How will teaching students strategies for reading and responding to questions impact student learning in science?

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Background

The idea for my research developed out of a deficiency in my students' ability to respond completely and correctly to written questions on assignments and tests. In particular, I noticed students struggled to answer questions with multiple steps.

Student Sample

Four 7th grade science classes at Lincoln International School in Buenos Aries, Argentina participated in the research. Lincoln is a privately owned school so there is little economic diversity, but students are ethnically and religiously diverse. Eight percent of the 7th grade students utilize the services of the Learning Center (special education), 8% of the population are English as a Second Language Learners and 11% of the population are both Learning Center and English as a Second Language Students. The remaining 74% of students don't receive any addition training.

Methods

In order to accurately represent the range of student ability in the population, data was collected from four different samples.

Method	Sample
Summative Assessments	Entire 7th grade
Formative Assessments	Entire 7th grade
Pre/Post-Treatment Interview	12 students of mixed ability
Longitudinal Interview	6 students of mixed ability

Research Questions

How will teaching students strategies for reading and responding to questions impact student learning?

- How will teaching students strategies to read and respond to questions impact their ability to assess and adjust their own learning?
- How will this research impact my teaching?

Research Question 1	Research Question 2	Research Question 3
Impact students' learning	Impact students' ability to assess and adjust their own learning.	Impact on teaching.
Methods		
Pre-test Classroom Assignment Unit Test Post-test	Pre-treatment Interview Classroom Assignment Opening Task Unit Test Post-treatment Interview Student Reflection	Formative Assessments Student Reflection Research Journal

Treatment

The treatment for this project consisted of teaching students a five step process for reading and responding to questions. Students were required to use the strategy on all types of questions throughout the 12-week treatment.

Step 1 – Circle the question or/and command words, identify their meaning and number tasks

1 2

Example: Why is science so fun? Explain.

Step 2 – Identify the type of question – simple or complex.

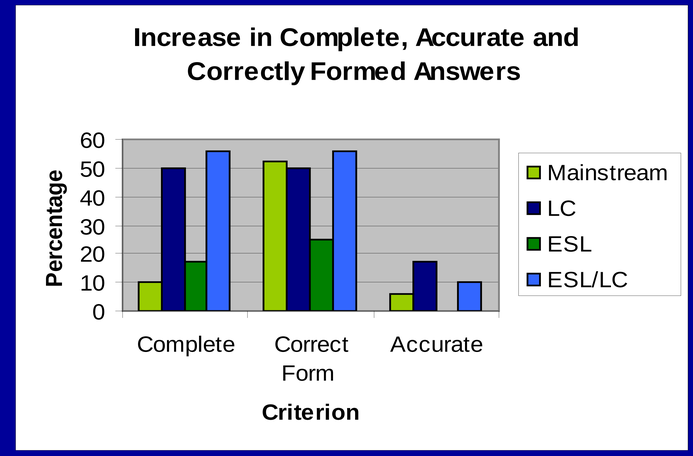
Step 3 – Reflect whether you understand the question.

Step 4 – Answer the question.

Step 5 – Check your answer.

Data Analysis - Student Learning

The treatment improved students' ability to answer questions completely, accurately and in the correct form. The results for each category are presented by demographic groups in the figure below.



Data Analysis

Metacognition

- Increased strategy use – 88%
- Students aware of benefit of strategy – 92%

Teacher Impact

- Allow more time for strategy instruction
- Simplify strategy - 51% of students said, "delete step 2"
- Include more reflection in class

Conclusion

Based on the results, three major conclusions can be drawn from this research. First, question strategy can improve student learning. When students use question strategy their answers are more likely to be correct, complete and accurate. Second, metacognitive awareness can be developed through guided self-reflection. Third, I learned that action research is an incredibly useful process which results in self-awareness and better instruction.