The Use of Discrepant Events in a Biology Classroom

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Introduction: I teach at the most diverse high school in Sarasota county with 70% of students on free and reduced lunch. Students are required to take an end of course exam that is worth 30% of their grade for the year. Last year, 54% of students scored as proficient. This proficiency rate is tied to the school grade so it is important for students, me as the teacher, and the entire staff that students increase their achievement.

I find that the first few minutes of class is the most critical. The students have a hard time settling in and switching their brain to the lesson at hand. If I lose them, it can take 15-20 minutes for them to become calm and focused which wastes almost half of the 47 minute class period. I hope to engage the students as part of the 5E lesson cycle through the use of discrepant events. Discrepant events are designed to be unexpected which puts the learner in a state of cognitive dissonance. The brain is stimulated to ask why the event happened and the learner becomes curious to explore further. The brain is set in motion down the path of knowledge acquisition. The rest of the 5E cycle is designed to bring the learner along until they reach the evaluation point. The parts of the 5E cycle are engage, explore, explain, elaborate, evaluate.

Research Questions

Primary Question:

How does the use of discrepant events impact student academic achievement in biology class?

Sub Questions:

1. Are students willing to struggle through the lesson if their brain has been engaged through a discrepant event?
2. How do discrepant events affect students' confidence levels?
3. What effect do discrepant events have on me as the teacher?

Research Matrix

Research question	Pretest	Posttest	Student interest surveys	Student interviews	Teacher observations	Assignment Completion	Teacher journal
How does the use of discrepant events impact student academic achievement in biology?	X	X		X	X	X	
Are students willing to struggle through the lesson if their brain has been engaged through a discrepant event?			X		X	X	X
How do discrepant events affect students' confidence levels?	X	X		X	X		
What impact do discrepant events have on me as a teacher?			X		X		X

Methodology

Four classes were divided into two groups, Group 1 was periods five and 7 and Group 2 was periods 6 and 8. Both groups were exposed to a unit with discrepant events and without discrepant events such as KWL and discussion based questions. Pretests and posttests were administered. Students participated in Likert surveys, and interviews. A teacher journal was kept. Completion of assignments were tracked as well as observations how students were working.

Data

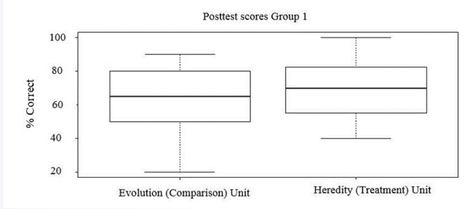

Figure 1 Boxplot of Posttest Scores Group 2, (N=33).

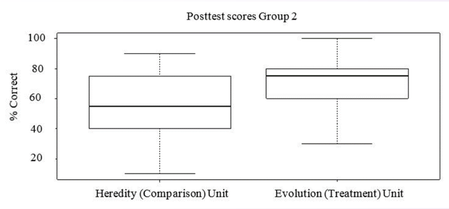

Figure 2 Boxplot of Posttest Scores Group 1, (N=32).

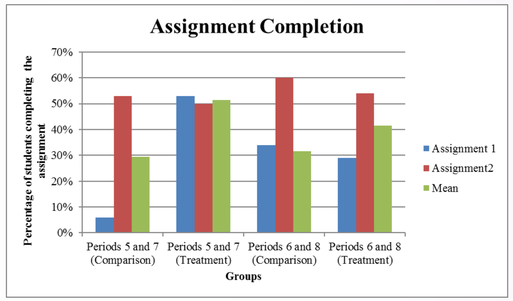

Figure 3: Bar graph of Assignment Completion Percentage. N=32 for Group 1. N=35

Findings

- Students scores were higher during the discrepant event units. (Group 1 +8.1% and Group 2 + 14.3%)
- More data is needed for how discrepant events effects their confidence.
- Students were more on task during the units that had discrepant events. (Group 1 had a 14% reduction and Group 2 had a 10% reduction.
- Students completed more assignments during the discrepant event units. (22% more for Group 1 and 10% more for Group 2)
- Colleagues reported that the teacher seemed to be happier and more excited when doing discrepant events.
- The teacher reported in the journal more positives about discrepant events even though the prep time was longer.

Teaching Implications

- Discrepant events will continue to be used in the classroom.
- As the science department chair, I plan on incorporating discrepant events planning into our professional learning community.
- By the end of next school year, I hope to have a tested set of discrepant events for biology and the major subject areas taught at Booker High school.

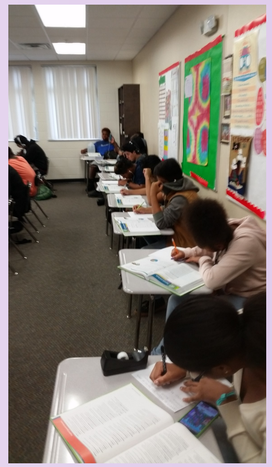

Figure 4 Students working on the horse fossil jigsaw.