



# IMPLEMENTING INTERACTIVE NOTEBOOKS WITH HIGH SCHOOL ENGLISH LANGUAGE LEARNERS



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## Introduction

Nearly 40% of the students enrolled at San Ysidro were classified as English Language Learners (ELLs), where almost every teacher on campus has worked with students who are learning English as a second language. Since the majority of classes that I have taught are biology, the students were exposed to a large amount of vocabulary and content specific language.

Making sense of the terminology can be challenging for many students, especially English Language Learners. One tool that can help facilitate inquiry-based learning is an interactive science notebook. Students are given opportunities to collect observations, make predictions, test out ideas, collect and analyze data, and draw conclusions. As this information is processed into the notebook, reading, writing, and even oral discussion occur.

## Research Questions

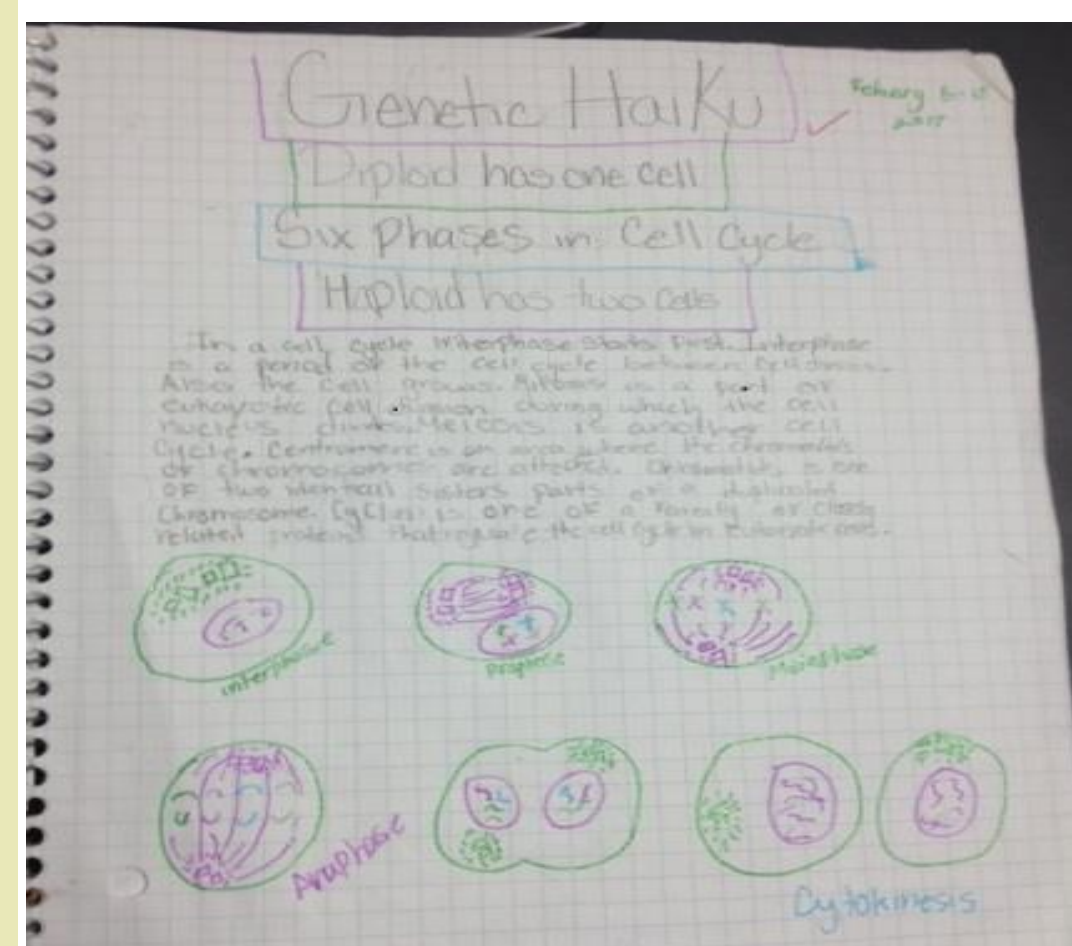


**Focus Question:** *What are the effects of using interactive notebooks with English Language Learners?*

**Sub Question 1:** *Can the use of science notebooks help close the achievement gap between English Language Learners and students who are classified as Fluent English Proficient?*

**Sub Question 2:** *Will various writing assignments in science improve student engagement and performance?*

## Sample Student Work & Quotes



- *“Writing in science has helped me understand more about the topic”*
- *“Using the notebook has helped me a lot. I used to just throw everything in my bag and it was a mess!”*

## Methods

- The study began with students completing the Student Literacy Confidence Survey. This instrument contained twenty Likert type statements designed to measure level of agreement on reading, writing, and comprehension of science information.
- Students completed pre- and post-content assessments for both non treatment and treatment units.
- The non treatment unit consisted of teacher led activities, direct instruction, and assessment.
- The treatment unit was inquiry based, using the 5E Cycle to guide instruction. Notebooks were used to facilitate student learning.
- A small sample of students were interviewed at the beginning and end of the study to make connections between assessment scores, notebook scores, and student perceptions.

Table 1. *Data Triangulation Matrix*

	Source 1	Source 2	Source 3
Focus Question	Student Science Literacy Confidence Survey	Pre- and Post-Content Assessment Scores	Rubric scores for notebook during the treatment unit
Sub Question 1	Pre- and Post-Content Assessment Scores	Student Science Literacy Confidence Survey	Interview questions based on value of performing well in science
Sub Question 2	Rubric Scores for Notebook and Vocabulary Assignments	One Sentence Summary Completion for Article	Interview questions based on writing in science

## Results

- The results of the Student Science Literacy Confidence Survey given before treatment, which included 20 Likert-type questions, indicated that 77% of the students either *agreed* or *strongly agreed* that writing in science would help them understand the English language better (N=52). When this was compared to the post treatment survey, the frequency increased to 82% (Figure 1).
- Sixty percent of students classified as English Language Learners completed the Genetics Haiku Vocabulary Assignment. When Notebook 10-Point Scoring Rubrics were compared to treatment unit test scores, there was a positive correlation between the two variables. The Pearson's Correlation Coefficient for all ELL students was  $r = 0.68$  (N=20). At a five percent confidence level, the P-Value was 0.0009. This result is considered significant (Figure 2).

## Results

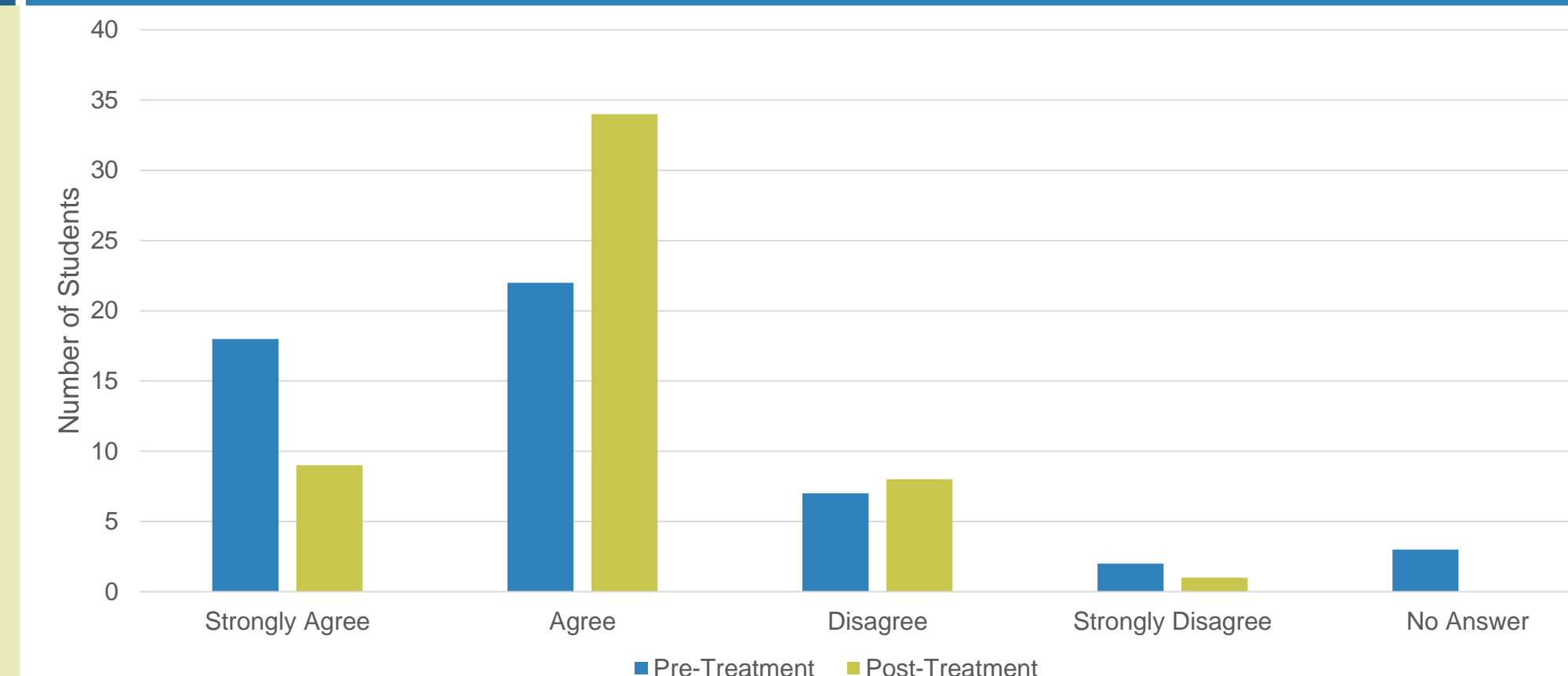


Figure 1. Student responses to the statement “Writing in science will help me understand the English language better” (N=52).

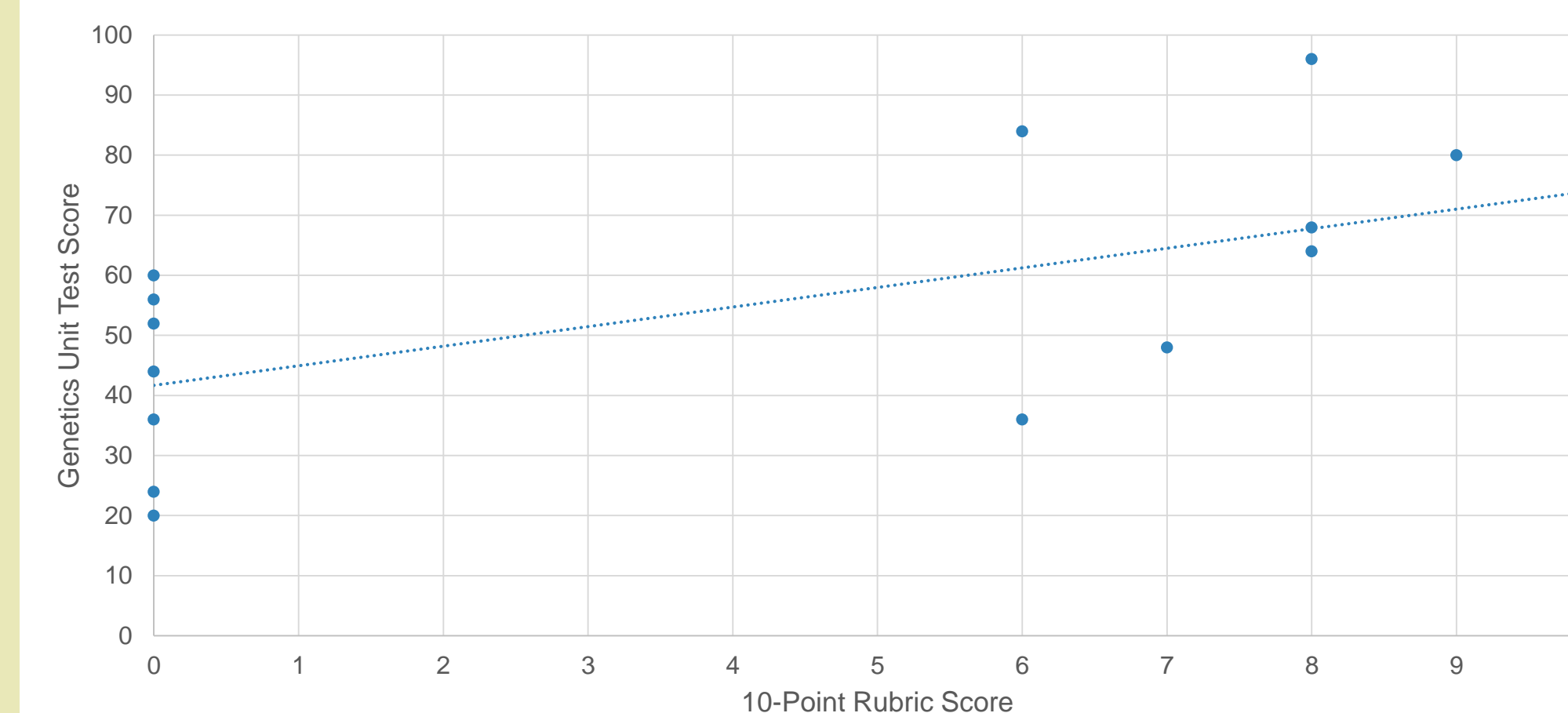


Figure 2. A scatter plot showing the relationship between the Genetics Haiku Vocabulary Assignment and Unit Test Scores for ELL students (N=20).

## Conclusions

After analyzing the data collected, there were positive correlations between the use of interactive science notebooks and student achievement. Although average test scores were slightly higher on the non-treatment test compared to the treatment test, ELL normalized gains were comparable to English Only students after treatment. This is a good indication that on average, ELL students can perform at the same level as their English Only classmates when science notebooks are utilized.

It was also observed that many students agreed the use of notebooks and writing in science would help their overall achievement in class. Through compiling the data collected from surveys and interviews, over 80% of students felt that if they kept up with the notebook and completed the writing assignments they would perform better in biology.