FORMING EXPLANATIONS FROM EVIDENCE USING THE CLAIM-EVIDENCE-REASONING FRAMEWORK

Johanna Traut, MSSE Graduate Framework Candidate
Science Teacher, Poultney High School, Poultney, Vermont

Background

My capstone project was conducted with my ninth grade earth science students. I chose my topic because I noticed that students struggled explaining why their evidence supported their conclusions. I believe this lack of reasoning also impacted their understanding of the content area. By implementing a conclusion writing framework students’ analysis of evidence should improve along with their understanding of the content.

Research Questions

Primary Question
How will students’ ability to use evidence from explanations impact their content mastery?

Secondary Questions
1) If students practice using an outline based on CER in their scientific writing, will it improve their use of evidence in conclusions?
2) In what ways does implementing a conclusion writing framework and practice analyzing data improve students’ ownership of the learning process?

Data Collection and Analysis

Focus Question
How will students’ ability to use evidence to form explanations impact their content mastery?

Subquestions
1: If students practice using an outline based on CER in their scientific writing, will it improve their use of evidence in conclusions?
2: In what ways does implementing a conclusion writing framework and practice analyzing data improve students’ ownership of the learning process?

Results and Student Quotes

Sample Student CER and Journal Entry

"I need more help writing my claim and reasoning because it is hard for me to get the right details."

"Yeah, it helps me to focus on my claim and find supporting evidence. It is like writing a constructed response in science."

Conclusion

Content Mastery
- There was a general trend but no strong correlation between improvement on CER and assessment scores
- Framework helped students organize their thoughts and improve science writing
- Did not improve students’ confidence in conclusion writing

Evidence Usage
- The largest gains were seen in stating clear claims and using appropriate and sufficient evidence
- Appropriate evidence was consistently used, while evidence used was not always sufficient
- Use of evidence dependant on the task, understanding of concepts, and student buy-in

Student Ownership
- Limited to no increase in student ownership of learning process was observed
- While students did not take more ownership, outlining evidence did aid students in work completion

Overall
- Helped students organize thoughts
- Using as a formative assessment to gauge students’ understanding and misconception was very useful