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A Study of Skill Development in Single Concept Activities by Use of the Video Tape Recorder

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A STUDY OF SKILL DEVELOPMENT IN SINGLE CONCEPT ACTIVITIES BY USE OF THE VIDEO TAPE RECORDER

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by

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CHAPTER I

INTRODUCTION

During the recent years there has been much discussion as to whether the mastery of skills of the various physical activities can be improved by visual aids alone rather than the constant pupil-teacher relationship.

The purpose of this study was to provide data to aid in providing a solution to effective teaching of large groups. Bowling was selected because it lends to individual, small group and large group instruction. Due to the nature of television, existing physical facilities will not limit the instructional space needed. Viewing spaces need not be darkened since television produces its own light. Students may also participate during a video tape playback at another location.

The implementation of instructional video taping is currently being experimented with by such schools as Oakland Community College, Oakland, California; Green River Community College, Auburn, Washington; Central Washington State College, Ellensburg, Washington; University of Washington, Seattle, Washington; Miami Dade Junior College, Miami, Florida.

This study does not propose instructional television as a final answer to growth problems, but it may be the means by which teacher effectiveness can reach the greater number of students.

STATEMENT OF THE PROBLEM

The purpose of this study was to determine the differential effects of video taping as an instructional tool in the acquisition of bowling skills.

HYPOTHESIS

The study was designed to test the hypothesis that non-skilled bowlers will acquire basic skills faster and more efficiently by use of the video tape than non-skilled students not exposed to this medium.

LIMITATIONS OF THE STUDY

This study was limited to fifty men and women selected from a heterogeneous population at Fort Steilacoom Community College in Lakewood Center, Washington. All bowling instruction took place at the Bowlero Lanes located in Lakewood Center. The students ranged in age from seventeen to thirty-two. The class met a total of eleven times for twenty-two hours.

DEFINITION OF TERMS

VIDEO TAPE

A video tape is used to record picture and sound from television programs by a magnetic process similar to sound recording but including the reproduction of the picture.

INSTRUCTIONAL TELEVISION

Any form of television which imparts knowledge or skill by a systematic method is considered instructional television.

SINGLE CONCEPT

A single process or a series of actions definitely leading to a desirable result. The process or actions are usually silent.

MIRROR TELEVISION

Mirror television is a playback in which the students are video taped while practicing a skill and then replayed for self-critique with or without the teacher.

NON-SKILLED BOWLER

One who has not received any organized bowling instruction.

METHODOLOGY

What the teacher and students do together or what the students do by themselves to move toward the goals.

CHAPTER II

REVIEW OF RELATED RESEARCH

In general, the literature bearing directly on this subject and the experiments conducted indicates that motor skill is improved when a student can see his performance.

Instructional television use in physical education is relatively new when compared to older methods of teaching. All but one of the experimental studies the writer has read give results which do little more than indicate trends. More statistical research in the field of video television is needed.

Many instructors have gone to extremes. Some have asserted that skill knowledge is all-important and that teachers who are well read in their subjects will have no difficulty in devising means of teaching large groups without visual assistance. Others insist that visual aid must be used since deficiency in the knowledge of subject matter can be overlooked by good instruction. Therefore the use of visual aids are the only ways in which skill acquisition may be mastered. The common sense view of looking at the controversy is to consider the values of both. If teaching is to reach its highest degree of efficiency, it is evident that instructors must be thoroughly trained in the methods and materials of instruction in their fields, and must also possess a broad understanding in the use of visual techniques as a part of good teaching.

Owing to the development and importance of methodology at the present time in educational theory and practice, it is essential that the teacher who is to achieve success should make a careful study of

this part of his training. The method or methods, including classroom procedure which a teacher uses from day to day, determine to a great extent his success or failure.

Most teachers of every subject field generally have a definite course of study which guides them in their teaching of content material and therefore do not have the problem of determining what they shall teach but, rather, how they shall teach.

Each year school enrollments increase. This adds a new dimension to the instructor. The instructor now must communicate and utilize time more efficiently regardless of the group size.

The increase of student enrollments are noted when projected at both the local and national levels. During 1965 there were approximately 666,000 students enrolled in the kindergarten through twelve program in the State of Washington. The figure projected for 1975 is 768,000. This compares to the national average during the same span of approximately 49 million during 1965 to 57 million in 1975. (17:8)

In order for the teacher to cope with this rapid rate, utilization of different teaching aids are of beneficial assistance. Instructional television is one medium where the instructor can be extended beyond the range of single classrooms or groups. By the use of mirror television, students can maintain a systematic method of improvement without direct contact with the instructor.

The Federal Communication Commission in 1952 reserved 259 television channels for the exclusive use in schools, colleges, universities, and educational corporations. From the first licensing of station KUHT at the University of Houston in 1953, 70

educationally owned television stations have now been placed in operation, 65 of them holding non-commercial licenses. (8:25)

The use of instructional concepts in television were first defined for physical education by M. M. MacKenzie at the United States Air Force Academy in 1958. Even though television wasn't in use at this time, MacKenzie's justifications have stayed constant to 1968.

> The nature of motor learning is at best a complicated task. It involves, among other physiological and psychological process, the art of imitation. Efficient motor learning also requires frequent analysis of error in performance. When the learner understands what he is doing wrong, he can then correct it. It is believed by some that when the athlete can see his own performance he can better interpret the analysis of his teacher and more readily can correct and improve his performance. Thus by seeing others perform and by observing his own performance, the learning of motor skills become more rapid. (10:516)

To further support MacKenzie's justification, new research is being accumulated in instructional television showing the value in certain curriculum areas.

To show the effectiveness of instructional television as compared to conventional instruction, a group of 141 studies were used. Fifty-two showed a significant difference. Of the 52 studies, 40 favored the students receiving instruction by television and 12 favored the students in the control groups. It is most important to note that in 89 of the studies there was no change and showed no significant difference. Students learned as well in classes utilizing television as in those using conventional techniques.

> Students can learn as well when television is used by the teacher as in the conventional classroom situation; frequently, they learn better. (8:26)

Primarily because of the cost reduction in television equipment, video tape is now being used in physical activities more and more. One example is Hall High School in West Hartford, Connecticut.

Hall High School was not only one of the first in the northeast to use video tape but was also a pioneer at the national level. By not purchasing all the elaborate network of equipment available, Frank Robinson showed that it was feasible to get similar results from a modest set-up. His equipment included one video tape recorder, a television camera, and two receivers. (18:36)

Ken Winslow, Head of the Television Office, University of California at Berkeley has noted that with the development of the portable camera and technically simpler equipment his department is now able to saturate all areas of instruction.

> The portable camera has proved invaluable for classes in dance or sports. Students have taped one another for individual or group observation and evaluation, and recording performances or events is simplicity itself--as convenient as shooting 8 mm film with existing light. The units have been used to record sensitivity training sessions, group interaction, golf swings, interviews with Berkeley's student activists, botanical specimens in the field, data processing activity and much more. We feel that we have just begun to explore the possibilities. (3:1)

Studies testing the effectiveness of television show positive gains. Research is very limited in this area but a high school in the Fremont Union High School District shows its uniqueness by equiping its school with a portable television recorder. Ninety-six instructional hours per week were saved school authorities estimated. The enrollment of Cupertino High School is 2400. Principal George Fernandez set the recorder to work on a six day schedule. It

recorded 10 different programs totaling 3 hours 47 minutes of air time. By eliminating the need to repeat live programming, the recorder saved 96 man-hours in production. (4:45)

John L. Barringer, Director of Health and Physical Education in the Tucson, Arizona Public School District #1, conducted lessons using sixth grade students who were given seven fitness test items related to a television experience. The first efforts and attempts to use television have been successful and favorably received. The class procedures were given both visually and verbally so that the transition to televised testing would be of little consequence to the students. (15:29)

In order for instructors to obtain desired results when confronted with the task of teaching in activity areas where they feel inept, visual aids may be the answer to the teaching problem. Television can provide a total range of techniques that can be viewed by either large or small groups. (14:307)

In summary, the research material related specifically to the effectiveness of video tape in physical education activities is minimal. All availble research indicates that not much is being recorded but material that is recorded shows a positive gain.

If it is true that mental practice and observation has been demonstrated to be an effective motor-learning process, then the advantages of video tape recording over filming are of important consequence.

(1) No processing is needed. Motion pictures have long been a mainstay of visual instruction, but impractical for

everyday activity use. Video tape recording eliminates the cost and the time involved in film processing. Instructors can tape students in action, point out their mistakes instantly. The video recorder can be used in the gym as well as the playing field.

(2) There is no additional cost as reliance is largely on student crews. According to Chief Donald C. Milligan, Monmouth Fire Department of Monmouth, Oregon, "the video recording system was operated entirely by two men, neither of whom had ever seen a television camera or video tape recorder before. Even so, they both got great pictures of exercises with just a minute's instruction on the equipment." (19:1)

(3) Instant replay can be employed for immediate use.

(4) Stop motion and slow motion are available.

(5) The tape is re-usable. The Educational Media Laboratories of the University of California at Berkeley has developed this criteria. The investment in tapes would be prohibitive if all tapes were saved (20 minute tapes cost about $15.00). Secondly, there is some question about perpetuating any teaching technique. It is altogether too easy to fall into the habit of assuming that what has been recorded once is best for all time. Unless controlled, this could quickly lead to a static teaching system founded upon a dynasty of tapes. Third, they have found that the "irreplaceable" tape almost always remains unused after one or two showings because the person who asked that it be preserved has gone on to other things. (7:27)

(6) Sound may be recorded along with the picture. To edit a tape, portions may be subjected to a post-record narrative or dialogue over the picture. (24:36)

CHAPTER III

PROCEDURES AND TESTING

One hundred and two bowlers were selected as the original group. A division of group population to equated groups was made from a three item criteria. Individual ability level was determined by pinfall. Instruction took place during the first three class meetings which met once a week for two hours. The same teaching techniques were used for both groups, the experimental group had the added benefit of the video tape playback. Average scores for individuals were recorded on a chart each week and total average scores were recorded at the end of the quarter. (See Appendix A) The statistical process used for this study was comparative statistics. The characteristic scores of the two groups was contrasted.

By use of the following criteria, an experimental group of fifty was selected from one hundred two bowlers.

(1) Students with a physical problem that would impare the ability to perform were excluded.

(2) Students who have had one or more formal bowling lessons were excluded.

(3) Students who had bowled more than three times were excluded.

Two equal independent groups of twenty-five was designed by measuring the individual ability levels from total pinfalls in one line of bowling. The equated grouping was derived by placing each individual student alternately in Group A or B starting with the lowest number of pinfall to the highest. This resulted in two equal

groups of twenty-five. The experimental group A had use of the video tape. The control group B did not have the use of the video tape.

The class was organized so that one instructor gave the same bowling instruction to both groups. Beginning instruction in bowling was primarily designed around the following three areas; the approach, the delivery, and the follow through. After the third week of instruction, group A was separated from B and relocated at the opposite end of the bowling center. For the remaining seven weeks group A received only the use of the video tape playback while group B utilized the teacher for instructional feedback. The equipment used was a battery operated Videocorder and hand-held camera. For the playback, a portable videocorder with an 18" monitor was used. The monitor was located directly behind each group of bowlers. It was recommended that students view the playback from no further back than 15 times the screen width. This is the recommended maximum. (3:1) Another important factor is the angle from which the students view the screen. Expert opinion says the viewer's line of vision should never be more than 30 to 45 degrees off center. (12:19)

The camera was placed in three different positions; front, side, and rear. The camera was recording only during the first hour. During the second hour, the students could analyze themselves by use of the videocorder and monitor. By keeping track of the digit numbers on the recorder, individual bowlers could replay a sequence as many times as might be needed without pre-knowledge of the equipment.

CHAPTER IV

RESULTS OF THE STUDY

This study was undertaken in order to determine whether students, taught with the use of the video tape would achieve as well, or better than, students taught without the use of video tape. To determine whether there was a significant difference between students in either the control group or experimental group, the Fisher *t* was used to show the significance. The pretest score of *t* .33 showed no significant difference between the two groups. Using the Fisher *t* in the post testing scores a *t* of 1.43 was obtained.

The results favored the experimental group even though the results showed no statisically significant difference between the two groups as a *t* of 2.01 is necessary to be significant at the .05 level of confidence. (6:449)

The increase in the *t* from .33 to 1.43 is indicative that more improvement was made with the experimental group but can not be substantiated statistically.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The evidence within the limits of this study indicates that instruction with the addition of video tape is not a significantly more effective method of instruction than instruction without its use. According to the results of this study the pupils taught by the video tape had a slightly greater increase in pinfall than did the students taught without its use.

Since the results of this study indicate that instruction with the use of video tape will increase bowling proficiency, but not more significantly than instruction without its use, the writier recommends that additional studies using both the video tape and teaching be undertaken to confirm or disprove the findings in this study, as well as the subjective conclusions observed by the writer but not substantiated by research in this study.

SUBJECTIVE GENERALIZATIONS

1. Personal generalizations
    a. The pupils taught by the video tape were more interested and were more responsive.
    b. Instructional use of the video tape isolated skill breakdown and allowed self-analysis.
    c. Pupils taught by this method of instruction became better able to learn independently.
    d. Pupils taught skills without the video tape had trouble remembering the various instruction directions in skills attainment without memorization.

e. Pupils taught skills with the use of the video tape found little difficulty in interpreting skill breakdown.

f. Pupils utilizing the video tape displayed greater confidence in themselves in class discussion and were better able to express in their own words individual problem areas.

g. The replay of skill attainment by both the individuals and the group stimulated interest for self-identification.

h. Instructors using video tape are free from the routine duties of preparation of presentation. The time saved can be used in providing individual and small group work, or in counseling and meeting individual needs.

i. Pupils can be provided better viewing through its close-up techniques in television.

j. Because viewing spaces do not need to be darkened, supplementary activities such as taking notes or testing can be conducted during the telecast without interruptions.

k. Instructional use of the video tape makes it possible to share a well-qualified, effective teacher among many students.

2. Subjective generalizations by instructors other than the instructor of this experiment:

a. The view of instructors having similar groups for other activities indicated that the pupils taught with the use of video tape seemed to be more interested in their work, enjoyed class more, were more self-reliant in solving problems, and worked better as a group member in social situations.

b. Coaches in varsity athletics stated that players utilizing video tape were more interested in developing skill techniques and were more able to find out information for themselves.

3. The sampling or number of students used in this experiment was greater than in any other known study using video tape. This experiment was done by using two hour blocks once a week. All other experiments read by the writer were carried out during a one-hour class period.

RECOMMENDATIONS

Before objective claims of superiority of any visual aid are made, additional statistical research is needed. The material related specifically to different physical education activities is minimal.

Television laboratories should be available to the various departments of instruction to serve specific needs for the different types of television experiences. Comprehensive studies are needed to provide the answers to questions such as: How long should an instructional telecast be for effective learning? Can all activities be included?

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Group A				Group B			
SUBJECT	TOTAL PINS	GAME	AVE.	AVE.	GAME	TOTAL PINS	SUBJECT
A	4538	27	168	158	27	4266	A
B	4192	27	155	157	27	4239	B
C	4135	27	153	157	27	4239	C
D	4036	27	149	151	25	4077	D
E	3950	27	146	150	27	4050	E
F	3934	27	145	144	27	3888	F
G	3806	27	140	143	27	3861	G
H	3777	27	139	141	27	3807	H
I	3773	27	139	141	27	3807	I
J	3758	24	156	137	27	3699	J
K	3741	24	155	137	27	3699	K
L	3720	27	137	136	27	3672	L
M	3720	27	137	133	27	3591	M
N	3698	27	136	133	27	3591	N
O	3679	27	136	133	27	3591	O
P	3675	27	136	131	27	3537	P
Q	3592	27	133	131	27	3537	Q
R	3529	27	130	127	24	3048	R
S	3527	24	146	126	24	3024	S
T	3435	27	127	125	27	3375	T
U	3407	24	141	124	24	2976	U
V	3250	24	135	121	27	3267	V
W	3231	24	134	121	24	2904	W
X	3199	24	133	119	24	2856	X
Y	3456	27	128	145	20	2900	Y
Bowlers--25	92758	654	141	137	651	89501	25--Bowlers


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