SCHOLARSHIP OF EXCELLENCE IN TEACHING - COHORT 2023

Retrieval Practice, and Feedback- Driven Metacognition

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Problem

Students in the Elementary statistics course often struggle with recalling fundamental concepts learned at the beginning of the semester and face challenges making connections and using correct methodology when solving complex problems later on.

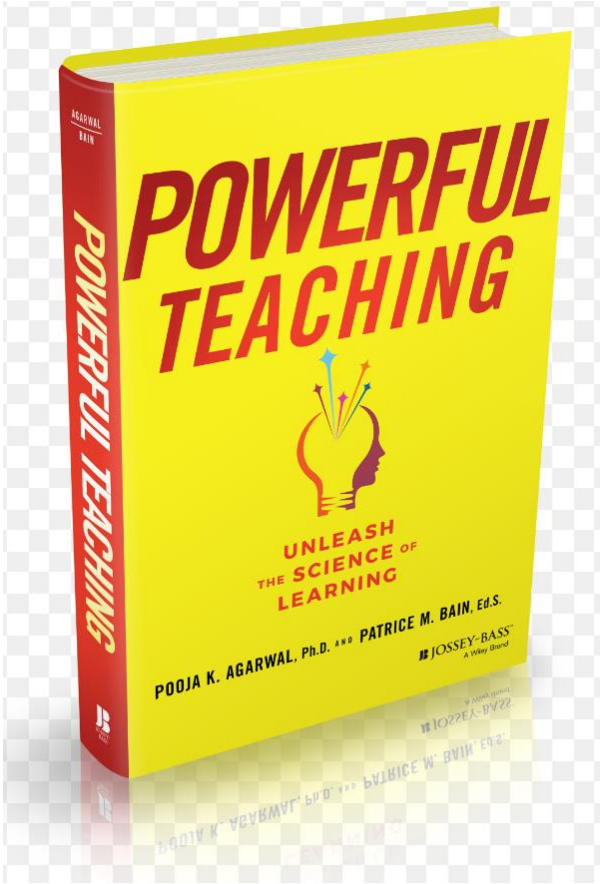
Goal

Help students retain concepts learned throughout the semester and develop proficiency in correctly identifying variables, statistics, parameter, using appropriate notations, and employing accurate statistical methodologies to solve complex problems correctly.

Inspiration

Evidence based strategies – Powerful tools

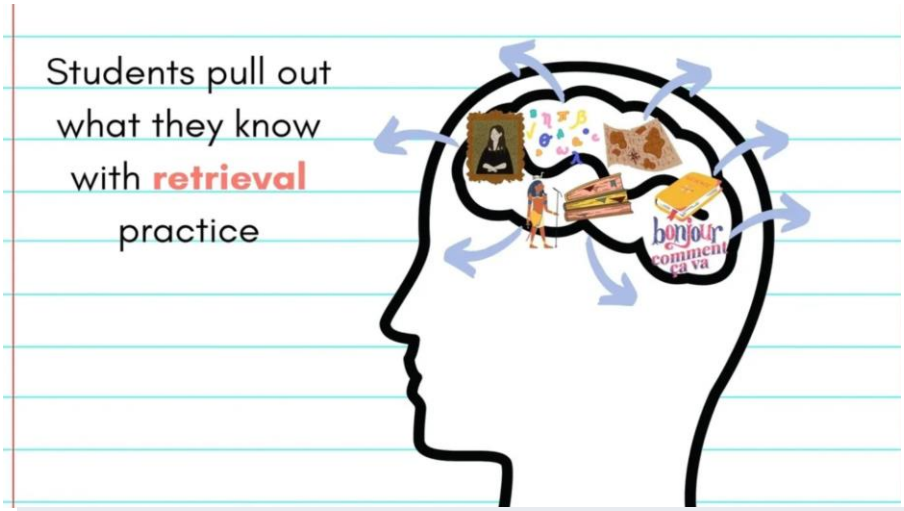
- Retrieval Practice
- Spacing
- Interleaving
- Feedback– Driven Metacognition

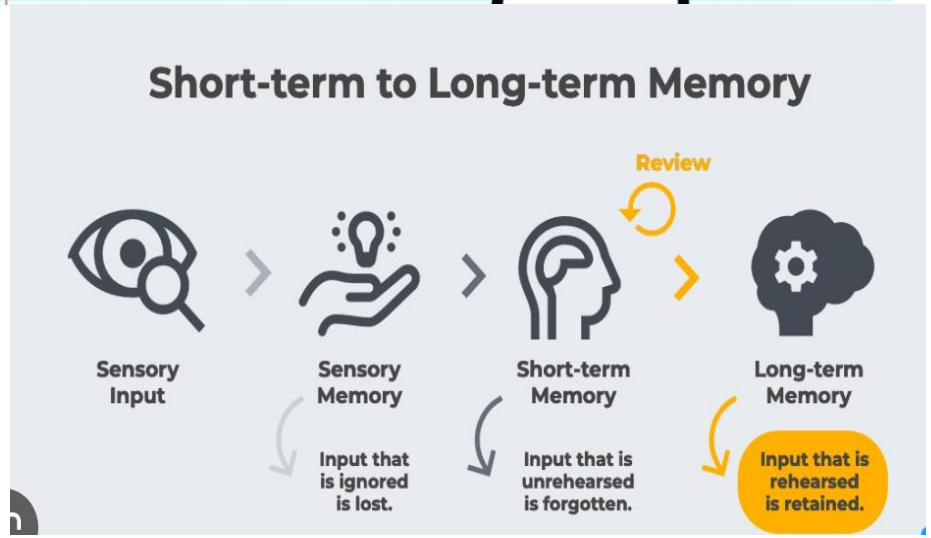


The Learning Strategies Implemented

Why Retrieval Practice?

- Boosts learning by pulling information out of the students' head, rather than cramming information into it.
- Improves students' learning and long term retention of information.
- Increases students' engagement and attention in class.
- Increases students' metacognition and awareness of their own learning.
- Increases higher-order thinking.





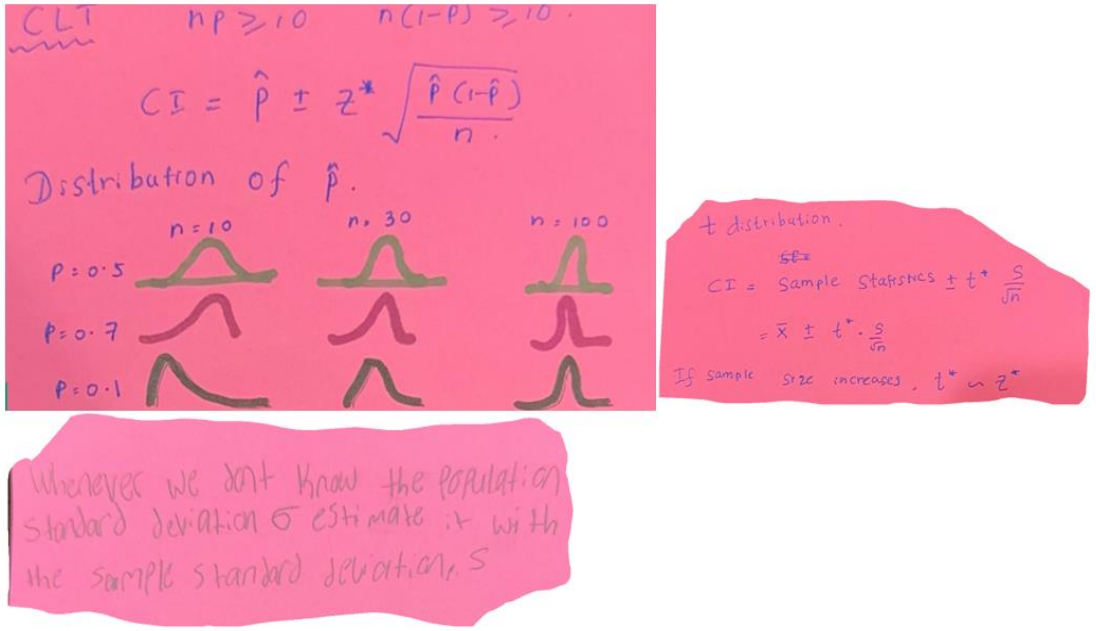
Why Feedback– Driven Metacognition?

- Boosts learning by letting students know what they know and what they don't know.
- Build confidence in their metacognition and learning as students make errors in low-stakes environment.

Strategy #1

Brain Dump followed by pair and share- Implemented in every class

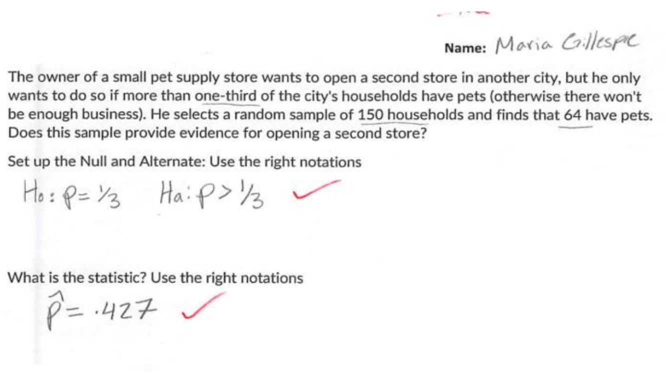
- Paused the lecture or activity after 25-30 minutes.
- Asked the students to write down everything they remember for 3minutes.
- Students paired up and discussed their points for 2 minutes.
- Shared the information with the class for 2 minutes.



Strategy #2

Retrieval Quiz followed by feedback- Implemented weekly, starting week 2 except on exam weeks

- Two or three questions (Warm-ups) in the beginning of the class.
- Based on past topics, emphasizing basic concepts.
- Low-stakes: 2 extra credit homework points.
- Discussed the solutions immediately after the quiz.



Name: Maria Gillespie

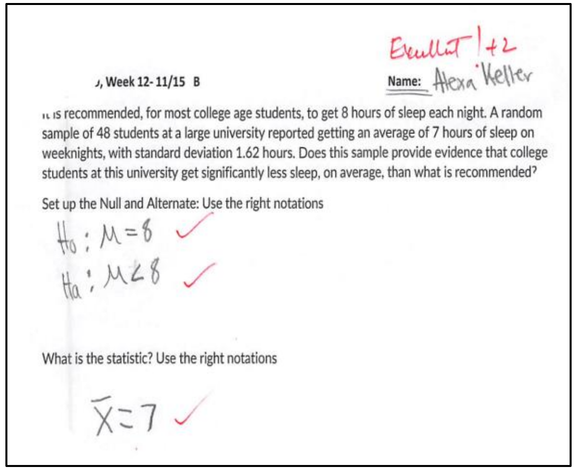
The owner of a small pet supply store wants to open a second store in another city, but he only wants to do so if more than one-third of the city's households have pets (otherwise there won't be enough business). He selects a random sample of 150 households and finds that 64 have pets. Does this sample provide evidence for opening a second store?

Set up the Null and Alternate: Use the right notations

$H_0: p = 1/3$ $H_a: p > 1/3$ ✓

What is the statistic? Use the right notations

$\hat{p} = .427$ ✓



Excellent! +2

, Week 12- 11/15 B

Name: Alexa Keller

It is recommended, for most college age students, to get 8 hours of sleep each night. A random sample of 48 students at a large university reported getting an average of 7 hours of sleep on weeknights, with standard deviation 1.62 hours. Does this sample provide evidence that college students at this university get significantly less sleep, on average, than what is recommended?

Set up the Null and Alternate: Use the right notations

$H_0: \mu = 8$ ✓

$H_a: \mu < 8$ ✓

What is the statistic? Use the right notations

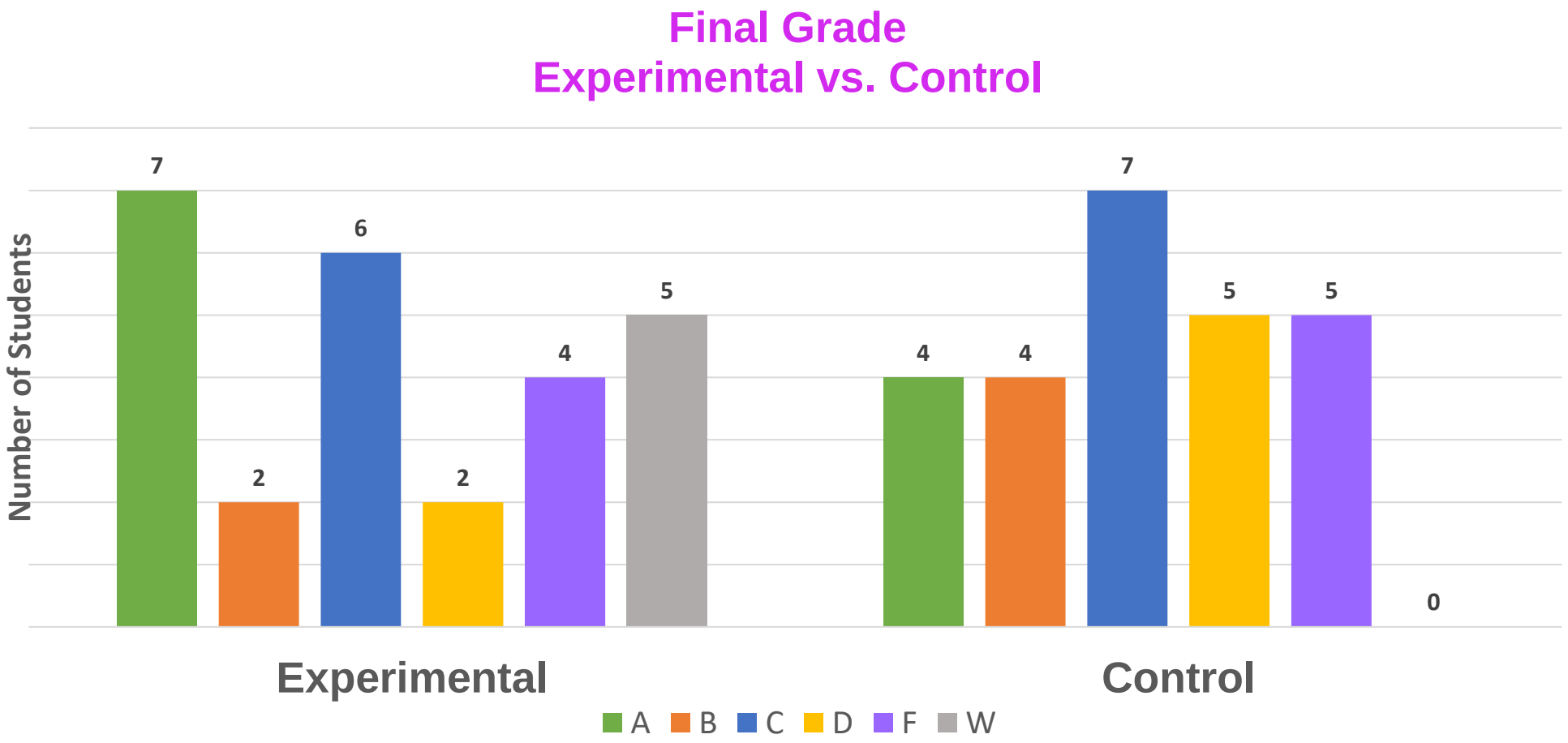
$\bar{x} = 7$ ✓

Assessment of the strategies

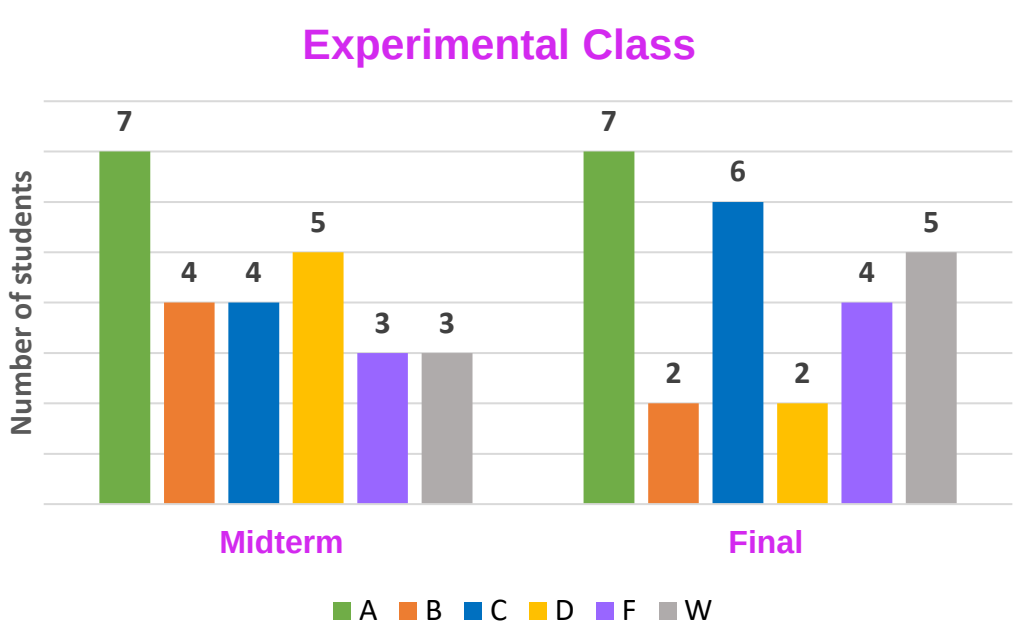
Out of the two sections of MATH117 (Elementary Statistics) taught during fall 2023, one was selected as the experimental class and the other as the control class.

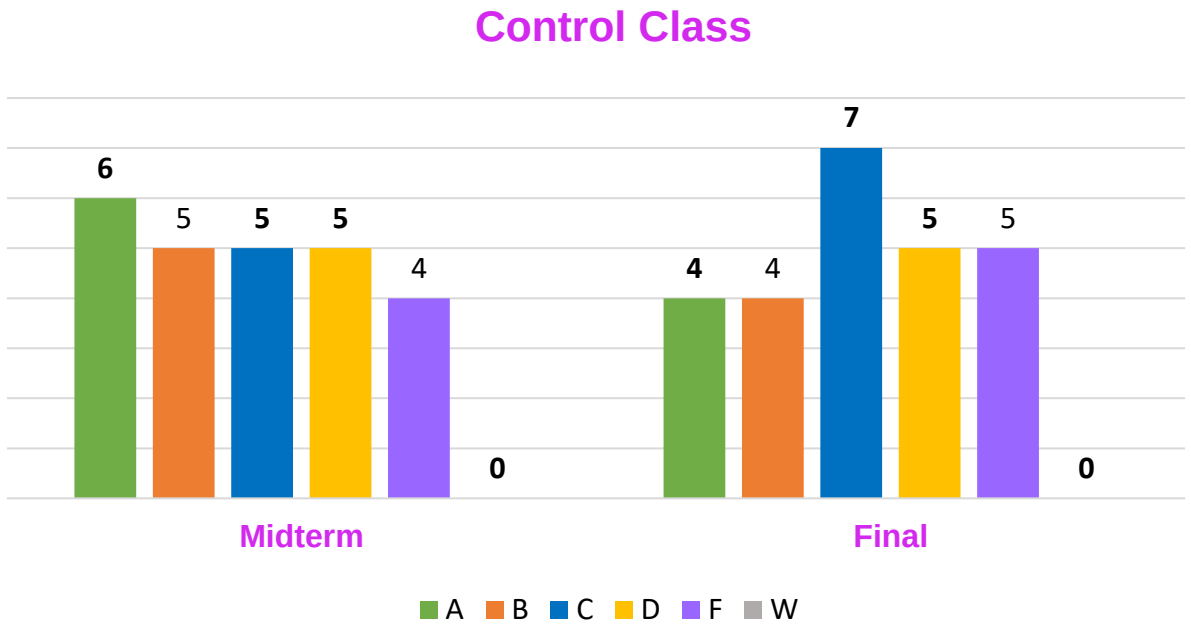
1. Final course grade comparison of the two sections- Experimental vs. Control.
2. Grade distribution change in each section over the semester- Midterm vs. Final.
3. Student survey results about the strategies.

Final Course Grade Comparison: Experimental vs. Control

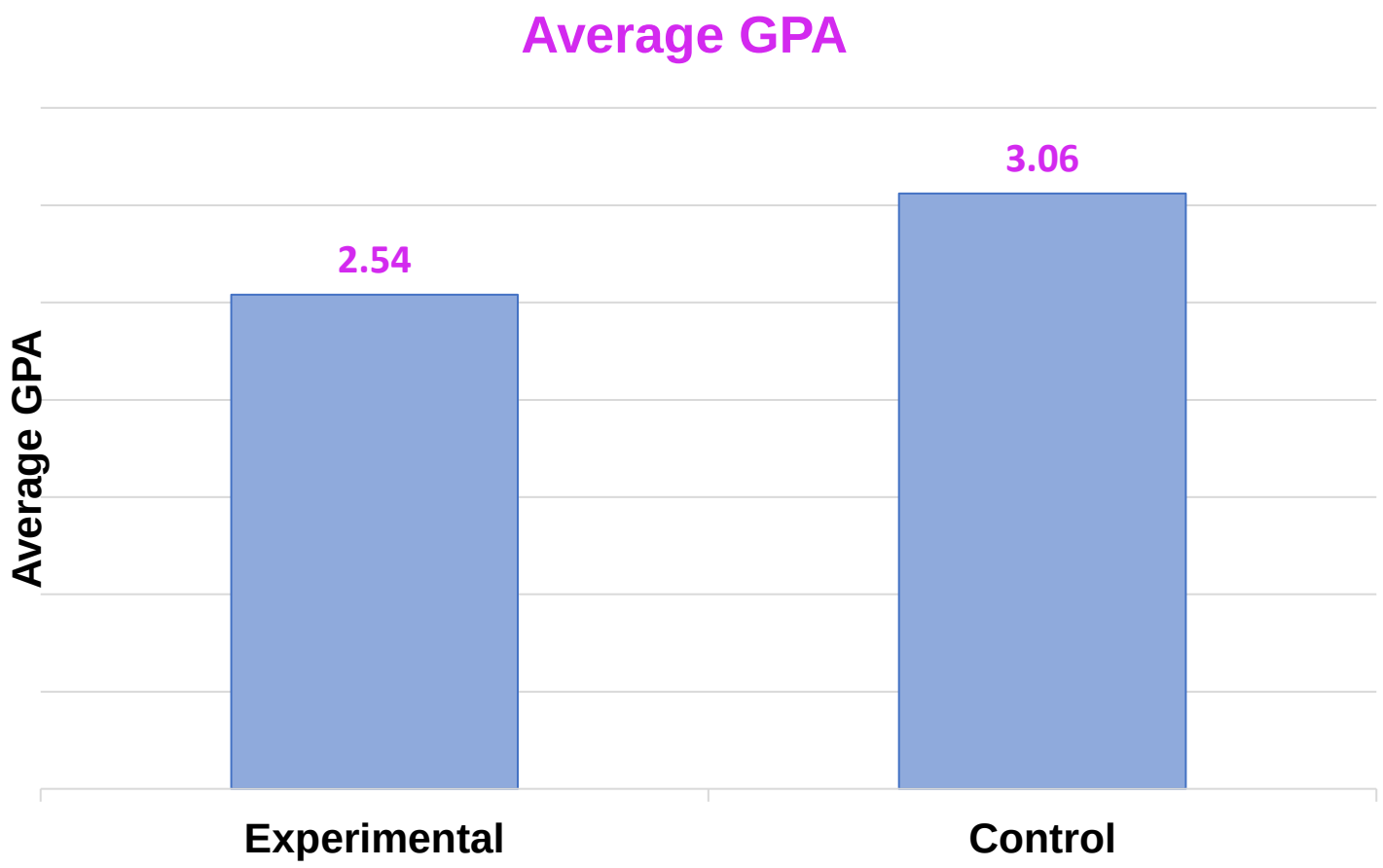


Grade distribution change: Midterm vs. Final





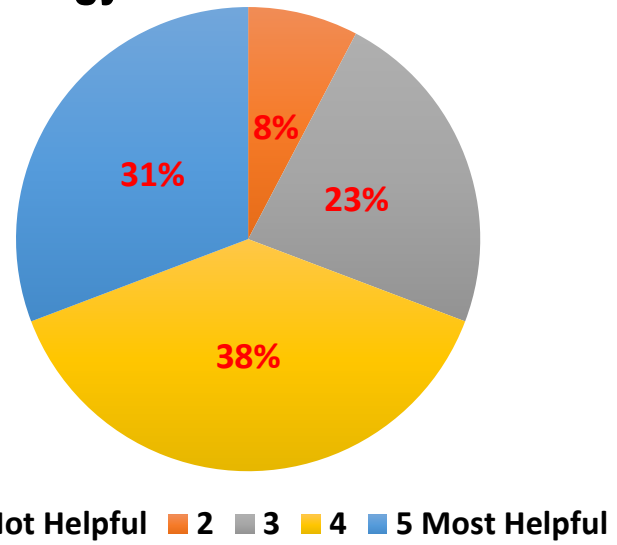
GPA Comparison: Experimental vs. Control



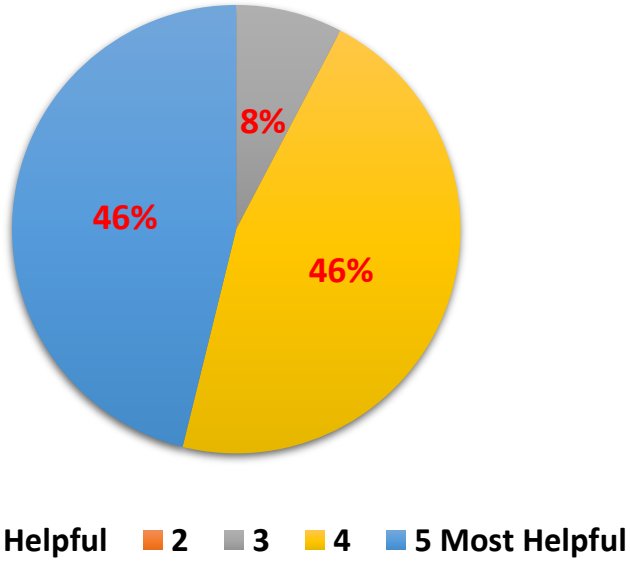
Were the strategies helpful to students?– Survey results

On a scale of 1(Not helpful) to 5 (Most helpful) how helpful was the strategy?

Brain Dumping

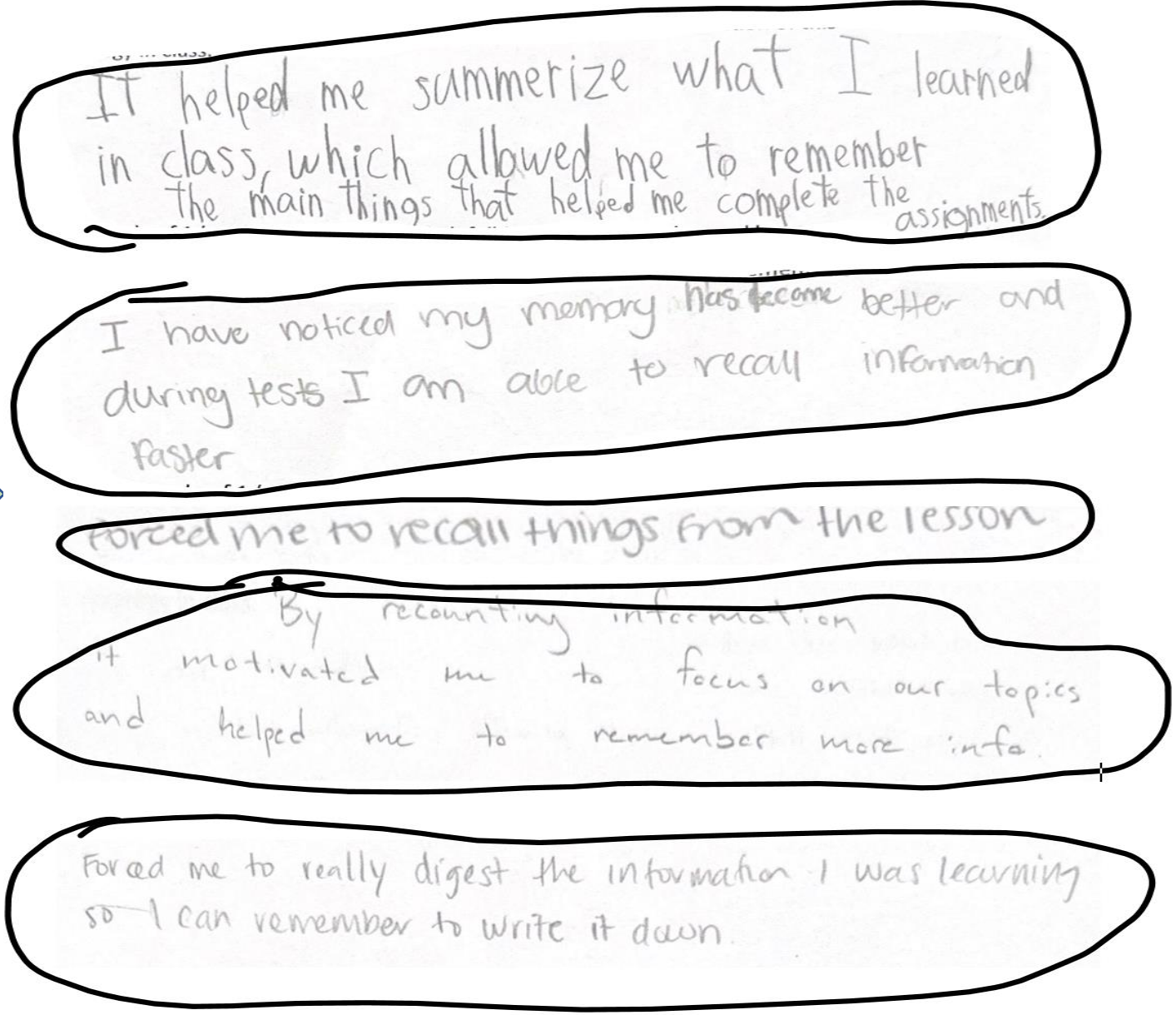


Retrieval Quiz



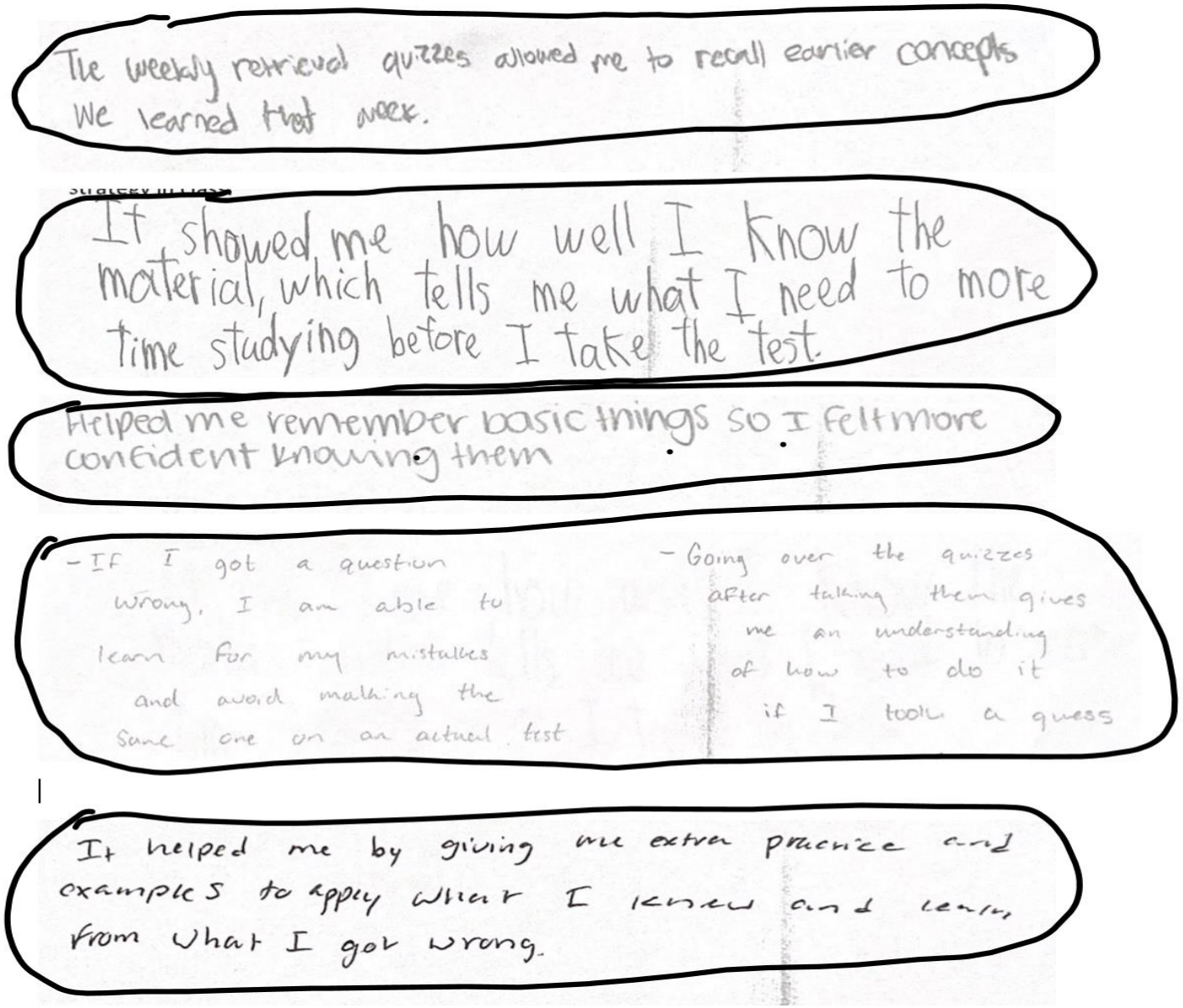
Survey results

Benefits of Brain Dumping



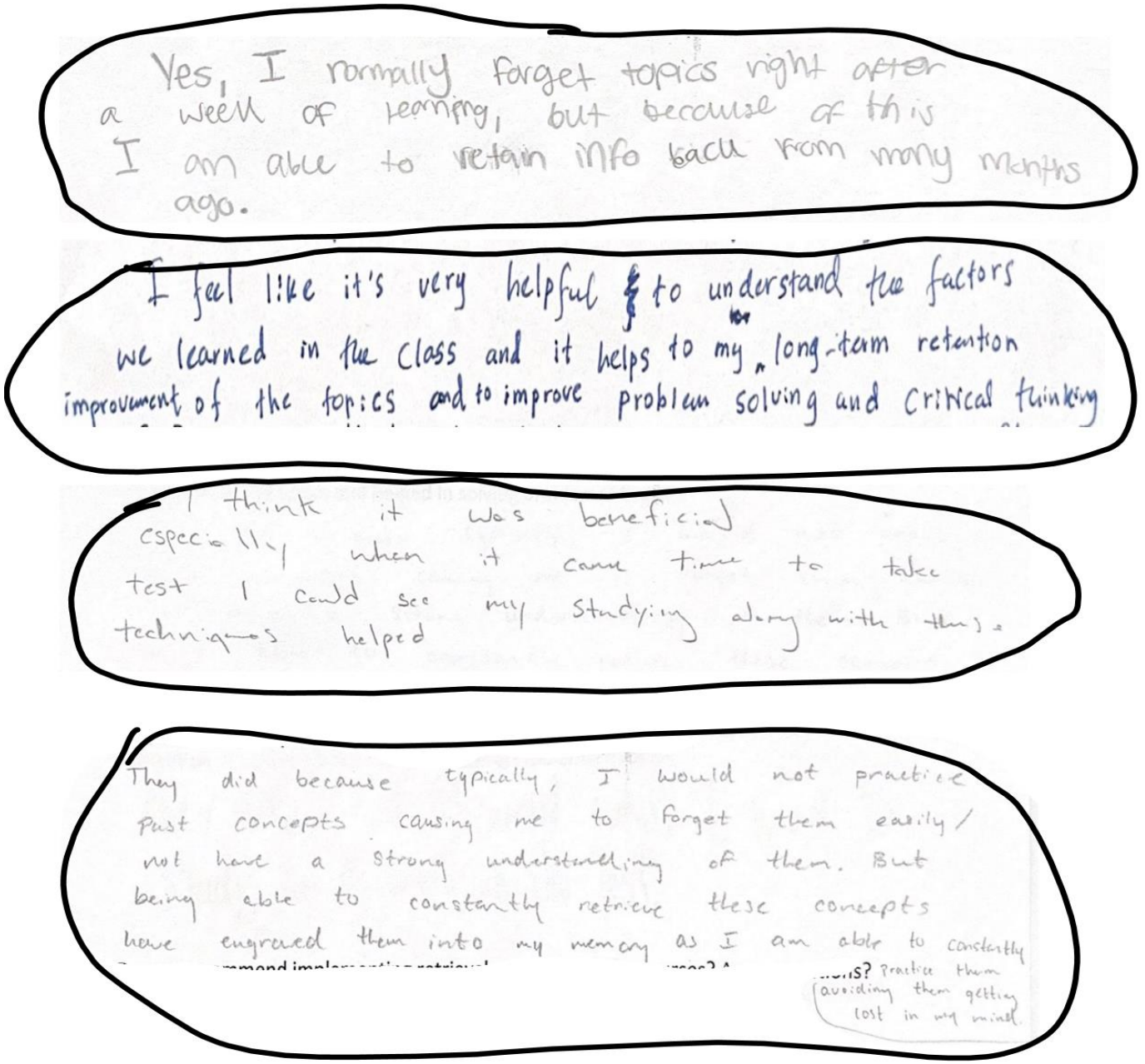
Survey results

Benefits of Retrieval Quizzes



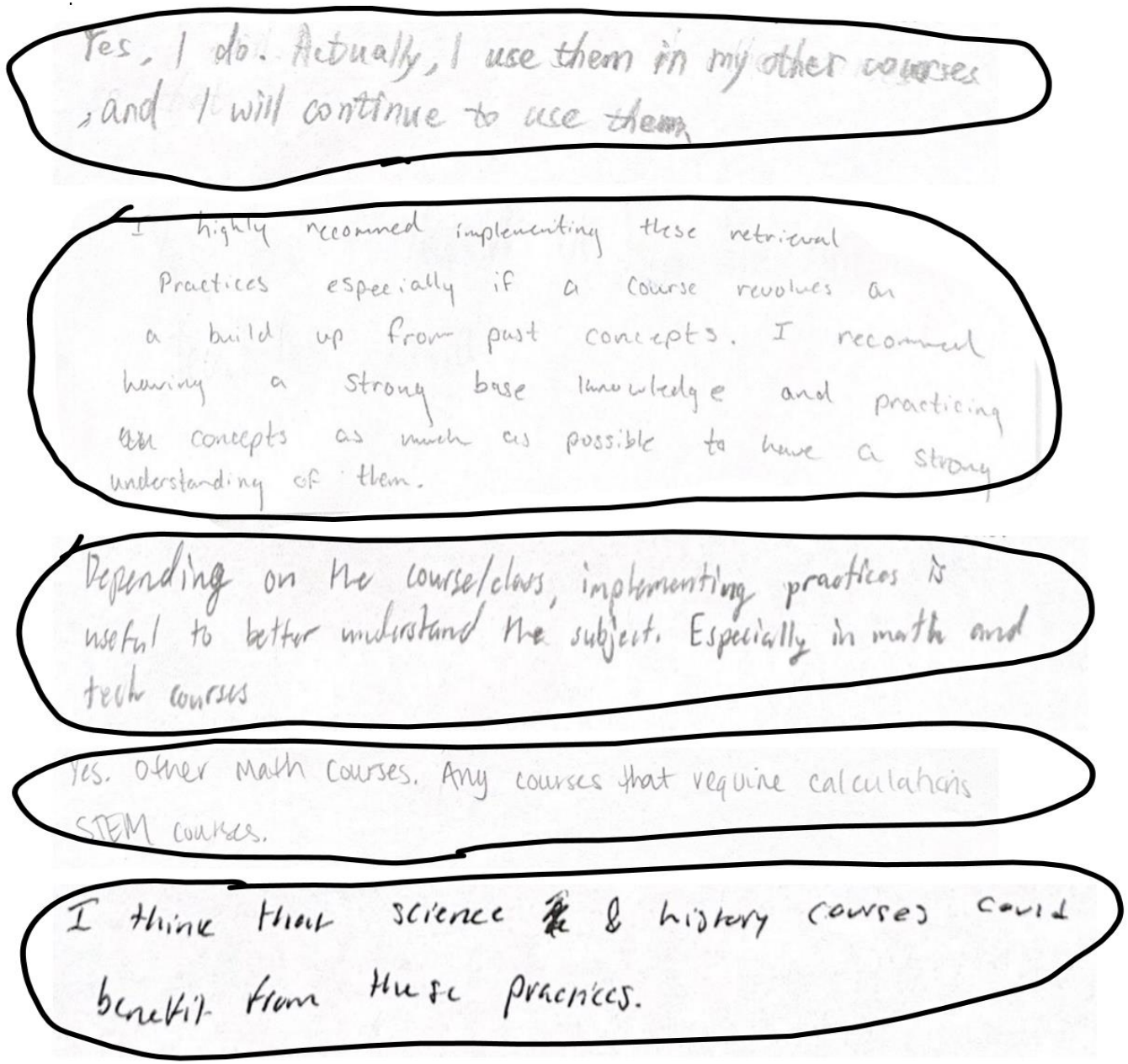
Survey results

Whether these strategies contributed to your long-term memory?



Survey results

Do you recommend implementing retrieval practice in other courses?



Conclusion

Looking at the data, I believe my strategies helped students that consistently attended class achieve higher grades at the end of the semester either through improvement in grades over the course of the semester or by retaining their sufficiently passing grades.

Thank You!

I would like to thank Joan for her leadership, guidance and support! I also want to thank all my SET colleagues for the valuable discussions and suggestions during the program.