

# **Bioscience Student's Perspectives & Academic Performance Before, During & After a Stability Period of COVID-19**

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## *About Myself!*

### ● **My Research Projects,**

- The effects of various stresses on the immune system-  
**University of Bath, UK.**
- Bi-directional communication between neuroendocrine and the immune systems- **Chinese University of Hong Kong.**
- Regulation of appetite by the brain neuropeptides-  
**University of Alberta, Canada.**
- Efficacies of teaching technology to teach anatomy & Physiology- **MacEwan University, Alberta, Canada.**
- Active teaching strategies to improve knowledge & academic performance of bioscience students.
- Knowledge retention in nursing education.

# ***Factors Impacting Teaching & Learning of Biosciences***

- **Teaching & learning of biosciences are impacted by,**
  - Fewer contact hours & interaction between professor and students.
  - Fewer teaching hours.
  - Increased student enrollment.
  - The increased cost of cadavers for anatomy teaching.
  - Limited access to cadavers.
  - The adoption of new teaching technology.
  - The most prominent factor that ever impacted teaching and learning is- **Coronavirus Disease (Covid-19)**

# *Impact of COVID-19 on Education Worldwide*

- Covid-19 was first reported in China-2019.
- WHO declared as a **pandemic** on March 11, 2020.
- Covid-19 positive cases worldwide were approx. **540 million**.
- The number of deaths reported was appx. **6.32 million**.
- COVID-19 affected **1.5 billion** educators and students in **183 countries**.
- Forced educators and students quickly to adopt e-learning (virtual).
- Created confusion, isolation, anxiety, stress and mental health issues for educators and students.

# ***Impact of COVID-19 Education in Canada***

- Covid-19 positive cases in Canada were approx. **3.93 million**.
- The number of deaths reported was appx. **41,763**.
- High-level anxiety, stress and social isolation with mental health issues were experienced by the Canadian educators and students.

## **In ALBERTA, CANADA**

- Covid-19 positive cases were reported= **586,000**.
- The number of deaths was reported as **4,591**.
- Covid-19 compelled to adopt three modes of teaching and learning- Synchronous online, Flex/hybrid and In-person.

# *Study Objectives*

👉 Student's perspectives on teaching and learning of biosciences before, during and after a stability period of Covid-19.

👉 Student's academic performance before, during and after a stability period of Covid-19.

👉 Post-Covid-19 survey on students' preferences on future teaching and learning modalities.

# *Experimental Design*

## **Before Covid-19**

**(Fall 2019 & before)**

- Passive & active learning strategies
- Use of the Anatomage
- Classroom discussion
- In-class quizzes, exams and Kahoots

## **During Covid-19**

**(Winter & Fall 2020, and Winter 2021)**

### *Delta variant*

- Lack of passive & active learning strategies
  - Lack of technology
  - Synchronous online teaching
  - Online exams

# *Experimental Design*

## **Hybrid/Flex teaching**

**(Fall 2021)**

*Omicron variant*

- One class synchronous online teaching
- Second class in-person
- Limited classroom interaction & discussion
- Lack of in-class quizzes & Kahoots
- In-person exams

## **Stability Period of Covid-19** (Winter 2022)

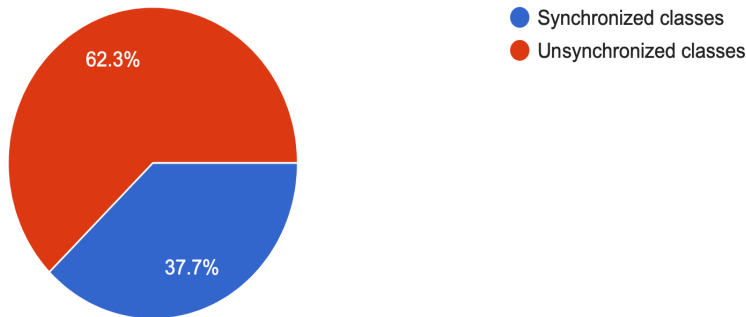
*BA2 & BA5 variants*

- Same as before Covid-19
- 100% in-person classes

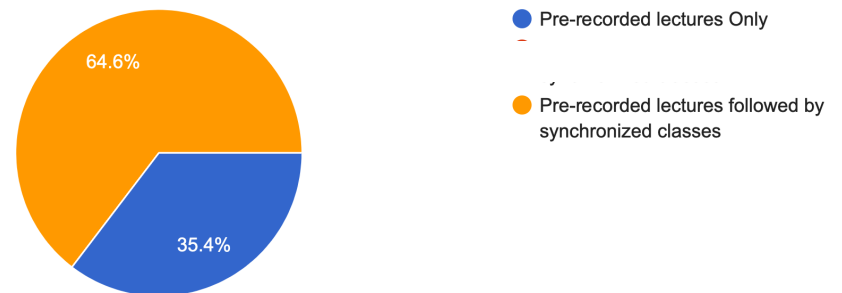


# *Teaching Modality Preferences by Students during COVID-19 & Hybrid/Flex Period*

1. I prefer,  
146 responses

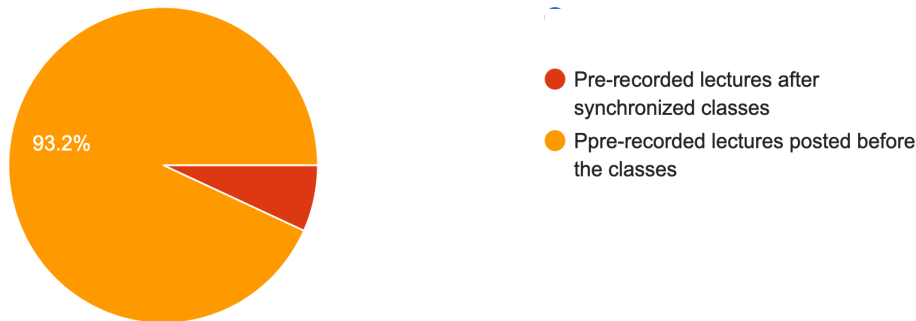


2. I prefer,  
147 responses

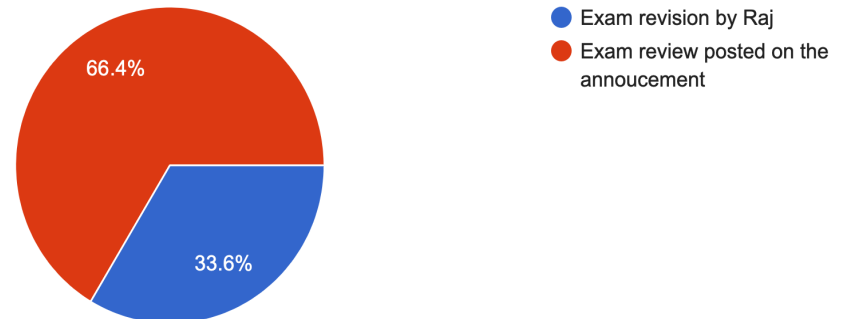


# Teaching Modality Preferences by Students during COVID-19 & Hybrid/Flex Period

4. I prefer,  
147 responses

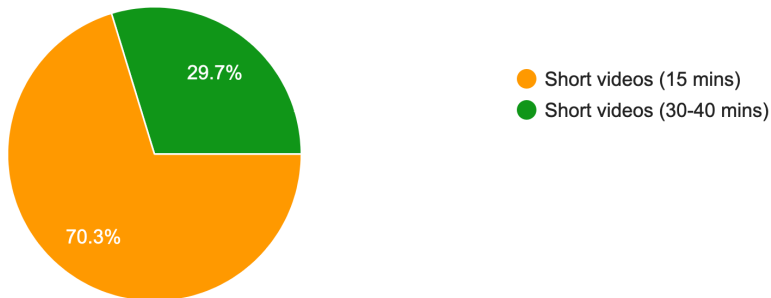


5. I prefer,  
143 responses



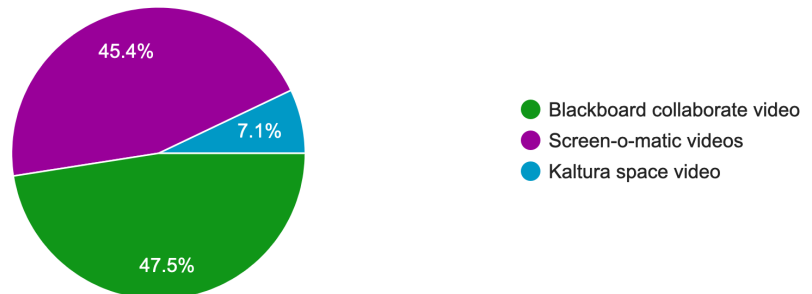
# *Teaching Modality Preferences by Students during COVID-19 & Hybrid/Flex Period*

6. I prefer,  
148 responses



● Short videos (15 mins)  
● Short videos (30-40 mins)

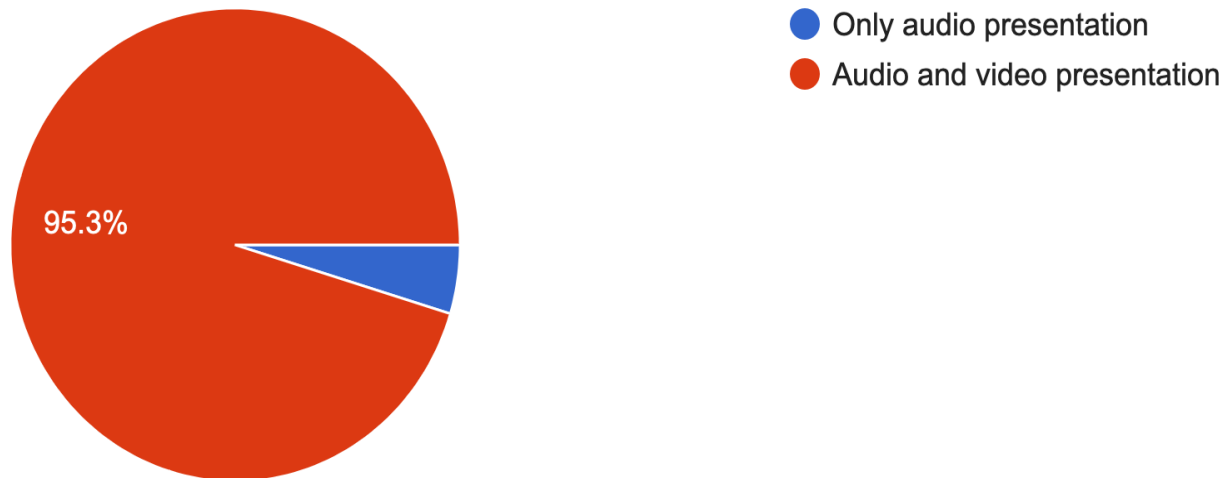
7. I prefer the videos made in,  
141 responses



● Blackboard collaborate video  
● Screen-o-matic videos  
● Kaltura space video

# *Teaching Modality Preferences by Students during COVID-19 & Hybrid/Flex Period*

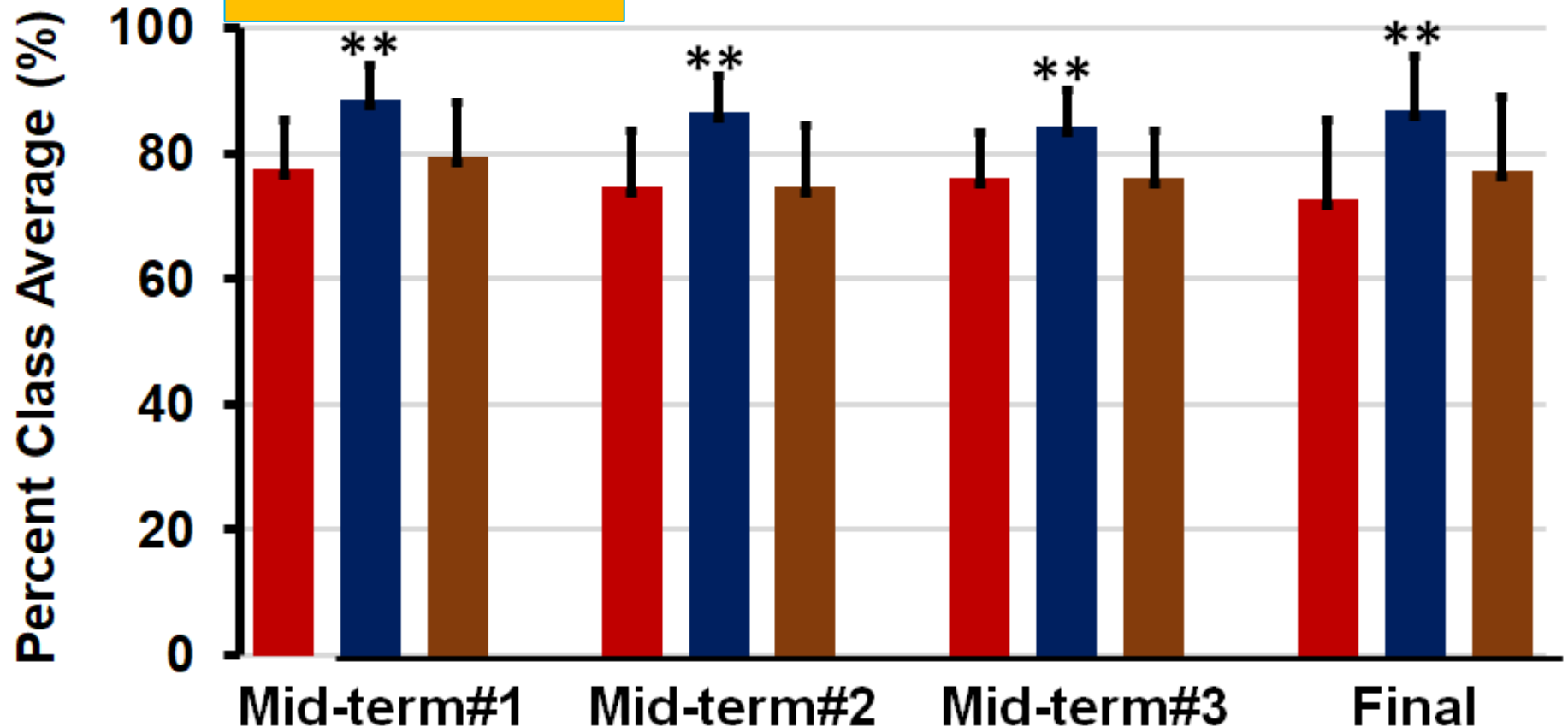
8. I prefer,  
149 responses



# *Impact of COVID-19 on Academic Performance*

■ Before ■ During ■ Stability period of COVID-19

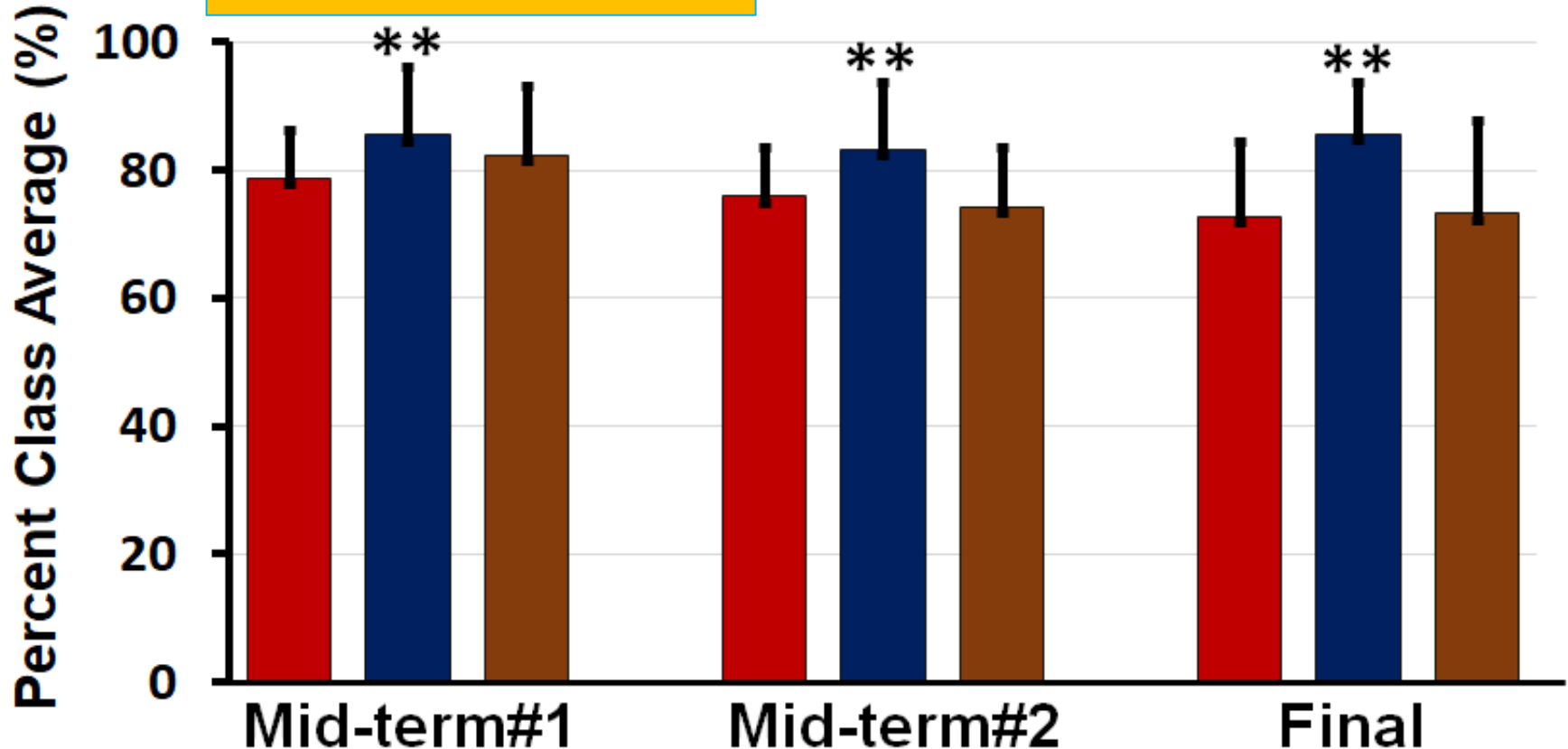
## ANATOMY



# *Impact of COVID-19 on Academic Performance*

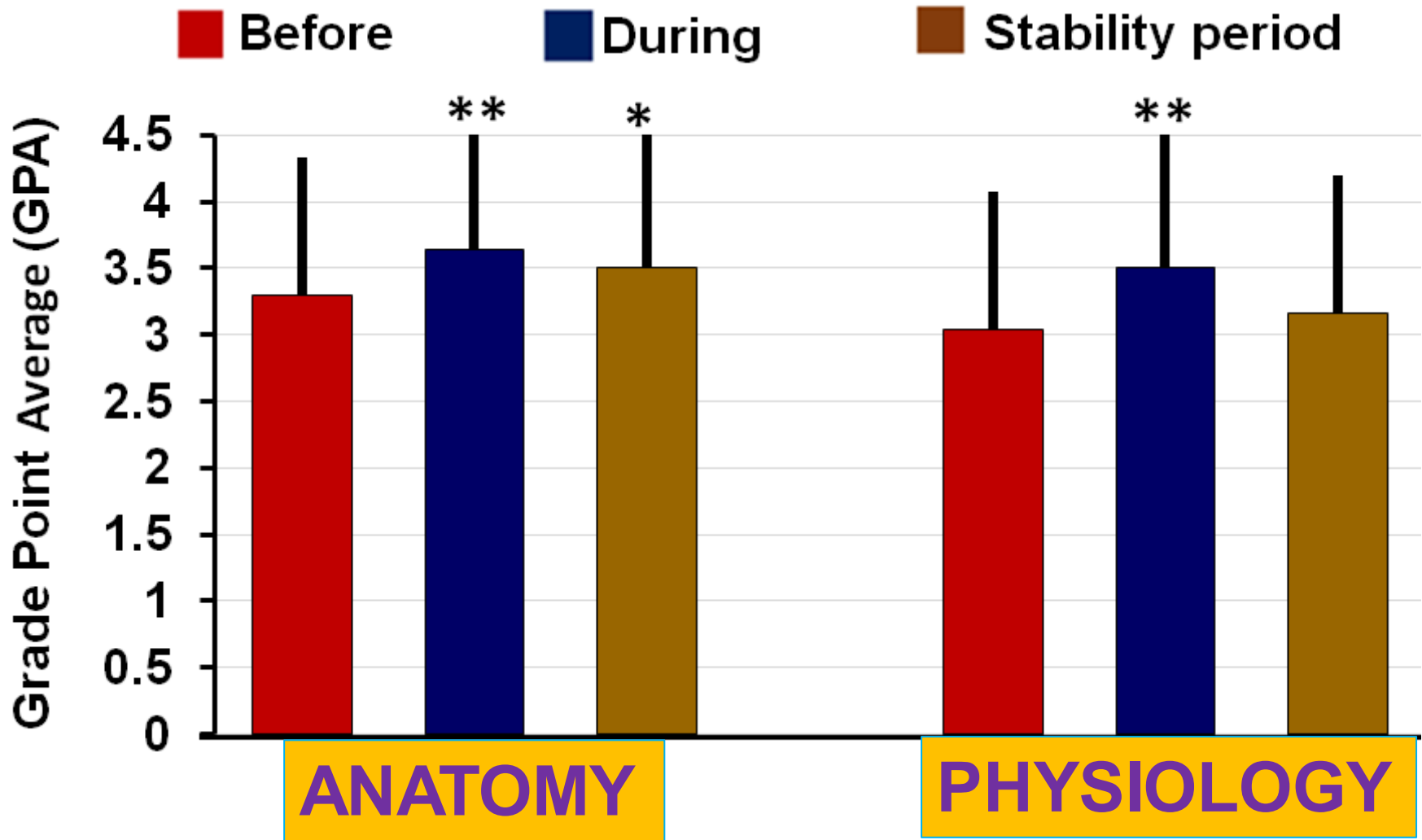
■ Before ■ During ■ Stability period of COVID-19

## PHYSIOLOGY



# *Impact of COVID-19 on Academic Performance*

**G P A**



# *Rationales for Improved Academic Performance & GPA*





# ***Rationales for Improved Academic Performance & GPA***

- **Pre-recorded lectures** with captions were posted a week before synchronized classes.
- Detailed **exam reviews** were posted well in advance before exams.
- A **drawing tablet** was used to explain physiology concepts.
- Students likely benefited from synchronized classes, help, & **guidance from the Prof.** during **virtual office hours** over the COVID-19 period.
- **Online quizzes** were conducted to assess their knowledge.

# *Rationales for Improved Academic Performance & GPA*

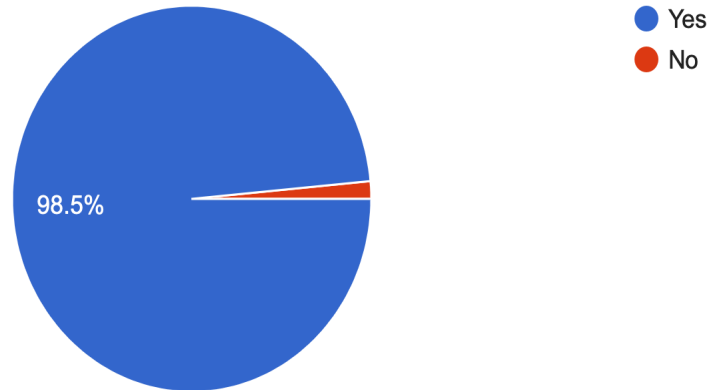
❑ On the other hand,

- Due to isolation and lack of social interaction with others, students spent **more time studying**.
- Students were adapted to **self-directed learning**.
- Students may have **adapted to online teaching** and learning.
- Students may have taken advantage of **unproctored online exams** to access course material during the exams.
- Non-blockage of a **web browser** during exams.
- Web **cameras were off** due to privacy & ethics.

# Post-Covid-19 Student Survey

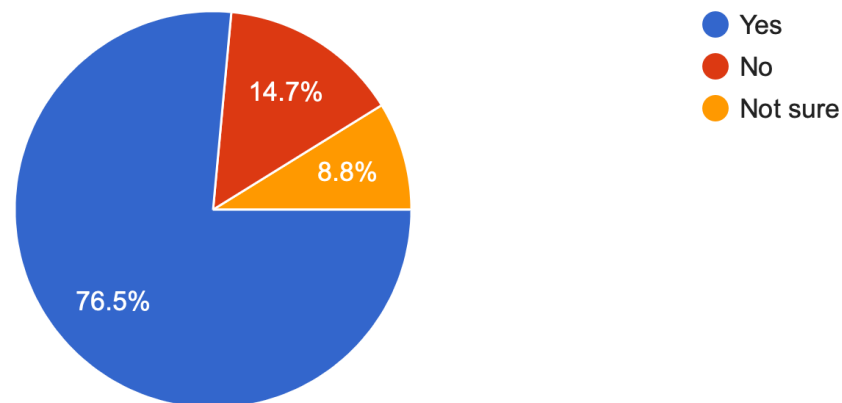
1. I consent to this survey

68 responses



4. Were you concerned about your nursing education due to the COVID-19?

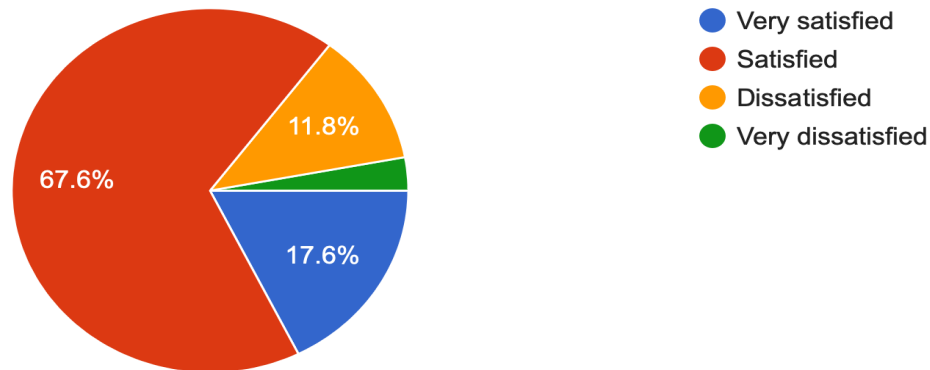
68 responses



# Post-Covid-19 Student Survey

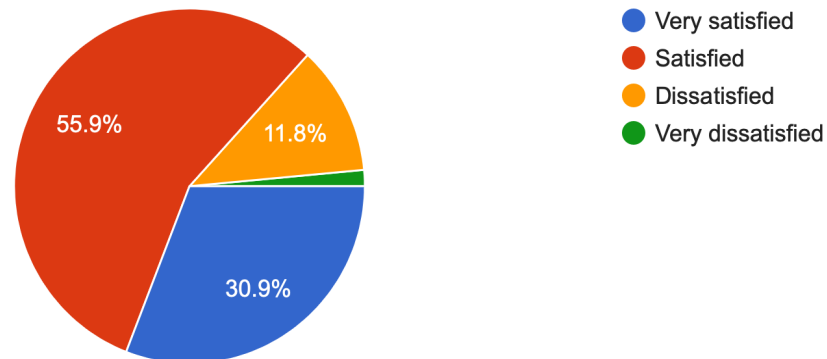
5. How satisfied were you with the online teaching and learning adopted due to COVID-19 measures?

68 responses



6. How satisfied were you with the instructor delivering online lectures during COVID- 19?

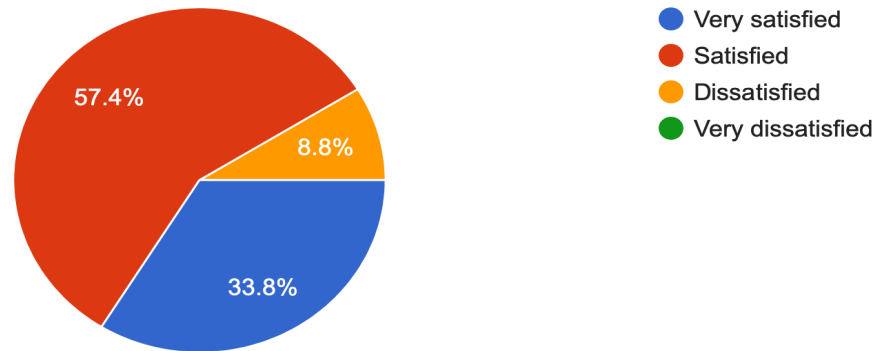
68 responses



# Post-Covid-19 Student Survey

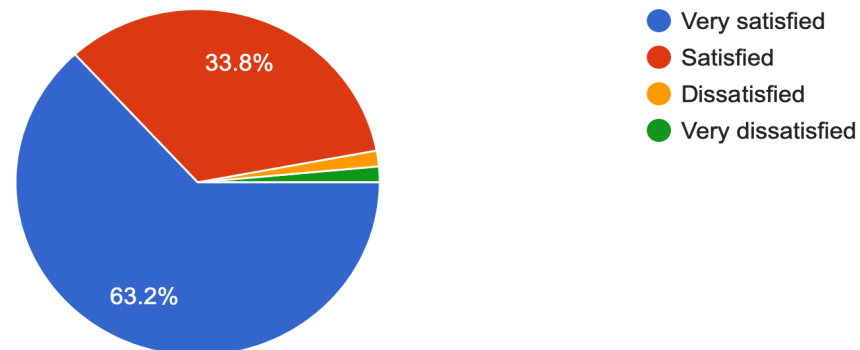
7. How satisfied were you with the instructor's knowledge of the use of teaching technology during COVID-19?

68 responses



8. How satisfied were you with the instructor promptly and timely answering the emails and phone calls and clarifying anatomy and physiology concepts outside online teaching?

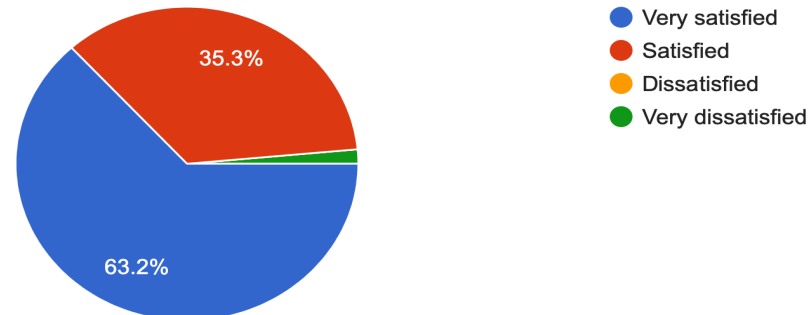
68 responses



# Post-Covid-19 Student Survey

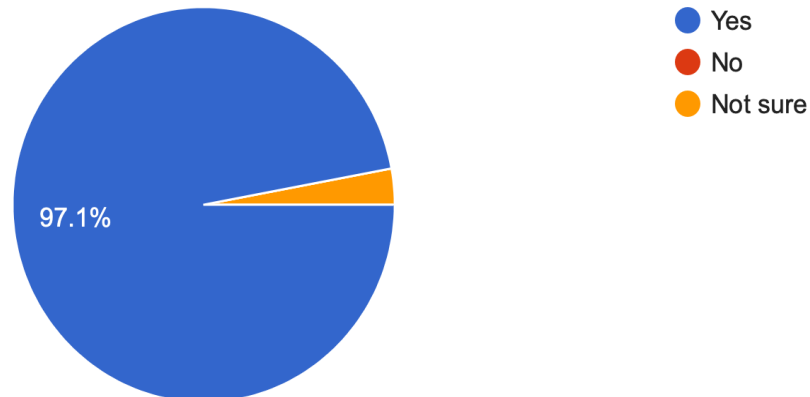
9. How satisfied were you with your instructor communicating with you through the Blackboard announcements about teaching during COVID-19?

68 responses



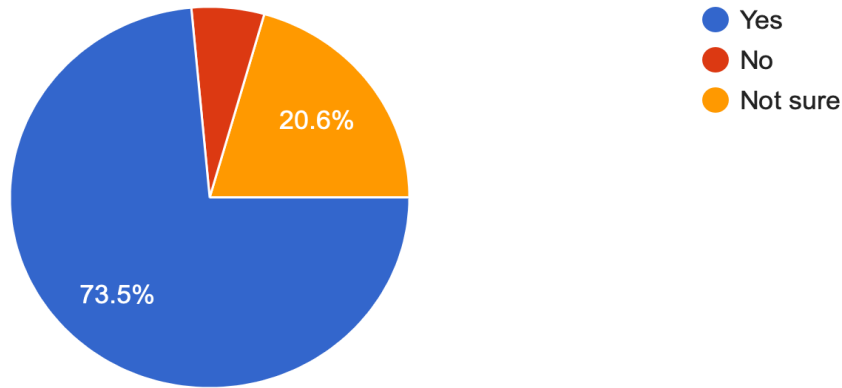
10. Were the mid-terms and final exams reviews posted on the Blackboard were content focused and helped you to prepare for the exams?

68 responses



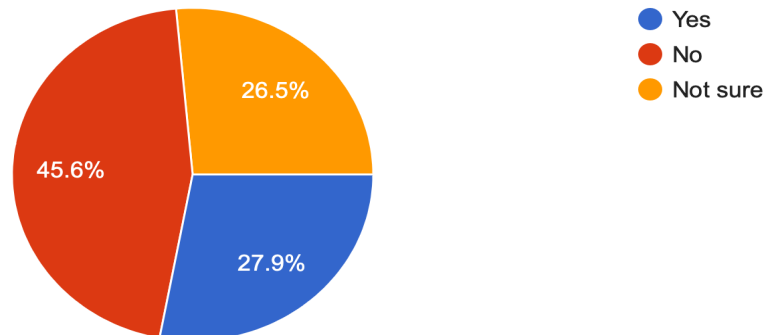
11. Were you satisfied with your instructor reducing online exam-related anxiety and stress during COVID-19?

68 responses



12. Do you prefer synchronous online teaching and learning?

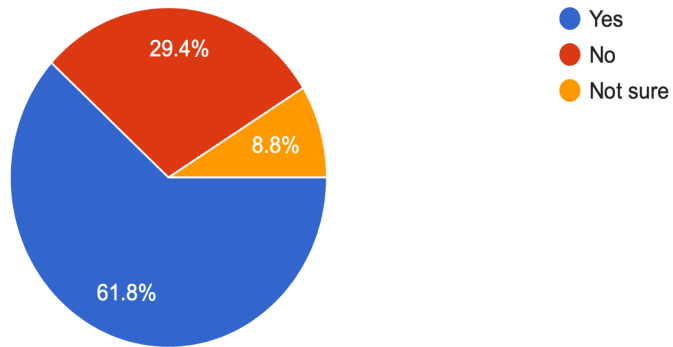
68 responses



# Post-Covid-19 Student Survey

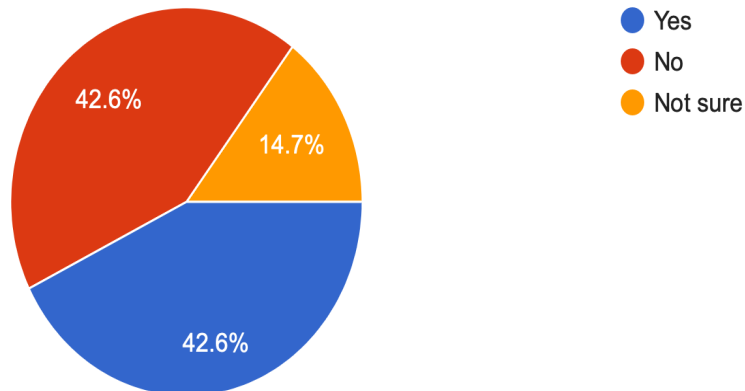
13. Do you prefer flex/hybrid (combination of synchronous online and face-to-face) teaching and learning?

68 responses



14. Do you prefer 100% face-to-face (in-person) teaching and learning?

68 responses

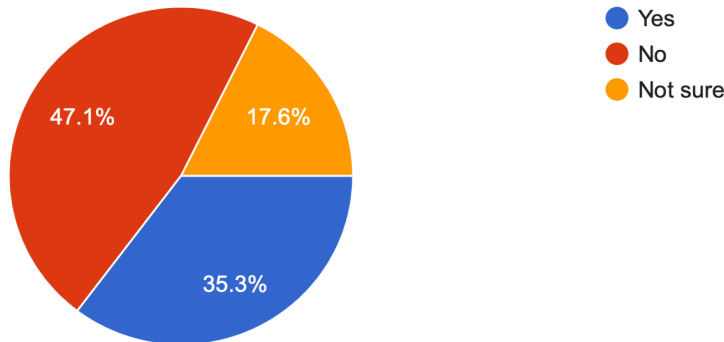




# Post-Covid-19 Student Survey

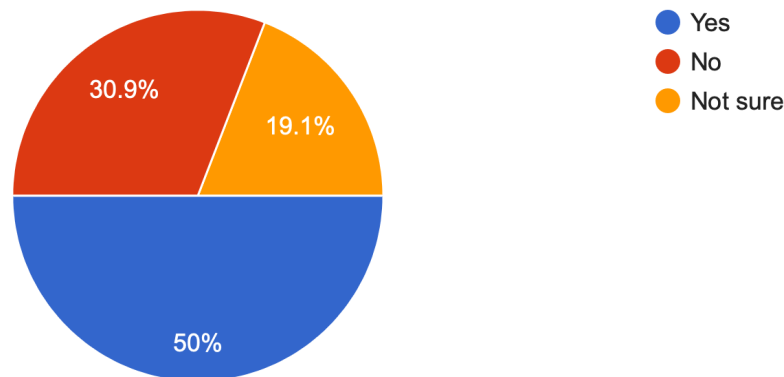
15. My understanding and knowledge of anatomy and physiology was much greater during synchronous online teaching and learning than in f...line and face-to-face) than face-to-face learning?

68 responses



16. My understanding and knowledge of anatomy and physiology was much greater during face-to-face teaching and learning than synchrono...f synchronous online and face-to-face) learning?

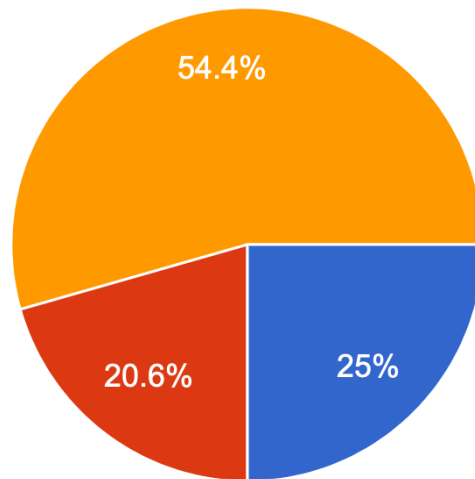
68 responses



# *Post-Covid-19 Student Survey*

17. Given an opportunity to teach and learn anatomy and physiology in the future, which mode of teaching and learning delivery methods will you prefer?

68 responses



- 100% face-to-face
- 100% synchronous online
- Flex/hybrid (combination of synchronous online and face-to-face) teaching and learning

# *What We Have Learned from Covid-19?*

## Conclusion



## *Conclusions*

- Findings suggest that nursing students may have **counter-balanced** the missing active learning strategies of face-to-face learning and adopted **self-directed** learning during the COVID-19 period through synchronized learning.
- Virtual, synchronized learning by using a ‘**blended, multi-modal & pedagogical**’ approach may serve as a “*new normal*” of teaching and learning of biosciences if pandemics like Covid-19 re-emerge in the future.

# Acknowledgements



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**Celina Vipond- Research Assistant**



**Inder Singh - Research Assistant**



*Thank you*

