

The Impact of Claim-Evidence-Reasoning Writing Techniques on Argumentation Skills in Scientific Investigations

Background

The research for my capstone project was done with my ninth grade biology students. I chose to focus my research on student ability to use argumentative writing to make claims and to back these claims up with evidence and reasoning. I implemented instruction of the CER (claim, evidence, reasoning) framework to help improve my students' scientific skills that relate to making, supporting, and evaluating claims.

Primary Question

What are the effects of the direct instruction of the CER framework on conclusion writing in scientific investigations?

Secondary Questions

- How does the CER framework affect the amount of times students write a claim when writing conclusions?
- How does the CER framework affect the amount of times data is used when supporting an argument from evidence?
- How does the CER framework affect the amount of times students use reasoning to link evidence to their original claim?
- Will the practice of writing with the CER framework improve student confidence in using scientific concepts in their reasoning?

Data Collection & Analysis

	Data Sources	
Primary Question	Pre and Post-Intervention Survey	Student Interviews
Secondary Questions	Pre and Post-Intervention Written Assessment	Student Interviews

Results

After being introduced to the CER framework, students showed a significant increase in their ability to write better claims. Students also showed a significant increase in the use of evidence with their claims. Before being introduced to the CER framework, only 29% of students used numerical data compared to 71% after using the CER framework. Students still continued to struggle with the use of reasoning, suggesting much more work that needs to be done in argumentative writing within the high school science classroom.

Treatment

After taking a pre-writing assessment on conclusion writing, students were introduced to the CER framework to determine if it would increase the use of claims, evidence, reasoning. Students then used this framework on two lab investigations and received formative feedback before taking a final post-test writing assessment. These assessments were identical and scored with the same CER rubric.

