Frequency of Anki Use in Foundational Sciences Curriculum: An Analysis of Students' Perspectives

Elizabeth Merlinsky[1], Oluwatobi Soares[1], Kyle Blackburn[1], Adel Hassan[1], Sandra Haudek, PhD[2], Nital Appelbaum, PhD[3]

[1]School Of Medicine, Baylor College of Medicine, Houston, TX | [2]Undergraduate Medical Education, Office of Curriculum, Baylor College of Medicine, Houston, TX | [3]Division of Medical Education Research and Scholarship, Baylor College of Medicine, Houston, TX

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BACKGROUND

○ Spaced Repetition Software (SRS) systems are frequently used for subjects requiring extensive memorization[1].
○ SRS allows to make flashcards, separating material into distinct information pieces.
○ The flashcards are presented to the students at intervals calculated based on their individual retention level.
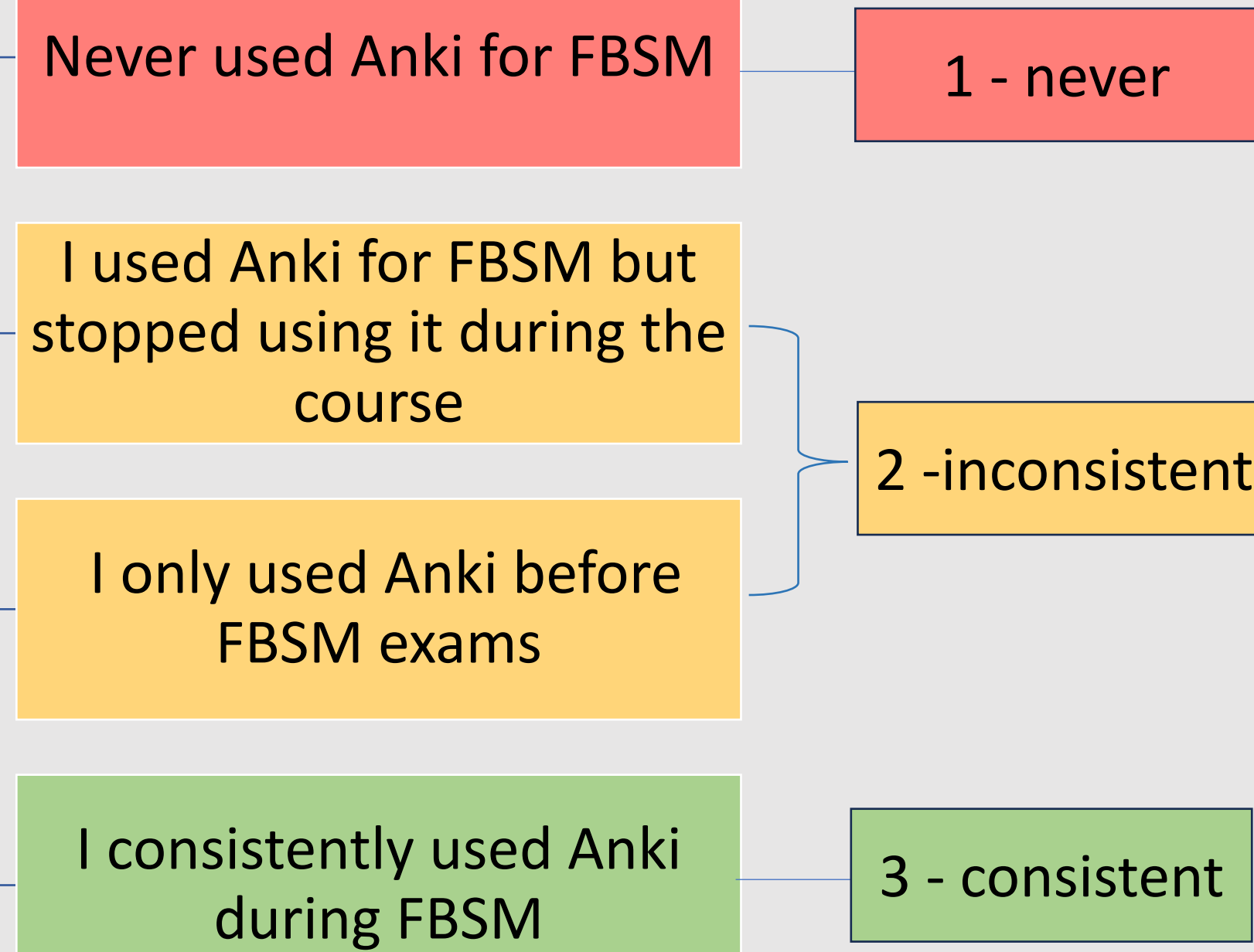○ Anki is the main open-source SRS modality used nowadays.

RESEARCH QUESTIONS

○ What do medical students think of Anki in the context of the Foundations to Biomedical Sciences course (FBSM) at BCM?
○ Would investing BCM's time and effort into the development of course-tailored Anki decks yield a valuable educational resource?

METHODS

○ We recruited 186 prospective MS3 and 167 prospective MS4 students in a comprehensive survey conducted during their individual class orientations.
○ The MS3 students had access to a custom Anki deck created by a peer. The MS4 students only had access to general, nonspecific decks.
○ Data on the frequency of Anki usage were categorized into three groups: "never," "inconsistent," and "consistent."
○ The quantitative analysis was conducted using the Chi-Square Test of Independence with R.
○ The qualitative examination of supporting free-form responses was done through open and axial coding in Excel[2].
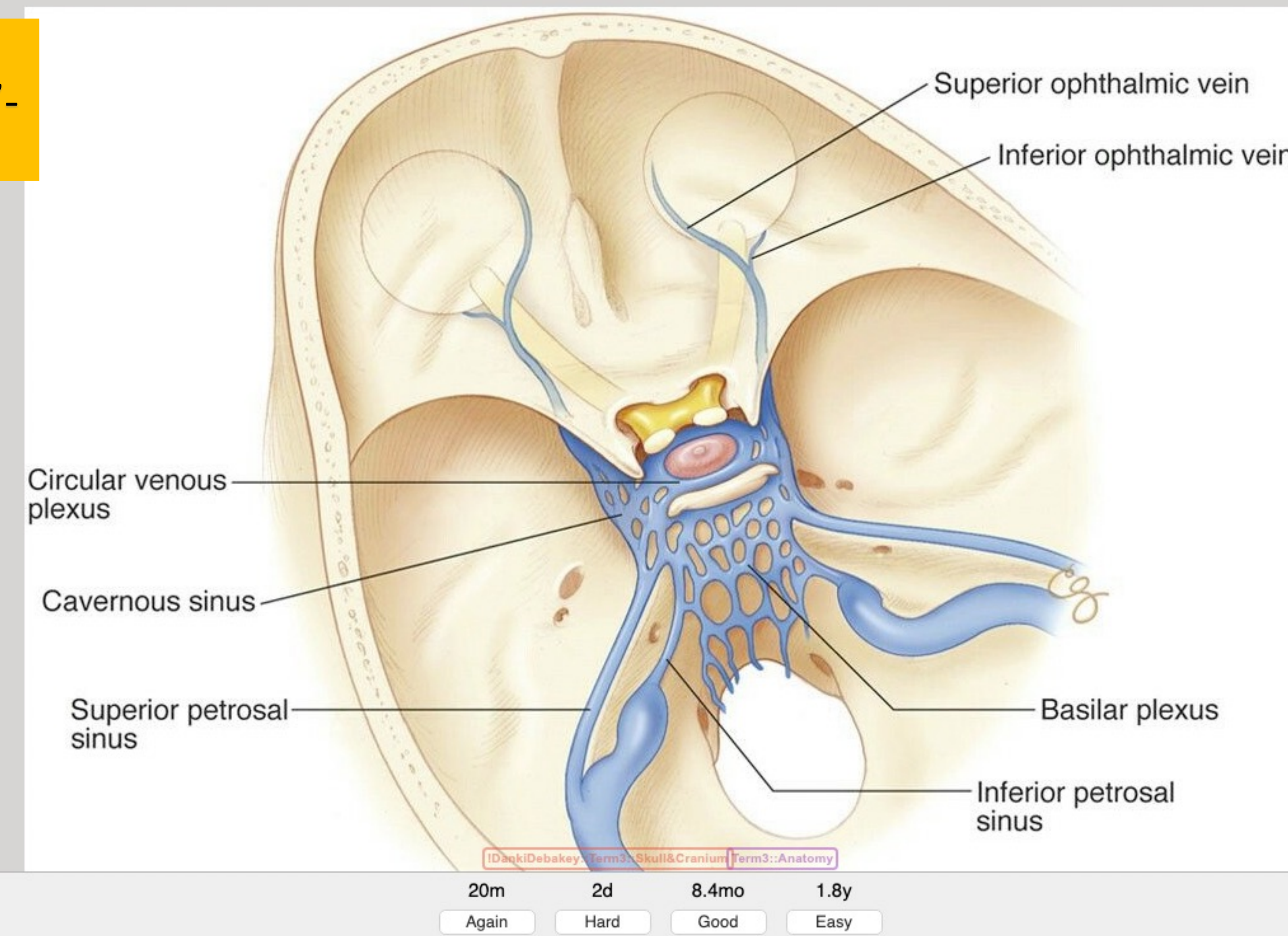
Which of the following statements describes your usage of Anki during FBSM?

- Never used Anki for FBSM → 1 - never
- I used Anki for FBSM but stopped using it during the course → 2 - inconsistent
- I only used Anki before FBSM exams → 2 - inconsistent
- I consistently used Anki during FBSM → 3 - consistent

ANKI INTERFACE

The inferior petrosal sinus travels in the inferior petrosal sulcus formed where the temporal and occipital bones meet and drains into the inferior portion of the sigmoid sinus or the internal jugular vein

Displayed answer for "cloze deletion"-type card

Supporting image designed to appear only when the answer to the "fill in the blank" is displayed

- Superior ophthalmic vein
- Inferior ophthalmic vein
- Circular venous plexus
- Cavernous sinus
- Superior petrosal sinus
- Basilar plexus
- Inferior petrosal sinus

| 20m | 2d | 8.4mo | 1.8y |
| Again | Hard | Good | Easy |

Edit   More ▾

Spacing interval calculated based on the difficulty level of the card

RESULTS

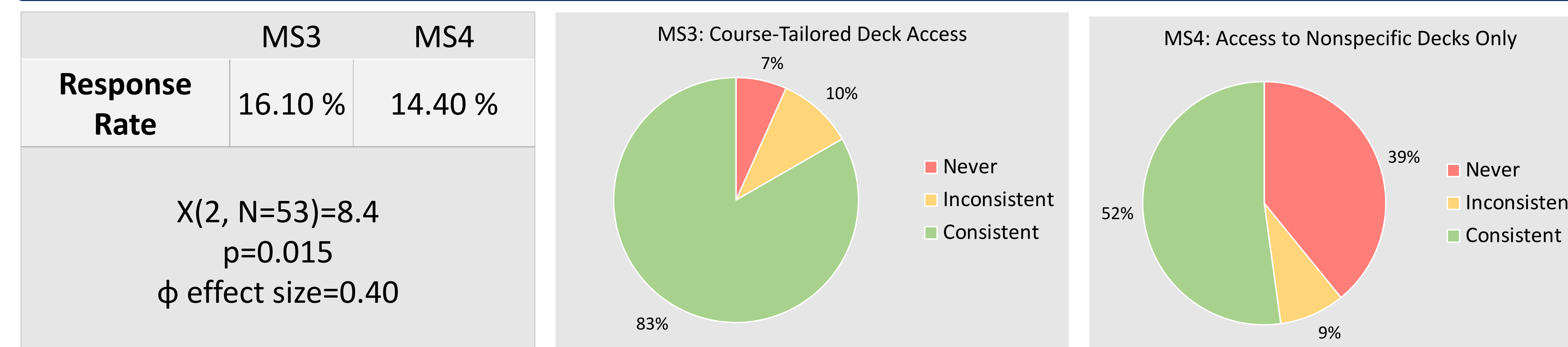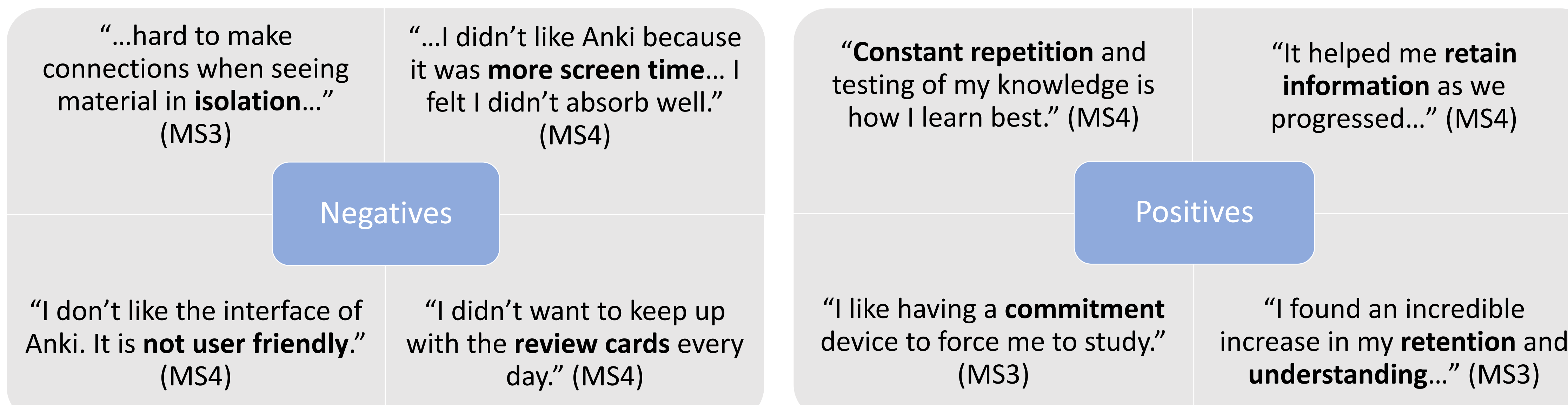### Figure 1. Categorized Frequency of Anki Usage by Cohort

	MS3	MS4
Response Rate	16.10 %	14.40 %

$X(2, N=53)=8.4$
$p=0.015$
ϕ effect size=0.40

MS3: Course-Tailored Deck Access
- 7% Never
- 10% Inconsistent
- 83% Consistent

MS4: Access to Nonspecific Decks Only
- 39% Never
- 9% Inconsistent
- 52% Consistent

Figure 2. What do Students Say on the Utility of Anki in the Context of FBSM?

Negatives

"…hard to make connections when seeing material in **isolation**…" (MS3)

"…I didn't like Anki because it was **more screen time**… I felt I didn't absorb well." (MS4)

"I don't like the interface of Anki. It is **not user friendly**." (MS4)

"I didn't want to keep up with the **review cards** every day." (MS4)

Positives

"**Constant repetition** and testing of my knowledge is how I learn best." (MS4)

"It helped me **retain information** as we progressed…" (MS4)

"I like having a **commitment device** to force me to study." (MS3)

"I found an incredible increase in my **retention** and **understanding**…" (MS3)

LIMITATIONS

○ Moderate effect due to a relatively low response rate.
○ High variability between medical school curricula warrants further studies to establish external validity.
○ While MS3 students did have access to the course-tailored deck, some may have opted to use previous years', non-customized decks. This requires further studies.

DISCUSSION AND CONCLUSIONS

○ There was a difference in Anki usage frequency between the surveyed MS3 and MS4 cohorts.
○ There was a trend in higher Anki use in the cohort where a course-tailored deck was available.
○ Students reported reinforcement of learning and ease of scheduling as the platform's advantages
○ Barriers to adopting Anki included isolation, contextualization, and technology-related hurdles.

FUTURE DIRECTIONS

○ Distributing the survey to the MS2 cohort - compared to the MS3 students, they had earlier access to the course-tailored deck;
○ Examining students' evaluations of the quality attributes of the tailored deck;
○ Analyzing numerical trends in weekly card reviews;
○ Examining relationships between Anki usage and in-house exam scores.

REFERENCES

1. Tabibian B. et al. Enhancing human learning via spaced repetition optimization. PNAS, 2019.
2. Williams, M., Moser, T. The Art of Coding and Thematic Exploration in Qualitative Research. International Management Review, 2019.

AUTHOR CONTACT INFORMATION

Elizabeth Merlinsky (MS2)
Elizabeth.merlinsky@bcm.edu