



Investigating Reading Strategies in a High School Earth Science Classroom

Mary Webb

Earth Science

Columbia Falls High School, Columbia Falls, Montana

June 12, 2020



Introduction

- The goal of this project was to increase student comprehension of scientific text in an effort to enhance student achievement, independent learning, and critical analysis.
- “Increasing literacy rates is the best way to increase student achievement”(McDaniel and Riddile, 2015, p. 58).
- By grade 12 student should be able to “engage in a critical reading of primary scientific literature” (National Research Counsel, 2012 p. 76).

Sample: Twenty two students took part in this study. Thirteen were male and nine were female. Excluding one eleventh grader, all students were in the tenth grade. Thirty one percent are eligible for free or reduced lunch.

Research Question

How do specific reading strategies impact students’ comprehension of scientific text?

How does including specific reading strategies in my practice impact my teaching?

How do student attitudes and self-confidence change when using reading strategies?

How does student choice of reading strategy impact comprehension, attitudes and self-confidence?

Students read a sample text, complete a comprehension pre-assessment and complete a Likert survey.

Strategy 1: Students use an Anticipation Guide when reading three passages. Students complete a reading assessment and survey.

Strategy 2: Students use PLAN when reading texts. At the end of the week students complete the same instruments as described previously.

Strategy 4: Students use a modified Know-What-Learn to answer their own questions they generate from the text. The same instruments will be used this week.

Strategy 3: Students use LAPS to analyze the purpose and the evidence in the text. Student data is collected using the same instruments.

Strategy 5: Students implement their preferred strategy when reading texts, then complete the weekly instruments, post study survey and interviews.

Results

- Student comprehension of scientific text statistically increased when using specific reading strategies. However, when comparing comprehension scores between reading strategies, there is no statistical difference (Figure 1).
- Student confidence summarizing scientific text increased, yet the gain was low (Figure 2).
- Anticipation guides and PLAN were strategies students chose most often (Figure 3).

Conclusion

- This study suggests that any reading strategy based on the Information Processing Theory will increase student comprehension of scientific text.
- When including current event articles, students reported more interest and value in the Earth Science curriculum.
- Evaluating the accuracy of data and arguments is a key component of the Scientific and Engineering Practices and Common Core Standards. Potentially, reading standards could be used as an interdisciplinary approach.

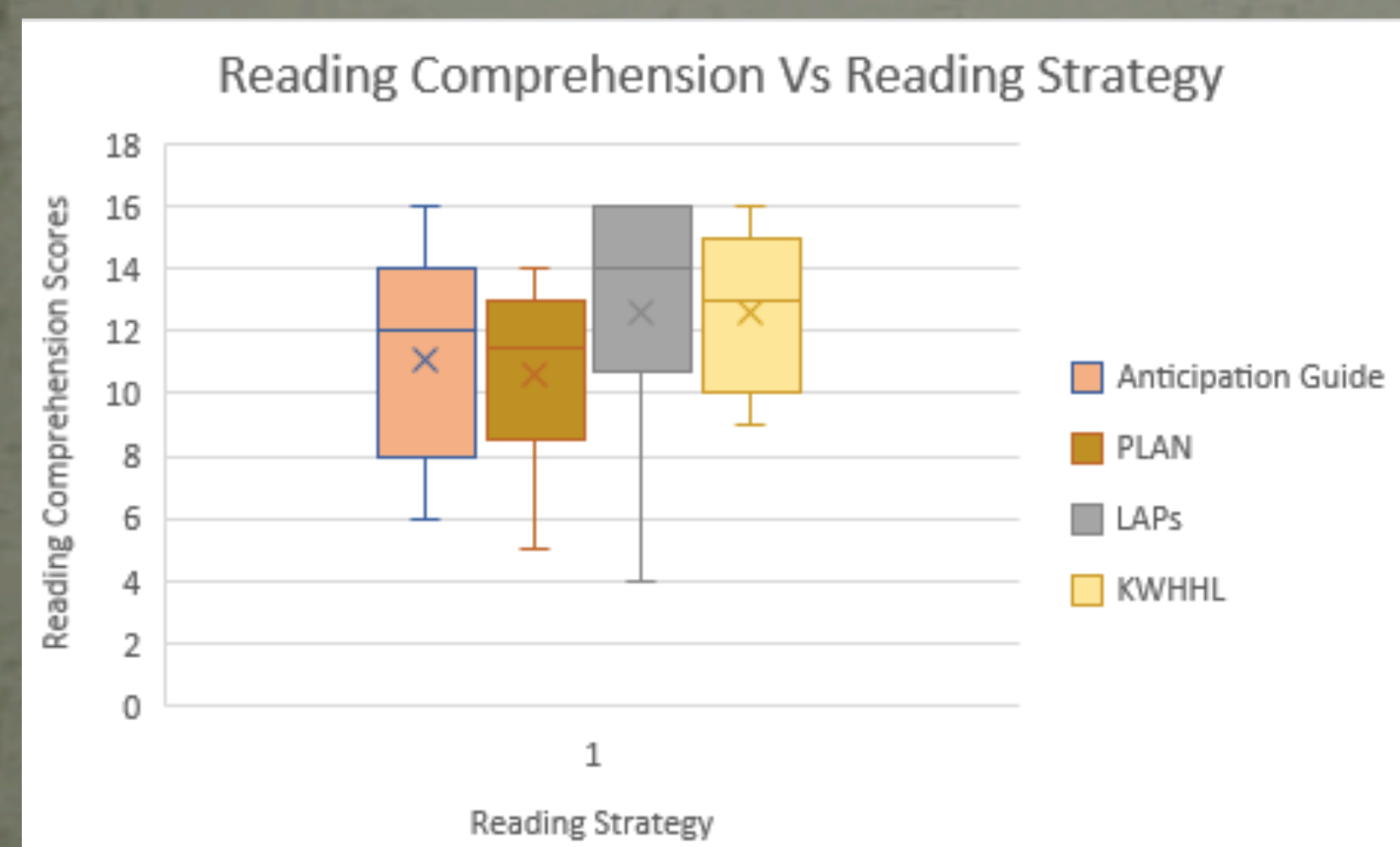


Figure 1: Reading Strategies Comprehension Scores (N=15)

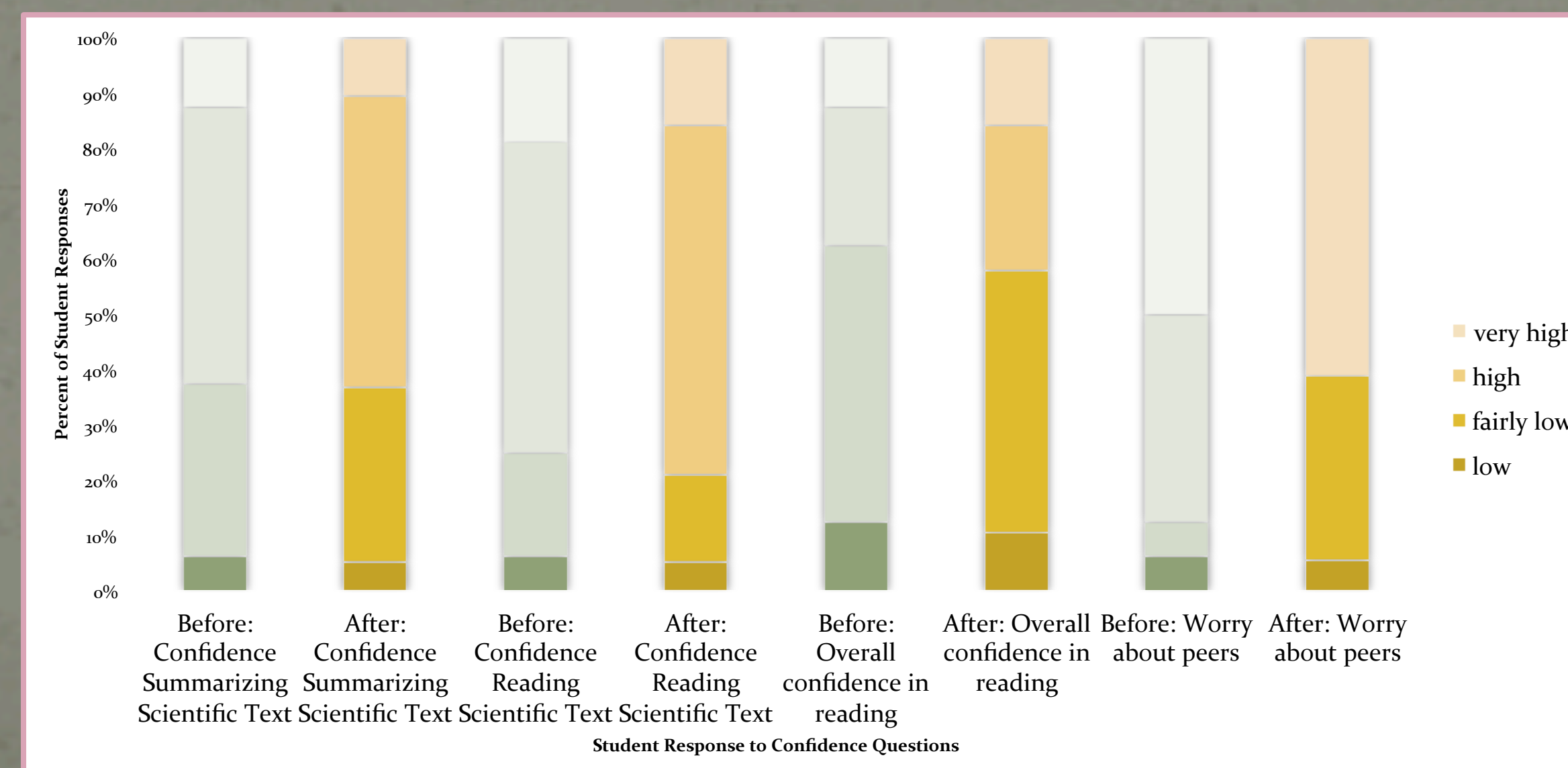


Figure 2: Student Responses to Confidence Questions (N=16)

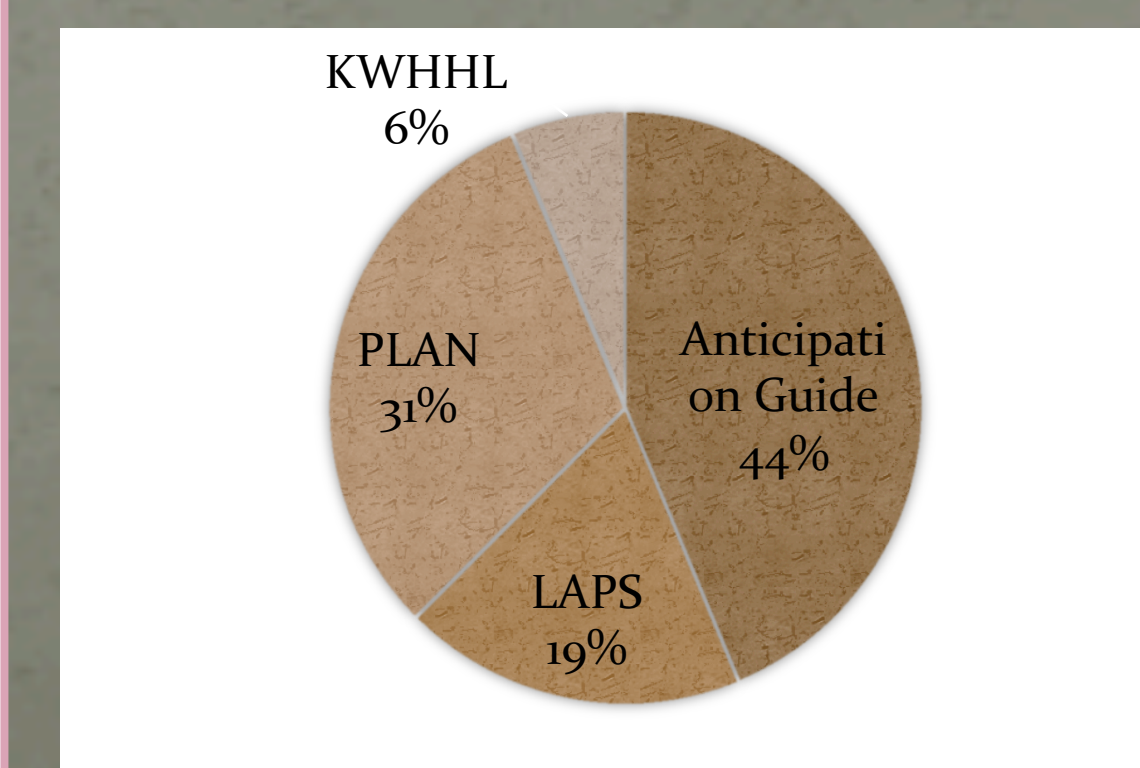


Figure 3: Student Choice of Strategy (N=16)

References

McDaniel, T., & Riddile, M. (2015). Literacy: every student, every classroom, every day. *Principal Leadership*, 15(5), 58-62.

National Research Council 2012. *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/13165>.