6-1-1967

A Comparison of two Methods of Teaching

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A COMPARISON OF TWO METHODS OF TEACHING THE ELEMENTARY BACKSTROKE

by

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B.S. in Education, University of North Dakota 1965

A Thesis

Submitted to the Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the Degree of

Master of Science

Grand Forks, North Dakota

June
1967

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ACKNOWLEDGMENTS

The writer wishes to extend his sincere gratitude and appreciation to Mr. Walter C. Koenig and to Dr. John L. Quaday for the many hours spent in helpful guidance and assistance in preparation and completion of this study; to Dr. Russell Peterson for the time taken as a member of the examining committee; to Dr. LaVernia Jorgensen for her critical analysis in preparation of the initial draft; and to colleagues and friends for their encouragement. Finally, the writer is most indebted to his parents for their continual support, inspiration, and encouragement to overcome the obstacles encountered in completing this study.

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ABSTRACT

The study consisted of a comparison of two methods of teaching the elementary backstroke to beginning swimmers. Students of the University of North Dakota "Upward Bound" project volunteered as experimental subjects. The instructor pre-tested the students to see that those participating fell in the beginning swimming classification. The students were taken through the beginning swimming progressions as outlined by the American Red Cross. After they had progressed sufficiently in basic swimming skills, the subjects were arbitrarily placed into two experimental groups.

One group was taught to swim the elementary backstroke using the whole method of instruction, and the other was taught the same stroke using the part method. Each subject attended ten instructional sessions during the experimental program. At the end of this experimental period the subjects were rated by a committee of four judges as to the performance of the prescribed stroke. These experts used a prepared check list in making their evaluations.

Conclusions:

1. In this study the "whole method" (experimental group II) proved to be better than the "part method" in teaching the elementary backstroke.

2. In this study the "whole method" group was ranked one, three and four out of the seven who were post-tested.

CHAPTER I

THE PROBLEM AND ITS SCOPE

Statement of the Problem

This study represents an attempt to compare the effectiveness of two methods of teaching the elementary backstroke to beginners in swimming.

Purpose of the Study

The purpose of this study was to compare the "whole method" with the "part method" in teaching the elementary backstroke.

Nature and Justification of the Problem

Educators are constantly seeking better ways of teaching. The most effective methods of teaching swimming must be discovered due to the ever increasing enrollment and teacher shortage. "Part" and "whole" learning, concomitant learning, transfer of training, distribution of practice and motivational control of learning are some of the theories which need further explanation. Studies done on the whole versus the part method, however, are contradictory and therefore inconclusive.

For many years physical education skills have been broken down into parts and later the parts put together to form the whole skill. This seemed the most logical way to acquire a skill because it was a product of inductive reasoning. Some instructors believe that

learning may be more effective if the functional whole of an activity is presented rather than a series of separate parts.

Around 1920, Gestalt's theories began to appear in the United States. This change of approach from "part" to "whole" learning came about as a result of experiments based on his psychology. Gestalt psychology is a theory based on the belief that biological, psychological, and physiological events occur as units or patterns rather than through the summation of separate elements. Gestalt is responsible for bringing the concept of the "organism-as-a-whole" into psychology. The first Gestalt experiments centered around visual perception and demonstrated that individuals see things as wholes. Further experiments showed that poems and nonsense syllables were learned faster when approached as wholes rather than as small phrases. Educators began to explore the possibility of applying this idea of learning to the teaching of subjects. The liberal arts were the first subjects successfully taught by the whole method; consequently physical educators began to ask themselves what possibilities this approach might hold for teaching motor skills.[1]

There have been very few studies reported that have involved the use of different methods of teaching swimming. During the past number of years interest in aquatic sports has grown and there seems to be an increased number of students taking swimming lessons. More schools are being built with pools and it would seem that swimming

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[1]Charlotte H. Sharpe, "An Analysis of the Scientific Principles Involved in the Whole Method of Teaching a Skill," (Unpublished Directed Individual Study, University of Denver, 1957).

instructors should know and use the most effective teaching methods.

Limitations and Delimitations

This study was limited to:

1. The frog kick as a method of leg propulsion on the back.
2. Students who ranked as beginners on the University of North Dakota Swimmer's Classification Test.
3. The elementary backstroke as described and analyzed by the American Red Cross.
4. High school boys and girls, ranging from 15 to 17 years in age, who participated in the project, "Upward Bound" during the summer of 1966 at the University of North Dakota.
5. A voluntary group that attended as regularly as their class schedules permitted them to attend.

University of North Dakota Swimmer's Classification Test:

1. 30 second jelly fish float.
2. one minute motionless float on the back.
3. one width of the pool or 42 feet using any method to propel themselves under the surface of the water.
4. one width of the pool using the elementary backstroke as recognized by the American Red Cross.
5. one width of the pool using the sidestroke as recognized by the American Red Cross.

Beginning Swimmer - A person who ranked in the beginner category on the University of North Dakota Swimmer's Classification Test.

The student would have been unable to complete satisfactorily any three items of the test.

Whole Method - A method whereby a stroke was presented as a functional whole after which the learner practiced it in its entirety at all times. Never, at any time, was practice done on the parts separately. No details were considered until the learner could perform the stroke. At this time he could concentrate on a part, but always in relation to the whole stroke.

Part Method - A method whereby each part of the elementary backstroke was presented separately. Each part was practiced separately and then parts were combined to produce the co-ordinated stroke. Details were stressed and the parts were worked on throughout the experimental period. The learner practiced the whole stroke at some time during each class period. Although this is the part-whole method, it will be referred to in this study as the part method.

Elementary Backstroke

Glide Position: The back glide was learned first to prepare for the learning of the elementary backstroke. A gentle push was made from the wall, the body was leveled into the back glide position with the ears underwater. The hips and knees were not noticeably bent. The arms were at the sides with the thumbs near the thighs and the palms pointing inward. The toes were together and pointed.

Arm Recovery - first stage: The thumbs should slide along the ribs toward the shoulders as the elbows bend.

Leg Recovery - start: In order to deliver the frog kick, the knees must be flexed and partially separated. The heels are held together as they are drawn toward and under the body. The toes of both feet are pointed toward the knees and away from each other.

Arm Recovery - second stage: With the thumbs on the ribs, the elbows were folded downward and backward. The wrists were flexed at the same time so as to keep the arms under the surface of the water. The wrists were rotated upward and outward so that fingers pointed directly away from the shoulder. The elbows straightened as the fingers extended forward and outward, parallel to the plane of the surface of the water and to a point which, at full extension, bisected the angle between head and shoulder.[2]

Leg Recovery - completion: The knees remained separated as the heels separated and swung downward and outward in a pendulum like action. The feet were brought together and held there during the glide. The leg stroke should be smooth and continuous at all times.

Arm Pull - The forearms were extended at the elbow throughout the pull. As the wrists reached the thighs, the elbows and wrists held the gliding position in readiness for the next recovery action.

Frog Kick - The positive phase of the leg action began with the toes pointed sideward and with a backward pressure

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[2]John A. Torney, Swimming (New York: McGraw-Hill Company, Inc., 1950), p. 105.

against the inside surface of the lower half of each leg, followed by a backward press with the soles of the feet.[3] The legs were brought back together to a position of full extension by a squeezing action.

Breathing - Inhalation took place during the latter stages of the pull and kick. Exhalation took place just before the next recovery was begun.

Related Literature

There are very few studies that have been reported in the area of aquatics which used the "part" and "whole" methods. The studies that have been done have shown conflicting results.

Olszewski[4] classified beginning swimmers into the following categories:

(a.) Absolute Beginner - Due to their chronological age, these children have never been exposed to water; they are very young.

(b.) Environment Beginner - Due to their environment they have never been exposed to water. Their parents have sheltered them. The groups they joined sometimes pressured them into learning how to swim.

(c.) Problem Beginner - This child has been frightened at one time or another by an accident in the water, by a closeness to a drowning or possibly by parents who are afraid of

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[3] Ibid., p. 106.

[4] J. Olszewski, "Teaching a Youngster to Swim," Athletic Journal, (November 1963), p. 39.

water. The child will fight learning to swim rather than accept it.

(d.) Embarrassed Beginner - The child who excels in many sports areas, but is embarrassed to admit in front of his peers that he cannot swim.

Foster[5] presented a brief background on how the method of teaching swimming evolved:

> Early swimming methods were limited to individual instruction. Elaborate apparatus for aiding learning both on land and in the water was often described. Potential swimmers were supported horizontally and limbs were manipulated by the instructor. Floatation devices were common and great emphasis was placed on specific joint action.
>
> Later swimming became so popular that it was necessary to develop means of mass instruction in which the first attempts placed great stress on land drill. Here the learner was taught the details of the movements for each skill through many repetitions. Class organization was thought to be of primary importance and the emphasis was in the outlined teaching sequence rather than the learning process.
>
> Mass or group instruction has since been considered the best practical means of teaching swimming and organizational patterns have been refined through the years to include division of swimmers into systems. The American Red Cross Technique of Instruction, a derivation of Cureton's method which is widely used today, exemplifies the highest refinement in mass teaching techniques to date.
>
> Throughout this development, emphasis in teaching method centered on detail of joint action and analysis of precise body movements thought necessary for accomplishment of the skill, usually based on traditional style.
>
> There was little mention of how best to communicate to the student in order that optimum learning could take

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[5]Margaret Virginia Foster, "The Development of a Method of Swimming Instruction Based on Efficiency of Propulsion Including a Comparative Study of Fear Reduction," (Unpublished M.S. Thesis, University of Wisconsin, 1963), p. 4.

> place, only what to have the student do. Suggested order of teaching skills varied from one author to another in terms of which stroke to begin teaching first and whether it was best to start with the whole skill or parts of the skill, but essentially the contents were the same.
>
> A variety of opinions were expressed concerning the part method versus the whole method versus progressive-part method; a difference of opinion which still prevails among instructors.

From an unpublished seminar report, Perry[6] said:

> How well have teachers applied what is known about motor learning to their teaching methods . . . Generally, there is no attempt to impart a knowledge of movement. Motor learning takes place through the kinesthetic sense but how many students are aware of this? . . . Instead of aiming at the development of a kinesthetic pattern, the student too often is encouraged to aim at a visual pattern, to look a certain way when he or she performs a skill. Many teachers expect students to reproduce the perfected skill. They indiscriminately call attention to details, and they wonder why their students are tense.

Lewellen[7] cited Rogers' study on teaching of soccer, volleyball and playground baseball by the whole, the part and the whole-part-whole methods. Rogers found a statistically significant difference in favor of the latter method.

Lewellen[8] compared the "part" method with the "whole" method in teaching the "human stroke" in his study. His subjects ranged in age from seven and one-half to nine years old. Lewellen concluded:

1. The Red Cross progressive part method and the whole-part method seemed to be effective methods of teaching

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[6]Elizabeth Cereta Perry, Teaching Procedures in Swimming Designed to Promote Realization of Self, (unpublished seminar report, University of Wisconsin, 1948), p. 8.

[7]John O. Lewellen, "A Comparative Study of Two Methods of Teaching Beginning Swimming," (unpublished dissertation, Stanford University), p. 6.

[8]Ibid., p. 59.

these children, ranging between the ages of seven and one-half years to nine years to swim.

2. The progressive part method and the whole-part method were not effective for all the children.
3. The whole-part method was significantly superior to the Red Cross progressive part method, in this experiment, in developing distance skill in beginners of the above mentioned age range.
4. The whole-part method was significantly superior to the Red Cross progressive part method, in this experiment, in developing form in swimming the human stroke.

Shead[9] found that the part-progression method was superior to the pure method in teaching the crawl and the backstroke to non-swimmers. The subjects for this study were 103 children. They were taught for a period of nineteen consecutive days. The criterion measures which he utilized were: "distance and time, in swimming, to an object forty-five feet from a pre-determined starting point."

Another aspect of research which was pertinent to the study of the elementary backstroke was buoyancy of the swimmer. Armbruster and Sieg[10] analyzed the butterfly breaststroke and concluded the more buoyant individual could remain high in the water and dominate the up and down movement of the stroke.

Several writings concerned with floating ability were found by Whiting.[11] He reported that: " . . . women were superior in floating ability, both in the tuck floating after maximum inhalation and during normal breathing in the horizontal floating position."

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[9]John Edward Shead, "The Relative Effectiveness of Teaching Two Basic Swimming Strokes by Two Methods to Non-Swimmers," (unpublished P.E.D. dissertation, Indiana University, 1959), p. 325.

[10]David A. Armbruster and Jack Sieg, "The Dolphin Breaststroke," Journal of Health and Physical Education 6:23 (April 1935).

[11]H. T. A. Whiting, "Variation in Floating Ability With Age in the Female," Research Quarterly, XXXVI May 1965, p. 216.

Lyman[12] reported that: " . . . apparently there is no statistically significant relationship between body proportions and buoyancy other than weight, which was found to be a potent factor."

Hunt[13] employed a similar method to measure buoyancy of male subjects and reported that: " . . . the factors favorable to buoyancy are: excess fat, poor muscular development, a light skeleton and narrow shoulders and wide hips."

Rork and Hellebrandt[14] found that, for women, a high positive correlation existed between multiple factors of buoyancy, surface area, vital capacity, and specific gravity. They classed floaters in two groups:

> (a.) Those who have a small specific gravity due either to adiposity or to a large pulmonary volume or both, and;
>
> (b.) those who have large surface area.

These authors felt that the floating ability would be the greatest when all the above mentioned attributes were simultaneously present.

> It's true that children learn faster from a good instructor who possesses teaching ability and "know how." Learning how to swim depends strongly upon this sort of instructor and upon the desire and the ability of his pupils to learn. For many, the group situation produces a normal learning experience resulting in satisfactory progress, whereas with others, individualized instruction constitutes the only way to meet their needs.
>
> Most swimming instructors must cope with the ever existing problem of large classes and too little assistance by qualified helpers. The element of time becomes a serious handicap, so

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[12]Eva Lyman, (unpublished Master's Thesis, State University of Iowa, 1930).

[13]Harold S. Hunt, "Physical and Anthropometric Factors in Buoyancy," (unpublished Master's Thesis, State University of Iowa, 1930).

[14]Rozelle Rork, and Frances A. Hellebrandt, "Floating Ability of Women," Research Quarterly, VIII December (1937), p. 19-27.

> that even the best of teaching methods and techniques, when working with exceptionally large groups, often reach a point of diminishing returns.[15]

In summary, a variety of literature related to the problem of the part and whole methods of teaching swimming was reviewed. The following points can be made:

1. A variety of literature related to the problem of part and whole methods of teaching skills other than aquatic was found.
2. Olszewski classified beginning swimmers into four distinct categories. They are: absolute, environment, problem, and embarrassed beginners.
3. Foster stated some facts on how the methods of teaching swimming evolved. No definite conclusions were reached.
4. Perry suggested that the instructors should decrease the emphasis on the visual pattern and should increase the development of the kinesthetic pattern.
5. Rogers found a significant difference in favor of the whole-part-whole method of teaching soccer, volleyball and playground baseball.
6. Lewellen found the whole-part method significantly superior in the part method in teaching the human stroke to children ranging in ages from seven to nine.
7. Shead found the part-progression method was superior to the pure method in teaching the crawl and the backstroke to non-swimmers.

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[15]Edwin F. Fieger, "Novel Techniques in Teaching Swimming," Scholastic Coach, (October, 1960), p. 54.

8. Facts concerned with floating ability were found for both men and women.

9. Beginning swimmers would learn faster and better from an instructor who possesses teaching ability and "know how."

CHAPTER II

PROCEDURE

The subjects for this study were selected from a group of high school students enrolled in the University of North Dakota summer project "Upward Bound." The children came from five counties surrounding Grand Forks. The purpose of the project was to whet the student's appetite for higher education. The group consisted of boys and girls between the ages of 15 and 17 years.

The participants selected were all beginning swimmers who ranked in the beginner category on the University of North Dakota Swimming Classification Test. The students participating in this study were placed in either experimental group I or experimental group II by the writer. There were twelve boys and ten girls at the beginning of the program. The instructor placed the twelve boys in experimental group I and ten girls in experimental group II. The writer felt that this was the most convenient way of dividing the group since their attendance was voluntary and not compulsory. All the students were then taken through the beginning swimming progressions as outlined by the American Red Cross. The elementary backstroke was introduced to the subjects during the fourth lesson after they had mastered some of the beginning swimming skills. The instructor would assign work to one group and then an assistant would see that the work was being done

satisfactorily. The instructor would work with one group and then return to the other group. The students had something to work on at all times. The following times were spent practicing the stroke:

LESSON NUMBER	5	6	7	8	9	10
MINUTES SPENT PER LESSON	15	10	10	10	20	10

The students who participated in this study were there because they wanted to learn how to swim. They were there because they thought swimming was fun and they felt that it was a skill that they should learn. No extrinsic motivation was needed because interest was inherently present in the situation.

Initial Practical Test

The students were given the University of North Dakota Swimming Classification Test. They were required to perform the following skills in the deep end of the pool:

1. To float in the jelly fish position for 30 seconds
2. To float motionless for one minute
3. To propel themselves one width of the pool under the surface of the water using any possible method
4. To propel themselves across the width of the pool using the American Red Cross elementary backstroke.
5. To propel themselves across the width of the pool using the American Red Cross sidestroke

The students selected for this study were:

1. Students who were absolute non-swimmers and did not want to attempt any part of the test.
2. Students who were unable to perform satisfactorily any three of the items on the test.

Teaching Procedure for the Part Method (Experimental Group I)

1. The instructor demonstrated the leg stroke on the pool deck.

2. The students practiced the leg stroke by lying on the deck of the pool and holding their legs out over the water. The students were then able to practice the frog kick in a realistic type land drill. All the above was done on the back.

3. The students chose partners and practiced the leg stroke as they held on to the overflow trough while their partners supported them. The student executing the leg stroke was on his back and was supported by his partner who placed a hand under the small of the back near the buttocks.

4. The students then got swimboards and propelled themselves (using their legs alone) back and forth across the pool in the shallow end. The students were on their backs with swimboards under their heads. They held on to the swimboards with both hands.

5. The instructor then demonstrated the leg stroke in the water while hanging on the overflow trough, using the swimboards and then just using the leg stroke alone. The instructor demonstrated all of the above from the regular elementary backstroke position.

6. The instructor then explained the arm stroke and had the students practice the arm stroke on the deck while standing up on the deck. The students were checked by the instructor while performing

the arm movement on the land. At no time was the arm stroke practiced separately in the water but was coordinated with the leg stroke.

7. The instructor demonstrated the whole stroke in the water.

8. The students then entered the water and coordinated the whole stroke.

The students learned the elementary backstroke during the fourth lesson, and practiced the stroke for prescribed periods of time as previously stated. The early lessons were divided into leg stroke and total stroke. About half the time was spent on the whole stroke. Details were emphasized as each part was mastered.

Teaching Procedure for the Whole Method

1. The instructor demonstrated and explained the elementary backstroke as a whole. The explanation was given on the land and the demonstration was given in the water.

2. The students attempted the whole stroke first on the land by coordinating the arms with one foot while standing on the deck of the pool. No attention was called to details until the learner could coordinate the arms and legs. Correct breathing, timing of the leg stroke, the exact pattern of the leg stroke and of the arm stroke were not mentioned until the student could perform the basic arm and leg movements.

3. The students continued to practice the whole stroke. The students were asked to concentrate on a part of the stroke only when there was need for it. Then they concentrated on the part while performing the whole stroke. At no time throughout the lessons were members of experimental group II allowed to practice any part of the stroke separately.

Development of Evaluative Instrument

The investigator formulated a rating scale so that the judges would be able to rate the students on a one, two, three scale. "One" meant the student performed the skill in an above average manner. "Two" meant average performance. "Three" meant the student failed to perform the skill properly. The judge placed the number under the appropriate skill.

Selection of the Judges

The judges were graduate physical education majors from the University of North Dakota. The members of this panel had many years of teaching experience. Their experiences varied in many ways. They had taught courses which ranged from beginning swimming to adapted classes for the handicapped. One member had seen the group at the beginning of classes while the others had not seem them until the night of the testing. The names of the judges appear in the appendix on page 35.

Evaluative Instruments

The scale appearing in Figure 1 on page 18 was devised so the judges would be able to rate the students quickly and effectively. It was a check list that enabled the judge to "tick off" the score that the student should receive. At the top of the scale was a key that explained the numbers.

The fundamentals rated were: bobbing, back float, back glide, and sculling with a flutter kick.

Figure 1

RATING SCALE USED BY JUDGES TO EVALUATE FUNDAMENTAL BEGINNING SWIMMING SKILLS

The points on the scale were defined as follows:

1. Above Average--Stroke met all specifications of form with few apparent errors
2. Average--Stroke met the basic specifications but lacked smoothness and ease or lacked control in some respect which affected the stroke as a whole
3. Below Average--Stroke was recognizable but failed to meet the standard form in practically every element involved.

		BOBBING			BACK FLOAT			BACK GLIDE			SCULLING WITH FLUTTER KICK		
No	Student	1	2	3	1	2	3	1	2	3	1	2	3
1													
2													
3													
4													
5													

The check list appearing in Figure 2 on page 20 was devised along the same lines as the one for the fundamental swimming skills. The check list needed to be easy to use because the judges had to rate the student on three aspects: arms, legs and coordination. The judges would again "tick off" the score that the student should receive. The same numbers were used throughout the testing to evaluate the performance and therefore eliminate any chance of error.

The panel of experts was advised to take into account the fact that the subjects were beginners and to judge accordingly. The judges had done previous work with beginners and the writer felt that they were suitably selected.

Explanation of Tabulating Results

The rating sheets were gathered and the writer assigned another set of numbers to the results. The number "five" was given to the above average score, "three" to the average score and "one" to the below average score. This process of weighing the data was utilized for the purpose of giving more value to the above average performance.

Figure 2

RATING SCALE USED BY THE JUDGES TO EVALUATE SELECTED ASPECTS OF ELEMENTARY BACKSTROKE

		ARMS			LEGS			COORDINATION		
No.	Student	1	2	3	1	2	3	1	2	3
1										
2										
3										
4										
5										

CHAPTER III

TREATMENT OF THE DATA

This study was made to compare the "part method" with the "whole method" of teaching the elementary backstroke. The instructor used four fundamental swimming skills tests to see how the students were able to learn these skills and then incorporate them into the elementary backstroke. The following results were obtained by an analysis of the data collected.

Totals and Average Scores of Fundamental Swimming Skills Test

Using the revised numbering system, each judge's ratings were revamped. The totals and the average scores of the judges were then found. Each student was given a number and his scores were shown as the judges rated him.

Experimental group I (part method) scored better on the fundamental swimming skills test than did experimental group II. Experimental group II (whole method) did not do as well, but one person ranked third with a score of 12.5. From the results compiled, it appeared that the members of experimental group I (part method) were rated higher on the fundamental swimming skills test than were members of experimental group II.

TABLE 1.

TOTALS AND AVERAGE SCORES OF FUNDAMENTAL SWIMMING SKILLS

	Student	Judge 1					Judge 2					Judge 3					Judge 4					Average
		A	B	C	D	T	A	B	C	D	T	A	B	C	D	T	A	B	C	D	T	
Experimental Group I	2	3	3	3	5	14	3	3	1	3	10	3	3	3	3	12	3	3	3	3	12	12.0
	5	3	1	3	1	8	5	5	5	3	18	3	1	3	3	10	3	5	5	3	16	13.0
	6	3	5	1	3	12	3	5	3	3	14	3	1	3	3	10	5	3	5	5	18	13.5
	7	3	3	3	1	10	3	3	3	1	10	3	3	3	3	12	5	5	3	5	18	12.5
Experimental Group II	1	1	1	3	3	8	5	5	5	3	18	3	1	3	3	10	3	3	3	3	12	12.0
	3	3	1	3	3	10	5	5	5	5	20	3	1	3	3	10	3	3	3	1	10	12.5
	4	1	5	1	5	12	1	1	5	1	8	3	3	1	3	10	5	3	5	3	16	11.5

A. Bobbing C. Back Glide T. Total

B. Back Float D. Sculling and Flutter Kick

Totals and Average Scores of the Elementary Backstroke

Again using the revised numbering system, each student's totals and average scores were calculated.

The data revealed that the subjects in experimental group II (whole method) were rated higher by the judges than were those in experimental group I. One member from experimental group I ranked number two in the elementary backstroke skills test. The remaining students in experimental group I scored much lower, grouping around 6.0. Taking everything into account, experimental group II received better scores than experimental group I on the elementary backstroke skills test.

Rank Order of Two Experimental Groups

Experimental group I scored better on the fundamental swimming skills test but did not rate as high on the elementary backstroke test. Experimental group II scored better on the elementary backstroke skills test but not as well on the fundamental swimming skills test. It would appear then that the subjects in experimental group I learned the parts, but were unable to integrate and coordinate these in the performance of the elementary backstroke.

TABLE 2

TOTALS AND AVERAGE SCORES OF ELEMENTARY BACKSTROKE

	Student	Judge 1 A	Judge 1 B	Judge 1 C	Judge 1 T	Judge 2 A	Judge 2 B	Judge 2 C	Judge 2 T	Judge 3 A	Judge 3 B	Judge 3 C	Judge 3 T	Judge 4 A	Judge 4 B	Judge 4 C	Judge 4 T	Average
Experimental Group I	2	3	1	3	7	3	3	3	9	3	1	1	5	3	1	1	5	6.5
	5	3	3	3	9	5	3	5	13	3	3	3	9	3	3	3	9	10.0
	6	1	1	3	5	3	1	1	5	3	1	3	7	3	1	3	7	6.0
	7	5	1	1	7	1	1	1	3	1	1	1	3	1	1	3	5	4.5
Experimental Group II	1	3	3	3	9	3	3	3	9	3	3	3	9	3	3	3	9	9.0
	3	5	1	3	9	3	1	3	7	3	1	3	7	3	1	3	7	7.5
	4	1	5	3	9	3	5	3	11	3	5	3	11	3	5	3	11	10.5

A. Arms

B. Legs

C. Coordination

T. Total

TABLE 3

RANK ORDER OF TWO EXPERIMENTAL GROUPS

	Subject	A	B
Experimental Group I	2	6	5
	5	2	2
	6	1	6
	7	4	7
Experimental Group II	1	5	3
	3	3	4
	4	7	1

A. Fundamental Swimming Skills

B. Elementary Backstroke

CHAPTER IV

DISCUSSION

The students who participated in this study were from the University of North Dakota's summer program "Upward Bound." The writer was the pool manager for the summer during which this study took place. Therefore, he had a chance to observe the students during their recreational swimming activities in addition to the instructional period. The students swam almost every day. The length of the time they spent in the water varied from day to day.

The students were from rural areas of North Dakota. For some, this was their first visit to a large town and their first time ever to swim in an indoor heated pool. The participants were all very happy and jovial individuals who came to learn some swimming skills.

At the first meeting, the students were put into a beginning swimming or a swimmers category. For most students it was only the second or third meeting with fellow classmates. It was the first meeting with the swimming instructor. The students did not know each other. There was still some fear and apprehension about the "Upward Bound" program. The students did not know what to expect of the swimming program, so there was some hesitation in coming to the classes. The group was fairly large at the beginning of the study. Later it dwindled to approximately ten subjects or less. Lack of interest, plus other activities,

seemed to be reasons for the decrease. The group that remained consisted of the most devoted and dedicated students. These were the individuals with whom an instructor would like to work.

The majority of the subjects did not take the test and were placed in the beginning swimming category automatically. The instructor worked with these people quite often and tried to get them to relax as much as possible. The writer found that a peer would have more patience and persistence to work with these pupils and achieved more success than the instructor. The students worked hard to improve their swimming skills in order to achieve success and therefore to receive peer approval.

The students helped one another through observation of each performance and then constructively criticized and corrected each other's weaknesses. The students strove to improve their beginning swimming skills and their performance of the elementary backstroke. The writer found that peers working with the two pupils who were afraid of the water succeeded better than the instructor could. Through alternate encouragement and persistence the peers succeeded in relaxing the frightened students and therefore proved to be more effective in dealing with frightened beginners. The instructor also noticed that the boys often helped the girls, and that girls occasionally helped the boys as well. A very friendly atmosphere developed among the students. There was a spirit of accomplishment rather than a spirit of competition.

The writer used the whole method with the girls through demonstration of the whole stroke on the deck. The combined stroke was done slowly so that all could see the movement of the parts. No attention

was paid to individual movements. The instructor then proceeded to demonstrate the whole stroke in the water. The students viewed the stroke from all angles. The students then proceeded to swim the stroke back and forth across the pool.

The first problem that the students encountered was their inability to move anywhere. The students considered their hands as their primary source of power while their legs were believed to be only a secondary source. The instructor then explained the procedure of pointing the toes, kicking out and around and clapping the medial borders of the feet together. The writer then stood on the deck of the pool in full view of the students and clapped his hands together while the students did the elementary backstroke across the pool. The clapping aided the students in the development of timing and coordination. At this point, the students seemed to have a great deal of difficulty. They could not understand why the toes had to be pointed out and why the lower leg and ankle were being pulled underneath the buttocks. They were even more confused when the buttocks fell and they assumed a "hammock" type position. But once student number "4" achieved success in the leg stroke, her experience was then passed on to the remainder of the group. Soon most of the students began to improve their leg strokes. At no time were the arms omitted from the practice of the stroke.

The students had problems with the arm stroke since they thought their arms were the prime source of power. The students wanted to fling the arms over the head and pull rapidly and forcefully. Once the insight was envisioned, the students integrated the arms and legs to form a better coordinated elementary backstroke.

The coordination of the stroke was difficult to achieve because most felt it should be a "one-two" movement, that is "pull and kick." Once the students integrated the arm action with the leg stroke, they seemed to understand better such factors as:

1. why the legs should do most of the work
2. why the arms just help the upper body stay afloat
3. why good buoyancy was essential to streamline the stroke.

The instructor asked the students to visualize arms and legs tied together with a string and then to work them as a unit. The writer asked the group to pretend they were marionettes with the arms being attached to the legs by strings. Therefore, each time the arms moved the legs would also have to move. The command was "pull- kick, and then glide." The students seemed to understand this explanation for they proceeded to work on their own and the stroke improved.

The boys were taught using the part method. The boys, as a whole, had poor buoyancy. One reason might be the highly developed lower trunk and legs. The boys were also very tense and very determined to learn the stroke. Because of mechanical inefficiency, often their muscles would work against them rather than for them. At times the students felt discouraged and frustrated because their forward progress was limited.

The instructor demonstrated the leg stroke and then permitted the students to practice the leg stroke in the water. The students held on the overflow trough and were supported by their buddies as they practiced the kick. The pointing of the toes and clapping of the medial sides of the feet together were stressed.

After five minutes of practice, the students were given swimboards and allowed to stroke back and forth across the pool using legs only. The subjects worked diligently. Because they dropped their buttocks, they were unable to do the leg stroke properly as the knees came out of the water. This resulted in decreased effectiveness of the leg stroke. The students returned to the overflow trough and practiced the leg stroke again until an eddying effect could be felt around the legs during the leg stroke. The students then returned to the swim boards.

Once the leg stroke was mastered, the arm stroke was introduced. The difficulties that were encountered seemed to be about the same as those experienced by experimental group II. The boys had a great deal of difficulty coordinating the arms and the legs. They used the arms as the prime source of power and the legs as the secondary source.

The instructor used the same command technique "pull - kick, and then glide" with the boys as had been used with the girls. The boys wanted to use great force to achieve the goal of long distance. Their tenseness seemed to deter rather than aid their efforts. It took longer for experimental group I to coordinate the stroke than it had for experimental group II. Perhaps it was due to the boys' aggressive spirit. The boys wanted to move and were frustrated because of their inability to move. The instructor stressed the fact that relaxation and proper coordination played an important part in their movement through the water.

Whiting[16] stated, " . . . women were superior in floating ability both in the tuck floating after maximum inhalation and during normal

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[16]Whiting, loc. cit.

breathing in the horizontal floating position." The writer would agree with this statement. Through observation, it became apparent the "whole method" group was far superior as "floaters" compared to the "part method" group. The "whole method" group grasped the stroke more rapidly than the "part method" group. The instructor found that buoyancy contributed a great deal to the girls' success and mastery of the stroke. Since this was a voluntary program, the writer felt it was important to keep the students' enthusiasm high in order that they return for the next class session. The instructor would allot some time near the end of the class session for fun activities. These fun activities included canoeing, diving off the deck and playing water polo in the shallow end of the pool.

The writer used a visual approach in teaching the elementary backstroke. Perry[17] felt that a kinesthetic pattern should be used rather than a visual one. She stated:

> How well have teachers applied what is known about motor learning to their teaching methods? . . . Generally, there is no attempt to impart a knowledge of movement. Motor learning takes place through the kinesthetic sense but how many students are aware of this? . . . Instead of aiming at the development of a kinesthetic pattern, the student too often is encouraged to aim at a visual pattern, to look a certain way when he or she performs a skill. Many teachers expect students to reproduce the perfected skill. They indiscriminately call attention to details, and they wonder why their students are tense.

The writer felt that the part method was the best method of instruction when the study began. From the data, it was found in this study that the whole method proved to be better than the part method in teaching beginning swimmers the elementary backstroke. Experimental group I learned the skills but were unable to integrate them into

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[17]Perry, loc. cit.

performance of the elementary backstroke. The instructor was disappointed with the size of the group when it came around to final testing, but that was a problem incurred with a voluntary group.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to compare the "whole method" as against the "part method." The frog kick was used with the "whole method" and the "part method." Boys and girls from the University of North Dakota summer program, "Upward Bound," were used as subjects.

The University of North Dakota Swimming Classification Test was given to those students who were willing to attempt it. As a result of the test each student was classified as a beginning swimmer. During the first three class meetings, the writer taught such beginning swimming skills as breath holding, prone float, prone glide, back float, back glide, jellyfish float and bobbing (rhythmic breathing) in shallow water. Once these skills were mastered, the students were placed into two groups. These groups were classified as the "part method" group and the "whole method" group.

At the end of the program, the students were tested and rated by a group of four experts. The students were rated on a "one, two, three" scale. The guides were as follows:

one - above average performance
two - average performance
three - below average performance

The final test of the fundamentals included bobbing, back float, back glide, sculling, flutter kick. The final test of the study was to evaluate the performance of all subjects performing the elementary

backstroke. This stroke was divided into three components:

1. arm stroke
2. leg stroke
3. coordination of the leg and arm stroke in relation to the total stroke

The students received a total and average score in both the fundamental swimming skills and the elementary backstroke. From the averages the students were put into a rank order of finish. This was done for the fundamental swimming skills and the elementary backstroke.

Conclusions

The following conclusions seem warranted after the analysis of the data:

1. In this study the "whole method" (experimental group II) proved to be better than the "part method" in teaching the elementary backstroke.

2. In this study members of the "whole method" group were ranked one, three and four out of the seven who were post-tested.

Recommendations

The following recommendations were made as a result of this study:

1. A longer study should be made having co-educational, equated groups.

2. A study should be made using the kinesthetic approach as stated by Perry.

3. A study using younger children, around ten years old, would be interesting. Their results could be compared with the older group.

APPENDIX

Judges

Harris, Patrick, Graduate Student, University of North Dakota.

Kotyk, Ted, Recreation Director, Upward Bound, University of North Dakota.

Longmuir, Gordon, Graduate Student, University of North Dakota.

Rosin, Daniel, Graduate Student, University of North Dakota.

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