The Impact of the 5E Learning Cycle on 7th Grade Students’ Learning and Retention of Science Concepts

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Project Background:
In the fall of 2016, Montana adopted new science content standards modeled after the Next Generation Science Standards (NGSS). This generated a need to improve my inquiry-based teaching skills. I set out to do so by implementing the 5E Learning Cycle, an inquiry-based instructional strategy that includes five phases: engage, explore, explain, elaborate, and evaluate. During the study period, I implemented two 5E Learning Cycle units and two non-5E Learning Cycle units for comparison. The project allowed me to monitor my transition to more inquiry-based teaching practices while comparing my 125 seventh-grade life science students’ learning and retention of science content in traditional versus 5E Learning Cycle units.

Research Question:
What impact does the use of the 5E Learning Cycle, an inquiry-based format, have on seventh-grade life science students’ learning and retention of science concepts?

Sub Questions:
• How does the 5E Learning Cycle impact students’ learning of science concepts?
• How does the 5E Learning Cycle impact students’ retention of science concepts?
• How does implementing the 5E Learning Cycle impact me as a teacher?

Table 1
Quantitative and Qualitative Data Collection Tools

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<th>Sub Question 1</th>
<th>Data Source 1</th>
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<tr>
<td>Pre- and post-unit test results</td>
<td>Performance assessment results</td>
<td>Pre- and post-unit concept maps</td>
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<td>Post- and delayed post-unit test results</td>
<td>Essential Vocabulary Progress Checks</td>
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<td>Lesson plan template, Science learning cycle lesson plan rubric</td>
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Results:
• In reviewing the data collection tools used to assess how the 5E Learning Cycle impacted student learning, a definitive statement for or against the 5E Learning Cycle cannot be made. Normalized gain scores for pre- and post-unit tests suggest that non-5E instruction may be best whereas student scores were higher on performance assessments embedded within 5E units. There was no statistical difference between concept map scores on 5E versus non-5E units.

References: