

SWIMMING AND DIVING PROJECT FOR YOUTH: AQUATIC SKILLS AND THE DEVELOPMENT OF SELF-ESTEEM

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Daniel Frankl

Department of Physical Education, California State University, Los Angeles, CA, USA

Abstract

The purpose of this project was to introduce water safety principles, and teach swimming and diving skills to children-the majority of whom come from low-income families-with the intent of enhancing self-esteem through the mastery of swimming and diving skills. Second, third and fourth graders (N=210) received twenty-one 35-minute swimming lessons at a community swimming center during one school year. Measurements included swimming skills, self-esteem, and selected attitudes toward swimming and diving. Upon completion of the program, the participating classroom teachers were surveyed by an open-ended questionnaire which related attitudes toward the project, and performance of the swimming & diving instructors to the children's classroom performance and academic achievements. Post-test scores for three intact classrooms (N=78) revealed significant improvements in swimming ability for all participants ($t=15.49$, $p<.0001$). The combined group of second and third graders demonstrated increase in self-esteem ($n=47$, $t=3.31$, $p<.002$), as measured on the Battie self-esteem inventory and as reported by the classroom teachers. Based on the available data and the teachers' comments it was concluded that the "prime teaching time" lost to swimming in the morning hours was recovered with a much improved afternoon session. In addition, the participating classroom teachers reported overall improvement in classroom performance and a higher self-esteem in particular.

Keywords: children, swimming & diving skills, attitudes, self-esteem

Zusammenfassung

PROJEKT DES SCHWIMMENS UND WASSERSPRINGENS FÜR DIE JUGENDLICHEN: FERTIGKEITEN UND DIE ENTWICKLUNG VON SELBSTACHTUNG

Der Zweck dieses Projekts war sowohl die Einführung von Wassersicherheitsmaßnahmen, als auch das Lehren von Schwimm- und Wasserspringfertigkeiten bei Kindern, die meistens aus den Familien mit niedrigem Einkommen stammten, mit der Absicht, die Selbstachtung durch Beherrschung von o.a. Fertigkeiten zu erhöhen. In einem Zeitraum von einem Schuljahr haben die Schüler aus der ersten, zweiten und dritten Klasse (N=210) 21 Schwimmunterrichtsstunden in einem Schwimmbad besucht - jede Unterrichtsstunde dauerte 35 Minuten. Das Messen umfaßte Schwimmfertigkeiten, Selbstachtung und die ausgewählten Stellungnahmen zum Schwimmen und Wasserspringen. Nach der Beendigung des Programmes wurden die Lehrer mittels einer offenen Umfrage befragt, ihre Stellungnahmen sowohl zum Projekt, zur Arbeit von Lehrern als auch zur Leistung von Kindern im Unterricht zu äußern. Die Resultate des Tests für drei gesamten Klassen (N=78) haben eine bedeutende Verbesserung von Schwimmfähigkeit bei allen Teilnehmern ($t=15.49$, $p<0.0001$) gezeigt. Die kombinierte Gruppe, die die Schüler aus der zweiten und dritten Klassen umfaßte, zeigte die Erhöhung der Selbstachtung ($n=47$, $t=3.31$, $p<0.002$) in den Tests für die Beurteilung von Kampfbereitschaft und Selbstachtung. Diese Erhöhung war auch in den von den Lehrern geäußerten Meinungen erkennbar. Die uns zur Verfügung stehenden Daten und die Meinungen der Lehrer zeigen, daß die beste Zeit für das Lehren, die morgens verwendet wurde, in Nachmittagsstunden nachgeholt werden konnte. Die Lehrer haben auch die gesamte Verbesserung von Leistungen bemerkt, und besonders die Erhöhung von Selbstachtung.

Schlüsselwörter: Kinder, Schwimm- und Wasserspringfertigkeiten, Stellungnahmen, Selbstachtung

Introduction

The consideration of physical education and sport as an important part of the curriculum in the public schools system (and Southern California, unfortunately, is no exception) has been on the decline for some time (Armstrong, 1984). One reason for the continuous erosion of our discipline's status in the general curriculum is political leaders', administrators' and educators' belief that children, if left alone, are naturally active and will get enough exercise on their own (Hovell, 1978). Another misconception is that recess, and free play can be con-

sidered as a legitimate substitute to formal physical education instruction (Logsdon, Barrett, Ammons, Broer, Halverson, McGee, & Robertson, 1984; Wall & Murray, 1990). The rising levels of obesity in North American children and the low performance scores on fitness tests, however, attest to a different reality (Nieman, 1990; Ross & Pate, 1987). Yet, despite the increase in hours dedicated to the academic program on the expense of physical education and other disciplines, such as the arts and music, there seems to be no improvement in academic performance as demonstrated by national math and reading scores.

Compared to above average and/or high income families, children from low income families, are less likely to be involved in extra curricular activities since such endeavors require a substantial commitment of time and money (Coakley, 1987, 1994; McPherson, Curtis, and Loy, 1989). The limited access to youth sport programs in low income neighborhoods makes the role of the school's physical education curriculum central to their health-related and skill-related fitness preparation and maintenance. Serving as student teacher supervisor I have witnessed, over the last few years, an increase in the number of students per class along with a steady decrease in days and/or number of hours dedicated to weekly elementary and secondary physical education programs.

Out of concern about overemphasis on academics, and insufficient amount of exercise, French physicians and educators in the early 1950s decided to study the effects of a revised curriculum that would include 1 to 2 hours per day (as contrasted with two weekly hours in the regular program) of physical education. As reported by MacKenzie (1974), a number of experiments were set up in 1951 at the Vanes Primary School situated in the southern suburbs of Paris, France, to test the hypothesis that physical education, at the expense of the academic program, will enhance rather than impede academic performance. "By 1960, the results of the experiments more than confirmed the basic hypothesis. Not only were the health, fitness, discipline and enthusiasm superior in the experimental schools, but the academic results surpassed those of the control classes... Similar experiments were then repeated in Brussels and Japan, with similar results (Bailey, 1976, p. 88)."

At the onset of this project, it was hypothesized that at risk children from predominantly low income families, who have limited access to youth sports programs, will greatly benefit from an activity that will provide them with physical exercise and the acquisition of new and unusual skills. The selection of swimming and diving skills, over other activities was done since swimming and diving skills can contribute to drowning accident prevention, and provide the individual with a life long important mode of exercise that can improve and maintain health related physical fitness. Overcoming fear of water and fear of heights, and the acquisition of new and unusual skills can contribute to feelings of competency and thus result in a more positive self-esteem in the project participants. Hopkins and Fleming (1983), for example, reported significant gains in self-esteem in a Melbourne primary school resulting from a ten day swimming program.

Children that possess a higher or more positive self-esteem, according to Weiss (1987), are more likely to interpret success in athletics and/or in school work to be a result of their talents and hard work (i.e., attribute their success to internal, stable and self-controllable reasons). Children with low self-esteem, on the other hand, are more likely to interpret success in terms of "It was too easy" or "I was lucky" (i.e., unstable or uncontrollable factors) (Weiss, McAuley, Ebbeck, & Wiese, 1990).

Finally, the availability of the AAF Rose Bawl Aquatic Center with its professional staff for a minimal price of 50 cents per child per day coupled with an in kind

donation of bussing services by the Pasadena school District and a \$10,000.00 grant by the Wingart Foundation made this project a reality.

The purpose of the swimming and self-esteem project was to (1) introduce water safety principles, (2) teach swimming and diving skills to children-the majority of whom come from low-income families, and have no or very limited access to a swimming pool and swimming and diving instruction,(3) enhance self-esteem and achievement motivation through the mastery of swimming and diving skills, and (4) provide an additional mode of exercise for the development and maintenance of life long health-related fitness. Based on the literature review, it was hypothesized that a program providing swimming and diving instruction to children at risk will (1) achieve gains in swimming and diving skills, (2) boost self-esteem, and (3) enhance motivation and thus contribute to improved academic performance.

Method

Subjects

Second, third and fourth graders (N = 210) attending an elementary school at the Pasadena Unified School District took part in the 1993-1994 swimming and diving project. Approximately 80% of the students participated in the lunch program and some 25% were bilingual and received Spanish service.

Measures

Swimming Ability Measures. The evaluation of swimming skills was in accordance with the Red Cross testing guidelines. A nine point scale ranging from level I, or the equivalent of a non-swimmer, through level IX, or the equivalent of an advanced swimmer, with level VI being the equivalent of a proficient swimmer was utilized to assess swimming progress.

Self-Esteem Measures. James Battle's (1992) Culture-Free Self-Esteem Inventory (CFSEI-2 Form A, grades 2 through 9) contains a total of 60 items under the following subtests:

- General self-esteem (20 items)
- Social/peer related self-esteem (10 items)
- Academic/school-related self-esteem (10 items)
- Parental/home-related self-esteem (10 items)
- Lie/Defensiveness subtest (10 items)

Attitudes Toward Swimming and Pool Activities. Statements (10 items) relating to pool and/or swimming activities that students were asked to complete by checking one of the following three options: "I like it," "I don't know," or "I don't like it." For example, "When we go to the pool...;" "When I wear my bathing suit...;" "When it is time to use the diving board..."

Questionnaire for the Classroom Teachers. An open-ended questionnaire probing issues, such as, student classroom related performance and academic achievement, attitude toward the project, performance of the

AAFRBAC staff, project related activities that took place in the classroom, and overall evaluation of the project.

Procedures

The project's research director instructed the program director at the AAFRBAC in all matters of data collection and provided him with all the necessary forms. The AAFRBAC program director trained his staff and the participating classroom teachers, and supervised both skills testing and self-esteem data collection.

Children participating in the project received twenty one 35 minute swimming lessons at the AAFRBAC during one school year. The program included basic and advanced swimming skills, water games, fundamentals of spring board diving, and lap swimming for health related fitness. Students were bussed in from their elementary school to the AAFRBAC in Pasadena 2-3 times a week. Students left school, swam, and were bussed back to school. While the project was an integral part of the everyday curriculum (no extra time was allocated for it) a little more than one hour of the academic program was missed on pool days. The project was executed by certified swimming and diving instructors employed at the AAFRBAC. The student instructor ratio at the pool was 1 to 6 or 7.

The CFSEI-2 was administered to small groups in grades 2 & 3 with assistance to select individuals, and to the whole class in grade 4. The teachers read the directions aloud as the children read silently. The teachers told the children not to hesitate to ask if they had any questions about what was to be done. The same procedure took place once during the second week of the project and a second time during the last week of the project.

The questionnaire probing general attitudes toward swimming and pool activities was administered along with the self-esteem (on a separate form) questionnaire. Shortly after the conclusion of the project the participating teachers completed and returned the classroom teacher questionnaires.

Data analyses were derived through the Statistical Package for the Social Sciences/Personal Computer enhanced edition (SPSS/PC+ 6.0) (Hedderon, 1991; Norusis, 1990). The critical level for rejection of the null-hypothesis was set at .05. However, exact probabilities are reported when appropriate.

Results

Completed forms and data including pre- and post-test data were returned by only three of the seven participating classroom teachers. The following evaluation and analysis, therefore, discusses the 78 complete or nearly complete available records. Subjects who dropped out before completion, and subjects who joined in late in the program, and had three or more missing test items, were excluded from the data poll.

Swimming Ability

At the project's onset, there were two level 1, six level 2, seven level 3, twenty nine level 4, twenty level 5, one level

7, and five level 8 swimmers. The average pre-swim level for the present sample was 4.26. By the completion of the project there were one level 3, seven level 4, seventeen level 5, twenty one level 6, six level 7, fifteen level 8 and one level 9 swimmers. The average post-swim level was 6.06. A paired samples t-test between pre-and post swimming performance yielded a value of 15.49 with an associated probability of occurrence of .0001. Clearly, participants made substantial gains in their swimming skills throughout the program. No significant sex differences in swimming ability were detected at the pre- and post-program swimming skills evaluations.

Self-Esteem Inventory

A one-way ANOVA comparing pre- program self-esteem scores revealed significant differences between the boys' (n=39) and the girls' (n=38) scores $F(1,76)=4.6472$, $p=.034$. The mean pre-CFSEI score was 35.57 for girls and 39.25 for boys. The sex differences detected on the CFSEI pre-test diminished by the end of the program. The post-CFSEI mean score was 37.80 for girls (n=36) and 39.80 for boys (n=40) $F(1,74)=2.3123$ $p=.1326$. An independent t-test between the present project's post-CFSEI combined score, and Battle's (1992, N=1,679, M=35.37) mean values revealed that our sample's CFSEI mean score was significantly higher (M=38.81, $t = 4.93$, $p=.001$).

Attitudes Toward Swimming and Pool Activities. A t-test for paired samples between students' feelings about the pool and swimming during the second week of the program (M=5.31) and the last week of the program (6.83) revealed a significant positive change in attitude ($t = 3.7$ $p=.001$).

Questionnaire for the Classroom Teachers

In our open-ended questionnaire for the classroom teachers participating in our project, the teacher of the 4th grade group provided the following comments about her group:

- › *This is a gifted and talented cluster class. Fourteen of the students are identified [gifted] and the other 21 are over-achievers. They are all "leader types," and academically talented. The swimming lessons broadened their approach to all areas of the curriculum. They became more mature and self-confident.*

If you had a chance to repeat this program, would you choose to do it? Why?

- › *Yes. I feel the children are learning good skills in a friendly atmosphere. For a few of my children, it introduces them to skills & a sport they have never tackled before.*
- › *Yes. Great carry over into all aspects of curriculum and great growth in self-esteem.*

The differences between the second and third graders' CFSEIs and the fourth graders' CFSEIs became evident as we tallied the CFSEI forms. Rather than analyzing the whole sample as a homogeneous group, which obviously it was not, a second analysis with the second and third graders as one group and the fourth graders as a separate

group was performed.

The swimming skills were essentially the same for both the second and third and fourth graders. The fourth graders' pre-test self-esteem scores, however, were clearly superior when compared to the self-reports by the second and third graders.

Second and Third Graders' Swimming Skills Scores

The younger group of our sample included 49 students (26 girls and 23 boys). The group's pre-test swimming skills mean score was 4.27 (3.96 for girls and 4.63 for boys). The post-test swimming skills mean score was 6.10 (5.72 for girls and 6.54 for boys). No significant differences were detected for pre- or post-test swimming skills between boys and girls. Both sexes, however, demonstrated significant improvements in swimming skills at the completion of the project ($t = 11.51$ $p = .0001$).

Second and Third Graders' Self-Esteem Scores

The second and third graders' pre-test self-esteem mean score was 34.95 (32.73 for girls and 37.47 for boys). The post-test self-esteem mean score was 37.70 (36.04 for girls and 39.43 for boys). Improvement in self-esteem was significant for the group ($t = 3.31$, $p = .002$) by the end of the project. The difference in self-esteem favoring the boys at the pre-test $F(1,47) = 5.29$ $p = .0259$, dissipated by the end of the project $F(1,45) = 4.0069$ $p = .0514$, thus, non-significant at the .05 level.

Fourth Graders' Self-Esteem Scores

The fourth graders' pre-test self-esteem mean score was 41.78 (41.75 for girls and 41.81 for boys). These scores are by any standard very high. The post-test self-esteem mean score was 40.72 (41.33 for girls and 40.29 for boys). A dependent t-test between the pre- and post-CFSEI mean scores showed no significant differences. Students in this special class started with an exceptionally high self-esteem score and maintained that score throughout the program. Mrs. Calvert's fourth graders scored one perfect 50 out of 50, two 49s, three 48s and numerous 47s, 46s, and 45s on the CFSEI. Table 1 on page 4 provides a comparison of CFSEI mean scores for the Linda Vista and other groups of same age children.

Discussion

The swimming for youth project was designed to inculcate water safety awareness and develop swimming and diving skills in predominantly at risk second and third graders. Based on the Hopkins and Fleming (1981) report it was hypothesized that the learning and mastery of new, and for our population unusual skills, will also positively influence self-esteem and contribute to overall school performance. As expected, the professional swimming instruction staff at the AAFRBAC managed to produce impressive results as demonstrated by the documented performance improvements by the 2nd, 3rd, and fourth graders that had complete pre- and post-test swimming records.

Attitudes toward swimming and pool activities improved significantly along with the progress in swimming and diving skills. Liking the pool and swimming may seem to be a natural tendency with children. Our sample, however, was comprised of an unusually high number of boys and girls who were either afraid of the water or too embarrassed to walk on the pool deck in a "Speedo" bathing suit (supplied by the AAFRBAC through a special grant). By the third or fourth week of the project, a vast majority of the children participated fully in pool activities.

The pre-test self-esteem scores revealed an overall intermediate score for our sample according to the Battle (1992) classification of self-esteem scores for the elementary level. The self-esteem score of the entire group was significantly higher than the average self-esteem score of a 1,679 Canadian elementary school children sample (Battle, 1992). Despite the high initial self-esteem scores, still significantly higher scores were demonstrated by the completion of the project.

A second analysis of the data examining swimming and self-esteem scores among the subgroups that comprised our combined sample, revealed no differences in swimming skills performance between subgroup A (2nd & 3rd graders) and subgroup B (4th graders), and between boys' and girls' performance scores.

Self-esteem scores, on the other hand, remained unchanged for the fourth graders (they had a high score initially) and improved significantly for the second and third graders. The gender differences in initial levels of self-esteem in subgroup A diminished by the end of the project. The data trends suggest that the individuals that benefitted most from this exercise were the girls in subgroup A (2nd and 3rd graders).

A possible recommendation would be to seek out the individuals who are at the highest risk level and invest the time and effort in them since they seem to benefit the most from such programs. This idea was presented to the teachers and administrators prior to the initiation of the swimming and self-esteem for youth project, but it did not generate much support. A program that is focusing on individuals would be very hard to administer due to curriculum and logistics conflicts.

Overall teacher comments on the teacher's questionnaire were very positive. Additional information through telephone or personal interviews with the teachers further revealed that children were much more alert and motivated during the "slow" afternoon hours on the days they had swimming in the morning. Thus, the "prime teaching time" lost to swimming in the morning hours was recovered with a much improved afternoon session. The participating classroom teachers reported overall improvement in classroom performance and in self-esteem in particular. The teachers' subjective testimony was further supported by the finding that the 2nd and 3rd graders' scores were significantly higher on the post-test lie/defensiveness subtest items on the CFSEI-2. Thus, the 2nd and 3rd graders were more willing to ascribe to themselves characteristics of a generally valid but socially unacceptable nature. A child that reports that she "always tells the truth," for example, would be considered defensive since not always telling the truth is a common social fault that less defensive individuals may be more

Table 1 T-test for paired samples between the pre-and post-test swimming skills scores for the combined sample

Variable	Number of pairs	Mean	SD
Swimming Skills Pre-test	70	4.26	1.49
Swimming Skills Post-test		6.06	1.39
	t-value 15.49	df 69	2-tail Sig p<.0001

Table 2 Swimming skills progressions: step I - step IX

STEP I

POOL & WATER SAFETY RULES; FACE IN WATER & BLOW 10 BUBBLES WITH FACE IN WATER

STEP II

SUBMERGING HEAD UNDER WATER; OPENING EYES UNDER WATER & PICKING UP OBJECTS FROM BOTTOM OF POOL

STEP III

HOLD BREATH FOR 3 OR MORE SECONDS; FACE DOWN FLOAT; INTRODUCTION TO THE FLUTTER KICK & PRONE GLIDE WITH FLUTTER KICK

STEP IV

UNASSISTED PRONE GLIDE; TIMED FLUTTER KICK; FACE DOWN KICKING WITH SIDE BREATHING; BACK FLOAT

STEP V

ARM STROKES & SIDE BREATHING; INCREASED DURATION FLUTTER KICK

STEP VI

SIDE BREATHING WHILE SWIMMING WITH FULL STROKE; SWIMMING FOR DISTANCE; BACK FLOAT WITH KICKING

STEP VII

STROKE COUNTING WHILE SWIMMING; ELEMENTARY BACK-STROKE; STREAM-LINING FROM WALL & SWIMMING 25 YARDS WITHOUT STOPPING

STEP VIII

THE BACK CRAWL STROKE; PROPPER FLIP-TURN TECHNIQUE

STEP IX

TREADING WATER; WATER POLO GAME RULES; BASIC WATER POLO SKILLS

Table 3 T-test for paired samples between the pre-and post-test self-esteem scores for the combined sample

Variable	Number of pairs	Aritm. sred.	SD	SE
CFSEI-2 pre-test	75	37.4800	7.745	894
CFSEI-2 post-test		38.8133	5.786	668
	t-value 2.11	df 74	2-tail Sig p<.038	

Table 4 A comparison of the cfsei-2 mean scores reported by battle (1992), and the combined cfsei-2 pre-test scores for the 2nd, 3rd, and 4th graders

Battle ¹ 1992.	Combined Group Boys	Combined Group Girls
N = 1,679	N = 39	N = 38
Mean 35.37	39.25	35.57
ONE WAY ANOVA: A comparison of 2nd, 3rd, and 4th GRADERS' PRE-TEST SELF-ESTEEM TOTAL SCORES BY GENDER F(1,76)=4.6472, p = .034		

Table 5 A comparison of the cfsei-2 mean scores reported by battle (1992), and the combined cfsei-2 post-test scores for the 2nd, 3rd, and 4th graders

Battle ¹ 1992.	Combined Group Boys	Combined Group Girls
N = 1,679	N = 40	N = 36
Mean 35.37	39.80	37.80
ONE WAY ANOVA: SWIMMING AND SELF-ESTEEM 2nd 3rd and 4thGRADER'S POST-TEST SELF-ESTEEM TOTAL SCORES BY GENDER F(1,74)=2.3123 p = .13261		

Table 6 A comparison of the cfsei-2 mean scores reported by battle (1992), and the post-test self-esteem scores for the combined group and the 2nd and 3rd graders

Battle ¹ 1992.	Self-Esteem Combined Group	Self-Esteem 2nd and 3rd Grade
N=1,679	76	47
Mean 35.37	38.85	37.70
SD=8.32	5.75	5.99

Table 7 A comparison of the cfsei-2 mean scores reported by battle (1992), and the post-test self-esteem scores for the combined group and the 2nd and 3rd graders

Independent t-tests		
1. Combined Group/ Battle (CFSEI-2 Form A)	t = 4.93	p < .001
1. 2nd and 3rd Graders/ Battle	t = 2.5975	p < .01

Table 8 Form A. Classification of Scores Elementary Level

Score	Classification
46+	Very
41-50	High
26-40	Intermediate
15-25	Low
0-14	Very Low

willing to admit.

While the preliminary findings of this ongoing project are very encouraging, the results of the present study need to be interpreted with caution. Out of a total of

seven classes that included 210 students, proper data was available for this report for only three classes or a total of 78 records (37%).

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