



# Integration of Virtual Microscopy Podcasts in Histology Discipline: Learning Outcomes

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## Introduction

At Marian University College of Osteopathic Medicine (MU-COM), Histology (microscopic anatomy) is integrated with other disciplines.



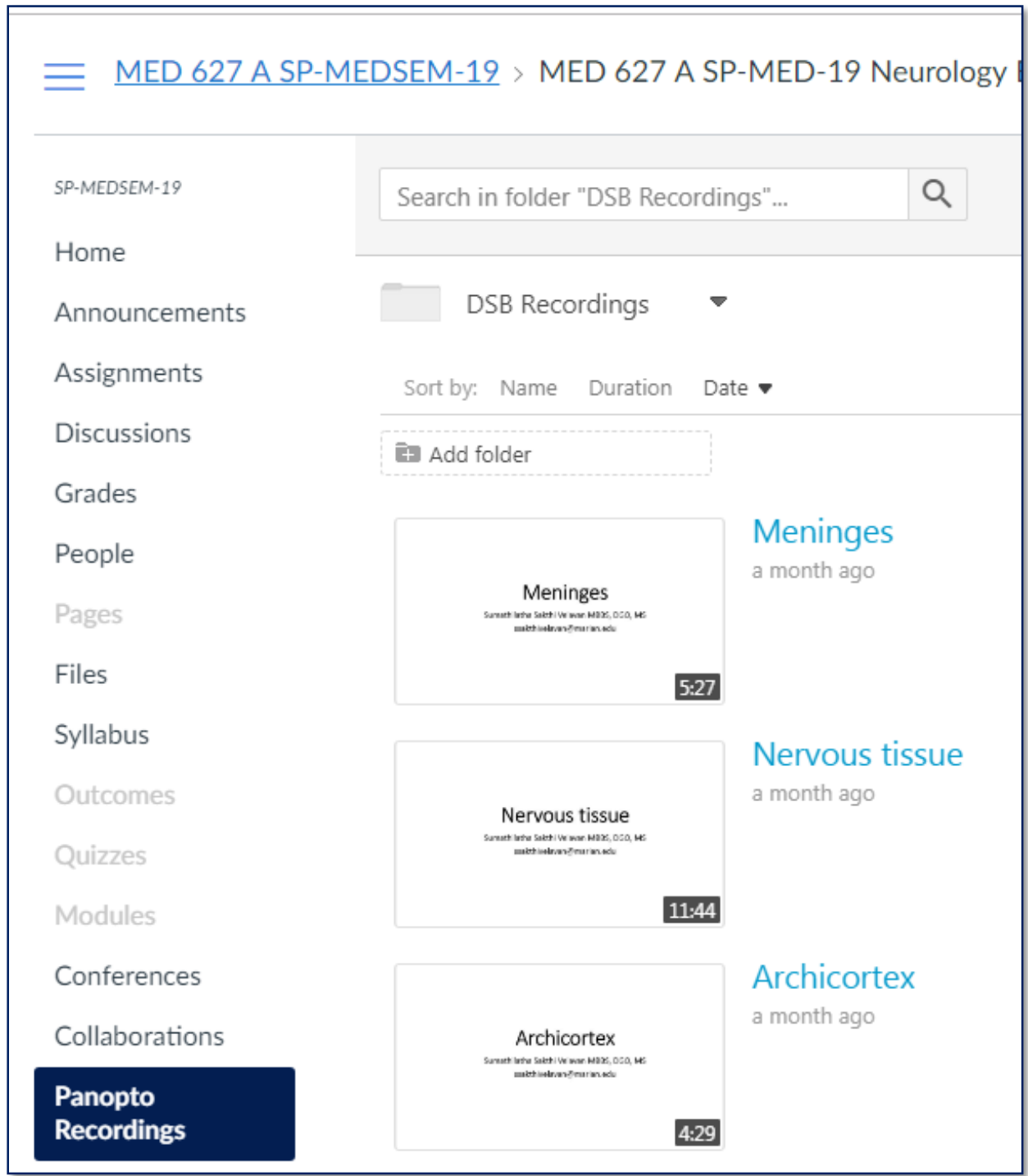
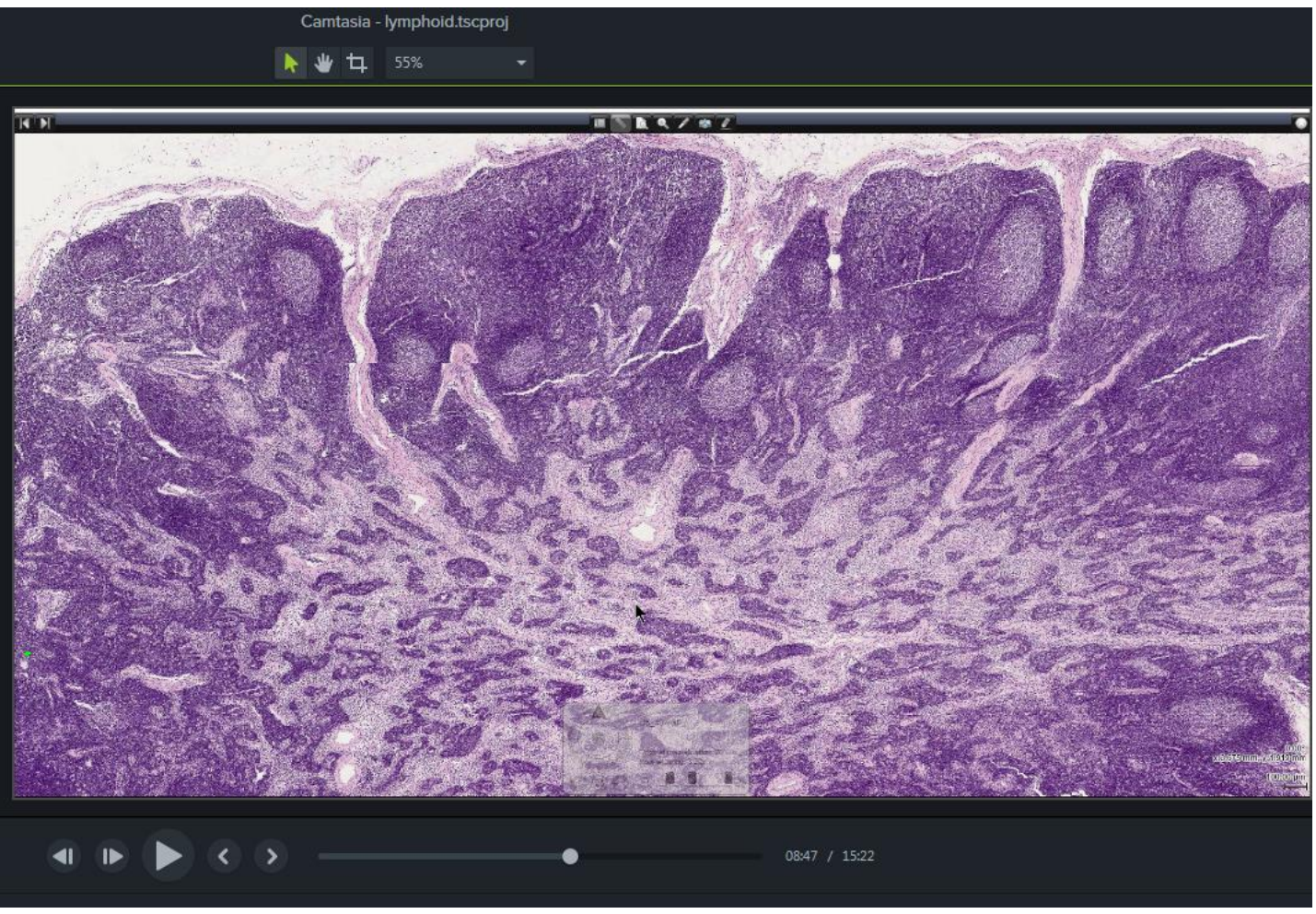
The DO curriculum includes virtual microscopy using 'Digital Slidebox' (DSB), rather than traditional microscopy.

**Instructional need:** An innovative teaching method that is more conducive to independent Histology learning was required due to the following reasons:

- Diverse background of DO students, many lacking a Histology framework led to students' perception of difficulty with microscopic images.
- Integrated Histology teaching and lack of exclusive laboratory hours necessitates assimilation of the content with other medical knowledge.
- The DO program is designed to facilitate the seven core competencies enunciated by the NBOME. Competency in Histology discipline is a component of the third learning outcome of the achievement of Medical Knowledge.

**Method:** Short narrative podcasts of digital microscopic slides were created and provided to the students as a supplementary Histology resource.

- Almost 60 podcasts were created using the software, 'Camtasia.' The recordings were uploaded to the Panopto recordings folder of the integrated courses.



- The class of 2020 had access to the podcasts in two courses, and the class of 2021 in five courses. The class of 2022 is currently using the podcasts.

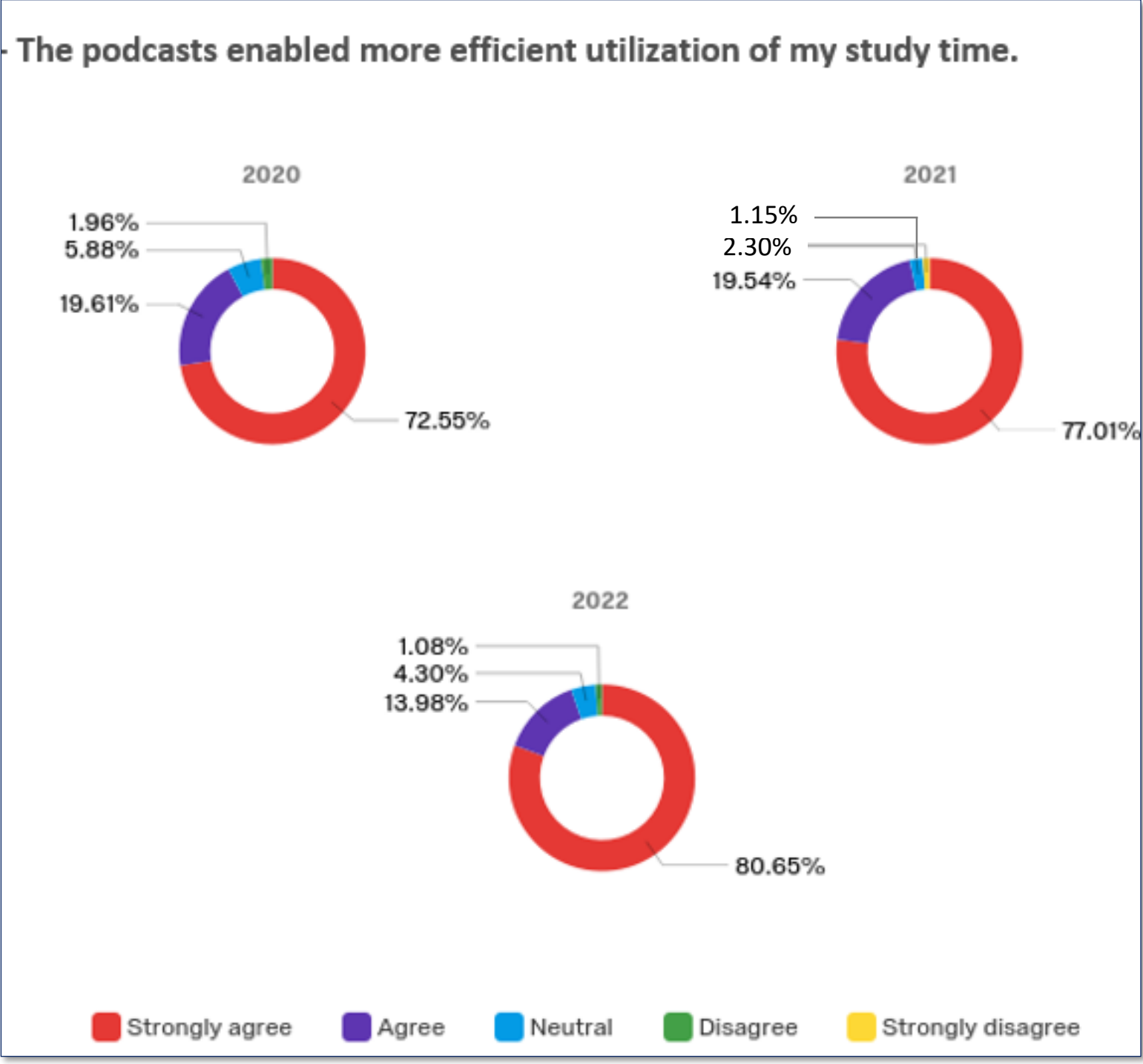
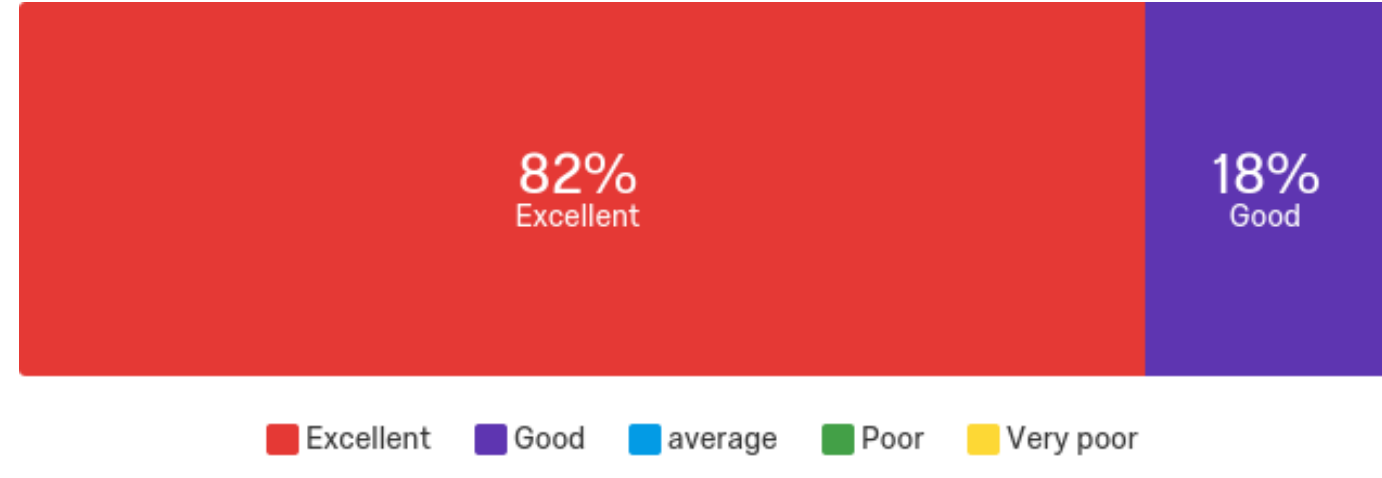
### Research:

- Students' perception of the virtual microscopy podcasts was analyzed using a voluntary and anonymous survey.
- The study is in progress, and the overall class performance in the Histology discipline is being analyzed using the Examsoft reports.

## Outcome

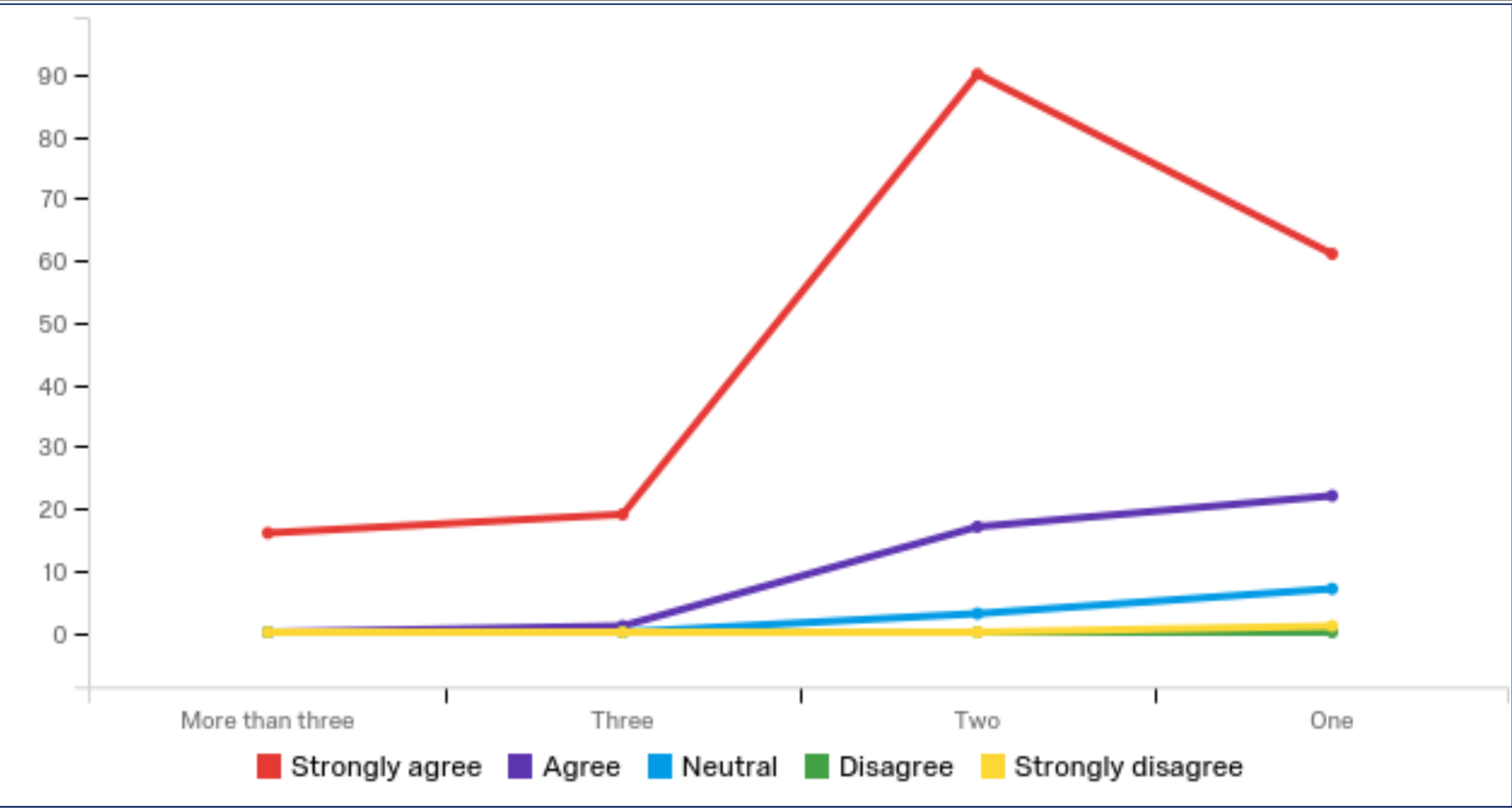
- The survey yielded an overall response rate of 49%. The Classes of 2022, 2021 & 2020 represented 39.75%, 37.66% and 22.59% respectively.
- The majority of respondents (84.81%) viewed the podcasts 1-2 times/ topic.

- All respondents rated the quality of the podcasts as Excellent or Good.



While 80.65% of the Class of 2022 strongly agreed that podcasts enabled more efficient study time, this was 72.55% for the Class of 2020. This is an interesting finding, particularly due to the increase in the amount of podcasts between the 2 cohorts (2-5 courses).

**Relationship between respondents' self-reported ability to utilize the podcasts to help them remember key information and the average number of times they viewed the podcasts per topic:**



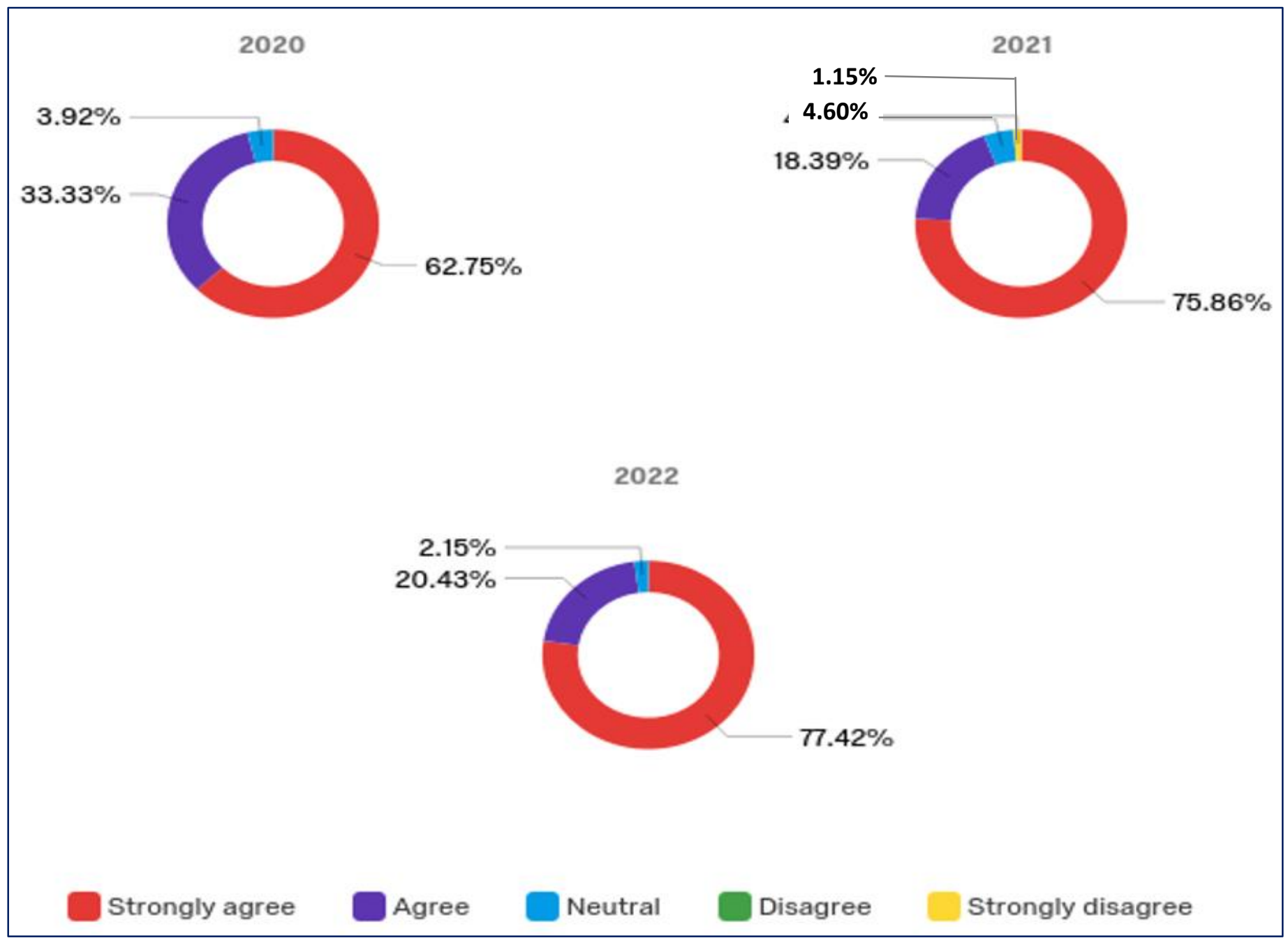
- Interestingly, the self-reported ability was strongest for the respondents who averaged two (2) viewings per topic. The self-reported ability to remember key information was lower for those students who averaged 3 or more viewings per topic.

- Cohort differences emerged when comparing student performance averages on Histology content on examinations. Students in the Class of 2021 performed 6.26% higher than the Class of 2020. The self-reported confidence in histology content (as a result of DSB podcasts) is also higher for the Class of 2021.

**Average Exam Performance in Histology: C2020 (76.07%); C2021 (82.33%); C2022 (In progress)**

- This indicates a strong relationship between student confidence in the histology content and actual performance on these topics on examinations. Further, this increase directly corresponds to the increase in the number of histology podcasts between the two cohorts (2-5 courses).

The Podcasts made me feel more confident about the Histology content of the examinations.



## Discussion

- The virtual microscopy podcasts comprise an innovative Histology laboratory manual and this tool enhances Histology learning and aligns with the institution's learning outcome.
- Evidence exists to support virtual microscopy to be a superior pedagogical tool and is preferred by learners over light microscopy [1]. A Histology pre-laboratory talk, using glass or virtual slides to show relevant structures live, has been shown to enhance learning [2].
- Unlike the live pre-laboratory talks, the virtual microscopy podcasts are available on Canvas and the students could watch them as many number of times as needed.
- The differences among the study groups indicated a positive association between the podcasts viewing and efficient utilization of study time, confidence about the Histology content and the class performance. Overall, the podcasts were found to be beneficial by the students and they were often used as pre-exam review material.
- A summary of students' feedback and academic performance will help us understand the significance of integrating multimedia with Histology teaching. The study will also facilitate planning a curricular modification when needed.

## References

1. Wilson AB, Taylor MA, Klein BA, Sugrue MK, Whipple EC, Brokaw JJ. 2016. Meta-analysis and review of learner performance and preference: Virtual versus optical microscopy. Med Educ 50:428-440.
2. Higazi TB. 2011. Use of interactive live digital imaging to enhance histology learning in introductory level anatomy and physiology classes. Anat Sci Educ 4:78-83.