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A Comparison of Conventional and Video Teaching Methods Among Beginning Swimmers at Utah State University

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A COMPARISON OF CONVENTIONAL AND VIDEO TEACHING METHODS AMONG BEGINNING SWIMMERS AT UTAH STATE UNIVERSITY

by

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A Comparison of Conventional and Video Teaching Methods Among Beginning Swimmers at Utah State University

by

Herald J. Jardine, Master of Science

Utah State University, 1973

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The purpose of this study was to determine the value, if any, of utilizing the instant playback feature of television videotape replay in teaching the front crawl and elementary backstroke to beginning swimmers at Utah State University.

A review of literature revealed controversy as to the usefulness of the VTR media in teaching selected motor skills.

Subjects consisted of 30 male freshmen and sophomore college students placed into two groups: experimental and control, on the basis of their individual scores on pre-instruction skill testing. The subjects participated in 12 instructional periods of 40-50 minutes. The control group received instruction by a conventional method involving verbal explanation, demonstration, practice, instructor analysis and correction.

The experimental group received the same type of instruction except that they were supplemented by the use of television videotape replay. Both test groups were taught by the same instructor.

A panel of five judges evaluated videotaped performances of a pre and post skill test of each subject performing the two selected strokes. The judges rated four areas; proper arm movement, proper leg movement, arm-leg coordination and smoothness of style from 1-10. The high score and low score for each subject was dropped and the raw score was determined by averaging the three middle scores of the five judges. An analysis of variance program was applied to the data with the pre test scores subtracted from the post test scores to determine performance differences. Sixty different observations were made on the 30 subjects. Summated analysis of variance was subjected to an F test for significance. The preset level of acceptance was .05.

The $\overline{X}$ change for both groups was 6.24 with the experimental group having a higher mean than the control group; 6.66 as compared with 5.83. The $\overline{X}$ reflects a positive learning curve for both groups. F tests for statistical significance indicated no difference between the means of the two test groups at any level of significance.

It was concluded that the conventional method of instruction involving verbal explanation, demonstration, and correction is not benefited by the use of videotape replay in teaching the front crawl and elementary backstroke to beginning swimmers.

(51 pages)

CHAPTER I

INTRODUCTION

There are many innovations now utilized within the teaching profession. One of the newest and most popular of these innovations is the use of television videotape replay in teaching subject matter.

In the curriculum of physical education, the utilization of videotape replay could be of value as an aid in teaching motor skills as indicated by Caine:[1]

> "... it becomes apparent that the profession of physical education has an important new learning method to help it deal with many of the problems that are inherent within the daily process of learning gross motor movement..."

Proponents of television videotape replay as a teaching media seem to agree that the biggest advantage offered by its use is that it provides immediate reinforcement. "A student can view his performance immediately after he has completed and can learn from his own mistakes or successes."[2] In learning motor skills, reinforcement is very

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[1] John Ernest Caine, Ed. D., "The Effect of Instant Analysis and Reinforcement of Motor Performance Through the Use of Cinematography Techniques Related to Television," Original not seen., Dissertation Abstracts, XXXII, (Sept., 1971), p. 1322-A.

[2] Kenneth A. Penman, Douglas Bartz and Rex Davis, Relative Effectiveness of an Instant Replay Videotape Recorder in Teaching Trampoline," Research Quarterly, XXXIX, (Dec. 1968), p. 1062-63.

important, Television videotape replay offers immediate reinforcement which is needed in motor skill activity.

Statement of the Problem

The purpose of this study was to determine the value, if any, of utilizing the instant playback feature of television videotape replay as a supplement in teaching two swimming strokes to selected male college students as compared to a conventional method of instruction.

Justification of Study

Since the first working production model of a videotape recorder was demonstrated by Ampex Company in 1958, there has been some controversy concerning its application within the physical education curriculum.

The purpose of this study was to determine if conventional methods of teaching swimming were more effective if supplemented by the use of television videotape replay. Completed Research in Health, Physical Education and Recreation from 1959 through 1966 showed no completed work related to this study.[3] It is hoped that the results of this study might show the value, if any, of the utilization of television videotape replay in teaching swimming.

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[3] A. W. Hubbard and R. A. Weiss (eds.), Completed Research in Health, Physical Education and Recreation, (Washington D. C., American Association for Health, Physical Education and Recreation, Vols. 1-5, 1959-66.)

Basic Assumptions

Subjects pre-instruction skill testing gave a true indication of the ability of the subject in the two different swimming strokes and gave evidence that the subject had only limited swimming experience. It was further assumed that environment conditions would not affect the performance of the subject either during practice sessions or test sessions and that each subject would do his best to achieve competency in the two swimming strokes and would perform to the utmost of his ability during test sessions.

Delimitations

The study was delimited in scope to include 30 freshmen and sophomore male college students chosen from a group at hand and placed in one of two groups, either control or experimental. Subjects were pre-tested in two swimming strokes prior to any instructions and were then given six weeks of instruction by the same instructor at the same pool using basically the same methods except that the experimental group's instruction was supplemented by television videotape replay. At the end of the instruction period, a post instruction skill test was administered and a comparison of the two scores of the skill tests gives the statistical data necessary for a comparison of the improvement shown by the subjects within the two groups.

Limitations

The following limitations were found:

1. The speed at which individuals acquire motor skills and their own psychological characteristics are uncontrolled variables.

2. The method in which subjects were selected to participate in this study might also be a limiting factor in that they were selected from a group at hand, and do not represent any particular population.

Definition of Terms

VTR: Abbreviation for Videotape Replay.

Beginning Swimmer: For the purposes of this study, a beginning swimmer is a subject who scored an average 0-15 out of 40 possible points on a pre-instruction skill test of two selected swimming strokes.

Conventional Method or Style of Instruction: Instruction which involves verbal explanation, demonstration and instructor analysis; without utilization of VTR.

Control Group: The group of subjects which were taught the two swimming strokes by the conventional style of teaching.

Experimental Group: The group of subjects which received instruction in the two swimming strokes in a conventional manner except that their instruction was supplemented by the use of television videotape replay.

CHAPTER II

REVIEW OF LITERATURE

A review of literature revealed that prior to 1969, very little had been done regarding the utilization of videotape replay in the physical education curriculum. Since that time, however, much has been done with videotape as either a teaching media or reinforcement factor in physical education instruction.

The majority of research utilizing videotape has pertained to bowling, golf, and various areas of gymnastics including trampoline. Various other studies have ranged from elementary physical education to swimming, with which this study dealt.

This review will show how television videotape has been utilized in physical education and the results of that usage in teaching gross motor skills.

Polvino studied the effectiveness of two methods of videotape analysis in acquiring bowling skills. Her study involved two groups of experimental subjects utilizing VTR and one control group taught by a conventional method; her findings revealed no significance between groups for the duration of instruction.[4] These findings were supported

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[4]Geraldine Joyce Polvino, Ph.D., "The Relative Effectiveness of Two Methods of Videotape Analysis in Learning a Selected Sport Skill," Original not seen. Dissertation Abstracts, XXXII, (Sept., 1971), p. 1322-A.

by Caine, who also performed research in the area of bowling. His study which involved instant analysis and reinforcement for beginning bowlers, revealed no statistical difference between a control group and an experimental group, who utilized VTR during instruction.[5] Ochs' study in bowling revealed similar findings as those of Polvino and Caine. His study involved three treatment groups of beginning bowlers: visual instruction, auditory instruction, and combination instruction. Results of the study showed significant gain by all three groups but no comparitive significance of one group over another.[6] Kraft's findings were not in agreement with the findings of Polvino, Caine and Ochs. Kraft shows statistical significant differences between bowlers taught using videotape and teacher feedback when compared to either a teacher feedback group or a videotape self-analysis group. These differences were significant at both the .05 and .01 level.[7]

In the area of gymnastics, Plese found results similar to those of Kraft. Plese utilized videotape replay with a traditional approach in teaching gymnastics skills. His findings showed the video method significantly superior to the conventional method in presentation of

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[5] Caine, loc. cit.

[6] Keith M. Ochs, Ed. D., "The Effect of Videotape Replay as an Instructional Aid in Beginning Bowling Classes." Original not seen. Dissertation Abstracts, XXXI, (Apr., 1971), p. 5183-A.

[7] Robert Eugene Kraft, Ed. D., "The Effects of Teacher Feedback Upon Motor Skill when Utilizing Videotape Recording," Original not seen. Dissertation Abstracts, XXX, (March 1973), p. 4917-A.

gymnastic skills. At the end of seven weeks of instruction 47 percent of the experimental group was able to complete a basic gymnastics routine and only 29 percent of the control group could achieve similar marks. Additionally, the experimental group appeared to acquire the more advanced skills quicker than the control group. Plese's findings were significant at the .01 level.[8] Anderson's study involved four different combinations of two selected teaching aids; VTR and loop films, in rebound tumbling skills. His findings revealed no significant differences of any of the four combinations. No one method proved superior to any of the other three.[9] These findings were supported by Wood who conducted a similar study comparing acquisition of gymnastics skills using the same two media. Although both programs indicated improvement on four compulsory routines, there were no significant differences between the two programs on three of the four routines.[10]

Penman, Bartz, and Davis studied the effectiveness of instant replay in teaching techniques on the trampoline. Their research design

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[8] Elliott Ray Plese, Ph. D., "A Comparison of Videotape Replay with a Traditional Approach in the Teaching of Selected Gymnastic Skills," Original not seen. Dissertation Abstracts, XXVIII, (1967), p. 3493-A.

[9] John Speer Anderson, Ed. D., "Effects of Two Selected Visual Instructional Aids on the Acquisition of Rebound Tumbling Skills," Original not seen., Dissertation Abstracts, XXXI, (March, 1971), p. 5172-A.

[10] Frederick Wood, Ed. D., "A Study of the Effect of Videotape Instant Replay on Learning Gymnastic Skills," Original not seen. Dissertation Abstracts., XXXI, (July, 1970), p. 207-A.

involving two groups; experimental and control, taught the same curriculum except that the experimental group utilized VTR. Final testing showed no statistical significance between groups at the .10 level which was the preset level of acceptance.[11] Buck also utilized VTR in a study of principles to facilitate learning a trampoline skill. Buck used VTR as a rating method to assess the gymnastics skill taught. His findings showed videotape replay to be an effective method of evaluation of a particular trampoline skill.[12]

Matthews studied the effectiveness of VTR as an adjunct in teaching the golf swing compared to a conventional method of instruction. His findings revealed no significant difference at the .05 level. He did find, however, that weekly testing showed noticeable gains by the total experimental group when compared to the total control group at various stages of instruction.[13] These findings were supported by Smith, who also researched in the area of golf. His findings revealed no statistical difference between four test groups; traditional group, teacher-student analyzed VTR gruop, student analyzed VTR group, and a loop film

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[11] Penman, Bartz, and Davis, loc. cit.

[12] Richard Rollo Buck, Ph. D., "Knowledge of Mechanical Principles to Facilitate Learning a Trampoline Skill Using Television as an Evaluation Aid," Original not seen, Dissertation Abstracts, XXXIII, (Nov., 1972), p. 2145-A.

[13] Edsel Lee Matthews, Ed. D., "The Effectiveness of Videotape Replay as an Adjunct in Teaching the Golf Swing." Unpublished dissertation, University of Utah, 1971.

group who also viewed videotapes of their performances. Students did indicate, however, that they had a better understanding of the pitch and run shot after having viewed their performance on videotape.[14]

In another area of physical education, McLaren studied the effectiveness of videotape replay as a supplement to traditional teaching methods in improving performances in the high jump. His only criteria for measurement was height jumped and form was not considered. McLaren's findings show significant mean gains in the television and traditional teaching group at the .05 level, with no significant change in the control and practice only groups.[15] These findings were not in agreement with those of Armstrong who studied the effect of videotape feedback in learning gross motor skills in tennis. Armstrong found that the use of VTR did not significantly affect the learning of the tennis skills taught in his study. He also found that the rate of learning was not significantly affected by the use of VTR nor was the motivation of the subjects greater in the group utilizing VTR.[16] These findings were

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[14]Barbara Bramlette Smith, Ed. D., "The Effectiveness of Television Videotape Instant Playback in Learning the Pitch and Run Shot in Golf," Original not seen. Dissertation Abstracts, XXXI, (Sept., 1970), p. 1059-A.

[15]John David McLaren, Ed. D., "The Effectiveness of Videotape Replay in Teaching the High Jump," Unpublished Dissertation, Brigham Young University, 1971.

[16]Wayne Jackson Armstrong, Jr., Ed. D., "The Effects of Videotape Instant Visual Feedback on Learning Specific Gross Motor Skills in Tennis," Original not seen., Dissertation Abstracts, XXXII, (April, 1972), p. 5587-A.

not in agreement with those of Paulet who studied the use of both videotape and loop film in teaching the tennis forehand drive to selected college students. Paulet found the video method superior and highly significant at the .001 level.[17]

In the utilization of videotape instruction in elementary physical education Eason found that there was not a significant difference in the method of instruction used in teaching the running jump and reach with a single foot takeoff to fifth and sixth grade male subjects.[18] These findings differ from those of Wrenn who tested second, fourth and sixth graders on the Motor-Performance, Multi-Recording Instrument. Wrenn utilized videotape as a teaching supplement in an experimental group and compared the performance of the experimental group with the performance of a control group. His findings showed the videotape feedback group superior to the control group in performance at each grade level.

In the area of swimming, which this study concerned, very little has been recorded regarding the utilization of television videotape replay as part of instructional methodology. Taylor studied the

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[17] James Gustave Paulat, Ed. D., "The Effects of Augmented Information Feedback and Loop Film Models Upon Learning of a Complex Motor Skill," Original not seen., Dissertation Abstracts, XXX, (Jan. 1970), p. 3307-A.

[18] Bobby Lee Eason, Ed. D., "The Effect of Videotape Instruction on Learning a Gross Motor Skill," Original not seen. Dissertation Abstracts., XXX, (April, 1973), p. 5533-A.

effectiveness of VTR in teaching the whip-kick to 48 male subjects. His findings showed an experimental group taught with the use of VTR and verbal feedback to be significantly superior to a group taught with VTR and no verbal feedback, a verbal feedback group, and a control group taught with no feedback. His findings were significant at the .05 level, and in addition he showed that low and middle skill level subjects taught with VTR seem to benefit more than the more advanced skill level subjects in the experimental group.[19] The findings of Taylor are supported by Green who studied the effectiveness of VTR as a technique in teaching swimming skills to beginning swimmers. Three classes of beginning swimmers were assigned to either a control or experimental group within their class. After 16 weeks of instruction, Green found significant difference at the .05 level between the two teaching methods in favor of TV replay.[20]

In summation of literature, much has been done in the past four years regarding the use of television videotape replay in physical education instruction methods. Findings reveal that its use is sometimes effective and at other times it is of no value. Based upon the literature

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[19] Wayne Gilbert Taylor, Ed.D., "The Effectiveness of Instant Videotape Replay as a Source of Immediate Visual Feedback Upon Learning or Improving Performance of a Gross Motor Skill," Original not seen., Dissertation Abstracts, XXXII, (February, 1972), p. 4407-A.

[20] William Bartell Green, Ed.D., "The Effectiveness of Television Replay as a Technique in Teaching Beginning Swimming Skills," Unpublished Dissertation, Brigham Young University, 1970.

reviewed, if the individual teacher has the necessary video equipment and if the use of that equipment fits his methodology, then he might benefit from its use. If using the VTR equipment presented too many problems or did not fit into methods employed by the individual teacher, then he probably should not use this media, especially if his only reason for using it were the successes revealed by studies of its use.

In either case, the success or failure of teaching motor skills lies with the individual teacher and he should be confident enough to select the best approach for him.

CHAPTER III

METHOD OF PROCEDURE

The Subjects

Subjects consisted of 30 male freshmen and sophomore college students placed into 2 groups; experimental and control, on the basis of their individual scores on a pre-instruction skill test. The subjects' ages ranged between 18-20 years. Physical characteristics of each student, such as height and weight, were not considered, as the pre-instruction skill test served to eliminate from the study any student who possessed a skill greater than that of a beginning swimmer or any student who could not function as a beginning swimmer.

Students who participated in either the experimental or control group were screened from among 40-50 potentials, down to the final 30 who qualified. The final 30 students signed a form,[21] agreeing that they:

(1) would attend all sessions at the prescribed time and place,

(2) would do no swimming other than that which was outlined within the scope of the study,

(3) understood that they would receive no grade or college credit for participation in the experiment, and

(4) understood that they were to receive no compensation for participation in the study.

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[21] See Appendix

The final 30 students were then placed in either the experimental or control group on the basis of their over-all performance in four areas of the front crawl stroke and the elementary backstroke. The pre-test scores were paired and one score of each pairing was placed on one of the two test groups, thereby giving a certain amount of equality in the two test groups as far as pre-test scores were concerned.

Pre-Test

Pre-instruction testing consisted of a skill test to measure ability in two common swimming strokes; the front crawl and the elementary backstroke.

All students were shown how to do the stroke by the instructor who later taught both the experimental and control groups. All participants were then given ten minutes to practice the two strokes. At the conclusion of the practice time they left the pool. Each student then performed the front crawl stroke the length of the pool and his performance was recorded on television videotape for future analysis. After all had performed the front crawl stroke they performed the elementary backstroke; again their performance was recorded on videotape for later analysis. Subjects were given only one trial in each of the two strokes.

The videotaped performances of all the students were later shown to a panel of five judges who possessed the Red Cross Water

Safety instructor's rating. The performances were played back at the university television station on a 21-inch monitor. The judges rated each participant's performance in the two swimming strokes from 1-10 in the following four areas:[22]

(1) Proper leg movement,
(2) Proper arm movement,
(3) Coordination of arm-leg movement, and
(4) Smoothness of style.

These four areas were to test each student's competency in each stroke. His possible total score on each stroke could range between 0-40. The highest and lowest scores for each student were dropped and his total score was the average of the three middle scores established by the judges. The rating blank used by the judges was devised from the blank used by the American Red Cross for testing water Safety Instructors. (See Appendix)

For the purposes of this study it was determined that a beginning swimmer would be a subject who had an average tested competency in each of the two strokes of not more than 15 of a possible 40 points. Anyone who had an average of above 15 was eliminated from the study at this time. The final placement of subjects into either experimental or control groups was done according to their scores on the pre-test. Every effort was made to balance the two groups.

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[22]See Appendix

General Conditions of Instruction

After all 30 subjects were placed into one of the two groups, experimental or control, they were given instruction by the same instructor for the same length of time at each instruction session.

Subjects within the control group received instruction by a conventional method which involved verbal explanation, demonstration, practice, instructor analysis and coorection. Subjects within the experimental group received the same type of instruction except that they were supplemented with the use of television videotape replay.[23] The two groups met a total of 12 times in an instructional situation with the control group meeting one hour prior to the experimental group. The length of each class session was between 40-50 minutes.

Instructional Conditions-Control Group

The method of instruction within the control group by the instructor was the same basic method employed by him in many previous beginning swimming classes, except the emphasis was placed on the skills associated with two strokes; the front crawl and the elementary backstroke. The conventional style of instruction was employed

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[23] Donald Joseph Huff, "A Comparison Between Videotape and Conventional Methods of Instruction in Bowling." Unpublished Ph. D. Dissertation. College of H. P. E. R., University of Utah, (August 1969).

within the control group; this involved presentation of the skill by the instructor with an explanation and demonstration, trial of skill by the subject, evaluation and correction by the instructor, and further practice time by the subject. The control group met a total of 12 times, one hour prior to the experimental group and was exposed to the same environmental conditions as the experimental group, except for a difference in time of meeting.

Instructional Conditions- Experimental Group

The method of instruction within the experimental group was the same as in the control group, except that the conventional style of instruction was supplemented with the use of television videotape replay during the practice time of the students.

After the instructor had presented a skill to the students, he had each one practice the skill as he had done with the control group. During the subsequent performance of the skill, the technician recorded the subject's performance on videotape. The tape was then played back to the student on a 19-inch monitor located near the edge of the pool.[24] During the playback the instructor analyzed the performance, pointed out errors and made recommendations for improvement of the skill. The subject then returned to the water and practiced the skill. The experimental group was given all skills in the same progression as the

[24] See Appendix for location of television equipment.

control group. The only difference in instruction was the use of television for analysis by the instructor during practice time.

Equipment

The equipment consisted of an Ampex VR-7000, 1-inch videotape recorder and a television camera equipped with a telephoto lense for closeups of subject's performance. The videotape recorder and television camera were located in a balcony 10 feet above and at one end of the pool. This was the location for pre and post instruction tests, and for instructional use with the experimental group. During the experimental group session, there was also a 19-inch monitor located near the edge of the pool.

Post-Skill Test

At the completion of instruction all participants of both groups were brought together for the post skill test. Once again each student's performance in the front crawl stroke and the elementary backstroke was taped for later playback to the panel of five judges. The participants of the two groups were mixed so that the judges would not know to which group they belonged. The method of evaluation was exactly the same as in the pre-test, including the form used for evaluation. A comparison of pre and post skill test scores provided the data necessary for a comparison of the two groups; therefore providing evidence as to the

usefulness of television videotape replay as a teaching media. The data derived from a comparison of pre and post skill tests was handled with a 2-way analysis of variance with an F test for significance. The preset level of acceptance was .05.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to determine the effectiveness of videotape replay, as a supplement to conventional methods in teaching two selected swimming strokes to beginning swimmers. Results were derived from a comparison of pre and post test scores between a control group and an experimental group of data necessary for a statistical evaluation. There were 15 people in each test group. Groups were balanced before the study began based upon pre test scores.

A panel of five judges evaluated videotaped performance of the pre and post test. The high score and low score for each subject was dropped and the raw score was determined by averaging the three middle scores of the five judges. The judges were not informed as to which group the subjects belonged. Scores were then submitted to the Utah State University Statistics department for processing on the IBM 360 Computer. An analysis of variance program was applied to the data with the pre test scores having been subtracted from the post test scores in order to determine performance differences. Sixty different observations were made on the 30 subjects. Summated analysis of variance scores was subjected to an F test for significant difference between means. The preset level of acceptance was .05.

Mean scores were obtained for group 1 and group 2 and an overall mean score was obtained. In addition, each subject had a mean score which showed his individual improvement.

Table 1 shows the pre-test scores of the experimental group in test 1; front crawl stroke, and test 2; elementary backstroke, and the average of the scores of the two tests. The two test average shows a range of 11.17 with a $\overline{X}$ of 6.48. Table II shows the same pre test scores for the control group. The range is 9.25 and the $\overline{X}$ 6.52. A comparison of $\overline{X}$ shows how close these two groups were in balance at the beginning of instruction.

Table III is a summation of post instruction skill testing for the experimental group in the front crawl stroke (test 1) and the elementary backstroke (test 2) with an average of the two tests. The range of the two test average is 16.83 with a $\overline{X}$ of 13.11. Table IV gives the same summation of post test scores for the control group. The range for this group is 12.33 with a $\overline{X}$ of 12.32.

The procedure for rating the performance of each subject was based upon a scale of 0-10 with 10 the highest score and 0 the lowest. Four areas were rated; 1. leg movement, 2, arm movement, 3. arm and leg coordination, and 4. smoothness of style. (See Appendix) Ten points were possible for each of these areas on both pre and post test, (collectively, a possible of 40 on each of the two strokes).

The $\overline{X}$ change for both groups was 6.24, with the experimental group having a higher mean than the control group; 6.66 as compared

Table 1. Experimental group pre-test scores

Subject	Test 1	Test 2	Average
1	1.67	0.00	0.83
2	5.00	2.33	3.67
3	4.33	3.67	4.00
4	6.67	2.00	4.33
5	9.33	0.00	4.67
6	9.00	6.33	7.67
7	9.33	1.33	5.33
8	10.33	2.00	6.17
9	8.33	4.33	6.33
10	8.33	7.00	7.67
11	7.33	8.33	7.83
12	15.00	1.33	8.17
13	8.33	9.00	8.67
14	11.33	9.00	10.17
15	8.67	13.67	11.17

Test 1 was the front crawl stroke and Test 2 was the elementary backstroke.

Table 2. Control group pre-test scores

Subject	Test 1	Test 2	Average
1	6.00	0.00	3.00
2	8.00	0.00	4.00
3	4.67	3.67	4.17
4	8.33	0.00	4.17
5	5.67	4.00	4.83
6	7.67	2.00	4.83
7	8.00	3.67	5.83
8	11.00	1.00	6.00
9	12.00	1.00	6.50
10	7.33	5.67	6.50
11	9.00	5.33	7.67
12	13.00	4.00	8.50
13	8.33	10.33	9.33
14	11.00	9.67	10.33
15	11.50	13.00	12.25

Test 1 was the front crawl stroke and Test 2 was the elementary backstroke.

Table 3. Experimental group post test scores

Subject	Test 1	Test 2	Average
1	9.00	1.33	5.17
2	10.00	14.00	12.00
3	7.67	8.00	7.83
4	12.33	9.33	10.83
5	14.00	5.00	9.50
6	11.33	9.67	10.50
7	8.00	9.00	8.50
8	17.50	8.00	12.75
9	16.00	12.00	14.00
10	20.00	13.33	16.67
11	15.33	15.00	15.17
12	14.67	14.33	14.50
13	22.33	21.67	22.00
14	15.33	20.33	17.83
15	16.33	22.33	19.33

Test 1 was the front crawl stroke and Test 2 was the elementary backstroke.

Table 4. Control group post test scores

Subject	Test 1	Test 2	Average
1	7.33	7.33	7.33
2	17.33	18.67	18.00
3	14.33	12.67	13.50
4	7.67	6.67	7.17
5	13.00	7.00	10.00
6	10.00	9.00	9.50
7	11.33	8.00	9.67
8	11.33	9.67	10.50
9	12.67	10.33	11.50
10	7.00	9.00	8.00
11	11.33	14.00	12.67
12	27.00	12.00	19.50
13	18.00	15.67	16.83
14	11.67	15.67	13.67
15	17.67	16.33	17.00

Test 1 was the front crawl stroke and Test 2 was the elementary backstroke.

with 5.83. (See Table V) The $\overline{X}$ reflects a positive learning curve for both groups. F tests for statistical significance indicated there was no significant differences between the means of the two groups at any level.

Both of the test groups contained individual mean scores which were well above and below the mean for that particular test group. In group 1 (experimental group) the mean score of subject 13 was 13.335 which was well above the $\overline{X}$ of the group as a whole. This particular subject had a high degree of ability in many motor areas and it is possible he could progress in swimming skills faster than others in his test group. Subjects 3, 6, and 7 all had $\overline{X}$ scores much lower than the group $\overline{X}$. These $\overline{X}$ scores might be explained by the subjects' individual abilities to acquire motor skills. They were simply not able to acquire the necessary skills as fast nor to the extent as did the other members in the test group. This was a recognized limitation to the study.

In group 2, (control group) subjects 2 and 12 both had scores much higher than the 5.83 $\overline{X}$ of the group. Subject two seemed to acquire a greater understanding of the skills as they were being presented. In addition, he possessed all-around motor educability superior to other members of his group. Subject 12 did not seem to possess the same all-around ability as subject two but he did possess some of the skills necessary to become a competent swimmer. Subjects 10 and 4 both had $\overline{X}$ scores far below the $\overline{X}$ for the group.

Subject 10 had a $\overline{X}$ score of 1.50 which was the lowest of either test group. This individual possessed a body build which was not typical of the build of most good swimmers. He was very muscular with little adipose tissue. He seemed to lack flexibility in the shoulder area; and in addition, he seemed uncomfortable in the water. Subject four possessed a great deal of adipose tissue, did not seem particularly at home in the water, and lacked the motor educability necessary to become a proficient swimmer.

The ranges within the two test groups were 10.50 experimental and 12.50 control. The wide range of $\overline{X}$ scores cannot be attributed to the media utilized even though there is a difference of 2.0. Comparatively, this difference would have to be attributed to the subjects within the two test groups and their own abilities to acquire the necessary skills. One other cause for this wide range in $\overline{X}$ is that there were only 15 subjects in each group, which is a relatively small number of subjects. If the number of subjects were increased, the range would not be as great.

In summation of data, the experimental group had a $\overline{X}$ of 6.66 as compared to the control group's 5.83. Both groups showed a positive learning curve but there was no statistical significance between the $\overline{X}$ of the two test groups at any level. There was a wide variance of range in individual $\overline{X}$ scores which can be attributed to individual motor educability among subjects and the relatively small size of the test groups. The wide variance of individual $\overline{X}$ must be attributed to individual differences among subjects even though this difference is less

significant in the experimental group than in the control group.

Table V gives a summation of individual improvement of each of the 15 subjects in both test groups. Also given are the group $\overline{X}$ and the $\overline{X}$ for both groups.

Table 5. Average improvement of each subject in the two strokes tested

Experimental Group		Control Group	
Subject	Average	Subject	Average
1	4.330	1	4.330
2	8.335	2	14.000
3	3.835	3	9.330
4	6.495	4	3.005
5	4.835	5	5.165
6	2.835	6	4.665
7	3.170	7	3.830
8	6.585	8	4.500
9	7.670	9	5.000
10	9.000	10	1.500
11	7.335	11	5.500
12	6.335	12	11.000
13	13.335	13	7.505
14	7.665	14	3.335
15	8.160	15	4.800

$\overline{X}$ Experimental Group: 6.661 $\overline{X}$ Control Group: 5.831

$\overline{X}$ Both Groups: 6.246

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

During the past four years, a great deal of research has been conducted to test the desirability of using videotape replay as a teaching supplement (reinforcement factor) in the physical education cirriculum.

A review of literature has indicated that advisability of utilizing this media is still in doubt. Many studies have revealed the VTR media to be of no value in teaching motor skills. Other studies have shown it to be of significant value. None of the researchers have advised against the use of VTR, however, because in all of the studies, the VTR method has been at least as effective as the conventional methods employed for comparison.

In this study, 30 freshmen and sophomore males at Utah State University participated in two test groups, experimental and control. They were given instruction in the front crawl stroke and elementary backstroke by the same instructor, using the same methods except that the experimental group received instruction supplemented by the use of television videotape replay. Pre test scores were subtracted from post test scores to determine the achievement level of each subject. An analysis of variance indicated no significant difference in $\overline{X}$ scores of

either group. The experimental group did have a slightly higher $\overline{X}$ than did the control group. Both groups showed a positive learning curve.

Conclusions

The purpose of this study was to determine if the use of videotape replay, as a reinforcement factor, was of value as a teaching supplement to beginning swimmers.

The utilization of the video media within this study showed the same basic results as revealed in many of the studies reviewed. Although there was no significant difference between the $\overline{X}$ of the two test groups, the experimental group did have a slightly higher $\overline{X}$ than the control group, and even though this difference in $\overline{X}$ was not significant, it was at least as good.

This indicates that even though it was not proven to be a superior media in this particular study, it was not proven to be an inferior or an undesirable method of instruction. The subjects within the experimental group viewed the use of VTR in their instruction as a novelty or a variation from the type of instruction to which they were accustomed. They were very receptive to the VTR method and might have been slightly more motivated than the control group, even though the members of the control group were very receptive to the learning situation.

The wide amount of individual variance among the subjects of both groups was one factor of surprise. While the rate at which

individuals acquire motor skills was a recognized limitation of the study and one factor which influenced this variance, there were other factors involved. First of all, it would be unrealistic to assume that any group, particularly beginning swimmers, would progress through a motor skill at the same rate. Secondly the size of the test group would have an effect upon the variance between individual subjects. Since the groups in this study contained only 15 subjects, it would be possible to have a wide variance in individual $\overline{X}$ and group range.

The rating system utilized within the study would be ideal for evaluating a swimmer's performance in a normal grading situation where a later grade is issued for a specific performance. Under the conditions of this study, however, where a subject's individual improvement in a given area from start to finish had to be determined, the method of evaluation used might have been too comparitive to the performance of other subjects. It was, however, the best method available for use in this study.

The advisability of utilizing this media was not determined by this study. The study did show this media to be at least as effective as a conventional method of instruction involving verbal explanation, demonstration and instructor analysis. Add to this the fact that VTR could serve as a motivational factor to students and be used in other areas of the physical educational curriculum and justification for its use can be found.

Based on the findings of this study, the following conclusions were drawn:

1. The conventional method of instruction involving verbal explanation, demonstration and instructor analysis was not benefited by the use of VTR in teaching the front crawl stroke and elementary backstroke to beginning swimmers.

2. Students do not achieve a greater level of competency in selected swimming skills when VTR is utilized in instruction; however, they do achieve at least as well.

3. The use of videotape replay can be justified if it fits into instructional methods employed by the individual teacher.

Recommendations

The following recommendations are suggested for further study in this area:

1. The study should be undertaken using more advanced swimmers who have met requirements for a specific level. This would place all subjects at basically the same starting point and would eliminate the extreme range of individual scores.

2. This study should be conducted with a greater number of subjects per group.

3. The time factor should be shorter in a similar study so that the subjects are evaluated sooner.

4. A more accurate measure of individual achievement levels should be devised so that evaluation is not comparative.

5. It is recommended that a study like this be conducted involving regular swimming classes with normal class enrollment.

6. A study should be made to see if videotape is of benefit in teaching the highly proficient swimmer.

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APPENDIX

Name _____ Age _____ Class Rank _____

Student Number _____ Health Classification _____

Advisor _____ College _____ Dean _____

I agree to participate in the research project with the understanding that I must adhere to the following guidelines:

(1) I must attend all sessions at the prescribed time and place.

(2) I will do no swimming other than that which is outlined within the project until the project is over.

(3) I understand that this is not a formal class and that I will receive no grade or credit from it.

(4) I will receive no compensation for my participation in this project.

Signature
Date

Rate each of the following individuals from 1-10 on each of the four listed criteria for the two strokes involved.

Judge's Name ______________________________

	FRONT CRAWL STROKE					ELEMENTARY BACK STROKE					
ECT'S NAME	PROPER LEG MOVEMENT	PROPER ARM MOVEMENT	ARM-LEG COORDINATION	SMOOTHNESS OF STYLE	TOTAL	PROPER LEG MOVEMENT	PROPER ARM MOVEMENT	ARM-LEG COORDINATION	SMOOTHNESS OF STYLE	TOTAL	COMMENTS

PART I. WATER SAFETY INSTRUCTOR COURSE

- Instructor conducting course prepares one legible copy for transmittal to instructor conducting Part II who will forward it to area office upon completion of Part II.
- Observe student and place a check (✓) under the aspect demonstrated correctly. Place a zero (O) under aspect demonstrated incorrectly. Each check is worth one point.
- Students with less than 3 checks on a 4-ASPECT skill; less than 2 on a 3-ASPECT skill; and less than 1 on a 2-ASPECT skill, should continue to work on the skill. (Maximum number of points, 80. Minimum number for passing, 60.)
- Complete "OTHER TRAINING" and "RECOMMENDED" sections.
- Chapters should prepare additional copies of this report for their record.

ASPECT ▶

			RHYTHMIC BREATHING				TREADING WATER		FLOATING MINIMUM E	SIDE STRO OR OVERA SIDE STRO				BREAST S OR INVERT BREAST S				AMERICAN CRAWL OR BACK CRA				TRUDGEN OR TRUDG CRAWL				ELEMENTA BACK STR				STANDING DIVE				SURFACE (PIKE OR		REAR APPROACH				UNDERWA APPROACH			
	NAME OF STUDENT	AGE	INHALES AND EXHALES THROUGH MOUTH	LOOKS COMFORTABLE	MAINTAINS RHYTHM FOR 2 MINUTES	LOOKS COMFORTABLE	REMAINS AFLOAT 3 MINUTES - LEGS ALONE	LOOKS COMFORTABLE	REMAINS AFLOAT 5 MINUTES	PROPER LEG MOVEMENT	PROPER ARM MOVEMENT	PROPER COORDINATION	LOOKS SMOOTH	PROPER LEG MOVEMENT	PROPER ARM MOVEMENT	PROPER COORDINATION	LOOKS SMOOTH	PROPER LEG MOVEMENT	PROPER ARM MOVEMENT	PROPER COORDINATION	LOOKS SMOOTH	PROPER LEG MOVEMENT	PROPER ARM MOVEMENT	PROPER COORDINATION	LOOKS SMOOTH	PROPER LEG MOVEMENT	PROPER ARM MOVEMENT	PROPER COORDINATION	LOOKS SMOOTH	GOOD TAKE-OFF	GOOD APPEARANCE IN AIR	GOOD ENTRY	FEET TOGETHER ON ENTRY	PICKS UP OBJECT IN 8' TO 10' DEPTH	GOOD FORM	KEEPS EYE ON VICTIM	PROPER REVERSE	MAINTAINS CONTACT	SATISFACTORY LEVEL-OFF	SUBMERGES SATISFACTORY DISTANCE	REVERSES BEFORE CONTACT	MAINTAINS CONTACT	SATISFACTORY LEVEL-OFF
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DATE PART I TRAINING STARTED	DATE COMPLETED	NO. OF HRS.	WHERE CLASS WAS TAUGHT

CONTINUE ON OTHER SIDE

SKILL	ASPECT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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FRONT SURFACE APPROAC	KEEPS EYES ON VICTIM																
	REVERSE BEFORE CONTACT																
	MAINTAINS CONTACT																
	SATISFACTORY LEVEL-OFF																
	TRANSITION-LEVEL-OFF TO CARRY																
CROSS-CH CARRY	FACE ABOVE WATER																
	EFFECTIVE ARM AND LEG MOVEMENTS																
	TRANSITION-LEVEL-OFF TO CARRY																
HAIR CAR	MAINTAINS PROPER CONTACT																
	EFFECTIVE ARM AND LEG MOVEMENTS																
	TRANSITION-LEVEL-OFF TO CARRY																
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	EFFECTIVE LEG MOVEMENT																
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	REVERSE POSITION																
	MAINTAINS CONTACT WHILE TURNING																
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	SATISFACTORY LEVEL-OFF																
	GRASPS ARM CORRECTLY																
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	TOTAL																
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	WITNESSED MOTION PICTURES																
	DISCUSSED SMALL CRAFT																
	RECOMMENDED FOR PART II TRAINING (CHECK (✓) ONE)																

SIGNATURE OF INSTRUCTOR

ADDRESS

NAME(S) AND ADDRESS(ES) OF ASSISTING INSTRUCTOR(S)

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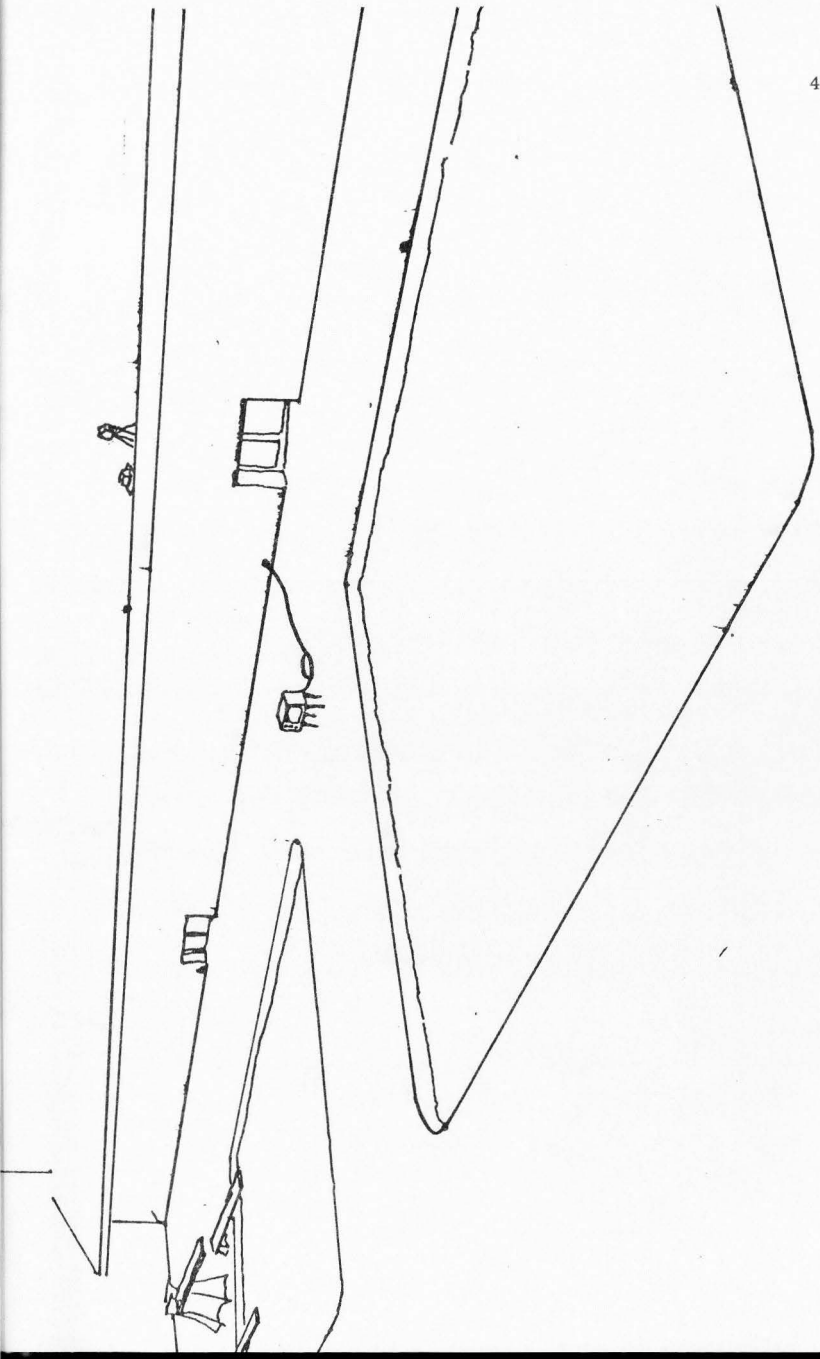

AMERICAN CRAWL STROKE

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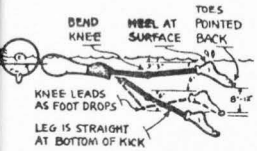

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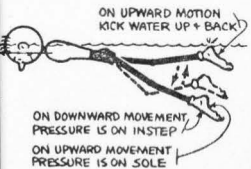

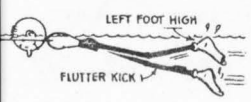

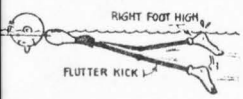

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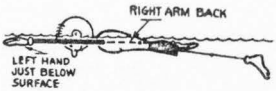

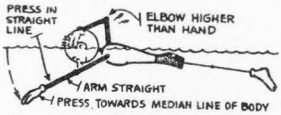

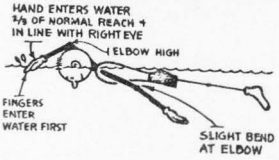

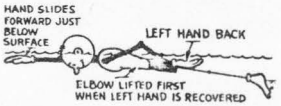

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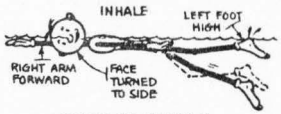

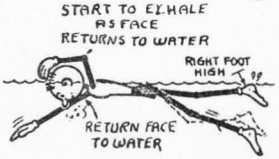

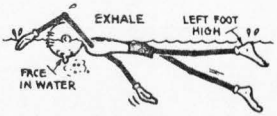

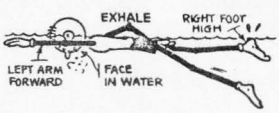

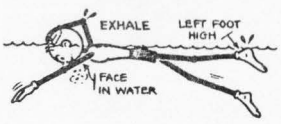

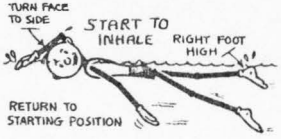

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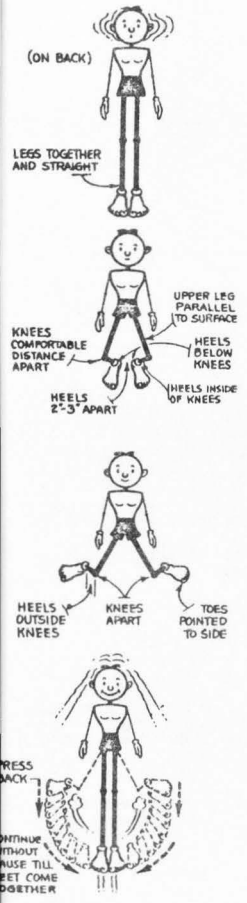
ELEMENTARY BACK STROKE

LEGS



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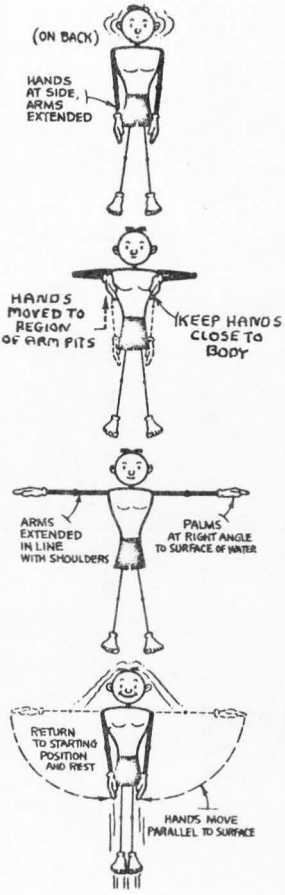

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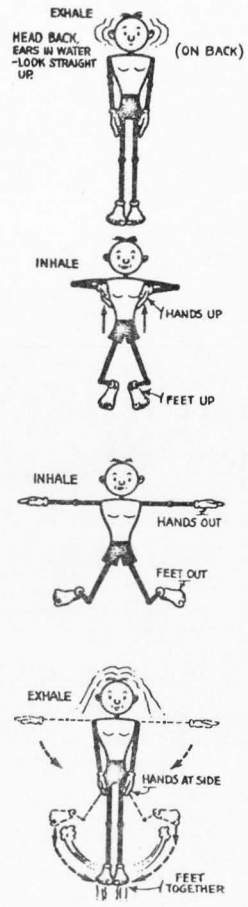

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VITA

Herald J. Jardine

Candidate for the Degree of

Master of Science

Thesis: A Comparison of Conventional and Video Teaching Methods Among Beginning Swimmers at Utah State University

Major Field: Physical Education

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Education: Attended elementary school in Arco, Idaho 9/51-5/58; junior high in Arco, Idaho 8/58-5/60; graduated from Butte County High School in 1964; attended Ricks College in Rexburg, Idaho 9/64-6/65; attended Utah State University in Logan, Utah 9/65-6/69 when received B. S. degree in Physical Education; did post graduate work to M. S. at Utah State 9/69-6/70; completed requirements for Master of Science degree in Physical Education at Utah State in 1973.

Professional Experience: Student teacher in Physical Education at South Cache Jr. High School 3/69-6/69; Graduate Assistantship in Physical Education Department at Utah State 9/69-6/70; Teacher-Coach Elko County School District Elko, Nevada 9/70-6/73.