

# Yoga in Public Schools: Evidence from the Encinitas Union School District's Yoga Program 2012-2013

January 30, 2014



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This study was conducted by the Center for Education Policy and Law (CEPAL), a research entity operating under the auspices of the School of Leadership and Education Sciences and the School of Law at the University of San Diego. Established by a grant from the William D. Lynch Foundation in 2007, CEPAL's mission is to foster better linkage between educational research, policymaking, and practice. To this end, CEPAL undertakes empirical and legal research on educational policy issues, enhances communication between education leaders and state-level policymakers, and facilitates understanding among USD law students and education graduate students about the policymaking process through courses, internships, and research opportunities. Additional information about CEPAL is available at [www.sandiego.edu/cepal](http://www.sandiego.edu/cepal).

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This study documents the potential student and community effects of the first year of the Encinitas Union School District's Yoga Program. This program is the first district wide yoga program to offer all K-6<sup>th</sup> grade students weekly access to yoga during the traditional school day. This mixed-methodological study incorporated yoga instructor, teacher, principal, district leader and parent interviews with stakeholder surveys, and student biometric data, and various school-based indicators. Although limitations related to concurrent program implementation and research as well as low response rates compromised the original design, promising findings about student wellness, behavior, and school-based outcomes are detailed within.

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## Executive Summary

The Encinitas Union School District (EUSD) serves the city of Encinitas and the south Carlsbad region of North San Diego County. Nine elementary schools enroll approximately 5,500 K-6<sup>th</sup> grade students. The EUSD yoga program came to be through the support of the Sonima Foundation<sup>1</sup> and EUSD's intent to build its health and wellness program. This three-year partnership ensures all EUSD K-6<sup>th</sup> grade students participate regularly in yoga. EUSD partnered with the Center for Education Policy and Law (CEPAL) at the University of San Diego to capitalize on this opportunity to learn about the effects of yoga in schools.

The EUSD Yoga and Wellness program is the first instructional-day-embedded, district-led, K-6<sup>th</sup> grade yoga program in the country. Year one of the three-year study was an opportunity for school, district and external personnel to focus on the effectiveness of the program's implementation and begin learning about the yoga program's impact on the EUSD students. This report provides findings related to program's impact on EUSD students and the response of the EUSD community.

During the 2012-13 school year, researchers engaged in qualitative and quantitative research to understand how EUSD yoga is impacting students. Students, parents, and teachers completed surveys, principals and district leaders were interviewed, parents, teachers, and yoga instructors took part in focus groups, and observations of yoga instruction occurred to collectively understand how students were being impacted by EUSD yoga. Preliminary findings from year one include:

- EUSD students “like” EUSD yoga, and stakeholders value it as part of the school day.
- Girls “like” yoga more than boys; younger students “like” yoga more than older students.
- Students who are less fit like yoga more than those who are more fit
- Fifth grade EUSD students who participated in a year of yoga passed two Fitnessgram activities (Flexibility and Trunk Exterior Strength & Flexibility) at higher rates than their peers who did yoga for only half of the school year. Further, those in half-year yoga passed the Upper Body Strength Fitnessgram activity more frequently than their all-year yoga peers.
- Although stakeholders report yoga is improving student behavior, academic performance, and emotional wellness, student results do not corroborate all these sentiments
- Stakeholders generally affirm yoga has taught students important skills to handle stress and remain calm when challenging situations arise.
- Parents and school personnel report students are generalizing yoga outside of the yoga classroom in a number of ways.

Preliminary findings from the first year of EUSD's yoga program contribute to the field of yoga in schools research identifying areas of interest to further explore. In year two of this work major steps have been taken to improve data quality with the intent to draw more definitive conclusions about this area of study. Specifically, a Theory of Action for year two hypothesizes that yoga influences students' ability to self-regulate, which in turn, affects various school-based outcomes. Year two findings will be available in the fall of 2014.

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<sup>1</sup> Formerly the Jois Foundation.

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Just as yoga is gaining popularity among adults throughout the United States, youth yoga programs and activities are beginning to gain prevalence as well. Private organizations and extracurricular programs are introducing the practice of yoga to children of all ages, many of them in fun and engaging ways. Programs may differ in their methods and philosophy, but all are designed to support the health and wellness of children through the practice of yoga.

Prior to 2012-13 school year, other schools and districts offered 'opt in' yoga programs outside the instructional day but Encinitas Union School District's (EUSD) yoga program is different. It is the first instructional-day-embedded, district-led K-6<sup>th</sup> grade yoga program in the country. Year one of a three-year study was an opportunity for school, district and external personnel to focus on the effectiveness of the program's implementation and begin learning about its impact on the EUSD community. This report provides preliminary findings related to the program's impact on student fitness, behavior, wellness and their reaction to yoga. This and the companion report<sup>2</sup> on the implantation of EUSD yoga may prove helpful to other schools and districts interested in adopting yoga in their school communities.

## Overview of EUSD's Yoga Program and Partnerships

EUSD serves the city of Encinitas and the south Carlsbad region of North San Diego County. Nine elementary schools enroll approximately 5,500 K-6<sup>th</sup> grade students. The student population is approximately 20% Hispanic, 70% Caucasian, and 10% other minorities. Four of the nine EUSD schools qualify to receive Title I funding to support their English learners and/or students from low-income families. All EUSD schools have earned the California Distinguished School Award and four schools are National Blue Ribbon Schools.

EUSD is committed to engaging all students and connecting learners through purpose, passion, and empowerment. The district's leadership has implemented a number of programs and initiatives that exemplify this commitment, including the development of their Health and Wellness Program aimed to support the physical and mental wellness of children through a variety of interconnected activities. The first health and wellness component that was systematically introduced in September of 2012 to EUSD schools was the yoga program.

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<sup>2</sup> Center for Education Policy and Law (2013). *Implementing yoga in public schools: Evidence from the Encinitas Union School District's pilot yoga program 2012-2013*. San Diego, CA: University of San Diego.

The EUSD yoga program came to be through the support of the Sonima Foundation<sup>3</sup> and EUSD's intent to build its Health and Wellness Program. As a result of this partnership, all K-6<sup>th</sup> grade students in EUSD had the opportunity to participate in yoga at least once a week. EUSD partnered with the Center for Education Policy and Law (CEPAL) at the University of San Diego to capitalize on this opportunity to learn about the effects of yoga in schools.

## Report Focus

Findings highlighting the student effects of year one of the EUSD yoga program are provided in this report. While collecting data to study the effects of the yoga program, CEPAL's research team also collected data specifically related to the district's implementation challenges and their resolutions. Details related to EUSD yoga's implementation are contained in a separate report (CEPAL, 2013). Key findings from that report include:

- Establish open communication with community stakeholders prior to the implementation of the yoga program.
- Plans for the implementation of a new yoga program should be well thought-out and thoroughly reviewed.
- Adopt a district policy that sets a minimum amount of yoga time for each grade level.
- Yoga should occur in an environment that facilitates practice and avoids distractions.
- Work expectations of yoga instructors should be articulated prior to the start of their contract. Their schedules should consider the physical, emotional and temporal demands of teaching yoga to large groups of youths.
- Districts should take instructional pedagogy and available time into consideration when designing their yoga program.
- Policy on the connection between yoga and PE should be documented and communicated to school and district personnel.
- A district wide opt-out policy should be articulated.

## Methodology

The EUSD yoga implementation process differed at each of the nine EUSD schools. These differences along with the limitations detailed below including the cumulative impact of low initial response rates, varied yoga participation and randomization challenges between the two groups of schools compromised the Randomized Control Trial (RCT) design that was initially proposed. Because of this compromise the level of rigor commonly associated with an RCT could not be achieved. Thus, it would be irresponsible to assert causal inferences related to yoga participation.

## Research Design

During the 2012-13 school year, researchers engaged in a mixed-methodological research design to understand how EUSD yoga is impacting students. In September of 2012, CEPAL's research team attempted a Randomized Control Trial (RCT) design delaying the start of yoga at four of the nine schools

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<sup>3</sup> Formerly the Jois Foundation.

until January of 2013. This RCT model resulted in two groups of schools differing in the amount of time their students participated in yoga. The five schools in the *all year yoga* group began yoga in October of 2013 and completed ten weeks of yoga instruction before the four *half-year yoga* schools began yoga. This approach offered the potential to study differences among students of similar backgrounds who were and were not exposed to yoga. EUSD collected two different types of data from all nine of its elementary schools for this study. *Active* data collection includes information specifically collected for the purposes of this study while *passive* data includes student data drawn from existing district sources.

### Active Data Collection

**District administrators.** Individual interviews were conducted with members of the district's administration team to understand the leadership's decision-making process to begin yoga, their perspective about the progress of the EUSD yoga program and its impact on student's health, wellness, and academic success.

**School principals.** Individual interviews were conducted with each *all year yoga* school principal three months after the onset of the yoga program. Questions addressed school-specific implementation matters such as scheduling, community buy-in, yoga instructor satisfaction, and their programmatic perspective as school leader.

**Classroom teachers.** Over the course of the 2012-13 school year EUSD teachers were asked to complete four short electronic surveys that investigated the behavior and academic engagement of their students. Three of the surveys were administered to teachers during the months of October, November, and December of 2012. The fourth survey was given at the end of the academic year in June of 2013. All four surveys were identical except for an open-ended question added to the second, third and fourth surveys and three retrospective questions added to the last survey. Each survey consisted of 11 core questions – six that examined student behavior and five that measured academic engagement. There were three response types on the survey, including: 1) a five-point Likert scale; 2) simple numeric responses and 3) an open-ended response. The surveys were administered to all EUSD teachers.

Teacher focus group participants were randomly selected from four strategically selected EUSD schools. The schools were selected based on their representativeness of EUSD as a whole and their school community culture. In the focus groups teachers were asked about their perception of the yoga program, their students' experiences, perceived changes in student behavior, as well as successes and challenges encountered during the program's first year.

**Yoga instructors.** Four focus group interviews were conducted with yoga instructors; two involved those in the *all year yoga* schools, and two involved instructors from *half-year yoga* schools. Instructors were asked to share their school-specific experiences with the program and their personal experiences as EUSD yoga instructors. Additionally, all yoga instructors recorded themselves teaching yoga with differing grades throughout the year. Observations of all yoga classes also took place throughout the school year in order to document differences in their delivery of yoga curriculum.

**Parents.** Parents of students in EUSD were electronically surveyed at the beginning, middle and end of the 2012-13 school year. All surveys featured six Likert-style questions focused on how EUSD children felt about school, and also asked about the foods they consumed on a typical school day. The third survey added four additional Likert-style questions that asked parents about their overall impressions of the Health and Wellness Program, and dropped the foods consumed on a typical school day question. All three of the surveys also included an open-ended question that allowed parents to add anything they felt appropriate. As was the case with teachers and students, the surveys were administered to all parents of students in EUSD.

Additionally, randomly selected parents at three strategically selected schools participated in school-based focus group interviews. EUSD principals collaborated with the research team to identify school communities representative of the EUSD population. District employees invited parents to participate in one of three focus groups: English only, Spanish only, and English with translation support. Focus group questions were designed to understand community and school-specific matters related to program implementation and its impact on the participants' sons or daughters.

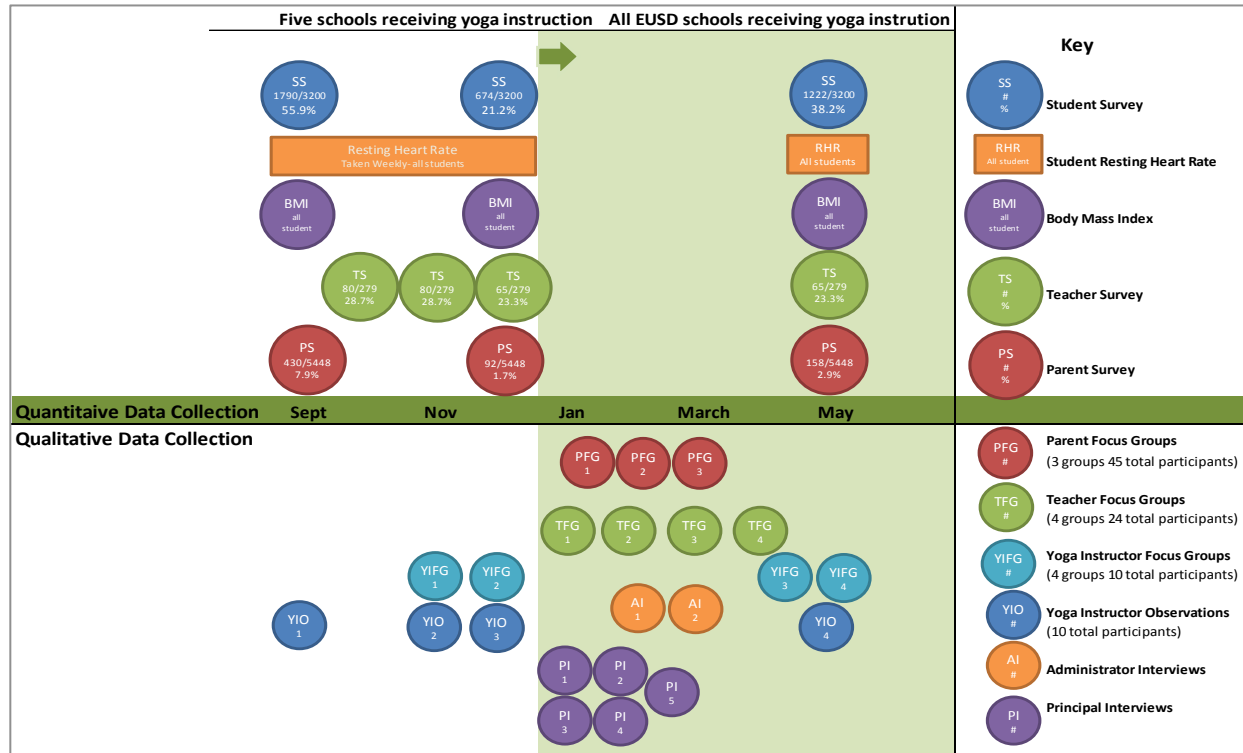
**Students.** Students in grades 3-6 were asked during the 2012-13 school year to complete three short surveys on their iPads that investigated their feelings of belonging, trying, and bullying. The three surveys were administered at the beginning, middle, and end of the school year. All three were identical except for a closed-ended question on survey three that asked retrospectively about their experience with yoga and an open-ended question on surveys two and three that allowed students to add anything they felt appropriate. Each survey consisted of ten core questions; four that examined the extent to which students felt they belonged at school (belonging), two that examined how hard they were trying at school (trying), and four that involved the extent to which they were bullied or were bullying others at school (bullying). The questions that measured belonging and trying used a four-point Likert scale (ranging from strongly disagree to strongly agree), while the four bullying questions asked students to simply select the numerical choice that best represented the number of times that a particular event occurred. The three response choices for the retrospective question on the last survey ranged from *not liking it* to *liking it a lot*. As previously noted all students in grades 3-6 were invited to complete surveys, including those in *all year yoga* and *half-year yoga* schools.

Additionally, all EUSD students were weighed and measured three times over the school year in order to calculate their Body Mass Index (BMI). Resting heart rates were taken concurrently with height and weight and also recorded weekly for all students during the first ten weeks of the program. A final heart rate measurement was taken at the end of the school year. Finally, student observations were conducted at all schools to observe the level of student engagement during yoga class.

In total, data were collected in 37 instances over the course of the 2012-2013 school year. Figure 1 (following page) displays each instance of data collection and organizes them into a quantitative (top half) and a qualitative group (bottom half) along the academic year's timeline (in green). The timeline also notes the point in the year, January, when all schools began participating in yoga.



Figure 1: 2012-13 EUSD Data Collection Timeline



**Passive Data Collection**

While data were actively collected for the purpose of this study, passive data were also collected by EUSD in compliance with state and local mandates. EUSD data from all nine schools were shared with the research team and are outlined below:

**Attendance.** To compare student absences within schools as well as between EUSD schools, the number of days students were absent in three key time periods during the school year was converted into percentages by dividing the sum of three types of absences –excused absences, unexcused absences, and suspended absences – by the number of school days in the time period. Specifically, these periods were the pre-yoga period (8/20/12 – 9/21/12) with 23 school days, the intervention period (9/24/12 – 12/21/12) with 50 school days, and the 106 school days when all nine schools were receiving yoga (1/7/13 – 6/21/13). These three time periods are referred to as *pre-yoga intervention*, *yoga intervention*, and *all school yoga*.

**Fitnessgram Assessment.** The Fitnessgram<sup>4</sup> is California’s annual physical fitness assessment administered to all students in grades five, seven, and nine. Students complete a series of performance exercises that fit into six categories: Aerobic Capacity, Abdominal Strength and Endurance, Upper Body

<sup>4</sup> See <http://www.cooperinstitute.org/hfz-standards> for more details on Fitnessgram

Strength and Endurance, Body Composition, Trunk Exterior Strength, and Flexibility. Figure 2 below depicts exercises in each Fitnessgram category.

**Figure 2: Fitnessgram Assessment Activities**



Healthy Fitness Zone (HFZ) standards are upheld by the state of California for students of different ages and genders. Based on their performance, students fall into one of three categories for each of the six fitness areas: *HFZ*, *needs improvement*, or *needs improvement-health risk*. These data were collected from all fifth graders by EUSD personnel at all nine schools and provided to CEPAL researchers for analysis.

## Analysis Process

**Qualitative.** Data from administrator and principal interviews, parent, teacher, and yoga instructor focus groups, and survey free responses were qualitatively analyzed to identify common emerging themes. Data were transcribed by a professional transcription company and translated into English when applicable. CEPAL researchers used analytic software to qualitatively analyze transcripts. Emergent themes and key information from the data will be shared in the findings that follow.

**Quantitative.** Both descriptive and inferential statistics were used to analyze the results from the teacher, parent, and student surveys. For example, descriptive statistics were used to tabulate and present the results from the student surveys, while independent sample t-tests were used to statistically compare results between the *all year yoga* and *half-year yoga* schools, as well as between grade levels and gender. When reporting the results of inferential tests, the researchers apply the widely accepted statistical thresholds of  $p=.10$ ,  $p=.05$ , and  $p=.01$ , which respectively indicate that there is 90%, 95%, and 99% certainty that findings did not occur by chance.

Although significant preliminary findings emerged from the analysis, small response rates led to findings that rise to a level of *practical* but not statistical significance. These involve a number of areas in which a group (school, grade level, gender), according to a sample of its participants, has noteworthy effects that fall short of reaching statistical significance. As such, they provide some comparative information, but due to the low response rates are not inferentially robust.

## Methodological Limitations

**Low initial response rates.** Limitations linked to the concurrent implementation and evaluation of EUSD yoga limit the strength of some of the findings presented in this report. Low response rates are chief among these concerns. Low levels of participation among students, teachers and parents occurred repeatedly over the course of the year undermining some quantitative findings. Table 1 (following page) presents the response rates for each data collection opportunity.

**Classroom teacher.** Teacher survey response rates across the first three surveys were uniformly poor. *All year yoga* schools, for example, had an average response rate of 29.2% across the first three surveys; the corresponding number for the *half-year yoga* schools was 22.8%. This means between two and three out of every ten teachers responded to each of the first three surveys. Among responding teachers, 28% responded to the open-ended question on the second survey while 35% responded to the open-ended question on the third survey. From an individual school perspective, response rates varied from 11.5% to 56.3% for the first survey, between 0% and 62.5% for the second survey, and between 8.3% and 37.8% for the third survey. Response rates on teacher surveys one, two and three were a significant problem for several of the schools in EUSD.

The fourth survey had an overall response rate of 56.3%, split almost equally between the *all year yoga* schools (57.4%) and *half-year yoga* schools (54.8%). In addition to more than half of the teachers in the EUSD participating in the final survey, 54.8% of them took the time to respond to the open-ended question. Response rates varied among the schools from 46.9% to 73.5%, suggesting the results from

the final survey have the greatest potential to accurately characterize the experiences of students and classroom teachers regarding the implementation of yoga during the 2012-13 school year.

**Table 1: Response and Participation Rates**

	Data Collected	Collection Date	Total Number of Respondents	Total Possible Respondents	Total Percentage
<b>Student Data</b>	Survey 1	Sept. 2012	1,790	3,200	55.9%
	Survey 2	Dec. 2012	674	3,200	21.2%
	Survey 3	May 2013	1,222	3,200	38.2%
	Body Mass Index (BMI)	Fall/Winter 2012 June 2013	varies	5,448	varies
	Resting Heart Rate	Weekly Sept-Dec. & May '13	varies	5,448	varies
<b>Parent Data</b>	Survey 1	Sept. 2012	430	5,448	7.9%
	Survey 2	Dec. 2012	92	5,448	1.7%
	Survey 3	May 2013	158	5,448	2.9%
	Focus Group	Spring '13	3 Groups 45 parents	5,448	>1%
<b>Teacher Data</b>	Survey 1	Oct. 2012	80	279	28.7
	Survey 2	Nov. 2012	80	279	28.7%
	Survey 3	Dec. 2012	65	279	23.3%
	Survey 4	May 2013	157	279	56.3%
	Focus Group	Spring '13	4 Groups 24 teachers	279	8.6%
<b>Yoga Instructor Data</b>	Focus Group	Dec '12/May'13	10	10	100%
	Observations	Fall 2012 Spring 2013	10	10	100%
<b>Administrator Data</b>	Interview	Spring '13	2	2	100%

**Parent.** Parent response rates for all three surveys were uniformly poor, with 7.9% responding to the first survey, 1.7% of parents responding to the second survey, and 2.9% of parents responding to the third. While district-wide response rates are low, individual school rates varied considerably; from 2.4% to 13.7% for the first survey, from 0.0% to 6.6% for the second survey, and from 0.3% to 81.6% for the third survey. In general, parent response rates were a significant problem for almost all of the schools in the District.

The low response rates on parent surveys limit their utility by compromising their generalizability to the EUSD parent community at large. From a methodological perspective, the low response rates rule out any sort of meaningful descriptive or inferential analysis. However, among parents that did take the time to respond, the comments were almost uniformly positive (94.3%) and will be incorporated in the findings section below.

**Student.** Student survey response rates varied from acceptable (55.9%) on survey one to unacceptable (21.2%) on survey two, then back up to a marginally acceptable (38.2%) on survey three. As such, the results presented are derived from the first and third surveys only. *All year yoga* schools had a 54.5% response rate for the first survey and a 40.1% for the third survey, while response rates at the *half-year yoga* schools were 57.6% for the first survey and 36.1% for the third, revealing that the findings in this section are based on the responses from fewer than half of the eligible student population. From an individual school perspective, however, response rates varied considerably; from 30.6% to 88.1% for the first survey, 0% to 84.6% for the second survey, and 14.2% to 81.6% for the third survey, demonstrating that response rates were a significant problem for several of the schools in the district. Among responding students, 57% responded to the open-ended question on the third survey.

**Varied Yoga Participation.** Although EUSD students participated weekly in yoga classes, the frequency, duration, and quality of those classes varied drastically from school to school and grade to grade within schools. This is particularly true for the schools in the *all year yoga* group who were faced with immediate implementation challenges and little time to adjust or accommodate this new program.

**Randomization Challenges.** In addition to low initial response rates, limitations existed in the randomization that assigned schools to the *all year yoga* and *half-year yoga* groups. True randomization should have theoretically produced two comparable subgroups representative of the EUSD population. Although schools were randomly assigned to each subgroup, each subgroup ultimately proved unequal on the following key variables: socioeconomic status, English learner population, student achievement, instances of disruptive behavior, and bullying. These issues compromised the initial research design and call for caution when interpreting some findings.

## Findings

### Introduction

As described in the methodology section of the report, information about the EUSD yoga program was collected from all stakeholders in different forms over the course of the 2012-13 school year. Findings are organized around individual research questions and, to the extent possible, the answers that emerged from the analysis process. Table 2 outlines individual research questions, findings, and references pages in the report where more detail on each can be found.

**Table 2: Guiding Questions with Page References**

Research Question	Short Answer	Learn More
Do EUSD students like EUSD yoga?	Yes	Page 12
Do student group's opinions of EUSD yoga differ from one another?	Yes	Page 13
Might EUSD yoga impact EUSD students' physical fitness?	Maybe	Page 14
Might EUSD yoga participation affect student behavior?	Maybe	Page 16
Might EUSD yoga affect student attendance?	Not Likely	Page 17
Might student emotional wellness improve through EUSD yoga?	Yes	Page 17
Might yoga be affecting student achievement?	Yes	Page 18
Are students generalizing yoga beyond their yoga classroom?	Yes	Page 19

### Do EUSD Students Like EUSD Yoga?

**Yes.** A powerful finding resulted from a question on the final student survey that gave 3<sup>rd</sup>-6<sup>th</sup> graders a chance to reflect upon their experiences with yoga over the previous year asking, "Do you like doing yoga at school?" Results clearly suggest EUSD students liked doing yoga at school. Forty-five percent (551/1222) of students in grades three through six indicated they *like it [yoga] a lot*. The mean response of 2.28 fell between the choices of *liked it a little* and *liked it a lot*.

Parents, teachers, principals, and central office administrators commonly referenced the positive experiences and changes the EUSD yoga program provided for the districts' students. Open-ended responses from surveyed teachers described the students' feelings about EUSD yoga in the following words: 'they love yoga,' 'really fun,' 'excited about it,' 'fantastic,' 'enthusiastic,' and 'have taken a liking to yoga.' The majority of parents also offered positive feedback their son or daughter shared about the program. In a parent focus group conducted in Spanish, one parent shared a story about the conversation she had with her son prior to the evening's focus group:

Today I told him, "You will have to stay with the neighbor because I am going to my parent meeting at school about yoga." He said, "What's going to happen?" I said, "I don't know. It's a meeting." He said "Please mom, don't take me out of that class! I like it very much and I want to continue in it."

Another parent new to EUSD shared:

My son is in first grade, so we came from [another school district]. The first I ever heard about [the yoga program] was my son coming home and saying, "Mommy, I have to wear comfy pants tomorrow, because it is yoga." And he was so excited about it. He loves it. I think just coming from such a big district before, but this extra program that we have I think is fantastic.

The five EUSD principals who were interviewed offered favorable comments about the yoga program. One principal noted the students enjoy yoga:

You see the kids enjoying it. They'll tell you they enjoy especially the down time in yoga when they get just to sit and not meditate but that quiet time of just sitting reflectively. They enjoy that. They feel they're not as stressed. They'll report that, especially the upper grade kids. And the little kids, they just like the stretching and the yoga itself.

## Do Student Group's Opinions of EUSD Yoga Differ from one Another?

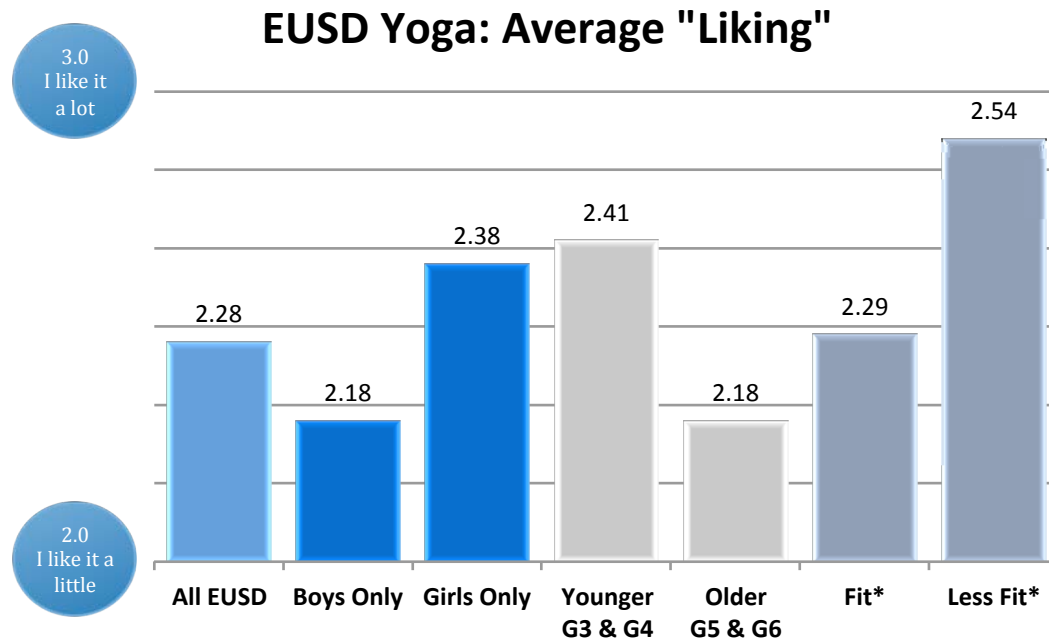
**Yes.** While it is clear EUSD students "like" EUSD yoga, differences in the degree to which groups differ in their "liking" of it exist. There are subgroups in the data whose results can be compared to one another meaningfully. These include gender, grade level and fitness level (See Figure 3 following page).

**Student age and gender.** Girls, on average, reported enjoying yoga more than boys ( $p=.01$ ), with boys reporting a score of 2.18 and girls 2.38. In addition, the youngest students surveyed liked yoga more than the older students, with third and fourth graders averaging 2.41 compared to an average score of 2.18 for the fifth and sixth graders ( $p=.01$ ).

**Level of physical fitness<sup>5</sup>.** The extent to which liking yoga was related to a child's fitness level was examined using the overall Fitnessgram scores of EUSD fifth graders. Fifth graders who had met fewer than four of the state's six fitness standards liked yoga more (2.54) than those who had met four or more of the standards (2.29). This difference was statistically significant ( $p=.05$ ) suggesting that EUSD yoga provides students who are less physically fit a school-based physical education activity that they enjoy more than their more-fit peers.

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<sup>5</sup> Fitnessgram data from one school in the *full year yoga* group was left out of this analysis due to what appears to be errors in the administration of the Flexibility activity. At this site, 100% of the 5<sup>th</sup> graders scored *Needs Improvement* in 2012-13. At this site, 33% & 23% scored *Needs Improvement* in 2011-12 & 2010-11 respectively.

**Figure 3: Subgroup Responses to “Do you like doing yoga at school?”**

\*Fit students met four or more of the Fitnessgram standards; Less Fit students met three or fewer standards

In interviews, some teachers and parents did report less-favorable student experiences. The majority of children who did not like yoga and did not want to participate were upper grade students and males. The teachers shared that students who did not like yoga often referred to the classes as “boring,” “lame,” and “too slow paced for their big bodies and who they are.” Although most parents positively responded to the yoga program, select parents pointed out that students, especially upper grade males, were trying to get kicked out of yoga classes on purpose by displaying disruptive behavior.

### **Might EUSD Yoga Impact EUSD Students’ Physical Fitness?**

**Maybe.** EUSD student fitness was measured through two data elements, resting heart rate and the Fitnessgram. As described in the methodology section, resting heart rate was collected weekly during each of the first ten weeks of the school year and again at the end of the school year. Fitnessgram scores for all fifth graders were collected in the spring of 2013 by EUSD.<sup>6</sup>

**Resting heart rate and Body Mass Index (BMI).** EUSD student resting heart rates were recorded by counting the number of beats over a 15 second interval. BMI rates were calculated using student height and weight measures collected by EUSD personnel. Invalid responses, spotty participation, and erroneous metrics render any findings in this area inferentially weak and non-generalizable. A detailed overview of the analysis process leading to this conclusion is beyond the scope of this document.

<sup>6</sup> For detailed information on resting heart rate or Fitnessgram, see the methods section of this report



**Fitnessgram.** All EUSD fifth graders participated in the Fitnessgram during the spring of 2013. The test itself consisted of six separate physical activities: Aerobic Capacity, Abdominal Strength and Endurance, Upper Body Strength and Endurance, Body Composition, Trunk Exterior Strength, and Flexibility. Fitnessgram scores are based on standards set by The Cooper Institute. For each of the six activities, published age-related performance metrics were used to determine whether or not students met the performance standards upheld by the California Department of Education.

To examine the extent to which participation in yoga was correlated with the passage rates for the six physical activities, independent sample t-tests were used to compare the passage rates between fifth graders in the *all-year yoga* and *half-year yoga* schools. Results indicate fifth graders in the *all-year yoga* schools had significantly higher passage rates on the two flexibility-related activities (Flexibility and Trunk Exterior Strength and Flexibility) than students attending the *half-year yoga* schools. Conversely, students at the *half-year yoga* schools had significantly higher passage rates on the Upper Body Strength and Endurance activity than students attending *all year yoga* schools. There were no significant differences between the two groups on the remaining three Fitnessgram activities Abdominal Strength and Endurance, Aerobic Capacity, or Body Composition.

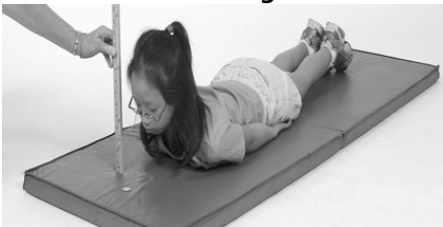
### Flexibility

(Sit & reach or shoulder stretch)



Passage rates for the Flexibility activity were 88% at the *all year yoga* schools and 78% at *half-year yoga* schools ( $p=.01$ ).

### Trunk Exterior Strength & Flexibility



Passage rates for the *Trunk Exterior Strength & Flexibility* activity were 99% at the *all year yoga* schools and 97% at *half-year yoga* schools ( $p=.10$ ).

### Upper Body Strength

(push-up, mod. pull-up, or flexed arm hang)



Passage rates for the *Upper Body* activity were 91% at the *half-year yoga* schools and 82% at *all year yoga* schools ( $p=.01$ ).

## Might EUSD Yoga Participation Affect Student Behavior?

**Maybe.** Evidence from interviews and focus groups suggest EUSD student behavior has changed as a result of the yoga program. EUSD teachers, principals and administrators who participated in interviews and focus groups reported a reduction in disruptive behavior, improvements in academic performance, and an enhanced level of socio-emotional wellness. End of year teacher survey data indicated fewer behavioral incidents at the *half-year yoga* schools than at the *all year yoga* schools. Student attendance and survey data were analyzed to triangulate these anecdotal perspectives.

**Disruptive behavior.** Teacher and student surveys and stakeholder interviews indicate student behavior in the classroom and on the school campuses improved during the 2012-13 school year. Four of five interviewed principals stated yoga has improved student behavior at their school site. One central office administrator echoed this sentiment: "We're seeing less fighting, there's less disruptions in class, kids are slowing down a little bit and have different ways to calm themselves down." According to teacher focus group participants, positive changes were evident in the classroom, on the playground, and in social situations between students. A number of interviewed teachers shared evidence of positive changes in student behavior. Specifically, teachers witnessed students reacting in a calmer manner to difficult situations by stopping to breathe before reacting to the situation. A kindergarten teacher recounts a school experience:

Yesterday we had a little problem in kindergarten; there was some unkind thing that happened outside. So we came in and I said 'well what is something that we could do if we get angry at somebody?' [a student responds] 'We could do our deep breathing that we learned in yoga.' I didn't even bring up yoga yet, and then they started talking about other things that yoga has taught them-and these are five and six year olds.

Teachers were also asked a series of behavioral questions – three involving the extent of bullying in their classes and the other involving the number of detentions issued. Among teachers that responded to the final survey those at the *half-year yoga* schools reported significantly fewer behavioral problems than teachers at the *all year yoga* schools. For example, teachers at the *half-year yoga* schools reported fewer victims of bullying ( $p=.01$ ), fewer perpetrators of bullying ( $p=.01$ ), fewer instances of bullying ( $p=.01$ ), and gave fewer detentions ( $p=.05$ ) than did teachers at the *all year yoga* schools.

Student survey data on bullying parallels the teacher's responses at the end of the year and extends the findings to the beginning of the year as well. At the beginning of the year students in the *all year yoga* schools reported significantly higher levels of bullying than their peers at the *half-year yoga* schools ( $p=.05$ ). The difference persisted through the end of the 2012-13 school year ( $p=.01$ ) and echoed the teacher responses. These data also indicate bullying is a larger issue for third and fourth grade students than it is for those in fifth and sixth grade. While student data is inconclusive, it suggests students in the *all year yoga* schools perceived more bullying than their peers at the *half-year yoga* schools and further that the amount of yoga students participated in did not change patterns of bullying.

## Might EUSD Yoga Affect Student Attendance?

**Not Likely.** Throughout the first year of the EUSD yoga program, yoga did not appear to have an effect on a student's willingness or ability to attend school. Analyses comparing absenteeism by the school they attend, duration of yoga, and grade level returned varying results that generally indicate EUSD yoga had little effect in altering school attendance trends. Absenteeism, in general, increased over the course of the year and did not appear to be influenced by the presence of yoga.

Absenteeism at the beginning, middle, and end of the year was compared at *all year yoga* and *half-year yoga* schools. Among *all year yoga* schools absences increased or stayed the same throughout the year. *Half-year yoga* schools reported the percentage of suspensions decreased over the course of the year and the percentage of unexcused absences fell after yoga was introduced. Independent sample t-tests between *all year yoga* and *half-year yoga* schools confirmed that both total absences ( $p=.10$ ) and unexcused absences ( $p=.05$ ) increased more over the course of the year at the schools that received yoga all year than those that did not. This suggests EUSD yoga did not reduce absenteeism among students at all schools over the 2012-13 school year.

## Might EUSD Student Emotional Wellness Improve Through EUSD Yoga?

**Yes.** EUSD stakeholders believe yoga has enhanced students' emotional well-being. Teacher survey responses indicate yoga has had a positive impact on students' development of social skills, character, and coping mechanisms. As one teacher responded, yoga classes "offer a much needed physical outlet and opportunity to develop skills in calming, breathing, challenging oneself, listening & perseverance."

During focus groups and through the survey free-response section, teachers suggested students are developing the capacity to handle frustration, self-regulate, control their actions, and take part in anti-bullying discussions. One teacher shared that yoga is helping students to have "a greater awareness of their actions and how they affect other people and themselves."

Many teachers, parents, and principals shared thoughts around students developing skills to handle stress, remain calm, stretch, breathe, and relax their mind and body. One principal explained this:

There's a really positive impact with the kids having some tools in their tool belt for coping and stress when they get angry or have anxiety... children's lives are more stressful and you can start to see kids using some of these techniques they learn in [yoga] class to help them with those sort of things. That to me has been my favorite part of watching the yoga.

Some parents also shared they noticed changes in their child's wellness since the program began. Interviewed parents recognized yoga to be a 'tool' for students to use to calm down, breathe, and become healthier. One parent shared a sentiment echoed throughout parent focus groups:

I have noticed that [yoga] makes them a little bit more focused and effective for the rest of the day...because of the ability to tune in to some self-calming techniques. One of [my children] gets a little high strung so the tools he is learning for focusing, concentrating, and calming are what thrill me. I know they can be applied to all the other subjects that he is studying.

Parents in the focus group interviews shared that their children are able to manage stress better and remain calmer in bad situations at home as well as at school. One parent shared that her son is sometimes nervous because he thinks he is going to have a bad day, “but he says that he will feel relaxed when he is in the yoga class.”

A sense of belonging is a strong component of a positive school climate and an additional indicator of wellness. Students were asked a series of three questions about their sense of belonging at school. In general, their responses indicate their sense of belonging did not significantly change from the beginning (3.25) to the end (3.20) of the school year. There were however, significant differences in belonging ( $p=.10$ ) between younger and older survey respondents. Over the course of the school year third and fourth graders increased their feeling of belonging throughout the district while fifth and sixth graders sense of belonging decreased. This difference was apparent at all EUSD schools independent of the time they spent in yoga.

## Might Yoga be Affecting Student Achievement?

**Yes.** In addition to academic knowledge, district administrators believe schools are responsible for incorporating health and wellness into the school day. In interviews, district administrators and principals noted life skill improvements were observable in classrooms and attributable to yoga. One principal shared,

When [students] go to yoga and they come back into the classroom they're much calmer, more focused. Teachers love to do math right after usually because it can help them to focus a little more.

Some teachers echoed these sentiments in interviews and survey responses. They suggested students were incorporating what they learned in yoga into their academic classrooms. Students' use of breathing techniques arose in multiple contexts including: as they prepare for tests, handle stress, and deal with bad situations. During interviews many teachers shared that yoga was helping students to listen better, focus more, engage in learning, challenge themselves, and have better self-esteem.

Teacher survey data indicated student classroom behaviors commonly associated with positive learning outcomes were occurring and being linked to EUSD yoga participation. Independent sample t-tests of teacher survey data indicate teachers at *all year yoga* and *half-year yoga* schools agreed that their students were calmer, better behaved, more focused, and that their academic performance had improved since the introduction of yoga in their schools ( $p=.01$ ). Qualitatively, teachers at all schools used a host of superlatives to describe the program. Among the four *half-year yoga* schools teacher survey data further indicated their students were significantly more likely to participate in class ( $p=.05$ ) and complete their homework ( $p=.10$ ). Taken together, this suggests that yoga had a positive effect on the focus, behavior, and academic performance of EUSD students.

Student survey results indicate there were no initial differences between students at the *all year yoga* and *half-year yoga* schools related to trying. The third survey, however, revealed at the end of the year

all students in the *half-year yoga* schools were trying harder than those at the *all year yoga* schools ( $p=.05$ ). Trying also differed across gender regardless of the amount of time students spent in yoga. When trying was analyzed by gender, girls from all schools were significantly more likely to try harder than boys at both the beginning and end of the year ( $p=.01$ ).

Given that EUSD yoga was implemented and refined concurrently with the evaluation throughout 2012-13, an analysis of student achievement data in this report is premature and will commence in 2013-14. Substantial programmatic changes occurred throughout year one suggesting that an analysis of student achievement will be more valuable in subsequent years. As EUSD yoga and the research design take shape in 2013-14, student achievement results will be analyzed and presented in the year two report.

## Are Students Generalizing Yoga Beyond their Yoga Classroom?

**Yes.** Interviewed parents note their children are excited to share what they learned in yoga class. According to these parents, students are talking about yoga at home, practicing poses at home, and teaching yoga poses to their parents and siblings. Parents provided a number of examples of how their children were sharing and using yoga at home. One mother shared:

[My daughter] went, 'Oh Mom, look, I'm in lotus pose,' and she goes, 'You know – I wouldn't be able to do this if my hamstrings were tight.' And I said, 'Really? How do you know that?' And she goes, "Because they taught me that in yoga.

Yoga instructors additionally recount similar stories that have been shared by both students during yoga class and by parents outside of school hours.

Parents report their children progress through yoga poses before sporting events including soccer and surfing. Other parents shared when they are stressed from a day at work, their child helps them to relax through yoga. One parent shared, "Sometimes I will come home kind of stressed out from work and [my daughter] actually tells me, 'Oh let me show you. This will really help you to relax.'"

Others shared that their children are also able to use their knowledge of yoga in difficult situations at home, particularly in regards to dealing with sibling issues. One parent shared a story explaining this:

I have noticed that my youngest daughter who is in first grade, if she is getting into an argument with her sister, and they are running around throwing stuff... she has been saying, 'Take a moment.' Then she just takes a deep breath and re-engages in a calmer manner.

An additional observed benefit of the yoga program is students applied what they learned from yoga in their academic classrooms. Interviewed and surveyed teachers shared how students are using yoga breathing techniques to prepare for tests, handle stressful situations, and deal with bad situations. Surveyed classroom teachers noted that the kids want to do yoga in the academic classroom and that some teachers are using yoga and breathing techniques when the students need a break from academics, in between lessons, or when unexpected events occur. One teacher noted: "...reference

the poses when we do our disaster drill, [the students] know exactly what position to get into under the tables." Another teacher shared an experience when she utilized yoga to engage her students:

We went to see a play at [the park] and there was kind of a glitch with time, what is universal that we can all do together? I'm like, 'Yoga!' So then we were all waiting there killing time and we were doing yoga and all the kids were focused, calm and we go through our little time glitch and then we were able to walk in and... they just had smiles on their faces.

Parents, teachers, and principals provided evidence in surveys and interviews that suggest students are generalizing their yoga practice outside of the yoga classroom. Moreover, the students' experience with EUSD yoga has encouraged teachers to utilize yoga techniques with their students, and parents are engaging with their students by participating in yoga with their children.

## Discussion

Takeaways from the first year of the Encinitas Union School District's (EUSD) yoga program offer preliminary findings that will be unpacked in this section. Limitations such as the demographic differences between the *half-year* and *all year yoga* schools in the Randomized Control Trial (RCT) impacted data that were collected throughout the school year. Despite this limitation and others described in the methodology section, interesting findings emerged that warrant further exploration while also guiding the year two research design. These findings predominately involve the Fitnessgram assessment and the potential change in student emotional wellness believed to result from EUSD yoga.

Compelling preliminary findings from EUSD's fifth graders emerged through the co-analysis of California's Fitnessgram data and student responses to the EUSD yoga survey. Responses from the survey question "*Do you like doing yoga at school*" were analyzed with the passage rates on the six Fitnessgram activities. Analyses revealed students who passed less than four of the activities reported liking yoga more than students who passed four or more Fitnessgram activities. Moreover, fifth grade Fitnessgram data also provided evidence suggesting that a student's duration in yoga enhances their ability to pass two physical activities of the state's annual assessment (Flexibility & Trunk Exterior Strength) while reducing their ability to pass an additional activity (Upper Body Strength).

The role EUSD yoga played in these outcomes may have various explanations. "More fit" students might engage more regularly in physical activity (through recess, sports, or after school activity) that provides them with skills to pass more of the Fitnessgram activities. "Less fit" students, alternately, may not participate to the same degree or may not have the motivation to engage in traditional physical activities leading to their lower Fitnessgram scores. Learning that "less fit" students are liking the EUSD yoga program more than their "more fit" peers may indicate they have found a new physical activity in which they will more eagerly engage.

*All year yoga* students' passage rates on both Flexibility and Trunk Exterior Strength were statistically higher than their *half-year yoga* counterparts suggesting that yoga enhanced their aptitude in these physical activities. Simultaneously, *all year yoga* students were less likely to pass the Upper Body Strength activity than *half-year yoga* students. The change in passage rates for these activities calls for

exploring this potential correlation. Curricular components of EUSD yoga that were reinforced weekly throughout the 2012-13 school year may have improved student Flexibility and Trunk Exterior Strength. At the same time, rather than doing yoga all year, *half-year yoga* students may have participated in traditional physical education programs that could translate into better results on the Fitnessgram's Upper Body Strength measures.

Qualitative data from EUSD stakeholders indicate student emotional wellness has positively changed as a result of students' exposure to EUSD yoga. Students are reported to be calmer, better behaved, more focused, and performing better academically. At the same time, through survey responses, students report their sense of belonging and their desire to try varies both by school and over time. Students also report that bullying is still an issue on their school campuses.

This disconnect between adult (qualitative) and student (quantitative) findings is intriguing and has guided the research design in EUSD for year two. The positive changes parents, teachers and principals shared may be informed by their class or school-level perspectives while students might be drawing their own conclusions based on peer interactions or other experiences to which adults may not have access. In response to this disconnect, a year-long observation component has been added to year two to examine student behavior before, during, and after yoga classes at each of the nine EUSD schools.

Although these perceived behavioral changes and Fitnessgram findings show promise, the shortcomings in the data collection render it only promising. Additional research is critical to continue exploring yoga participation's effects on school based outcomes.

## Conclusion

This report documents a newly created yoga program in a public school district. Because the program was concurrently constructed and evaluated, limitations surfaced that must be taken into consideration when interpreting its findings. Revisions that accompany the start-up of any new program such as instructional curriculum and delivery refinements, inconsistent schedules, varied instructional minutes, and personnel changes impacted the program and thus influenced its outcomes. The newness of the EUSD yoga program also impacted the survey response rates among students, teachers and parents particularly early in the year. These low response rates reduced the utility of the quantitative findings.

The cumulative impact of the imbalanced demographic and cultural factors when combined with the implementation issues detailed above compromised the Randomized Control Trial (RCT). Although interesting information was presented among *all year yoga* and *half-year yoga*, a full-scale RCT would provide additional opportunities to learn more about the effects of yoga in the public school environment.

Initial findings related to both the effects of EUSD yoga and the manner in which EUSD implemented their yoga program resulted in the refinement of the year two research design. The data collected in year one helped identify the components that were valuable to carry forward into year two. Researchers have refined those practices to ensure greater data reliability as well as a more refined and

rigorous research design. From the data collected throughout year one, the following preliminary findings are targeted for further exploration in year two:

- EUSD students “like” EUSD yoga, and stakeholders value it as part of the school day.
- Girls “like” yoga more than boys; younger students “like” yoga more than older students.
- Students who are less fit like yoga more than those who are more fit
- Fifth grade EUSD students who participated in a year of yoga passed two Fitnessgram activities (Flexibility and Trunk Exterior Strength) at higher rates than their peers who did yoga for only half of the school year. Further, those in half-year yoga passed the Upper Body Strength Fitnessgram activity more frequently than their all-year yoga peers.
- Although stakeholders report yoga is improving student behavior, academic performance, and emotional wellness, student results do not corroborate all these sentiments
- Stakeholders generally affirm yoga has taught students important skills to handle stress and remain calm when challenging situations arise.
- Parents and school personnel report students are generalizing yoga outside of the yoga classroom in a number of ways.

Preliminary findings from the first year of EUSD’s yoga program contribute to the field of yoga in schools research providing areas of interest to further explore. Major steps have been taken to improve the quality of data acquired throughout year two with the intent to draw more definitive conclusions about this area of study. Specifically, a Theory of Action for year two hypothesizes that yoga influences a student’s ability to self-regulate, which in turn, affects various school-based outcomes. Year two findings will be available in the fall of 2014.