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

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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.

Data Collection & Analysis

[Graphs showing average student claim score and frequency of numerical evidence use before and after the intervention]