16 -- Litter Carry	5 min.
Film: Traction Blanket	3 min.
Practice Session #17 -- Traction Blanket Lift	10 min.
Written Lesson	10 min.
Written Lesson, Review for Test	20 min.
Final Multi-Media Test	20 min.

APPENDIX B

Traditional Lecture Method

TRADITIONAL LECTURE METHOD

The traditional lecture method was taught by the researcher of this investigation. Aides were not used in the study. The students met in a class room. Students sat in desk chairs. Five one-hour classes of first aid were taught every day for three weeks. The class size ranged from twelve to twenty-one. Each trainee had the Standard First Aid and Personal Safety book, pencil or pen, and paper which she provided.

The procedure followed each day included: lecture by the instructor, discussion from students, questions and answers, and pop tests. Students were assigned to read Chapter One when the books were checked out during the physical education class.

First Day

Chapter One -- INTRODUCTION TO FIRST AID

- A. Definition
- B. Reasons for First Aid
- C. Value of First Aid Training
- D. General Directions for Giving First Aid

Assignment: Read Chapter Two

Second Day

Chapter Two -- WOUNDS

- A. Definition
- B. Common Causes
- C. Symptoms
- D. First Aid for Open Wounds
- E. First Aid for Severe Bleeding
- F. Prevention of Contamination and Infection
- G. Bites
- H. Closed Wounds
- I. Prevention of Wound-Causing Accidents

Pop Test: Ten questions over Chapter One and Chapter Two

Assignment: Read Chapter Three and Chapter Four

Third Day

Chapter Three -- SPECIFIC INJURIES
- A. Eye Injuries
- B. Head Injuries
- C. Neck Injuries
- D. Wounds of the Chest
- E. Abdominal Injuries
- F. Back Injuries
- G. Injuries to the Genital Organs
- H. Injuries to Legs and Feet
- I. Hand Injuries--First Aid
- J. Blisters--First Aid

Chapter Four -- SHOCK
- A. Definition
- B. Causes
- C. Signs and Symptoms
- D. Treatment Objectives
- E. First Aid

Assignment: Read Chapter Five

Fourth Day

Chapter Five -- RESPIRATORY EMERGENCIES AND ARTIFICIAL RESPIRATION
- A. Definitions
- B. Causes of Respiratory Failure
- C. The Breathing Process
- D. Artificial Respiration
- E. Cardiopulmonary Resuscitation
- F. Prevention of Respiratory Accidents
- G. Swimming Safety Tips
- H. Boating Safety Tips

Assignment: Read Chapter Six

Fifth Day

Chapter Six -- SWALLOWED OBJECTS AND CHOKING
- A. Causes
- B. Signs and Symptoms
- C. First Aid
- D. Prevention

Pop Test: Ten questions over Chapter Five and Chapter Six

Assignment: Read Chapter Seven

Sixth Day

Chapter Seven -- POISONING

A. Definition
B. Causes
C. Signs and Symptoms
D. Objectives in Treatment of Poisoning by Mouth
E. First Aid
F. Contact Poisons
G. Prevention
H. Poisoning by Marine Life
I. Poisoning by Insects
J. Poisoning by Venomous Snakes
K. Prevention of Accidental Poisoning

Assignment: Read Chapter Eight

Seventh Day

Chapter Eight -- DRUGS AND THEIR ABUSE

A. Definitions
B. Identification of Drug Abuse
C. Classification of Drugs

Assignment: Read Chapter Nine

Eighth Day

Chapter Nine -- BURNS

A. Definition
B. Causes and Effects
C. Classification
D. Extent and Location
E. First Aid
F. Prevention of Heat Emergencies

Assignment: Read Chapter Ten and Chapter Eleven

Ninth Day

Chapter Ten -- FROSTBITE AND COLD EXPOSURE

A. Frostbite
B. Cold Exposure
C. Prevention of Injuries from Extreme Cold

Chapter Eleven -- HEAT STROKE, HEAT CRAMPS, AND HEAT EXHAUSTION

A. Definitions
B. Causes
C. Heat Stroke

Chapter Eleven (continued)

D. Heat Cramps
E. Heat Exhaustion

Pop Test: Ten questions over Chapter Ten and Chapter Eleven

Assignment: Read Chapter Twelve

Tenth Day

Chapter Twelve -- SUDDEN ILLNESS
A. Heart Attack
B. Stroke
C. Fainting
D. Convulsion
E. Epilepsy
F. Prevention of Heart Attack and Apoplexy

Assignment: Read Chapter Thirteen

Eleventh Day

Chapter Thirteen -- DRESSINGS AND BANDAGES
A. Dressings
B. Bandages
C. Combination Dressings and Bandages
D. Special Pads
E. Application of Bandages
F. First Aid Kits and Supplies

Procedure: Students worked in pairs on the following bandages: arm sling, cravat bandage for forehead and cheek or ear, anchoring a bandage, tying of a bandage, figure-of-eight bandage for hand and wrist, and fingertip bandage. Students were allowed to use their books. Dressings and bandages were supplied by the school. Students were checked off on each bandage.

Assignment: Read Chapter Fourteen

Twelfth Day

Chapter Fourteen -- BONE AND JOINT INJURIES
A. Definitions
B. Fractures
C. Specific Fractures
D. Dislocation
E. Sprains
F. Strains
G. Prevention of Accidents Resulting in Skeletal and Muscular Injuries

Twelfth Day (continued)

Assignment: Read Chapter Fifteen

Thirteenth Day

Chapter Fifteen -- EMERGENCY RESCUE AND SHORT-DISTANCE TRANSFER

A. Definition of Emergency Rescue
B. Indications for Immediate Rescue
C. Procedure
D. Methods of Transfer

Procedure: Students did the following short-distance transfers: chair carry, two-handed and four-handed seats, blanket carry, three-man hammock carry, and three-man lift.

Assignment: Review entire book

Fourteenth Day

Review: Chapters One through Fifteen

Fifteenth Day

Final Test: Multi-media test of twenty questions. Time limit was twenty minutes. Checked in books at the completion of the test.

APPENDIX C

Iowa Test of Basic Skills

Individual Composite Scores

Iowa Test of Basic Skills
Individual Composite Scores
Multi-Media Method

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

*Composite scores for individuals 1-50 do not match with individuals 1-50 on the multi-media first and second testing scores.

**The grade equivalent of a given raw score on any test indicates the grade level at which the typical student makes this score. For example, if a student makes a grade equivalent of 5-7, this indicates her raw score on the test is the same as that made by the typical or median pupil in the fifth grade at the end of the seventh month. The mean score for the multi-media group was 81.5 or 8-2.

Iowa Test of Basic Skills
Individual Composite Scores
Traditional Method

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

*Composite scores for individuals 1-50 do not match with individuals 1-50 on the traditional first and second testing scores.

**The grade equivalent of a given raw score on any test indicates the grade level at which the typical student makes this score. For example, if a student makes a grade equivalent of 5-7, this indicates her raw score on the test is the same as that made by the typical or median pupil in the fifth grade at the end of the seventh month. The mean score for the traditional group was 80.8 or 8-1.

APPENDIX D

Individual Test Scores

First and Second Testing

Individual Test Scores
First and Second Testing
Multi-Media Method

Student Number	1st Test	2nd Test	Student Number	1st Test	2nd Test
1*	99	69	26	87	39
2	98	63	27	91	36
3	90	68	28	61	38
4	74	61	29	63	34
5	94	67	30	63	36
6	89	65	31	92	56
7	92	64	32	54	31
8	98	63	33	78	38
9	65	54	34	43	36
10	93	66	35	53	30
11	93	59	36	68	38
12	99	52	37	54	30
13	92	41	38	97	31
14	90	44	39	39	20
15	74	56	40	100	87
16	35	42	41	29	15
17	92	50	42	87	76
18	30	42	43	85	74
19	84	46	44	82	74
20	90	52	45	81	70
21	89	46	46	66	67
22	74	44	47	58	65
23	92	46	48	52	60
24	56	10	49	50	49
25	29	48	50	49	30

The mean score for the first testing was 74.2. The second testing mean score was 49.6. In order to pass, a student had to have 70 or above. A total of 30 students passed the first test, while only 5 students passed the second time.

*Composite scores for individuals 1-50 do not match with individuals 1-50 on the Iowa Test of Basic Skills scores.

Individual Test Scores
First and Second Testing
Traditional Method

Student Number	1st Test	2nd Test	Student Number	1st Test	2nd Test
1*	69	38	26	5	5
2	39	39	27	15	8
3	53	53	28	59	61
4	21	31	29	61	56
5	5	5	30	85	82
6	39	33	31	52	54
7	78	63	32	55	52
8	73	70	33	72	60
9	61	48	34	40	37
10	99	78	35	65	72
11	80	66	36	58	37
12	81	68	37	74	59
13	57	45	38	86	70
14	89	82	39	83	73
15	50	20	40	76	56
16	15	8	41	84	73
17	79	41	42	75	58
18	66	62	43	37	15
19	95	74	44	49	28
20	99	77	45	90	62
21	98	94	46	90	82
22	85	51	47	22	13
23	91	77	48	92	49
24	63	63	49	65	45
25	73	63	50	66	10

The mean score for the first testing was 64.0. The second testing mean score was 51.3. In order to pass, a student had to have 70 or above. A total of 24 students passed the first test, and 13 students passed it the second time.

*Composite scores for individuals 1-50 do not match with individuals 1-50 on the Iowa Test of Basic Skills scores.