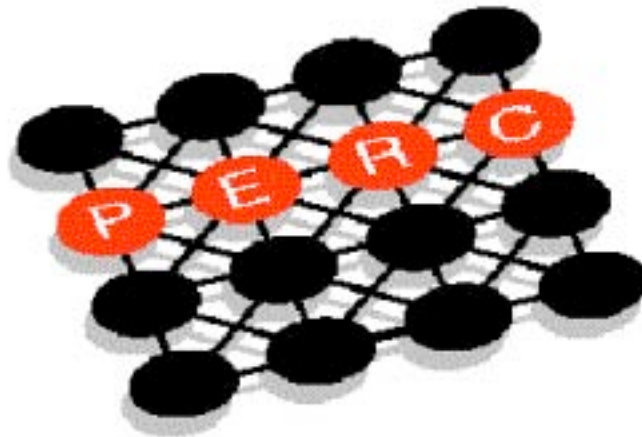


A Study of the Yoga Ed Program at The Accelerated School



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by
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Summary of Findings

This study examined the relationship of yoga instruction in an inner-city school to several significant student outcome variables, including academic performance, discipline, attendance, and students' attitudes about themselves, yoga and school. 405 students, 18 core subject teachers, and yoga instructors in this urban K-8 charter school were involved in the study. The findings were:

- Yoga class participation appears to help students' improve their attitudes toward themselves. Student agreement with self-esteem questions was significantly greater at the end of the year, with a 20% increase in students feeling good about themselves. This was statistically significant ($t=.779$, $n=305$, $p<.001$).
- Yoga class participation helped improve students' behavior. Findings show there exists significant negative correlations between student yoga participation and bad behavior as measured by school discipline referrals for elementary students ($r = -.463$, $p<.01$) and for middle school students ($r = -.367$, $p<.01$). Thus, those students who had high participation rates in yoga class had fewer referrals or discipline problems.
- Yoga class participation helped improve students' physical health. TAS students are significantly more physically fit (23.4% more 5th graders on average were rated fit and 28.5% more 7th graders were rated physically fit) when compared to the school district mean levels of fitness. This is particularly significant given the major role yoga plays in physical education at the school.
- Yoga class participation helped students perform better in school academically. Grades (GPA's) were correlated with yoga participation ($r = .399$, $p<.01$). The correlation is particularly significant in that it suggest students tend to benefit academically by diligently practicing yoga.
- Yoga class participation did not appear to improve students' attitudes toward school nor did it appear to be related to students' attendance levels, which were already high at the school.

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ABSTRACT

This study examines the relationship of yoga instruction in an inner-city school to several significant outcome variables, including academic performance, discipline, attendance, and students' attitudes about themselves, yoga and school. 405 students, 18 core subject teachers and yoga instructors in this K-8 charter urban school were involved in the study. Academic performance, positive student attitudes about themselves, student physical fitness levels, and student behavior were all positively related to students' participation levels in yoga.

INTRODUCTION

This study examines the relationship of yoga instruction in an inner-city school with several significant outcome variables, including students' academic performance, discipline records, attendance records, physical fitness scores and students' attitudes about themselves, yoga and school. All of the 405 students in this K-8 charter urban school were involved with the yoga program, although only grades 3-8 (N=310) completed the pre and post questionnaire on student attitudes. Eighteen core subject teachers also completed questionnaires about yoga instruction's effects on students. School records provided data on student grades, attendance, demographics, and discipline.

While there is a dearth of systematic studies in this area beyond 1980, a few research studies have shown the effectiveness of relaxation (Benson et al, 2000), meditation (Linden, 1973) and yoga (Angus, 1989; Hopkins, 1979) on students' concentration and stress levels, as well as their academic performance. A three-year study conducted by Benson, H. et al (2000) showed middle school students who were exposed to a relaxation response curriculum scored higher on work habits, cooperation, attendance and had significantly higher GPA's than their counterparts. The relaxation response curriculum Benson studied consisted of educating students in identifying personal stressors; learning the physiology of stress; being aware of their body; performing stretching exercises; "mini-relaxations" (i.e., quickly obtaining a relaxation

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response to stress); “mindfulness” training (i.e., developing concentration skills in the activity one is performing and returning concentration to the activity when distractions arise); and having a mental focus to obtain a relaxation response while being passive about any distractions. Relaxation response curriculum closely parallels the yoga curriculum in this study.

Also, the Transcendental Meditation (TM) Program has also been shown to improve perceptual-motor, cognitive and affective functioning. A number of research studies have shown its effectiveness of student’s academic performance. Aron and colleagues (1980) conducted a four-year longitudinal study of undergraduate students in the Transcendental Meditation (TM) program. The purpose was to measure whether the TM program enhanced student intelligence and personality. Results showed an increase on general intelligence for all students. In addition, an increase was seen in the four personality areas – social self-confidence, sociability, general psychological health and social maturity. Similarly, Kember (1985) study showed postgraduate students who took Transcendental Meditation improved in their academics. Janowiak, J.J. and Hackman, R. (1994) also investigated how meditation influenced college students’ stress and personality levels. Data was collected from 62 college students enrolled in health education courses. Randomly assigned, twenty-one students were assigned to two 8-week conditions of meditation and twenty students to a condition of relaxation, and the remaining twenty were the control group. Mantra meditation was taught to the meditation group and a form of yoga relaxation (Shavasana) was taught to the relaxation group. T-test results show post-test scores were higher than pre-test scores for the three groups; however, test scores were only significant for the relaxation group. In addition, a significant correlation was found for both groups, the meditation and relaxation group, between changes in stress ratings and compliance total scores, specifically those with greater compliance to meditation/relaxation showed a decrease in their stress level. Linden (1973) found that 3rd grade students who practiced meditation showed reduced anxiety when taking tests.

In summary, research has tended to focus on adults in the areas of meditation and relaxation – and mostly during the 1970’s and 1980’s. Few recent studies exist on the

impact of yoga on elementary, middle and high school students, and these demonstrated improvements in motor performance (Telles, 1993; Hopkins & Hopkins, 1979).

PURPOSE

The purpose of this current research study was to determine if Yoga Ed classes (yoga classes and practice) helped elementary and middle school students' improve their attitudes towards themselves and school, as well as their emotional and physical health. The study also examines the correlation between participation in yoga and students' academic performance, behavior and attendance. The main research questions in this study were:

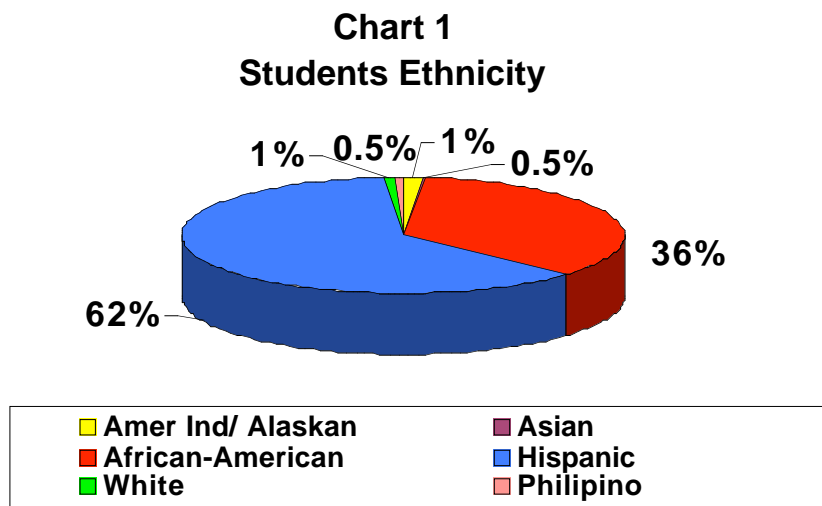
1. Does yoga class participation help students' improve their attitudes toward themselves?
2. Does yoga class participation help students' improve their attitudes toward school?
3. Does yoga class participation help improve students' behavior?
4. Does yoga class participation improve students' physical health?
5. Does yoga class participation help students perform better in school academically?
6. Does yoga class participation improve students' attendance?

METHODOLOGY

The study was conducted during the 2002-2003 academic year at a public charter school in a large urban district - the Los Angeles Unified School District. Yoga Ed, the formal title of the curriculum, began in 1998 and is funded by private donations. The yoga program was founded by Tara Lynda Guber and directed by Leah Kalish (2001). Several additional yoga instructors assisted the director. The method of instruction was based on the Yoga Ed curriculum. Elementary grade children received instruction 60 minutes per week and middle school students 120 minutes per week throughout the year the program.

Subjects

The subjects in this study were 405 kindergarten - 8th grade students, and the 18 core subject teachers from The Accelerated School (TAS). TAS is a charter school located in South Central Los Angeles. Chart 1 illustrates the school’s student body which is predominantly represented by two ethnic groups: 62% Hispanic and 36% African-American. While teacher ethnicity was not readily available, based on the researchers long-standing relationship and familiarity with the school, the majority of core subject teachers are minority (African American and Hispanic).



Procedures

The mission of the Yoga Ed program is “to inspire, educate, facilitate and support children in developing physical health, emotional intelligence and self-awareness through the experiential and transformational practices and tools of yoga” (Kalish, L. and Guber, T., 2001). Inclusive of elementary and middle school students, the program curriculum was divided into three developmental levels: Kindergarten – 2nd, 3rd – 5th and 6th – 8th grades shown in Table 1 below.

Table 1
Yoga Ed Program Curriculum

Grade(s)	Focus
Kindergarten – 2 nd	<i>Physical awareness and skills:</i> body and kinesthetic sense, spatial and environmental awareness, movement coordination, attention span, awareness of breath, strength, flexibility, balance, coordination, grace.
3 rd – 5 th	<i>Mental/Emotional awareness and skills:</i> focus/attention, emotional awareness and intelligence, impact of thoughts and choices, movement skills, attention to breathe, thoughts and behavior.
6 th – 8 th	<i>Self/Community/Universal awareness:</i> individuation/intention, values, goals, problem solving, teamwork, self-expression through movement, control of breath, thoughts and behavior.

During the 2002-2003 academic year, yoga teachers used a rubric to assess overall student effort, motivation and improvement, which was labeled “participation”, and a second rubric for student classroom behavior labeled “discipline”. They graded students at the conclusion of three different units (semesters) of study during the beginning, middle, and end of the school year. A two-page pretest and posttest questionnaire on yoga was also completed by students at the beginning and end of the school year as well. The questionnaire was designed to obtain information on the impact of the yoga program on students’ physical and emotional health as well as school performance. Specific questions were asked about the helpfulness of yoga on stress, anger, sleep, concentration, sadness, balance, self-control, confidence, tests, homework, pain, health and doing well in school. In addition, all 18 teachers from the school who taught the core subjects completed a questionnaire about the Yoga Ed programs at the school. The questions focused on their perceptions about yoga’s impact on students. Teachers graded students on participation level in yoga and discipline in class three times following the school’s grading cycle.

Student participation and classroom discipline ratings (grades) were collected from five yoga teachers at the end of the school year (June 2003). Pre and post-test data on the yoga questionnaire were collected from 310 students. Additional data collected

from student records were: date of birth, ethnicity, grade level, attendance, discipline referrals, suspensions, grade point averages (GPA's), Stanford Achievement Test (SAT 9) scores for the 2002-2003 school year, as well as physical fitness scores from the California Department of Education website. While GPA's were collected for grades 6th – 8th, grades for the elementary students were inaccessible due to school reconstruction at the time data collection was taking place.

The variables of greatest interest in this study were student outcome variables including grades (GPA's), attendance, discipline referrals, standardized test scores, physical fitness scores and attitudes about self, school, health, and diet. Independent variables included demographics such as gender, grade level, and ethnicity, as well as yoga “participation” grades and “discipline” grades.

Descriptive statistics, correlations, and analysis of variance were computed to analyze the data. Specifically, correlations were conducted for the following:



Students stretching in yoga class.

- Yoga participation and yoga class discipline “grades” or ratings by teachers of the students were correlated with:
 - Attendance, school discipline referrals, suspensions, gender, grade levels, ethnicity and grades (GPA's).

Limitations of the Study

A potential limitation of this study is the nature of correlation analysis. Much of the research conducted in this study was based on correlations between key variables. Thus, a potential limitation of the study is that of causal attribution. While “participation grades” in yoga are significantly correlated or related to several desirable outcomes in the school, it is not clear that the yoga participation caused students to perform better in schools. An alternative explanation for the results might be that there were other factors

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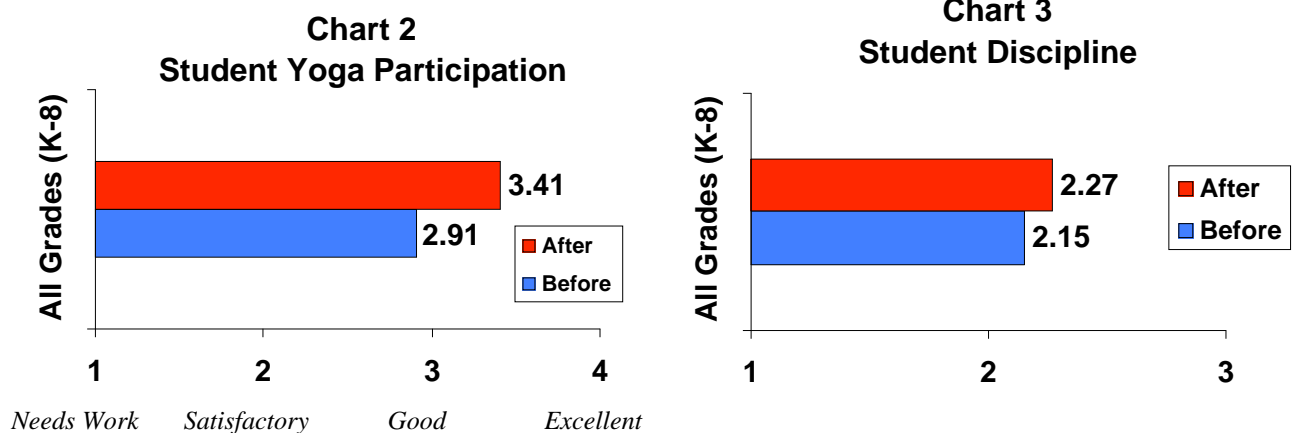
that may have contributed to the positive results. Perhaps highly motivated students were also motivated to participate more intensely in the Yoga Ed. classes, and that motivation is the root cause of the high performance levels in the variables of interest. Nevertheless, the supportive data from multiple sources suggests there is much more than spurious correlations at work here.

RESULTS

Records were examined for 252 elementary and 153 junior high school students, totaling 405 students. 18 core teachers completed surveys and 5 yoga instructors also participated by grading the students on “participation” and “discipline” in yoga class.

Student Participation & Discipline Grades

The student yoga participation ratings increased for *all* grade levels, ranging from an increase of 0.11 to 1.26 points on a four-point scale, as illustrated in Chart 2 below. Yoga teachers assessed students’ participation in yoga using a scale from 1 (‘needs work’) to 4 (‘excellent’), and students’ classroom discipline using a scale from 1 (‘frequent reminders’) to 3 (‘rare to never needs reminders’). This was done at the beginning, middle and end of the school year. Classroom discipline scores also improved from a mean score of 2.15 to 2.27, as shown in Chart 3 below.



Yoga Participation Grades

Students' yoga participation and discipline "grades" were correlated with gender, attendance, school discipline referrals, suspensions, grade level and school wide grade point averages (GPA's) for both elementary and middle school students.

Elementary School Level

Findings show there exists a significant negative correlation ($r = -.463, p < .01$) between student yoga participation and bad behavior as measured by discipline referrals for elementary students. Thus, those students who had high participation rates in yoga class had fewer referrals or discipline problems. Also, a positive correlation ($r = .293, p < .01$) was found for gender, showing girls' participation grades were higher in yoga class than boys' grades. None of the other variables mentioned above had a statistically significant relationship (correlation) with yoga participation grades.

Middle School Level

Findings for middle school students showed significant correlations as well. Again, a significant negative correlation was found between yoga participation and bad behavior as measured by discipline referrals ($r = -.367, p < .01$). (The scale used by the yoga teachers was reverse scored – high values meant fewer problems.) Three other variables were significantly correlated with yoga participation: gender ($r = .439, p = .01$), grade level ($r = .463, p < .01$) and GPA ($r = .399, p < .01$). Each of these correlations with participation in yoga class was statistically significant.

The last correlation is particularly significant in that it suggest students tend to benefit academically by diligently practicing yoga. Also, students who perform well and take yoga seriously tend to have fewer discipline problems in school.

Yoga Class Discipline Grades

Elementary School Level

As expected, a strong correlation was also found between yoga class discipline "grades" (which was reverse scored) and discipline referrals from the school ($r = -.543, p < .01$). Again, gender played a role ($r = .297, p < .01$) for elementary students.

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Middle School Level

One negative correlation was present between yoga classroom discipline and grade level for the middle school students ($r = -.347, p < .01$). Positive correlations found for middle school students were gender ($r = .347, p < .01$) and GPA's ($r = .463, p < .01$). The latter is particularly significant in that it suggests that yoga may play a role in student academic performance.

VARIABLES	Elementary School		Middle School
Attendance	171 days		171 days
Discipline (Referrals)	2		2
Suspensions	0		--
Grade Point Average (GPA)	--		2.78

Note: The maximum possible days were 175.

Yoga Program Student Survey

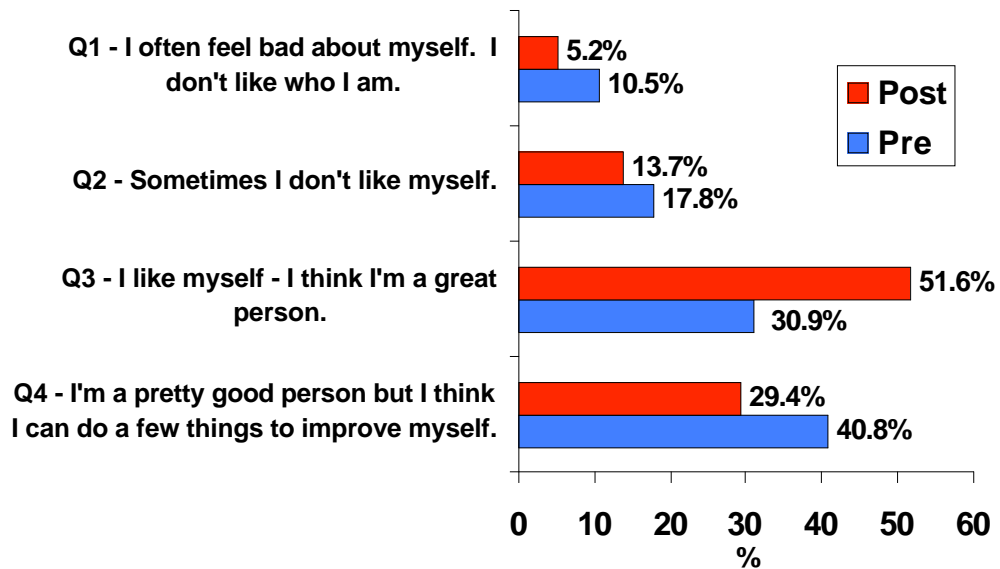
A total of 310 students completed the yoga questionnaire (152 pre and 158 post). Student grade levels ranged from 3rd to 8th grade.

When asked how they felt about themselves in comparison to other students, there was a small statistical significant change from the pre and posttest scores ($t = .153, p < .01$). Virtually none of the other questions demonstrated significant growth or change from pre to posttest. We suspect that the wording of the response set (yes or no) on questions to students (about the effects of yoga on aspects of their schooling) was partly to blame. Perhaps a likert scale with more than two scale points would have added precision. Also, another explanation for the lack of measurable change over time was the fact that almost all students in the study had been taking yoga classes for two or more years and the entire pre-post questionnaire only measured one year's (9 months) change in attitudes about yoga's influence.

However, students overall constructive views about themselves did increase and negative self perceptions decreased, as illustrated in Chart 4 below. This was statistically significant ($t = .779, n = 305, p < .001$). Student agreement with self-esteem question 3 ("I

like myself – I think I’m a great person”) was significantly greater at the end of the year, with a 20% increase in students agreeing with this statement.

Chart 4
Students' Overall Feeling About Self



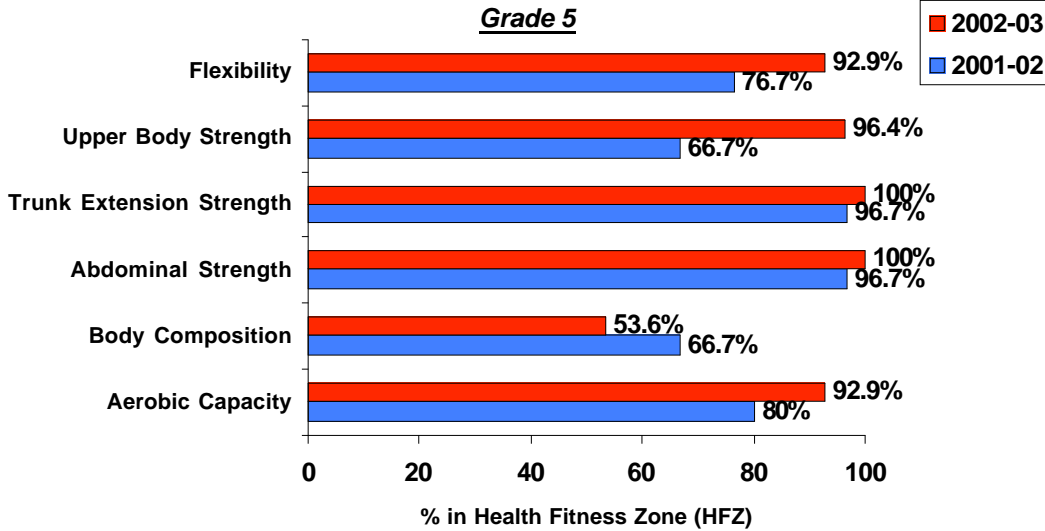
Physical Fitness Test Results

Yearly, students in the local school district are required to take the state Physical Fitness Test. This test examines students’ physical fitness performance and determines whether they fall under the “Health Fitness Zone”. Performance is classified into two general areas: “in healthy fitness zone (HFZ)” and “needs improvement.” Students are assessed using the Fitnessgram Standards for Healthy Fitness Zone. The physical fitness tasks that are measured are aerobic capacity (pacer, one mile walk/run, walk test); body composition (percent fat and body mass index); abdominal strength (curl ups); trunk extension strength (trunk lift); upper body strength (push-ups, pull-ups, flexed arm hang) and flexibility (back saver sit and reach, shoulder stretch).

TAS students’ Physical Fitness test scores were obtained from the California Department of Education website (2002-2003) to provide data related to the research question of yoga helping improve students’ physical health. Clearly from Charts 5 and 6 below, one sees measurable gains in several dimensions of health fitness at both the elementary and middle school level. Because yoga is such a large part of the physical education program at The Accelerated School, and given the lack of playground space

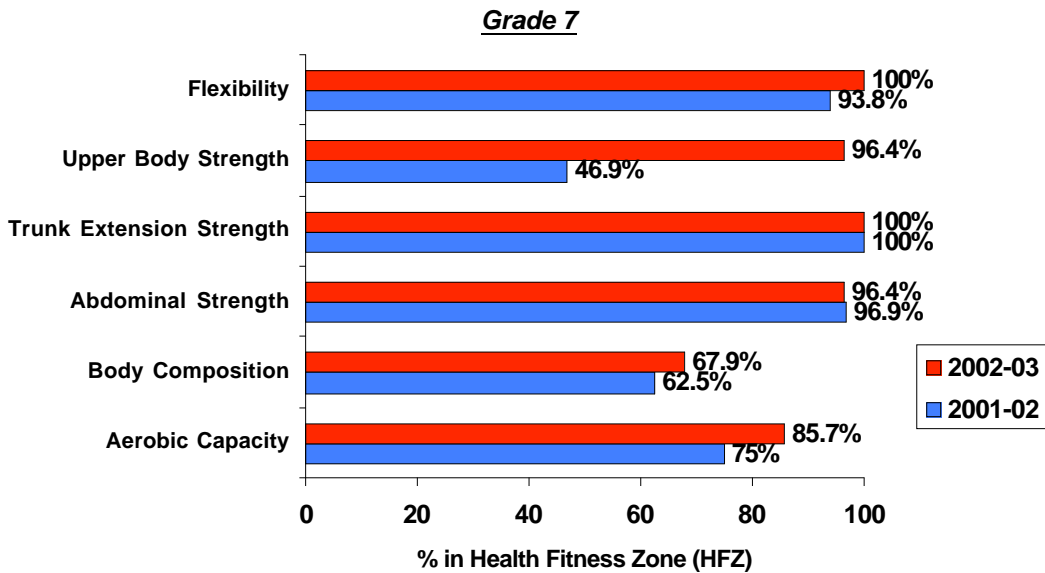
and lack of a gymnasium for traditional sports at this charter school, it is reasonable to expect the yoga program was a dominant factor in the students health and fitness levels. In particular, significant gains were noted in “flexibility”, “upper body strength”, and “aerobic capacity” – all related to yoga activities such as stretching, breathing, etc.

Chart 5
California Physical Fitness Report for TAS
2001/02 vs. 2002/03



Source: California Department of Education website

Chart 6
California Physical Fitness Report for TAS
2001/02 vs. 2002/03



Source: California Department of Education website

To put the schools levels fitness in perspective, TAS students’ scores for these two grades (5th and 7th) were compared with average scores of students in the entire school district – the Los Angeles Unified School District, or second largest district in the country. As can be seen from Table 3 below, TAS students are significantly more physically fit (23.4% more 5th graders on average were rated fit and 28.5% more 7th graders were rated physically fit) when compared to the school district mean levels of fitness. This is particularly significant given the major role yoga plays in physical education at the school.

Table #
The Accelerated School vs. Los Angeles Unified School District
Physical Fitness Test Scores for Grades 5 & 7

<u>FITNESS TASK</u>	Grade 5			Grade 7		
	TAS	LAUSD	□TAS	TAS	LAUSD	□TAS
Aerobic Capacity	92.9%	52.8%	40.1%	85.7%	48.5%	37.2%
Body Composition	53.6%	60.2%	-6.6%	67.9%	58.6%	9.3%
Abdominal Strength	100.0%	76.3%	23.7%	96.4%	71.0%	25.4%
Trunk Extension Strength	100.0%	82.8%	17.2%	100.0%	79.0%	21%
Upper Body Strength	96.4%	61.2%	35.2%	96.4%	56.2%	40.2%
Flexibility	92.9%	61.9%	31.0%	100.0%	62.4%	37.6%
AVERAGE	89.3%	65.9%	23.4%	91.1%	62.6%	28.5%

Note: N for district scores is N₅=56,320 and N₇=54,419.



TAS students’ doing abdominal exercises in Yoga class.

Teacher Survey

Eighteen (18) core teachers completed a 4-page survey on the TAS supplemental programs, which included a section on the yoga program. Of these, only half (50%) felt they had have been directly involved in the yoga program. As illustrated in Chart 7 below, two areas core teachers (not yoga teachers) felt yoga changed students behavior was “being able to deal with stress” and (positive) “attitude toward their own bodies”.

Chart 7
How Strongly Do You Think Yoga Influences Students...



Discussion

Findings in this study show the positive effects that yoga has on students' personal and academic life. There were six main research questions address in this study:

1. *Does yoga class participation help students' improve their attitudes toward themselves?*

Apparently yoga does aid in raising students self-esteem. Both gains on the pre and post test of students reflect this, as did the core teachers' perceptions on the survey they completed. Higher levels of participation in yoga class were related to higher levels of self-esteem, based on two separated data sources - student and teacher questionnaires.

2. *Does yoga class participation help students' improve their attitudes toward school?*

There was no significant change in students' attitudes toward school in this study.

3. *Does yoga class participation help improve students' behavior?*

Yes, there was a significant negative correlation between yoga participation scores and negative behavior as measured by school discipline referrals. In fact, negative correlations were found when yoga participation grades and discipline referrals were correlated, both at the elementary and middle school levels. Put another way, yoga appears to be positively related to good behavior in school (the lack of discipline referrals). Thus, those students who had high participation grades had fewer behavior problems.

4. *Does yoga class participation improve students' physical health?*

Yes, student scores on the statewide Physical Fitness Test improved significantly in the two-year period. State physical fitness test scores demonstrate significant gains in TAS students "flexibility", "upper body strength" and "aerobic capacity" - a gain of 9% for elementary students and 12% for middle school students between the 2001/02 and 2002/03.

Also, student fitness levels were dramatically better than the average levels of fitness of students throughout the school district. Also, the core subject teachers in the school felt that the Yoga Ed classes improved students' ability to deal with stress and it positively influenced their attitudes toward their bodies. Given these findings and the central role Yoga Ed plays in the school, it is fair to say yoga has been shown to improve students' physical health.

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5. *Does yoga class participation help students perform better in school academically?*

Students' grade points averages (GPA's) at the middle school level show a statistically significant positive correlation with yoga participation grades. Elementary grades, however, were not available for this study.

6. *Does yoga class participation improve students' attendance?*

No relationship was found between yoga participation grades and student attendance. This may be because student attendance levels at this charter school were already very high at approximately 97-98% average daily attendance.

In conclusion, the preponderance of evidence shows the yoga is clearly related to desirable school outcomes. Further research with control groups should be carried out to replicate these findings while controlling for student motivation and other possible causal factors. Such studies could reaffirm the many positive findings here while eliminating alternative explanations. Also, research on high school students should be conducted as this study focus on students in grades ranging from Kindergarten to 8th grade.

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