Student Science Notebooks: A Tool For Improving Conceptual Understanding

Stacey Ellis
Linderman Elementary School
Polson, Montana

Background
The idea for this capstone project came from observations of student writing. In recent years I have observed students become successful at creative writing, whereas expository writing has been a struggle for many of these young writers. I feel that expository writing should be focused on at a young age, and science provides an authentic means in which to do this. Students need to learn how to use writing as a personal tool with which knowledge can be constructed. I believe that through deliberate instruction and the utilization of student science notebooks that these goals can be achieved and that students can become successful science writers and learners.

Student Sample
Linderman Elementary School, a second through fourth grade school, is located in Polson, Montana, on the Flathead Indian Reservation. Currently three hundred sixty four students are enrolled in Linderman, fifty-five percent are part of the free and reduced lunch program, and thirty-six percent are Native American. My twenty fourth grade students were a part of this capstone project. This class was made up of eight females and twelve males.

Research Questions
What impact does the use of science notebooks have on student achievement and understanding in science?
What types of teacher feedback are most effective in supporting student learning and achievement?
How will the use of science notebooks affect student writing across the curriculum?

What Does the Literature Say?
Writing in science notebooks provides students an opportunity to develop a deeper understanding of the world around them (Klentschy & Molina-De La Torre, 2004). Science writing is important for generating a personal response to experiences, clarifying ideas, and constructing knowledge (Butler & Nesbit, 2008). The use of science notebooks is an active means in which to promote metacognitive awareness in students (Butler & Nesbit, 2008).

Treatment
The treatment for this study included the implementation of science notebooks as a part of daily science instruction to fourth grade general science students. Students wrote purposes, questions, predictions, observations, data, reflections, summaries, and questions for further investigation as appropriate. As a part of this treatment, the teacher provided consistent, high quality feedback in the form of questions in the student science notebooks. Throughout the study, expository writing skills were focused on during science instruction and metacognitive awareness was emphasized as a part of daily science writing.

Data Collection Instruments

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Data Analysis
Students' average composite scores on the Science Notebook Assessment Rubric increased by 10% over the course of the treatment phase. Students' social studies writing scores increased in the 6-Trait areas of ideas and voice while sentence fluency scores remained the same throughout the treatment period. By the end of the treatment period, 90% of the students claimed to use teacher feedback to improve the quality of their work.

Conclusions
Student Science Notebooks impacted student achievement and understanding in science in a positive manner. Student Science Notebooks and student writing can be used as a learning tool to improve student conceptual understanding. Teacher feedback should be consistent. Students should be given time to read and address the feedback in order to further their own learning.

Works Cited: