Does science vocabulary instruction increase student comprehension with 7th grade students in middle school?

Background

Research supports that the average student should gain at least 3000 words in a year. Many of these words are acquired through various content areas. Science is a content that consistently lacks student mastery. One of the causes for the non-mastery can be aligned with vocabulary instruction in science. Students are not successful without the knowledge of science vocabulary. Traditionally, as part of the science instruction, teachers present students with a list of vocabulary words to look up in the dictionary. They are instructed to write them down, and use them in sentences. However, this method is not an effective way to improve students' reading comprehension. This topic of study was selected because disaggregated data implicated that vocabulary instruction is deficient in an urban setting science classroom. Therefore, with this intense, purposeful vocabulary instruction be enough to increase student comprehension and science literacy at Crawford Long Middle school.

Student Population

I teach the whole seventh grade in Life Science three periods a day which consist of 189 students. Since I am the only science teacher for the seventh grade, the students were put on an "A" day and "B" day schedule. Instead of the students receiving science every day, it's every other day. Each class has an average of thirty –two children in each section. I performed my action research with the whole seventh-grade science classes to collect data from 189 students. Some 13 students are tagged gifted, nine students with an Individualized Educational Plan (IEP), and four English to Speakers of Other Languages (ESOL) students. In the 7th grade, 56% are girls and 44% are boys. The demographics of our 7th-grade student population for 2015-2016 are African-American 90%, Caucasian 1%, and Hispanic-Latino 9%. Due to the economy and low-incomes, the school currently has 100% of students qualifying for free and reduce lunch.

Focus and Sub- Questions

- Does vocabulary instruction increase student comprehension with 7th grade students in middle school?

  Sub-Questions:
- What strategies are teachers using to reinforce?
- What are the impacts of using methods that are considered best practice to teach science vocabulary on science literacy skills?
- How does using methods that are considered best practices to teach science vocabulary impact student attitudes?
- What are the impacts of vocabulary instruction on the classroom teacher?

Treatment

The research was implemented during a twelve week period on two units Genetics and Ecology. The invention was given to the entire seventh-grade life science classes for both units. After discussions with the Principal, Science instructional coach, ELA instructional coach, and all content teachers, I begin my treatment assessing each chapter to determine which words should be taught to achieve the largest increase in comprehension instead of using the vocabulary lists at the beginning of each chapter. Finally, I determined which words I was going to teach, and I designed the vocabulary enrichment activities for each unit.

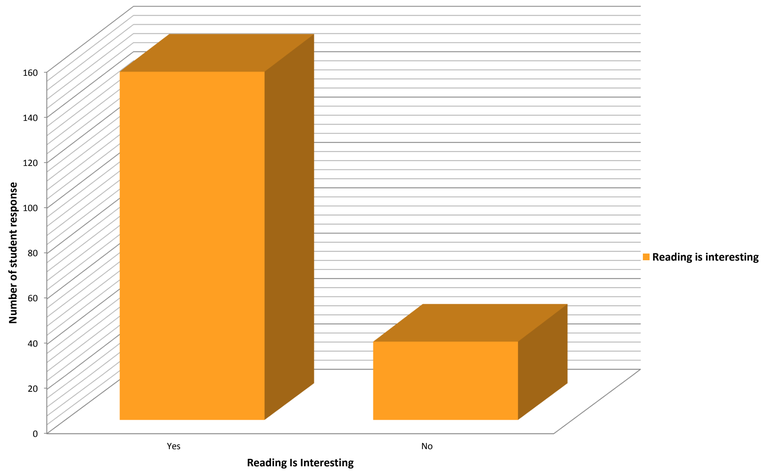

Figure 3. Reading is Interesting

Research matrix

Research Questions	Data Source #1	Data Source #2	Data Source #3
#1	Pre and Post Vocabulary Assessment Vocabulary Terms and Word Parts	Student Focus Group Survey Science Interactive Notebook	Formative/Summative Assessments Teacher Questionnaire
#2	Science Vocabulary Questionnaire Student Focus Group Vocabulary Survey	Summative Assessment Science Interactive Notebook	Science vocabulary questionnaire
#3	Student Focus Group Vocabulary Survey	Summative Assessment Science Interactive Notebook	Teacher Observation Teacher Questionnaire
#4	Student Focus Group Vocabulary Survey	Summative Assessment Science Interactive Notebook	Teacher Observation Teacher Questionnaire

Results

When asked why you don't like reading, one student said it hurts his head and sixteen students said it is boring. Eight students simply said they don't like to read. In additional, three students said they get sleepy when they are reading. The majority of the students like to read because it is fun, educational, interesting, and they can build of their vocabulary. Another pattern I noticed is 62% of my gifted students don't like to read, however 67% of my students with an IEP's like to read. After further investigation, my gifted and talented students said, "reading is boring, and they only read things that catch their interest but in school the textbooks are boring."

Implications

Vocabulary instruction is a very critical role in reading comprehension. After completing my studies on science vocabulary instruction understanding, it changed my teaching style in many ways. Increasing students' science vocabulary will help with increased comprehension. All content areas require comprehension of text. Students should have a toolkit that consists of strategies which will help them to identify words and generate the meaning of new vocabulary terms in order to increase comprehension. Additionally, teachers must provide opportunities for students to interact with new words on a daily basis in every subject area and relate them to real- life context.

Conclusions and Future Work

The next step will be to administer a teacher questionnaire and make observations in each science classroom. The teacher questionnaire pertains to the instructional materials used in the classroom, the methods used to teach vocabulary strategies and the frequency, and how she assesses student achievement for vocabulary knowledge and comprehension. In content-area classrooms, teachers are being asked to assume the responsibility of vocabulary instruction. Therefore, teachers should select words relevant to the content area that promote comprehension. I am hoping that spending more time teaching vocabulary instruction would lead to student learning, attitude toward scientific vocabulary, and science literacy skills.

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