



Evaluating the Effects of a Storyline Approach on Biology Student Performance and Attitudes



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BACKGROUND

Williams Bay High School:

- Enrollment = 230 students
- Fringe-rural public school between Milwaukee and Madison

9th Grade Biology & Honors Biology:

- Three sections - 2 biology and 1 honors biology
- Sample size of 47 students

Instructional Context:

- Annual perception of students that they "can't do science"
- Science is seen as a body of knowledge that an **exclusive** group of individuals can attain
- Biology has previously been **teacher-driven** and **lacking coherence and sense-making** on behalf of students

GOAL OF ACTION RESEARCH

To compare a **storyline** approach to traditional instructional methods when teaching biology. A **storyline** is a series of lessons that promote student-coherence, and involve collaborative sense-making with the teacher as a facilitator.

PRIMARY RESEARCH QUESTIONS

What is the effect of a storyline approach to teaching biology compared to a traditional method of instruction and learning?

Will student attitudes towards biology and individual science practices differ between the storyline and traditional approaches?

KEY FINDINGS

Collaborating through a storyline makes "us work with kids where we usually wouldn't work with. That prepares us for the real world when we have to get jobs . . . we have to 'play nice in the sandbox'." - 2nd Hour Biology Student

Previous science lessons were "more sit back and mostly just do your work in a book . . . you can actually participate now instead of just being a spectator." - 3rd Hour Biology Student

"This [storylines] is most closely related to literal science, right? You have to draw your own conclusions and work with the 'squad'." - 4th Hour Honors Biology Student

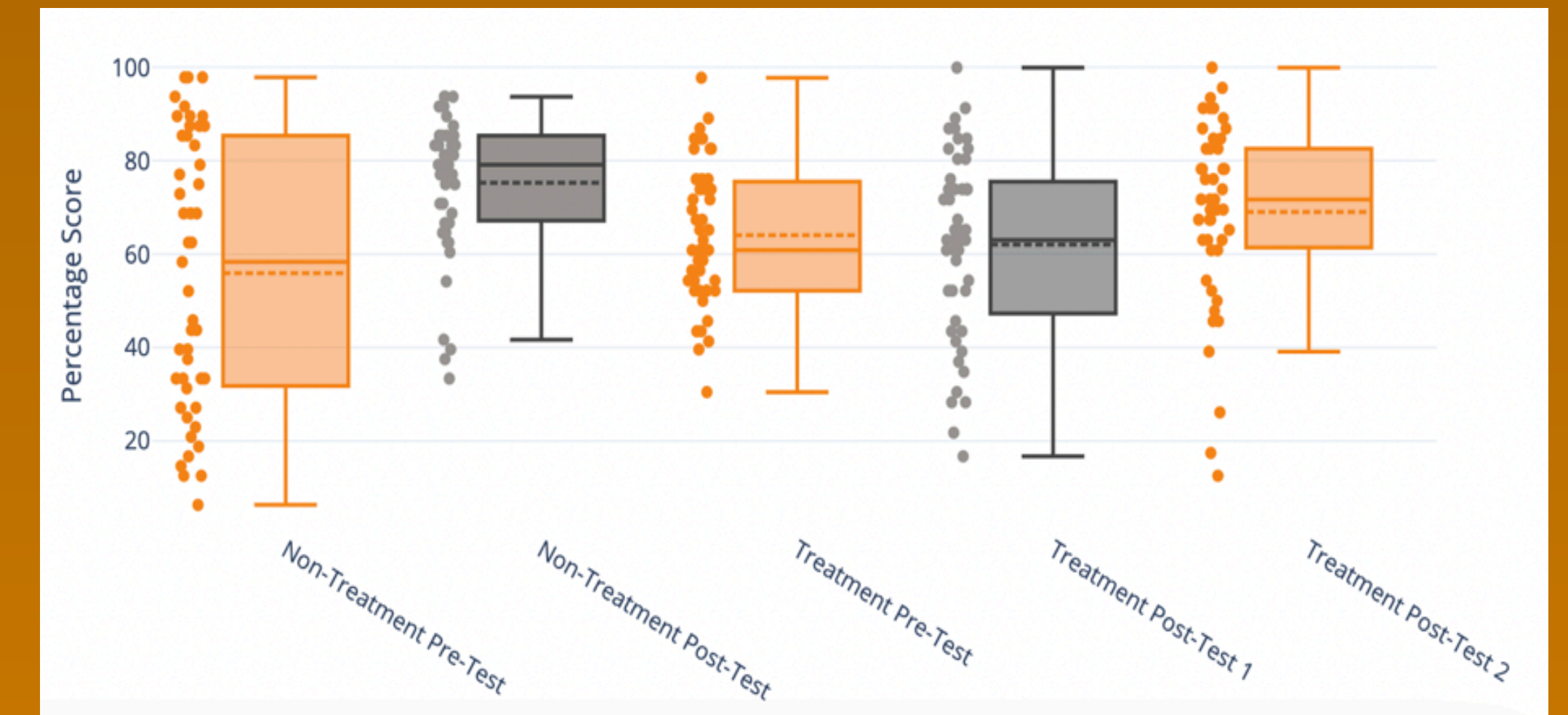


Figure 2. Pre and post-test scores for treatment and non-treatment (N=47). Dashed line indicates mean values and solid line indicates median value,

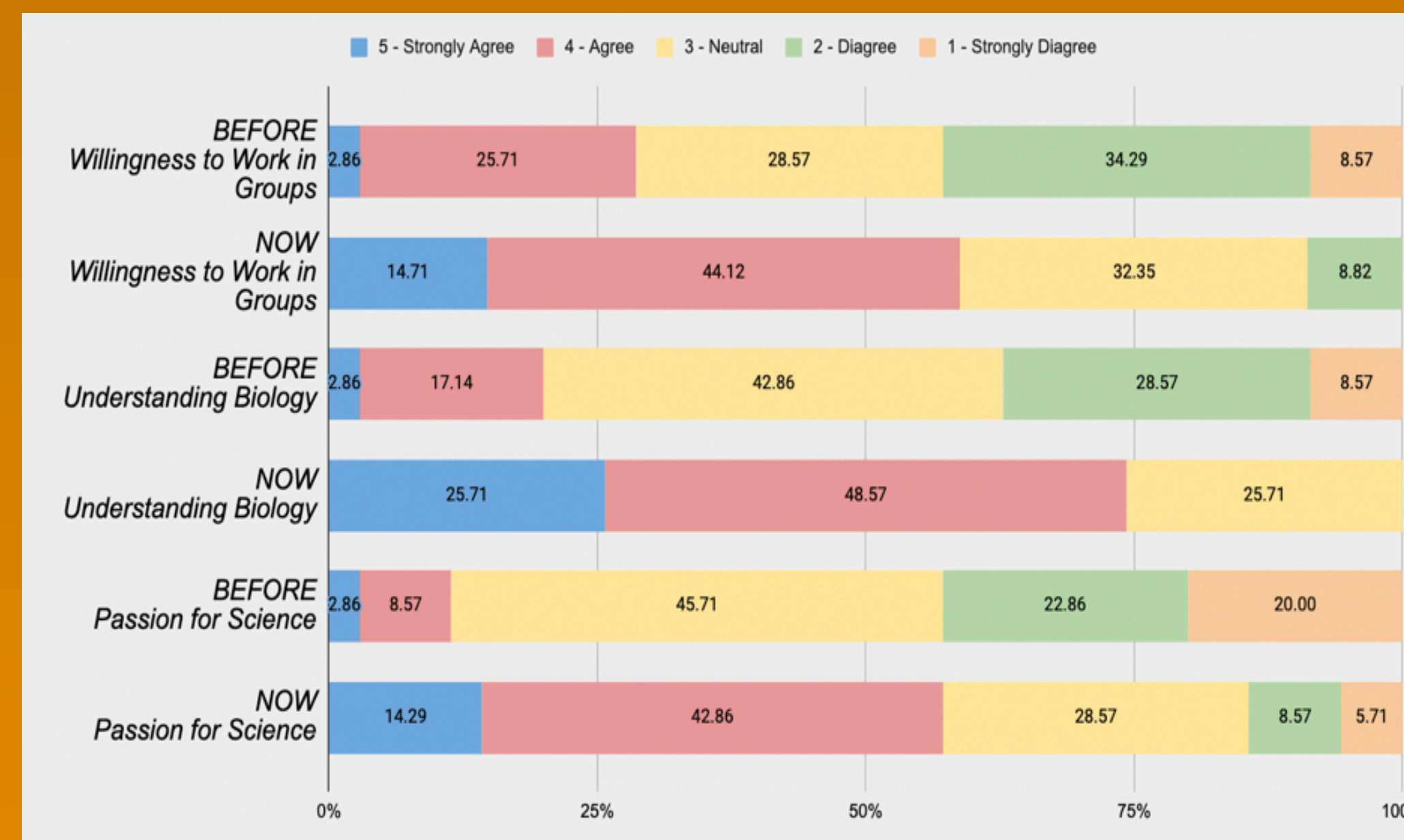


Figure 1. Survey II results showing student attitude towards group work, content understanding and passion for science post-treatment (N=35).

CLAIM – EVIDENCE – REASONING

CLAIM

- Students experienced greater content understanding through traditional instruction compared to a storyline
- Student attitude and self-efficacy towards science practices increased post-storyline compared to non-treatment

EVIDENCE

- Non-treatment pre/post-test median values: 58% to 79%
- Treatment pre/post-tests median values: 58% to 60% to 68%

REASONING

- Students valued the aspect of sense-making with their peers
- Acknowledgement of difficulty explaining concepts to peers compared to memorizing facts and terms from notes
- Ability to ask questions and engage in science practices without fear of being wrong was met with positive sentiment

METHODOLOGY (TWO FOUR-WEEK UNITS)

