

EFFECTIVENESS OF INTERACTIVE SCIENCE NOTEBOOKS ON STUDENT ACHIEVEMENT VERSUS A TRADITIONAL CLASSROOM MODEL

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Introduction:

This project was conducted with the 41 10th-12th grade students in my two chemistry classes at Bell City High School in Bell City, Louisiana. I chose this particular topic after interactive science notebooks were introduced at an in-service and we were encouraged to implement them for that school year. After seeing several coworkers from a variety of schools struggle with implementation, I wanted to see if interactive science notebooks are more effective for my students than a traditional classroom model. The research shows that interactive science notebooks can be more effective than a traditional classroom model if they are well-implemented.

Research Questions:

Focus Question

- How will integration of interactive science notebooks affect student achievement in my secondary chemistry classroom?

Sub Questions

- Will the use of interactive science notebooks be more effective than allowing students to determine their own form of record keeping?
- What are student opinions regarding interactive science notebooks, and do those opinions change as a result of their integration into my classroom?

Treatment:

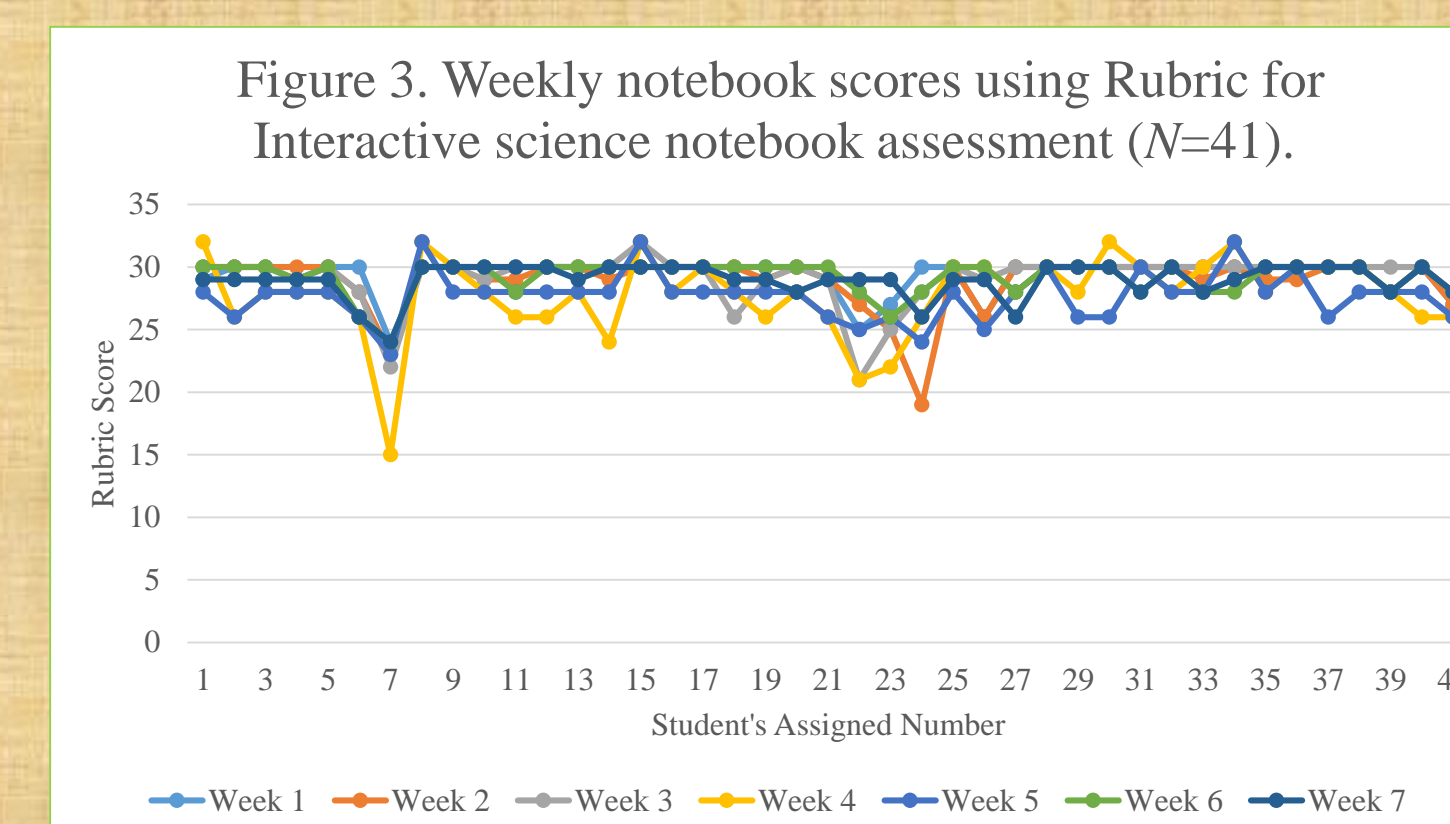
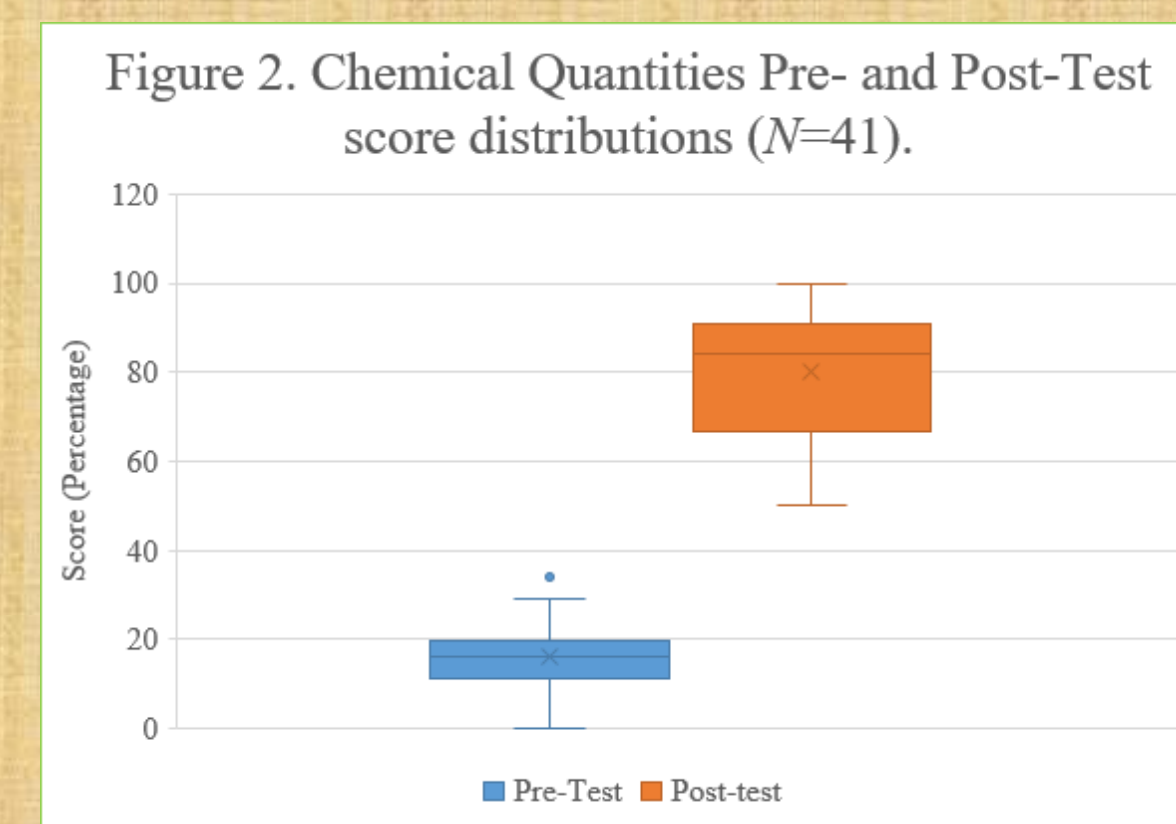
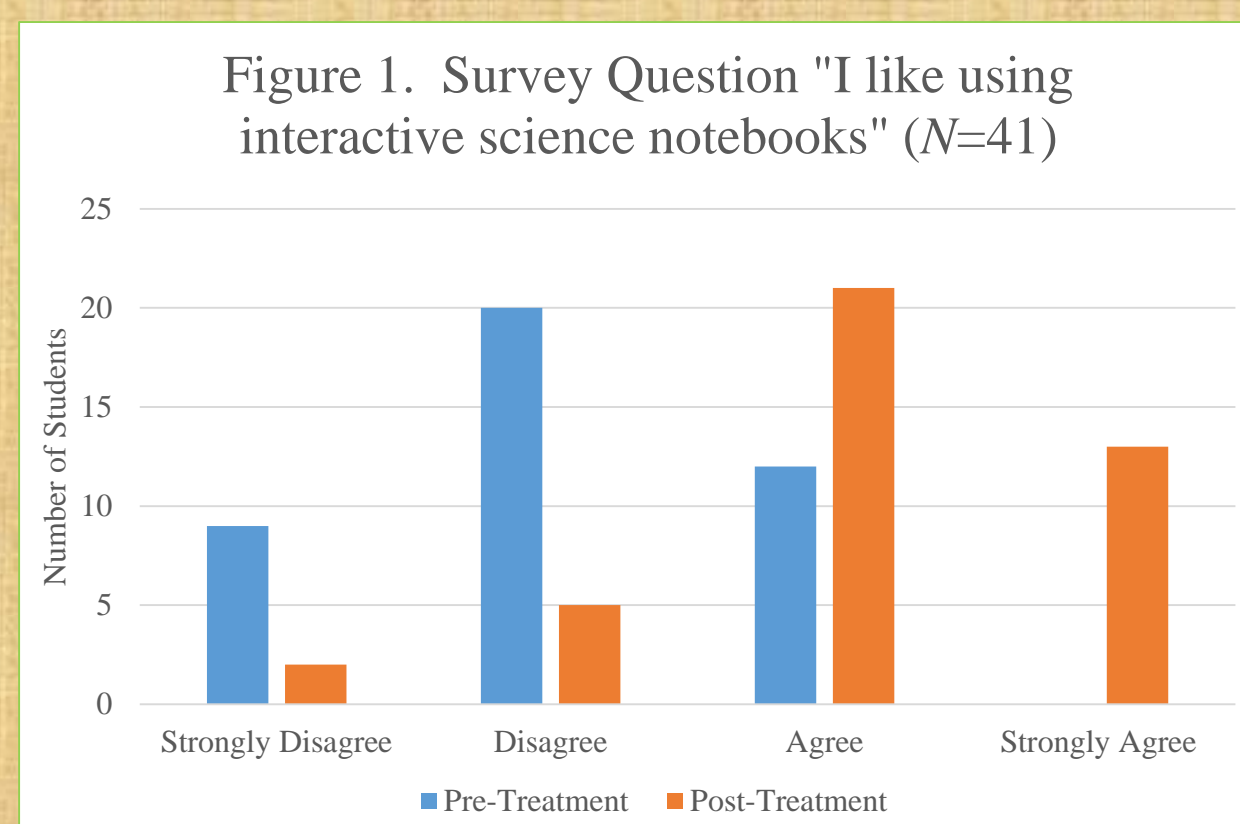
This study began with two pre-treatment units on Periodic Trends and Chemical Names and Formulas. These units were pre- and post-tested but were taught using a traditional classroom model. Three treatment units on Chemical Quantities, Chemical Reactions, and Stoichiometry followed the pre-treatment units. These units were pre- and post-tested and taught using an interactive science notebook model with input designed by the teacher and output designed by the students. The notebooks were assessed using a standard rubric. The students were surveyed and interviewed before and after the three treatment units.

Data Collection Methods

Research Questions	Data Source 1	Data Source 2	Data Source 3	Data Source 4
Focus Question	Content Pre- and Post-tests	Student Work Samples Analyzed with Rubrics	Teacher Journal	Interactive Science Notebooks Pre- and Post-Treatment Survey
Sub Question 1	Content Pre- and Post-Tests	Interactive Science Notebooks Pre- and Post-Treatment Survey	Interviews	Teacher Journal
Sub Question 2	Interactive Science Notebooks Pre- and Post-Treatment Survey	Interviews	Teacher Journal	Student Work Samples Analyzed with Rubrics

Results:

Survey results and interview responses indicate a shift in student opinions from negative to positive for many, but not all students (Figure 1). The results of the pre-treatment units indicated normalized gains of 0.69 and 0.81. The treatment units yielded normalized gains of 0.73, 0.72, and 0.74 (Figure 2). Interactive science notebooks scores remained consistent throughout the seven weeks of treatment (Figure 3).



Conclusions:

After data analysis was complete, student achievement was found to be more consistent during the treatment units than during the pre-treatment units, despite a pre-treatment normalized gain being higher than the treatment normalized gains. The consistency in the treatment units could also be interpreted as effective because this implies that the learning was consistent across all the treatment units in comparison to the uneven learning seen in the pre-treatment units. Also, student rubric scores were highly consistent through the seven weeks of data collection, which the student interviews attributed to increased organization.

There was consistency in student opinions of the interactive science notebooks as well. During the pre-treatment interview, none of the 10 students interviewed liked the interactive science notebooks. By the post-treatment interview, 9 of the 10 students interviewed liked the notebooks. This drastic shift in opinion is backed up by teacher journal entries recording the requests of students to continue use of the interactive science notebooks after data collection was complete as well as the shift in survey results seen above in Figure 1.

