The Effects of Note-Taking Strategies on Retention of Science Content on High School Students

Timothy C. Ferrigan Earth and Space Science Jersey Village High School Houston, Texas July 2019

BACKGROUND

The purpose of this study was to see if a particular note taking strategy had an impact on the learning of high school students. I also looked at how these strategies effected the retention of the material covered in a lecture. This study was chosen because I believe note taking is an important skill, especially for college students. During my literature review, several authors claimed that 85-90% of college professors use the lecture as their main tool to teach students the content. As I have seen over the years of teaching high school, juniors and seniors lack note taking skills. So, as they move on to higher education they struggle with the rigors of lectures in college. I have had former students, even my daughters make the claim that high school did not prepare them for this. Note taking is not only a benefit for college but also in the workplace.

When former students come back to visit while they are on break from college, beside the small talk about college, I always ask, how are your classes going. In our discussions about this, there seems to be a common theme. We, meaning high school teachers, are not preparing students for the rigors of college. They talk about things like homework, studying, and taking notes. Students nowadays, at least at my high school, do very little homework and studying outside of school. Taking notes comes in different forms at our school. Some teachers do not even give notes or they will give the students a handout of the notes and expect the students to write things down as the notes are discussed. Other teachers will have a PowerPoint or a Goggle Slides presentation, and some students will copy everything on the slide and some students will not copy anything. The point is there is no rhyme or reason for taking notes. I am just as guilty doing some of this myself. Note taking is a part of learning, both inside and outside the classroom. When high school students continue on to college to pursue higher education, it becomes a big part of their life in college.

RESEARCH QUESTIONS

- The Primary Research Question is:
  - "What is the effect of different note taking strategies on high school students' retention of science concepts?"
- Secondary questions.
  - Is one strategy better than another in terms of retention?
  - What is the impact of the study on me as a teacher?

DATA COLLECTION

Research Questions	Pre-assessment	Post-assessment	Summative test	Teacher Journal	Sample of Student Notes
What is the effect of different note taking strategies on high school students' retention of science concepts?	X	X	X	X	X
Is one strategy better than another based on retention?	X	X	X		X
What is the impact of the study on me as a teacher?				X	X

TREATMENTS/METHODOLOGY

- For this study, the three note taking strategies chosen were student-generated, partial (fill in the blank), and guided notes.
  - **Student-generated Notes – students take notes how they are comfortable with or use to.**
  - **Partial Notes – students are given a handout and fill in the blanks and diagrams.**
  - **Guided Notes – symbols guide student through notes – when to write, listen, highlight, or draw**.
- The study group consisted of fifty-three K-level (upper level) students which are a mix of seniors and juniors.
- The treatment consisted of one cycle of three phases. A phase consisted of a pre-assessment, a note taking strategy, and a post-assessment. Each phase had a different strategy. Then a summative assessment (15 questions from each area) was given to see if a particular strategy worked better.
- The treatment was conducted in the Spring semester of 2019. The cycle was implemented during the Earth's Oceans unit of our curriculum. Each phase covered a different concept of our oceans: oceans/ocean characteristics, seawater composition, and circulation/currents/tides.

RESULTS

- The student-generated notes/post-assessment #1 served as a baseline.
- The table below shows a comparison of the % correct means for each post-assessment and the summative. We see a slight increase with post-assessment #3 and a decrease with post-assessment #2
- Figure 5 shows the 15 question comparison between each post-assessment and the summative assessment.

Means and p-Values for % Correct on Pre-Assessments and Summative Assessment (*N*=53).

	Mean, %	Difference	p-Value
Post-Assessment #1 Ocean Characteristic	62.4	NA	NA
Post-Assessment #2 Seawater Composition	54.3	8.0	0.001
Post-Assessment #3 Circulation, Currents, & Tides	66.8	4.4	0.033
Summative Assessment All Concepts	77.4	23.1	0.000

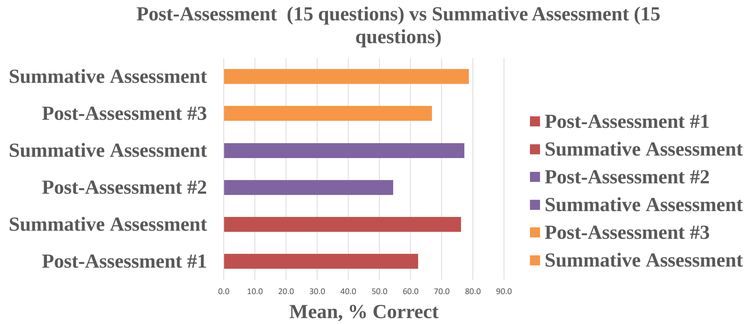

Figure 5. Means of percent correct of fifteen questions on post-assessment versus means of percent correct of fifteen questions on summative assessment, (*N*=53).

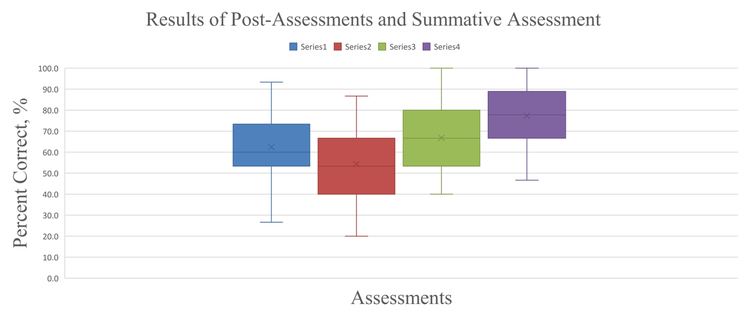

Figure 4. Student percent correct for the post-assessments and summative assessment, (*N*=53).

- Figure 4 is the box and whisker plot of the 3 post-assessments and the summative.
  - Series 1 – post-assessment #1 – baseline
  - Series 2 – post-assessment #2
  - Series 3 – post-assessment #3
  - Series 4 – post-assessment #4

CONCLUSIONS

Looking at the post-assessments, the qualitative data shows only a slight difference in the students' retention with the use of the different note taking strategies. Just based on the percent correct data, the guided notes were the best strategy. Even though it was not as high as I expected, the 67% correct for guided notes was an improvement over the 63% for student-generated notes and 56% for partial notes. Yes, we see larger difference with the summative assessment at 77% correct but the differences (Figure 5) within each area of the summative is insignificant and does not show one strategy outweighing another. Based on the data of the study, I will implement the guided notes strategy into my class lectures next year. Student expectations will need to be in place for the strategy but I believe guided notes will give my students the best opportunity for retaining the concepts in my classes.