



IDEAS TAKING ROOT

Deepening Learning Through Biological Storytelling with Grade 11 Boys

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RESEARCH QUESTION: How might the storied nature of scientific knowledge deepen curricular connections in Biology for Grade 11 boys?

INTRODUCTION

Despite many interventions and modifications, my Biology 11 students struggled with academic success in our unit on plants. I believed that if they could appreciate that Science was its own valid and compelling story, they might find it easier to learn the material and forge deeper curricular connections. I did not want to make the content anthropomorphic, as senior students can find it patronizing (Rowcliffe, 2004). I wanted to develop a storytelling framework where plant content was structured using the elements of a short story so that evolutionary cause and effect could be linked (Wildrich, 2012). The goal of this project was to determine how changing my teaching style would impact student learning.

RESEARCH CONTEXT AND PARTICIPANTS

St. George's School, founded in 1930, has 1160 students from Grades 1-12. Of these, 110 are boarders in Grades 8-12 and come from over 20 countries worldwide. Nine students were selected from my Biology 11 course. The research window ran from early September through early December, encompassing 28 classes of 70 minutes each.

THE RESEARCH ACTION

The entire unit was redesigned so that it was within a storytelling framework. Content was reorganized so that each plant phyla became its own chapter in the story of plants. Key facts of plants were presented as story components: setting (habitat), strengths and weakness of the hero (key phyla characteristics), family members (specific characteristics of subphyla), conflict (competition and limiting factors), growth and development (plant life), and romantic interests (sexual reproduction).

Each class began with a review of the previous "chapter" and seeing where the story had ended before presenting new content as the next "chapter". "Story" days generally alternated with lab skill days.

DATA COLLECTION

During the action research, I kept my own journal. I collected responses from student lab activities, an end of unit essay, and reflections from the boys' personal research projects.

Pre- and post-unit, I assessed content knowledge and attitudinal changes through:

- Multiple choice content assessment
- Open-ended questionnaire responses
- Personal reflection videos
- Mind maps



DATA ANALYSIS

The data were sifted through my research question framework to generate 4 themes.

Data Types	Analysis Conducted
Questionnaires	Phrases transcribed into tables
Mind maps	Coded for word usage, number of connections, and complexity of thought
Videos	Transcribed for content Facial expressions, body language, tone of voice also coded
Multiple choice test	A paired t-test analysis conducted on scores
Summary Essay	PEE chains coded for completion and complexity

KEY FINDINGS AND DISCUSSION

Content Acquisition

The summary essay, mind maps, multiple choices tests, and personal responses all showed a dramatic increase and retention of course content

Active Engagement

Students were on-task during direct instructional times and during lab activities. Little off-topic conversation and almost no cellphone use

Increased complexity of thought

Mind map and essay responses showed the students forming coherent, well-developed arguments and demonstrating enhanced critical thinking skills

Embraced the "story of Science"

Students shifted from "Stories don't really have a role in Science" to "Stories are just another way of looking at Science"

CONCLUSION

Using a storied framework increased my Biology 11 boys' ability to make connections. The boys demonstrated a much deeper understanding of the material, as shown in their essays, labs, and video responses.

I hoped for increased content acquisition and critical thinking skills. I was not expecting increased engagement during class. The framework's impact was huge for my classes.

This approach worked well with a senior group of students and could translate well to other Biology courses (AP Environmental Science). I would be interested to see how this approach might work in junior Science classes (grade 8 and 9).

Biggest impact: Two months later in another unit, I switched back to my old methods. My students asked if we could use the storytelling framework because "I miss it and found it really helpful." I am reformatting this unit and adapting the rest of this course to utilize this framework.

KEY READINGS

- Bickmore, B., & Grandy, D. (2014). Science as storytelling. *BYU Studies Quarterly*, 53 (4), 37-60.
- Rowcliffe, S. (2004) Storytelling in science. *School Science Review*, 86(314), 121-126.
- Widrich, L. (2012). The Science of storytelling: Why telling a story is the most powerful way to activate our brains. *Lifehacker.com* Vol 12 (2012): 05-12. [online]

