



Cradle Beach School  
Based Program:  
**Impact on Academic  
Achievement**

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## Overview

This report builds on an earlier research report entitled “Cradle Beach School Based Program.” That document provided descriptive information in comparison to district-wide data about the performance of students in the Cradle Beach Project SOAR program. This report, building on recommendations of the previous study, focuses specifically on the academic performance of students and utilizes a more rigorous experimental design to explore program impact relative to a control group of students who attended the same school, but did not participate in Project SOAR.

## Program Description

Project SOAR places Cradle Beach staff in the schools to work alongside teachers and other school personnel, providing a variety of services including individualized tutoring, cultural activities, active learning experiences, group work and enrichment activities. Additional programming occurs outside of traditional school hours. For instance, Cradle Beach staff conducts weekend retreats that are used to provide experiential learning opportunities for students, enhance their classroom learning, conduct individualized programming, and enhance science and math development. Weekend retreats are held throughout the year at Cradle Beach’s facility in Angola where students experience educational stations that include but are not limited to sports, computers, culinary arts, dance, music, beach and nature, photography, sensory, and theater. Weekend retreats are incorporated into the program to provide an off-site experience that many of these students have never experienced. Furthermore, the weekend retreats strengthen students’ commitment to their education and the program, increasing the overall impact on their educational and personal lives.

The current study focuses on students in the 3<sup>rd</sup> and 4<sup>th</sup> grades at one school in the Buffalo Public Schools. Academic records were obtained from 37 students who participated in Project SOAR and 116 control group students who did not participate in Project SOAR, but are from the same school and in the same grades.

## Program Objectives

The ultimate goal of the school-based program is to promote academic performance, the acquisition of skills that promote academic and life success, and positive behavior in the children it serves. A number of the program activities (e.g. tutoring) directly address the current academic needs of the children, while other activities (e.g. enrichment and cultural activities) are designed to foster positive attitudes toward learning and school. Consistent with their traditional camp-based programs, Cradle Beach staff seek to help children throughout the

program expand their developmental assets. The current report seeks to determine if participation in Project SOAR had an impact on school absenteeism, overall grade average including specific academic performance in math, English Language Arts, science, and social studies as well as performance on the NYS math and ELA assessments.

### **Buffalo Public Schools (BPS) Overview**

In 2010, the Buffalo Public Schools failed as a district to make AYP in Math and English Language Arts with 7 of 10 ethnic groups failing to make AYP for ELA at the elementary level and 8 of 8 or 100% failing at the secondary level. In mathematics, 7 of 8 groups failed to make AYP in mathematics at the secondary level, with only Caucasian students achieving AYP. At the elementary and secondary levels, students with disabilities, Limited English Proficiency, and economically disadvantaged all failed to make AYP. Furthermore, none of these groups made AYP in mathematics at the secondary level. Overall, in Grades 3 through 8, no grade achieved above a 32% of its students scoring at a level that demonstrated they met minimal standards in ELA or Mathematics. Finally, at both the elementary and secondary level, only single digit percentages achieved mastery of subject in ELA and Mathematics, greatly below NYS averages that averaged 20% of its students achieving mastery level (NYS Report Card, 2009 to 2010).

The Buffalo Public Schools, like many urban school districts, struggles to sustain higher levels of academic achievement in its students. The downward trend is apparent in the 2009 – 2010 NYS District Report Card that demonstrates a downward spiral in academic achievement each year over the past 3 years. Fewer BPS students scored above 85% and more students scored below 55% in Comprehensive English, Mathematics A, and Mathematics B each year over the past three years (NYSED Report Cards: 2007-08, 2008-09, 2009-10). Additionally, in the 2009-10 academic year, BPS students continued to show decline from 4<sup>th</sup> Grade to 8<sup>th</sup> Grade in both Reading and Mathematics.

***Essentially, BPS students would be recognized as achieving academic success if they maintained their level of academics or improved, going against the current trend of decreasing academic achievement over time.*** Therefore, an academic intervention, measured purely on academic grades, should be considered successful if it stabilizes the falling academic achievement of students while building student characteristics and skill-sets attributed to long-term academic achievement and strong personal growth.

## Executive Summary

Overall academic achievement, as measured by overall grade averages was higher for Project SOAR students at a statistically significant level. The following bullets highlight the results of this control group study.

- **Absenteeism** increased throughout the year in both groups. However, it was consistently higher among students in the control group, suggesting that project SOAR had a meaningful impact on reducing the level of absenteeism that would have otherwise been observed in students.
- **Grades** for all students exhibited modest declines between the first and fourth quarters of the academic year. However, overall grade average was consistently higher in each quarter for Project SOAR students when compared to the control group.
- **Math** grades for all students exhibited modest declines throughout the year. However, Project SOAR students consistently scored higher than control group students in Math, suggesting a positive impact of the Project SOAR program on Math skills.
- Results for **ELA** grades were similar to previous findings. ELA grades declined in both groups of students over the four quarters of the academic year. However, the ELA grades of Project SOAR students were consistently higher than those of students in the control group.
- While the average **Science** scores for Project SOAR students were higher from quarter to quarter, the difference was not statistically significant. Both groups of students saw a decline across the four quarters of the academic year.
- While the average **Social Studies** scores for Project SOAR students were higher from quarter to quarter, the difference was not statistically significant from grades in the Control Group. Both groups of students saw a decline across the four quarters of the academic year.
- Average scores were higher for Project SOAR students on both the **Math** and **ELA NYSAA** tests; however, the difference was not sufficiently large to be statistically significant. Furthermore, a higher proportion of Project SOAR students scored at the proficient level (3 or 4) than did the control group in Math (29.7% vs. 27.7%) and ELA (59.5% vs. 41.8%). The higher averages on NYSAA tests are consistent with the grade data reported above, but fell just short of being statistically significant.

## Program Assessment Methodology and Rationale

Data for this report was taken directly from student report cards and scores on NYS Achievement tests in math and English Language Arts.

### Control and Treatment Group Comparison

While demographic information was collected from Project SOAR students, only grade and gender information was available for control group students from their report cards. Students in both groups attended the same school and were drawn from the same neighborhoods. Therefore it is reasonable to assume that they share a common mix of ethnic and socio-economic characteristics.

The tables below illustrate the distribution of subjects by gender and grade level.

<b>Grade Level Distribution of Subjects</b>			
<b>Grade Level</b>	<b>Project SOAR Frequency (Column Percent) {Row Percent}</b>	<b>Control Group Frequency (Column Percent) {Row Percent}</b>	<b>Total Frequency (Column Percent) {Row Percent}</b>
<b>Grade 3</b>	<b>20</b> (54.1%) {31.25%}	<b>44</b> (53%) {68.75%}	<b>64</b> (53.3%) {100%}
<b>Grade 4</b>	<b>17</b> (45.9%) {30.36%}	<b>39</b> (47%) {69.64%}	<b>56</b> (46.7%) {100%}
<b>Total</b>	<b>37</b> (100%) {30.83%}	<b>83</b> (100%) {69.16}	<b>120</b> (100%) {100%}

<b>Gender Distribution of Subjects</b>			
<b>Gender</b>	<b>Project SOAR Frequency (Column Percent) {Row Percent}</b>	<b>Control Group Frequency (Column Percent) {Row Percent}</b>	<b>Total Frequency (Column Percent)</b>
<b>Male</b>	<b>20</b> (54.1%) {32.26%}	<b>42</b> (50.6%) {67.74%}	<b>62</b> (51.6%) {100%}
<b>Female</b>	<b>17</b> (45.9%) {29.31%}	<b>41</b> (49.4%) {70.69%}	<b>58</b> (48.3%) {100%}
<b>Total</b>	<b>37</b> (100%) {30.83%}	<b>83</b> (100%) {69.16%}	<b>120</b> (100%) {100%}

As can be seen from the tables above, while the control group is considerably larger than the Project SOAR group, both samples are similar in terms of grade level distribution and gender. As noted above, both groups are drawn from the same school, so it is assumed that the primary difference between these two groups is their participation (or lack of) in the Cradle Beach Project SOAR program.

### Methodology

The academic impact of Project SOAR was assessed in two ways. First, changes in dependent variables (e.g. absenteeism, grades, etc.) were tracked during each quarter of the school year, allowing an observation of how these outcome variables changed over time. Second, a control group was employed so that we could assess how Project SOAR students performed relative to students who were not in the program. This resulted in a 2 X 4 factorial design, where the between subjects factor was “Group” (2 levels – SOAR Students and Control Group Students) and the within subjects factor was “School Quarter” (4 levels). The dependent variable list included: Days Absent, Overall Grade Average, Math Grades, English Language Arts, Science, and Social Studies grades. Results for each independent variable are described below.

### Absenteeism

One of the goals of Project SOAR is to reduce rates of absenteeism for student participants. Number of days absent each quarter was obtained from student report cards and is reported in the table below.

Days Absent				
Group		Mean	Std. Deviation	N
Qtr 1	SOAR	2.3235	2.34483	34
	Control	3.2683	3.58339	82
Qtr 2	SOAR	3.5294	3.67823	34
	Control	4.7927	3.99301	82
Qtr 3	SOAR	2.7353	2.36526	34
	Control	4.2439	3.89226	82
Qtr 4	SOAR	4.0882	3.39668	34
	Control	6.1829	4.41973	82

A 2 X 4 mixed factorial ANOVA was conducted to compare the effect of Group (between subjects) and Quarter (Within Subjects) on Attendance. The Group variable had two levels: Project SOAR Students and the Control Group. The Quarter variable had four levels corresponding to the four quarters of the academic year.

There was a significant main effect of the Group variable,  $F(1,114) = 5.41, p < 0.05$ . There was also a main effect of the Quarter variable, Wilks Lambda = 0.774,  $F(3,112) = 10.88, p < 0.05$ . Interaction effects were not statistically significant.

Interpretation: Absenteeism increased throughout the year in both groups. However, it was consistently higher among students in the control group, suggesting that project SOAR had a meaningful impact on reducing the level of absenteeism that would have otherwise been observed in students.

### Overall Academic Performance

Among the chief concerns of Project SOAR staff is the academic performance of participating students. Overall academic performance was measured by students' numerical grade average in each academic quarter. (Subject specific performance is reported later in the report).

Overall Grade Average				
Group		Mean	Std. Deviation	N
Qtr 1	SOAR	85.3676	4.81484	34
	Control	82.7534	5.74732	74
Qtr 2	SOAR	84.5956	5.39922	34
	Control	82.6318	6.05458	74
Qtr 3	SOAR	84.6912	6.32787	34
	Control	82.0574	6.31094	74
Qtr 4	SOAR	83.2500	6.13948	34
	Control	81.1993	6.24486	74

A 2 X 4 mixed factorial ANOVA was conducted to compare the effect of Group (between subjects) and Quarter (Within Subjects) on Overall Grade Average. (Grades are expressed on a 0 to 100 scale.) As in the previous analysis, The Group variable had two levels: Project SOAR Students and the Control Group. The Quarter variable had four levels corresponding to the four quarters of the academic year.

There was a significant main effect of the Group variable,  $F(1,106) = 4.017, p < 0.05$ . There was also a main effect of the Quarter variable, Wilks Lambda = 0.825,  $F(3,104) = 7.37, p < 0.01$ . Interaction effects were not statistically significant.

Interpretation: Grades for all students exhibited modest declines between the first and fourth quarters of the academic year. However, overall grade average was consistently higher in each quarter for Project SOAR students when compared to the control group.

## Academic Performance in Math

Project SOAR staff work with students throughout the year on math related activities to build their skills in this important discipline. The table below reports student grade averages in math in each quarter for SOAR Students and Control Group Students.

A 2 X 4 mixed factorial ANOVA was conducted to compare the effect of Group (between subjects) and Quarter (Within Subjects) on Math grades. (Grades are expressed on a -0 to 100 scale.) As in the previous analysis, the Group variable had two levels: Project SOAR Students and the Control Group. The Quarter variable had four levels corresponding to the four quarters of the academic year.

Math Grades				
Group		Mean	Std. Deviation	N
Qtr 1	SOAR	85.2941	5.36278	34
	Control	81.7467	7.10556	75
Qtr 2	SOAR	83.9412	6.48981	34
	Control	80.9600	7.51834	75
Qtr 3	SOAR	83.5882	7.03721	34
	Control	80.2933	7.20130	75
Qtr 4	SOAR	82.0882	7.18739	34
	Control	79.8400	7.90491	75

There was a significant main effect of the Group variable,  $F(1,107) = 5.246$ ,  $p < 0.05$ . There was also a main effect of the Quarter variable, Wilks Lambda = 0.870,  $F(3,105) = 5.224$ ,  $p < 0.01$ . Interaction effects were not statistically significant.

Interpretation: Math grades for all students exhibited modest declines throughout the year. However, Project SOAR students consistently scored higher than control group students in Math, suggesting a positive impact of the Project SOAR program on Math skills.

## Academic Performance: English Language Arts

During the school year, Project SOAR staff engaged students in activities designed to strengthen their English Language Arts skills. Academic performance in this area is assessed quarterly. Grade information was obtained from student report cards.



English Language Arts Grades				
Group		Mean	Std. Deviation	N
Qrtr 1	SOAR	85.3676	4.81484	34
	Control	82.7534	5.74732	74
Qrtr 2	SOAR	84.5956	5.39922	34
	Control	82.6318	6.05458	74
Qrtr 3	SOAR	84.6912	6.32787	34
	Control	82.0574	6.31094	74
Qrtr 4	SOAR	83.2500	6.13948	34
	Control	81.1993	6.24486	74

A 2 X 4 mixed factorial ANOVA was conducted to compare the effect of Group (between subjects) and Quarter (Within Subjects) on English Language Arts (ELA) grades. (Grades are expressed on a 0 to 100 scale.) As in the previous analysis, The Group variable had two levels: Project SOAR Students and the Control Group. The Quarter variable had four levels corresponding to the four quarters of the academic year.

There was a significant main effect of the Group variable,  $F(1,106) = 4.017, p < 0.05$ . There was also a main effect of the Quarter variable, Wilks Lambda = 0.825,  $F(3,104) = 7.376, p < 0.01$ . Interaction effects were not statistically significant.

Interpretation: Results for ELA grades were similar to previous findings. ELA grades declined in both groups of students over the four quarters of the academic year. However, the ELA grades of Project SOAR students were consistently higher than those of students in the control group.

### Academic Performance: Science

Throughout the academic year, Project SOAR staff assisted students with science homework and engaged them in a variety of activities designed to nurture an interest in science. Academic performance in science is assessed quarterly. Grades were obtained from student report cards.

Science Grades				
Group		Mean	Std. Deviation	N
Qrtr 1	SOAR	85.3529	6.03968	34
	Control	83.3514	6.45412	74
Qrtr 2	SOAR	85.0588	7.08794	34
	Control	83.1757	7.19847	74
Qrtr 3	SOAR	84.1471	8.57810	34
	Control	81.4595	8.12098	74
Qrtr 4	SOAR	83.3235	6.65022	34
	Control	81.3649	6.83379	74

A 2 X 4 mixed factorial ANOVA was conducted to compare the effect of Group (between subjects) and Quarter (Within Subjects) on Science grades. (Grades are expressed on a -0 to 100 scale.) As in the previous analysis, the Group variable had two levels: Project SOAR Students and the Control Group. The Quarter variable had four levels corresponding to the four quarters of the academic year.

For Science grades, only the main effect of the Quarter variable was significant, Wilks Lambda = 0.869, F (3,104) = 5.213, p < 0.01). Neither the main effect for Group nor any interaction effects were statistically significant.

Interpretation: While the average Science scores for Project SOAR students were higher from quarter to quarter, the difference was not statistically significant. Both groups of students saw a decline across the four quarters of the academic year.

### Academic Performance: Social Studies

Project SOAR staff engage students in cultural activities, active learning experiences, group work and enrichment activities that should enhance student performance in the area of Social Studies. Average grades across the four quarters of the academic year are reported in the table below.

Social Studies Grades				
Group		Mean	Std. Deviation	N
Qtr 1	SOAR	85.3235	6.44191	34
	Control	82.4795	6.87004	73
Qtr 2	SOAR	84.9118	6.54295	34
	Control	82.3836	7.43795	73
Qtr 3	SOAR	86.1471	7.60435	34
	Control	83.2329	8.12664	73
Qtr 4	SOAR	83.8824	7.19328	34
	Control	81.6849	6.66641	73

A 2 X 4 mixed factorial ANOVA was conducted to compare the effect of Group (between subjects) and Quarter (Within Subjects) on Social Studies grades. (Grades are expressed on a -0 to 100 scale.) As in the previous analysis, the Group variable had two levels: Project SOAR Students and the Control Group. The Quarter variable had four levels corresponding to the four quarters of the academic year.

For Social Studies grades, only the main effect of the Quarter variable was significant, Wilks Lambda = 0.89, F (3,103) = 4.235, p < 0.01). Neither the main effect for Group nor any interaction effects were statistically significant.

**Interpretation:** While the average Social Studies scores for Project SOAR students were higher from quarter to quarter, the difference was not statistically significant from grades in the Control Group. Both groups of students saw a decline across the four quarters of the academic year.

### New York State Assessment Tests

Students in 3<sup>rd</sup> and 4<sup>th</sup> Grade in New York State take standardized assessment tests in Math and English Language Arts. Student scores on the tests are converted to a 4 point scale:

NYSAA Score	Definition
Level 1	Not Meeting the Performance Indicators for the Learning Standards. The student does not demonstrate accuracy and/or independence.
Level 2	Partially Meeting the Performance Indicators for the Learning Standards. The student partially demonstrates accuracy and independence.
Level 3	Meeting the Performance Indicators for the Learning Standards. The student demonstrates accuracy and independence.
Level 4	Meeting the Performance Indicators for the Learning Standards with Distinction. The student thoroughly demonstrates accuracy and independence.

NYSAA scores for the Project SOAR students and the Control Group were compared. The tables below report the mean score levels for each group on the Math and ELA exams.

NYSAA Exam Score Averages			
Math	Mean	Std. Deviation	N
SOAR	2.6486	.67562	37
Control	2.3797	.72153	79
ELA	Mean	Std. Deviation	N
SOAR	2.1351	.67339	37
Control	2.0864	.71059	81

Distribution of State Math Scores				
Group		Frequency	Percent	Cumulative Percent
<b>SOAR Group</b>	<b>Level 1</b>	1	2.7%	2.7%
	<b>Level 2</b>	14	37.8%	40.5%
	<b>Level 3</b>	19	51.4%	91.9%
	<b>Level 4</b>	3	8.1%	100.0%
	<b>Total</b>	37	100.0%	
<b>Control Group</b>	<b>Level 1</b>	7	8.9%	8.9%
	<b>Level 2</b>	39	49.4%	58.2%
	<b>Level 3</b>	29	36.7%	94.9%
	<b>Level 4</b>	4	5.1%	100.0%
	<b>Total</b>	79	100.0%	
	<b>Missing*</b>	4		
	<b>Total</b>	83		

\*Scores Unavailable for some students

Distribution of State Math Scores				
Group		Frequency	Percent	Cumulative Percent
<b>SOAR Group</b>	<b>Level 1</b>	6	16.2%	16.2%
	<b>Level 2</b>	20	54.1%	70.3%
	<b>Level 3</b>	11	29.7%	100.0%
	<b>Level 4</b>	0	0	N/A
	<b>Total</b>	37	100.0%	
<b>Control Group</b>	<b>Level 1</b>	15	18.5%	18.5%
	<b>Level 2</b>	46	56.8%	75.3%
	<b>Level 3</b>	18	22.2%	97.5%
	<b>Level 4</b>	2	2.5%	100.0%
	<b>Total</b>	81	100.0%	
	<b>Missing*</b>	2		
	<b>Total</b>	83		

\*Scores Unavailable for some students

**Interpretation:** Average scores were higher for Project SOAR students on both the Math and ELA NYSAA tests; however, the difference was not sufficiently large to be statistically significant. Furthermore, a higher proportion of Project SOAR students scored at the proficient level (3 or 4) than did the control group in Math (29.7% vs. 27.7%) and ELA (59.5% vs. 41.8%). The higher averages on NYSAA tests are consistent with the grade data reported above, but fell just short of being statistically significant.

## Conclusions

Overall, there is considerable evidence that the students who attended Project SOAR performed at a superior level academically when compared to a control group of students from the same school. However, the results were not uniform, suggesting areas that Project SOAR administrators may wish to consider for further attention as they continue to develop this innovative academic enrichment program.

Project SOAR students demonstrated lower rates of absenteeism during the four quarters reported on in this study. However, both groups saw absenteeism rise throughout the year. Project SOAR staff should attempt to identify the factors leading to absenteeism in their students and develop plans to reduce the impact of these factors.

While grades went down in all subjects for both groups, Project SOAR students maintained their grades at a higher level than those in the control group in Math and English Language Arts. Average grades for Science and Social Studies were higher for Project SOAR students, but not enough to be statistically significant. Project SOAR staff should consider programming in Science and Social Studies to see if there are ways to further strengthen student skills in these areas.

Finally, a greater percentage of Project SOAR students demonstrated that they met or exceeded performance standards (Level 3 or 4) on the New York State Academic Assessment tests, but not quite enough to be statistically significant. Project SOAR staff should consider modifications to their programming in Math and English Language Arts that would better prepare students for the NYSAA tests in these subjects. As well, they may wish to consider instruction in test taking skills since the literature suggests that children from disadvantage backgrounds and certain ethnic groups have greater difficulty with standardized tests.

***Overall academic achievement, as measured by overall grade averages was higher for Project SOAR students at a statistically significant level.*** Given that this was the first year of the research, this outcome is promising. The program appears to be off to a strong start. The parent organization, Cradle Beach, has a strong history of developing exceptional programming for youth facing academic and economic challenges as well as youth with disabilities and the staff appears to be fully capable of making necessary adjustments to the program that will address the areas cited by the report that need modification.