Effects of Tracking Student Growth and Success Celebrations on High School English Learners in Science
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Background

Burlington-Edison High School (B-EHS) is located in the Skagit Valley in Washington. Many Hispanic families have established this area as their home, and the B-EHS student population is 31.9% Hispanic. My classroom reflects this with 19% of my students being classified as English Learners (EL). A common perception that EL students express is that they are not good at science. Many teaching strategies with EL students focus on content knowledge but not on how to build engagement. This action research project focuses on increasing engagement in my EL population through goal setting and celebrating student success with a goal of improving their self-perception in science.

Research Questions & Methodology

Research Questions	Pre & Post-Test	Student Survey (Likert Survey)	Individual Student Interviews	Teacher Journal
Main Focus Question: What impact does creating an environment where students' successes are celebrated through regular pre-test & post-test growth celebrations and Scientist of the Lab awards have on the engagement of English Learners?				
Does regular tracking of their own progress towards a specific goal increase growth in test scores for EL students?	X		X	
How does the implementation of the Scientists of the Lab Award influence EL students' level of engagement in science?		X	X	X
What impact does implementation of both test score tracking and Scientists of the Lab have on the students' engagement towards science?		X	X	X
What is the impact of the study on the teacher?		X	X	X

Treatment and Sample

Baseline data (Likert survey, pre- and post-test data) were collected during a subject unit. Following this unit, the treatment was implemented. The treatment was comprised of two parts: students tracking their growth and celebrating the use of scientific skills through the Scientist of the Lab Award. Students tracked their growth from pre-test to post-test and set goals for growth. Students also participated in labs where a specific skill was identified and then a lab group was selected for the best demonstration of that skill. The winning group received class recognition along with an award. At the end of the unit, students took a post-test on the content and then reflected on if they met their goal and why. This treatment was repeated for a second unit. Following the completion of both treatment units, students took a Likert survey on engagement to attempt to measure if the treatment improved their engagement.

This project was implemented in two Physical Earth Science classes. These classes consisted mostly of freshman and sophomores, however there are some juniors as well. Together there are 45 students in both classes. 19% of the students were classified as EL with Spanish as their first language. The treatment was applied to all students as a point of comparison.
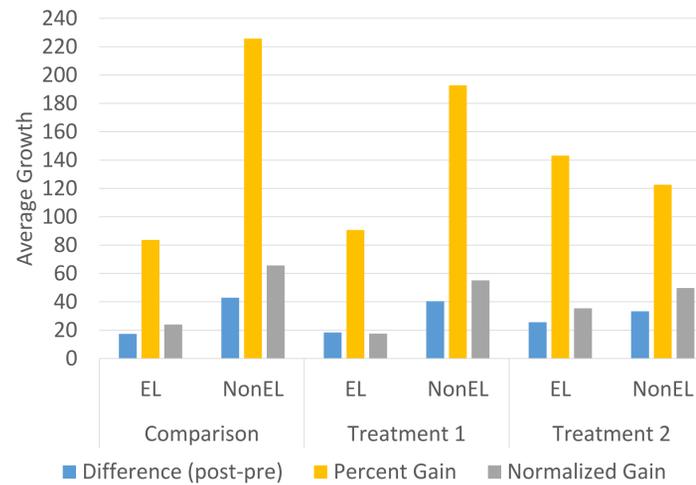
Data: Pre- & Post-Test

Figure 1: Average gains from pre-test to post-test analyzed using three methods (EL *N*=10, non EL *N*=31).

Table 1
*Statistical Analysis of Average Gains (*EL *N*=10, non EL *N*=31)

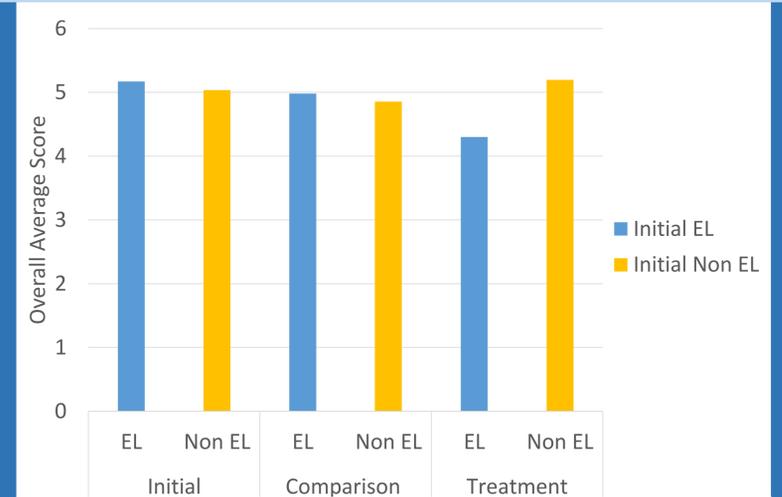| Study Group	Comparison of Data Sets	Method of Analysis	Higher Average	Statistical Test	p-value	Difference Statistically Significant?
EL	Comparison unit to Treatment 1	Difference (post-pre)	Treatment 1	Welch	0.93	No
		Percent Gain	Treatment 1	Wilcoxon	0.64	No
		Normalized Gain	Comparison	Welch	0.83	No
	Comparison unit to Treatment 2	Difference (post-pre)	Treatment 2	Wilcoxon	0.25	No
		Percent Gain	Treatment 2	Welch	0.43	No
		Normalized Gain	Treatment 2	Wilcoxon	0.28	No
Non EL	Comparison unit to Treatment 1	Difference (post-pre)	Comparison	Welch	0.58	No
		Percent Gain	Comparison	Wilcoxon	0.58	No
		Normalized Gain	Comparison	Welch	0.06	No
	Comparison unit to Treatment 2	Difference (post-pre)	Comparison	Welch	0.03	Yes
		Percent Gain	Comparison	Wilcoxon	0.21	No
		Normalized Gain	Comparison	Welch	0.01	Yes

Data & Analysis: Likert Survey

Figure 2: Overall average Likert survey scores for EL and non EL students during each collection period (EL *N*=10, non EL *N*=37).

Table 2
Statistical Analysis of Likert Survey (EL *N*=10, non EL *N*=37)

Study Groups	Comparison of Data Sets	Higher Average	p-value	Difference Statistically Significant?
EL	Initial to Comparison	Initial	0.5	No
	Comparison to Treatment	Comparison	0.0001	Yes
Non EL	Initial to Comparison	Initial	0.02	Yes
	Comparison to Treatment	Treatment	0.02	Yes

Conclusion

Engagement: The goal of this research project was to see if there was an impact on EL engagement by having students monitor their progress and celebrate their success. Despite observing a slight quantitative decrease in engagement from this treatment in EL students (from the survey responses), there were qualitative indicators of improvement in engagement from comparison to treatment. During the qualitative interviews, EL students referenced how the Scientists of the Lab award and tracking their progress improved their engagement.

Performance: When students set goals and tracked their own progress throughout the course of a unit, there was no statistically significant increase in their growth over a subject unit. They did grow from pre-test to post-test but not more than during the comparison period. Qualitatively though, most EL students explained in interviews that they liked to track their progress and see how much they grew over the course of a unit.

Value to Teacher: Making all my students feel successful and that they can "do" science has been a primary focus for me in my teaching career. This classroom research project made me want to continue to build classroom systems that celebrate student success such as the Scientists of the Lab Award or student growth celebrations. Comments such as "I was surprised by how much I actually grew from post-test to pre-test" and "I felt like I talked more about the lab during the lab with my lab partner when we did the Scientist of the Lab award" provide qualitative indicators that the practice of focusing on student success should be continued.