

# Math Department Unit-Level Assessment Liaison Report Spring 2023

Liaison Project Start Date: Fall 2022

Liaison Report prepared by: Chao Lu

## **I. Department Buy-In and Outcome Definition**

Many of our students find that Mathematics is one of the most difficult subjects that they encounter in their academic journey. Mathematics, as a pure theoretical subject, is not that enjoyable for some students. Learning it can be somewhat stressful and challenging.

Since the pandemic started in early 2020, many things have been changed including living style, working environment, and learning at school. It also changed how we teach and how student learn. When the pandemic started, the traditional in-person, classroom setting learning became unfeasible. The reality forced school/teacher to be open-minded to seek new delivery methods to teach our students. The Online Live classroom was born. It is not a typical fully online course. It is a virtual classroom using conference software like Zoom or Google meets.

Math is a difficult or somewhat challenging for most of our students at Harold Washington College. Before the pandemic, most of our students chose in-person math classes. We used to hold about 80% to 90% of our sessions in-person and only about 10% to 20% were fully online sessions. When pandemic hit, the only choices/learning modalities left were to learn Math fully online or online live through virtual classrooms. How well are we doing? How do our students feel about the fully online, online live (Zoom) course versus traditional in-person setting? Which modality do our students prefer for his/her next level of math course while we are close to the ending stage of the pandemic or post pandemic? Those are the questions that Math faculty at our campus would like to know.

## **II. Assessment Research and Design**

The research and design of the assessment occurred in Fall 2022 semester.

At the first department meeting of Fall 2022 semester, colleagues from the math department at Harold Washington College decided to conduct a survey to collect related information regarding the students' learning modalities. The first draft was completed and sent to the department for review and feedbacks around the end of the first quarter of the semester. Then we did some modification based on the feedback from colleagues. We used Google Forms as the tool for the survey. The tool consists of multiple-choice questions and short answer questions. The survey separates students into different sections according to

the modality of his/her math course for the current semester. There are three modality formats used in the survey are defined as follows, 1. On Campus (Class meets regularly in person on campus); 2. Live Online (Class meets regularly via Synchronous Zoom); 3. Fully Online (There are no regular class meetings during the semester-Section number will start with WW. ex Math 141 WW1). Major questions include the reason he/she chose the current learning modality; the concerns or challenges regarding the current class; feedback for the learning software if used in the class; the device he/she used for assignments; and the choice of the learning modality for next Math course at City College of Chicago if applied.

### **III. Pilot Assessment Tools and Processes**

The department decided not to conduct a pilot but do full deployment to the students who enrolled in any math section for Fall 2022 semester at HWC between week 10 and week 14 of the Fall 2022 semester.

### **IV. Administer Specific Assessment**

At the first department meeting of Fall 2022 semester, colleagues from the math department at Harold Washington College decided to conduct a survey to collect related information regarding the students' learning modalities. The first draft was completed and sent to the department for review and feedbacks around the end of the fourth week of the semester. Then we did some modification based on the feedback from colleagues. The department decided not to conduct a pilot and would do full deployment to the students who enrolled in any math section at HWC between week 10 and week 14 of the Fall 2022 semester.

During week 10 of the Fall 2022 semester, we invited students who enrolled in any math course including Foundational Study, Various levels of Algebra courses, Trigonometry, Finite Math, Calculus sequence courses, and Linear Algebra course. It involved a total of 93 sections, 45 instructors and 1822 students as potential participants.

The survey was initially planned to run for 4 weeks, between November 4<sup>th</sup>, 2023, and December 3<sup>rd</sup>, 2023, but it was extended to later December (closed on December 17<sup>th</sup>, 2023) due to the low participation rate at the end of the initial period. We tried to collect more unique student responses. Every week, a reminder email including sample email that could be sent to students was sent out to all 45 faculty members to encourage the participation.

### **V. Data Analysis**

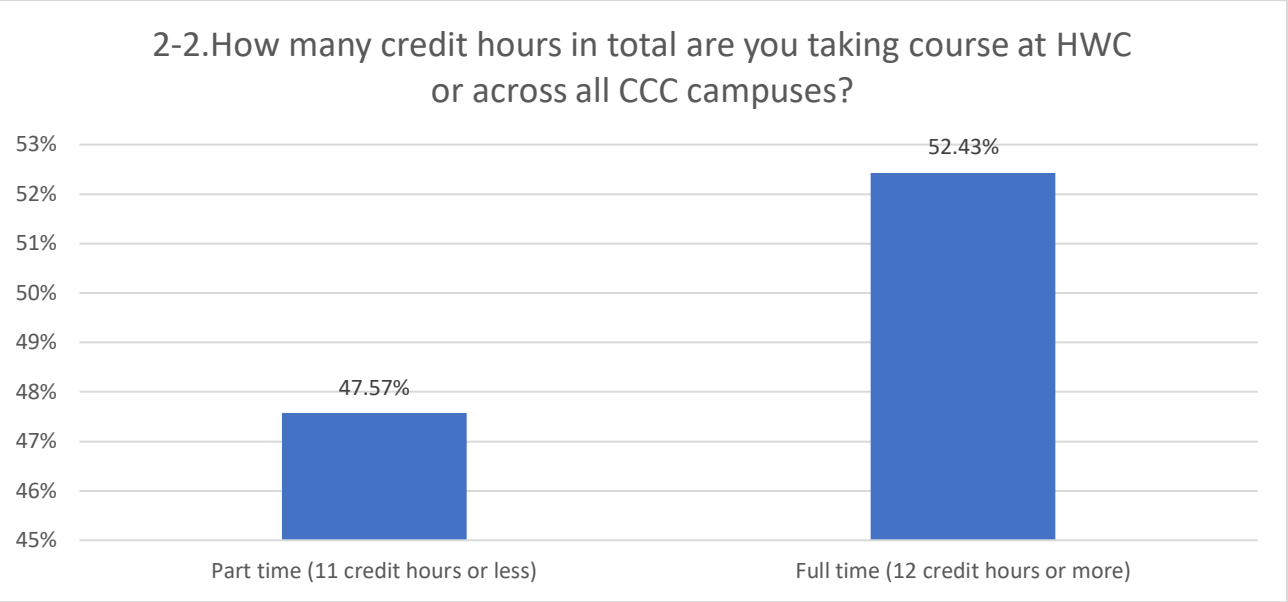
The survey closed on December 17<sup>th</sup>, 2022. The survey received total of 335 Responses with 309 unique/valid responses.

During the Fall 2022, the English department did a similar survey. At the beginning of the Spring 2023 semester, we started the data analysis process. Amy Rosenquist (English department liaison) and I reached out to Phil Vargas, the Assessment Committee's data analyst for help on analyzing the data for non-open-ended questions and comparing some of the data across two departments for some similar questions.

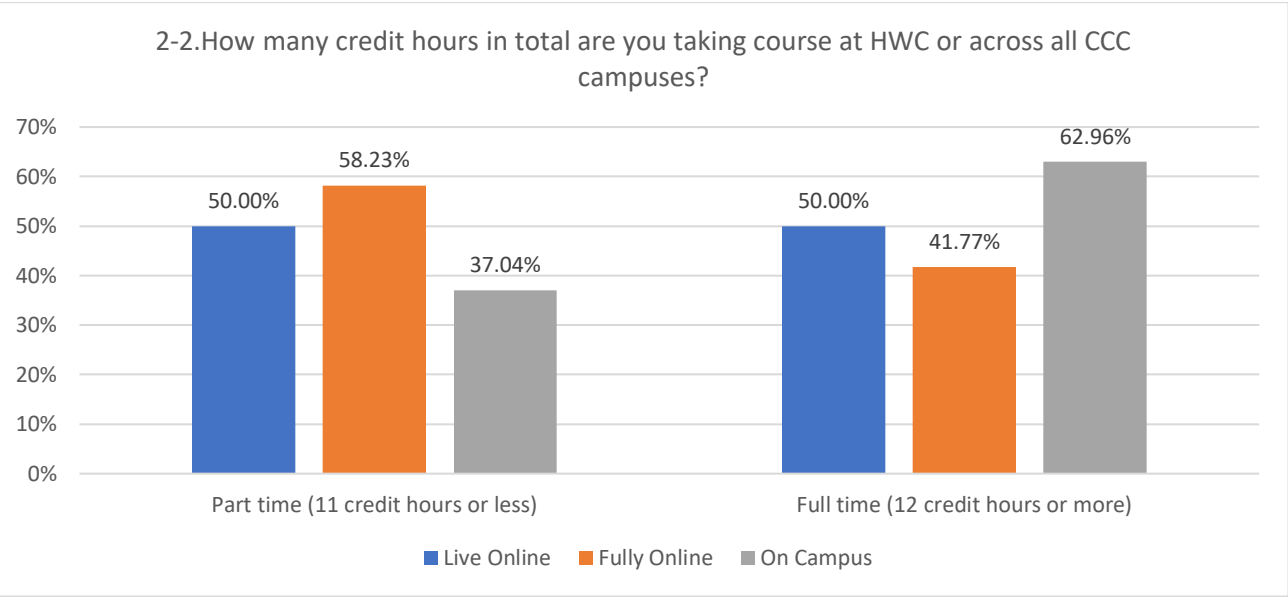
Here are the findings from the survey from our math department.

➤ 2-2. How many credit hours in total are you taking course at HWC or across all CCC campuses?

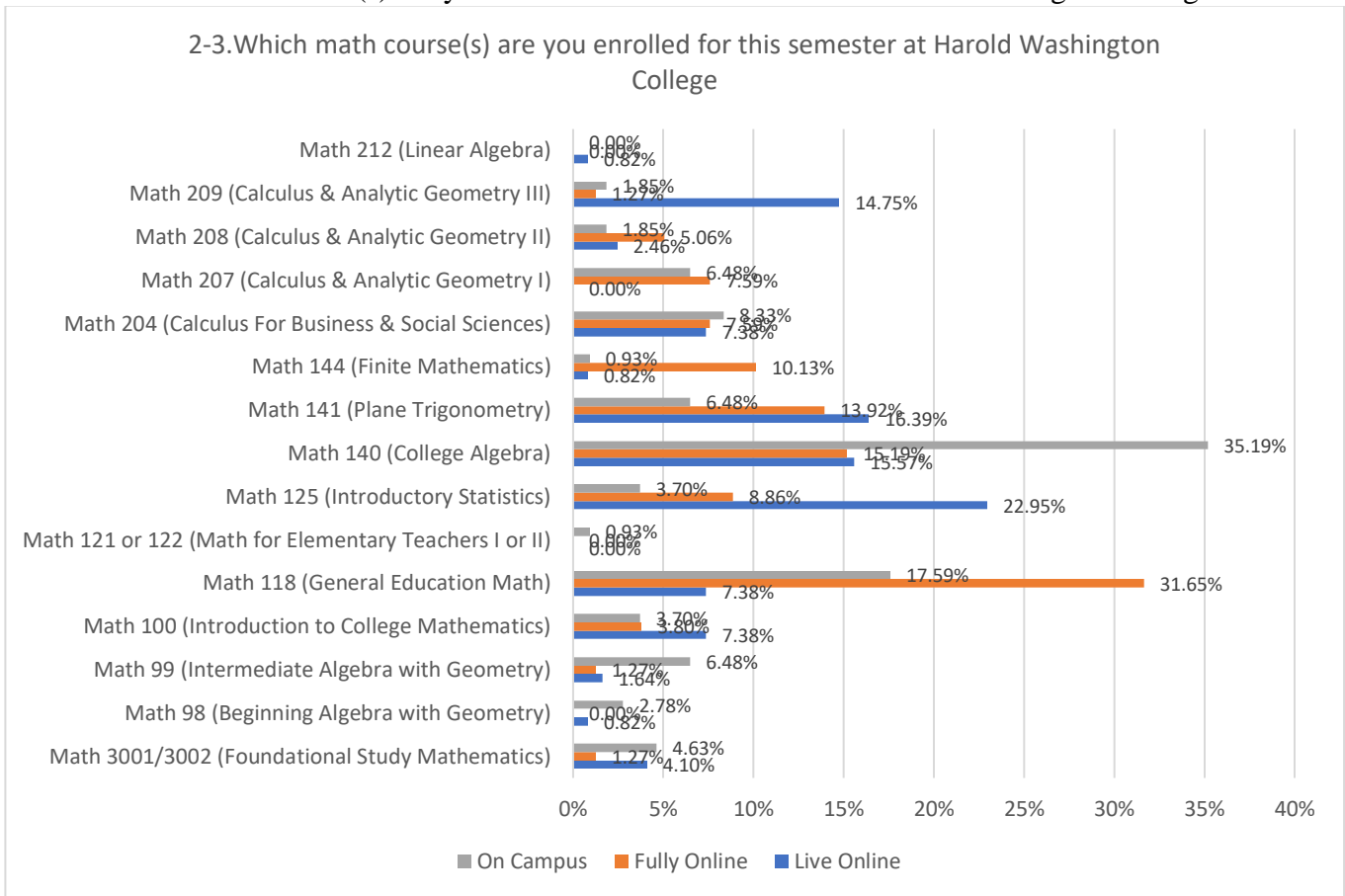
- Overall



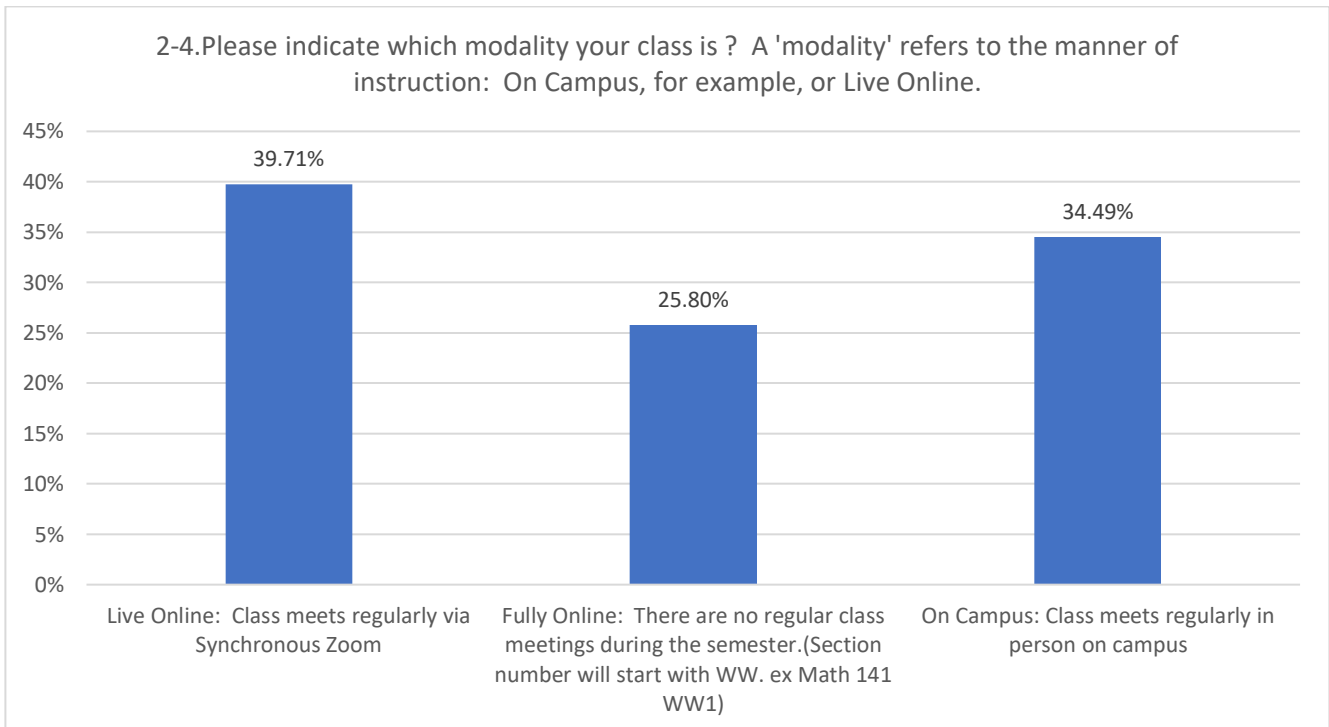
- Breakdown into different learning modalities



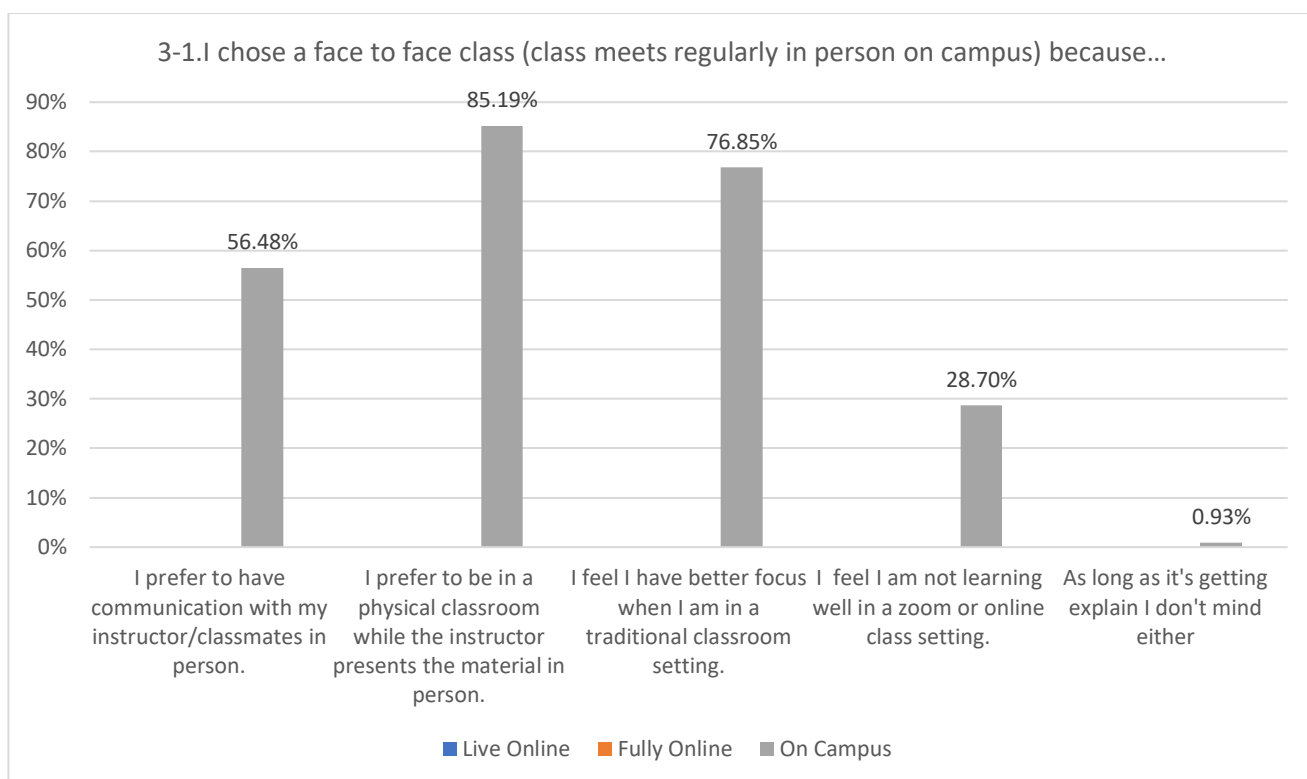
➤ 2-3. Which math course(s) are you enrolled for this semester at Harold Washington College



➤ 2-4. Please indicate which modality your class is ? A 'modality' refers to the manner of instruction: On Campus, for example, or Live Online.



➤ 3-1 I chose a face-to-face class (class meets regularly in person on campus) because...



➤ Question 3-2. What are your concerns or challenges regarding your current In-person math class?

- A total of 52 responses were received.

Covid Concerns	# of the responses
Covid/Potential having covid	4

Commute	# of the responses
Transportation is hard	1
Commute time is too long	3

Time management/learning skill	# of the responses
Not enough time to keep up with assignments	5
Being on time for in-person class	2
Don't know what to write down in classroom	1
No time to go to office hours/tutoring due to work	1

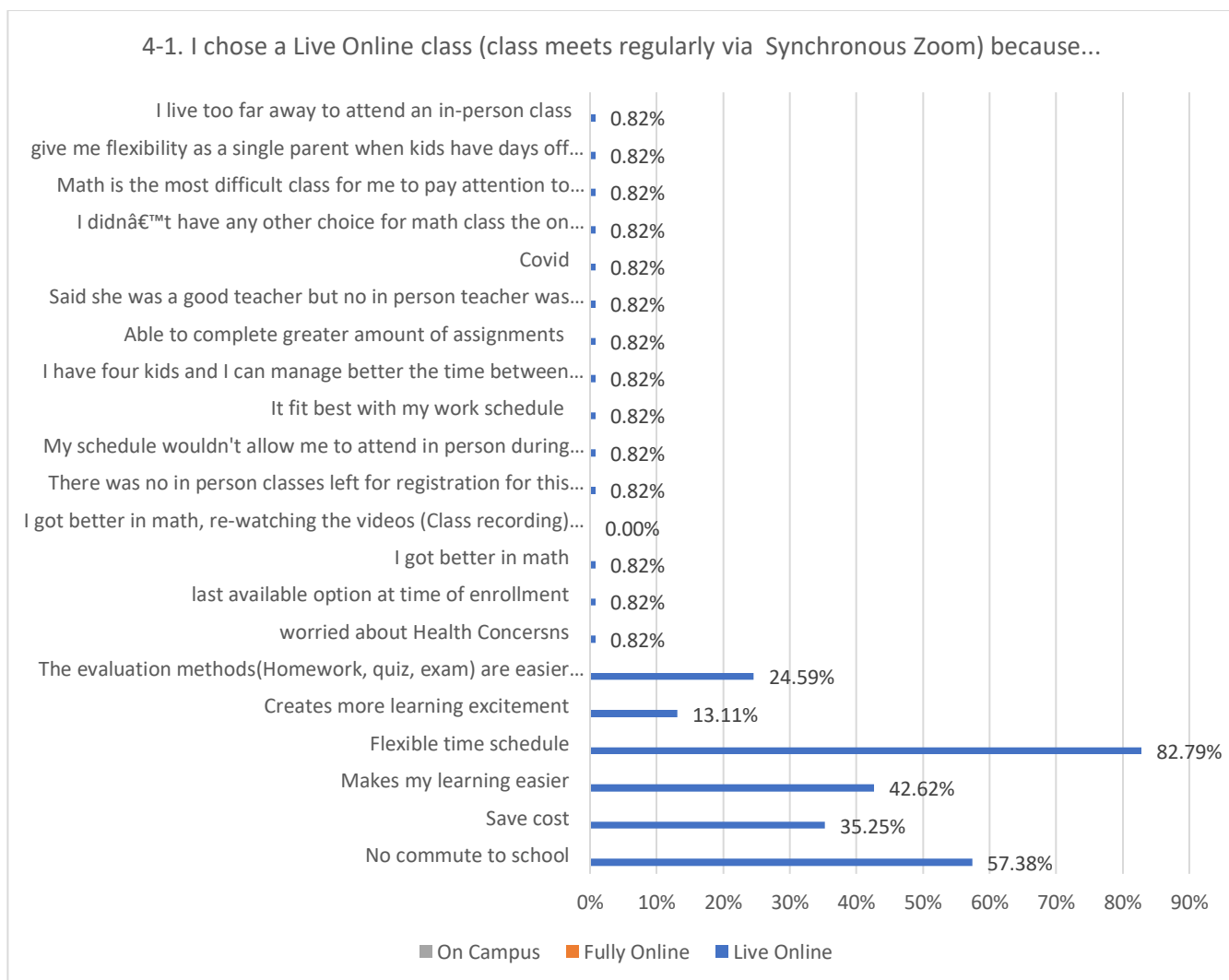
Course Content	# of the responses
Content is too much/ too difficult/hard to follow	8
Class is too fast	3
Too much homework/Difficult questions on assignments/exams	5
Can't retain information in long term	1
lack of study guide/review sheet	1

Related to Teacher	# of the responses
Spoken softly/thick accent	4
No communication with students/no questions answered by students	1
Only repeat examples from Textbook/lack of additional examples/Only read off Book/ lack of hands-on question	3
Did not refer to textbook/ did not cover all the content	2

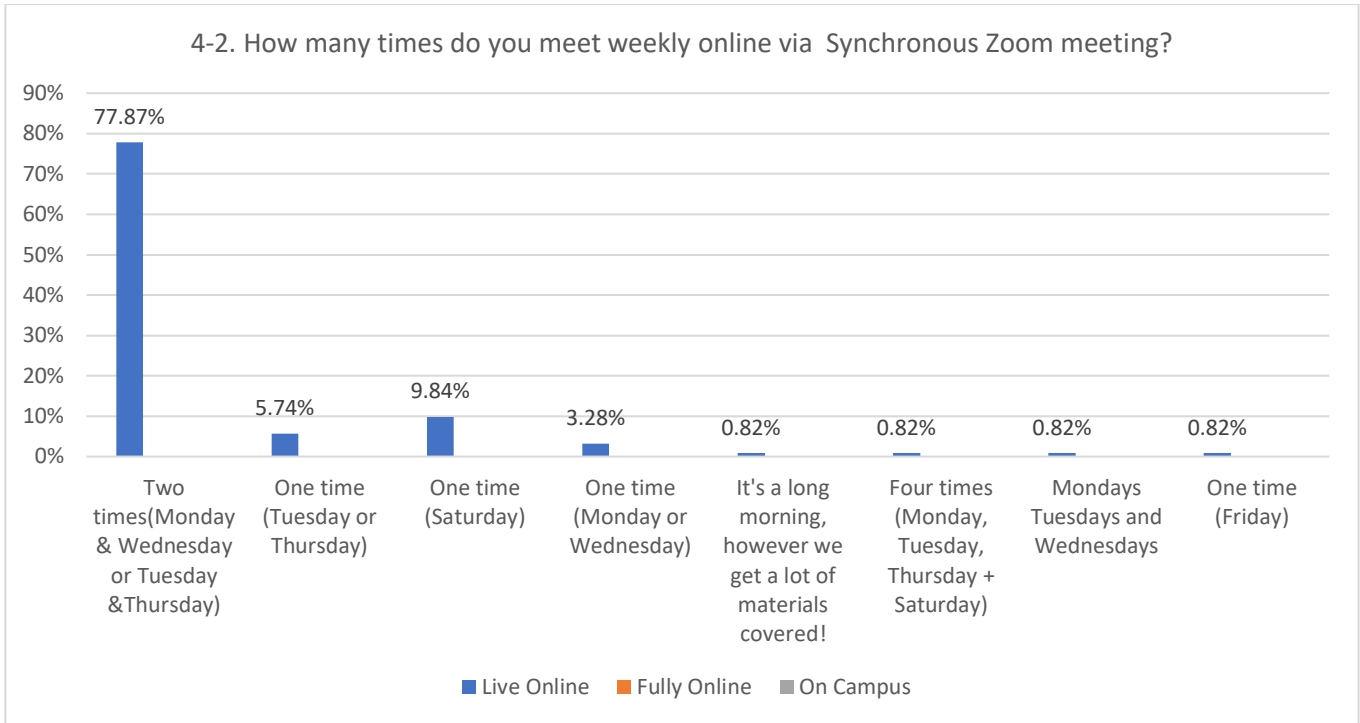
Related to Student's attitude	# of the responses
Hard to get motivate to do assignments	1
Complicate relationship with Math	1
Fell embarrassed to ask questions	1

Textbook/Software	# of the responses
Cost of the book	2
Software does not use friendly/difficult on submitting assignments	2

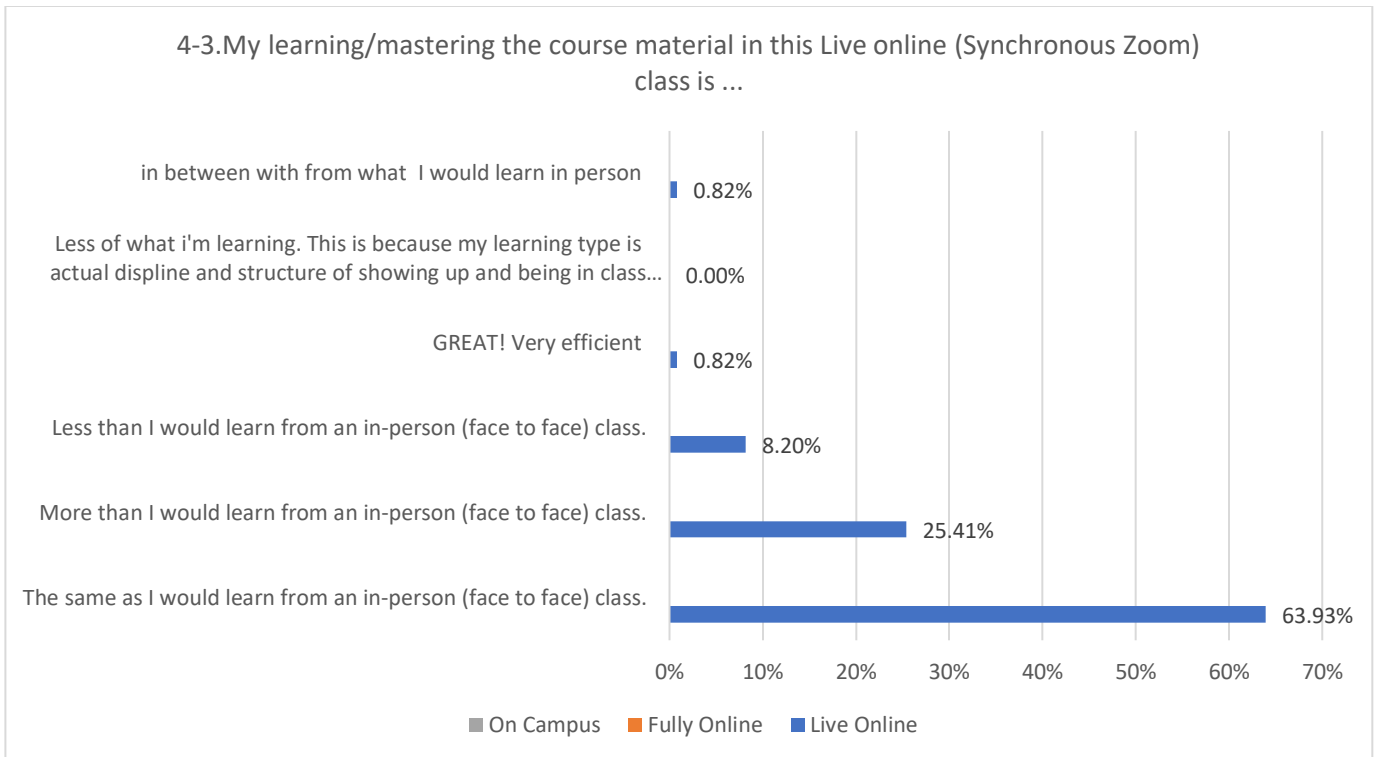
➤ 4-1. I chose a Live Online class (class meets regularly via Synchronous Zoom) because...



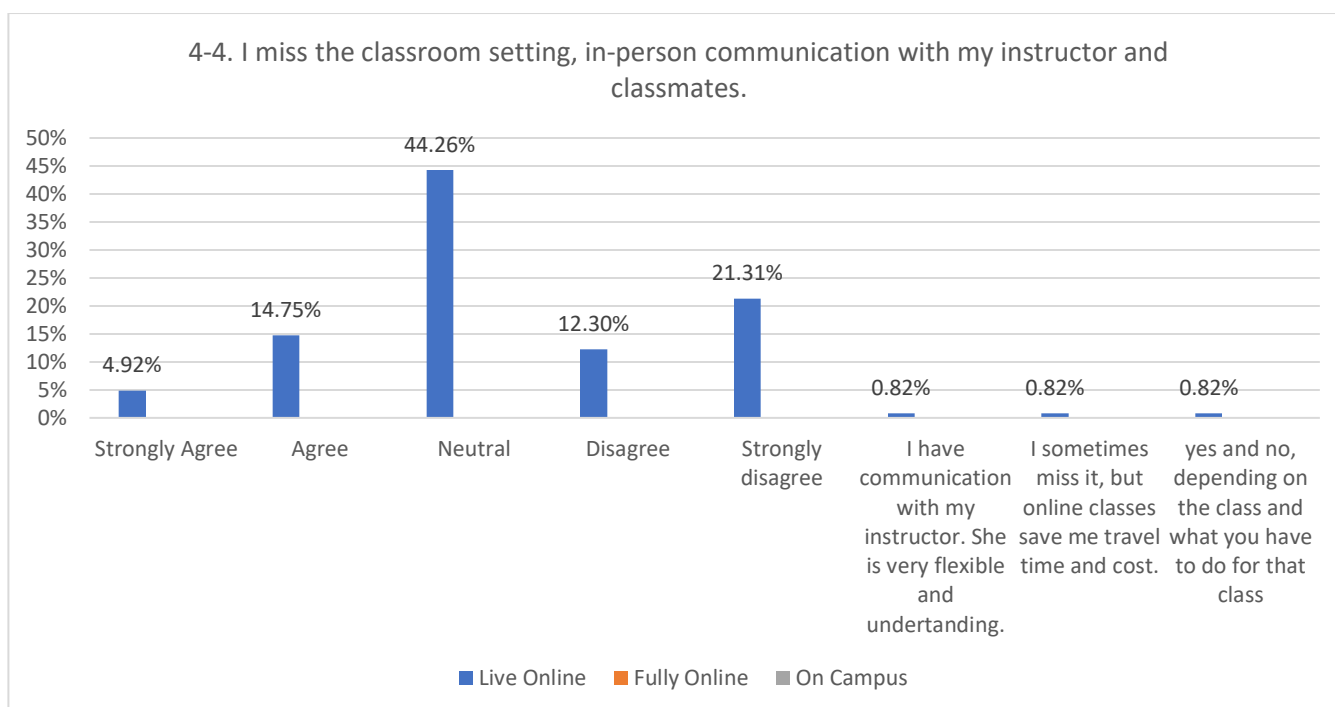
➤ 4-2. How many times do you meet weekly online via Synchronous Zoom meeting?



➤ 4-3. My learning/mastering the course material in this Live online (Synchronous Zoom) class is ...



➤ 4-4. I miss the classroom setting, in-person communication with my instructor and classmates.



➤ Question 4-5. What are your concerns or challenges regarding your current online live (Synchronous Zoom) math class?

- A total of 70 responses were received.

Time management/learning skill	# of the responses
Not enough time to keep up with assignments/turn in on time	7
Don't know how to take notes/ what to write down in classroom	1
Missing classes due to work/personal schedule	2

Zoom class setting	# of the responses
Learning environment different from in-person class	5
Hard to concentrate/stay focused/easy to get distracted	13
Lack of classwork/participation	5
Hard to communicate with teacher/classmates	5

Tech issue or others	# of the responses
Wi-Fi/internet issue/computer issue	7
Software/app/scanning issues	6
Financial aid related issue	1

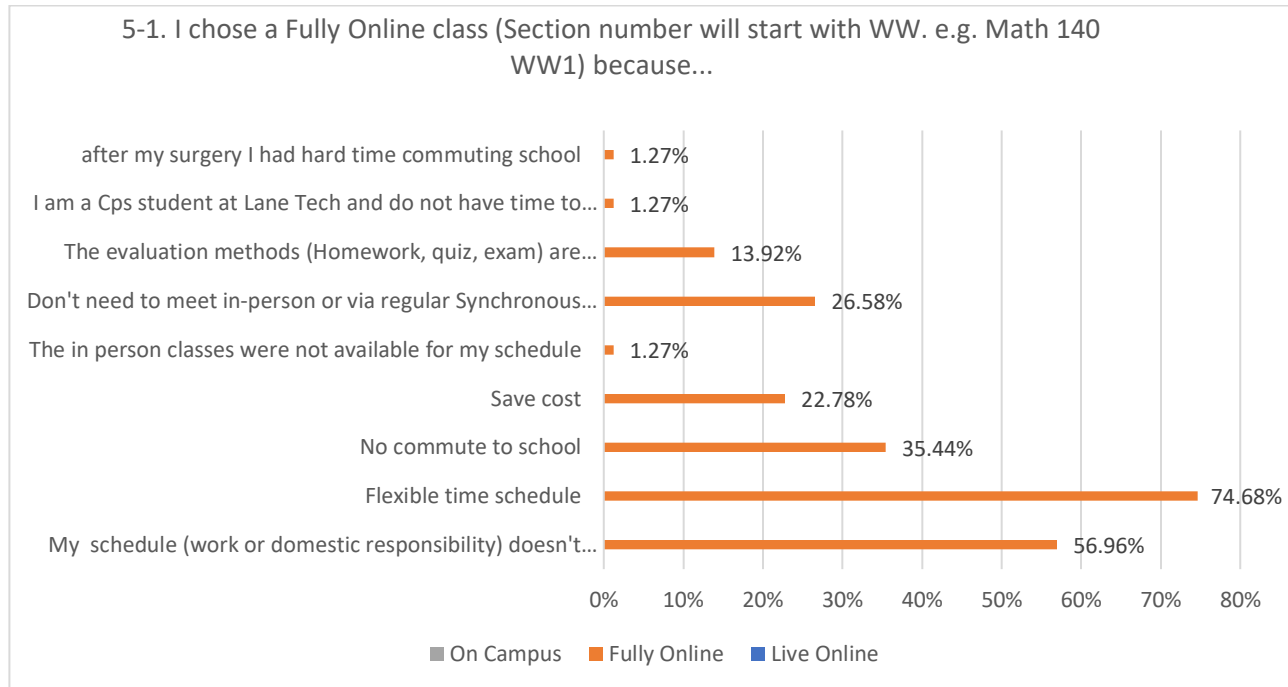
Course Content	# of the responses
Content is too much/ too difficult/hard to follow	10
Class is too fast	1
Too much homework/Difficult questions on assignments/exams	3
Can't retain information in long term	1
lack of study guide/review sheet	1



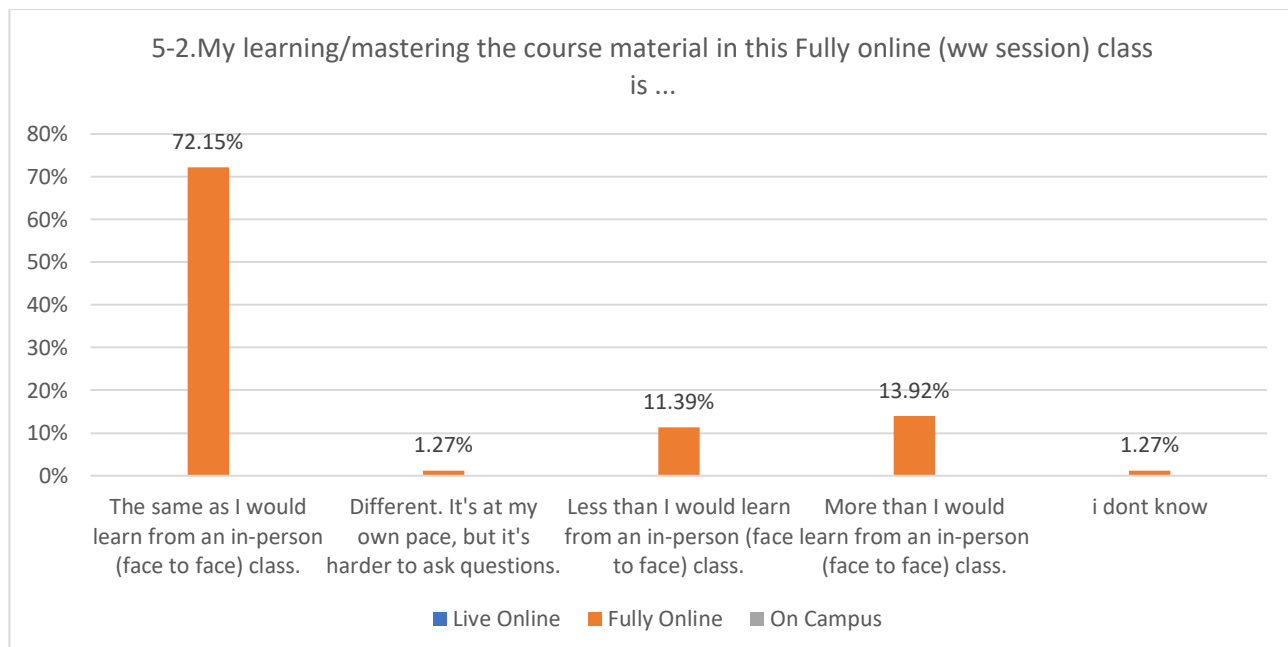
Related to Teacher	# of the responses
Teacher didn't respond to email	1

Related to Student's attitude	# of the responses
Anxiety to ask question behind screen	1

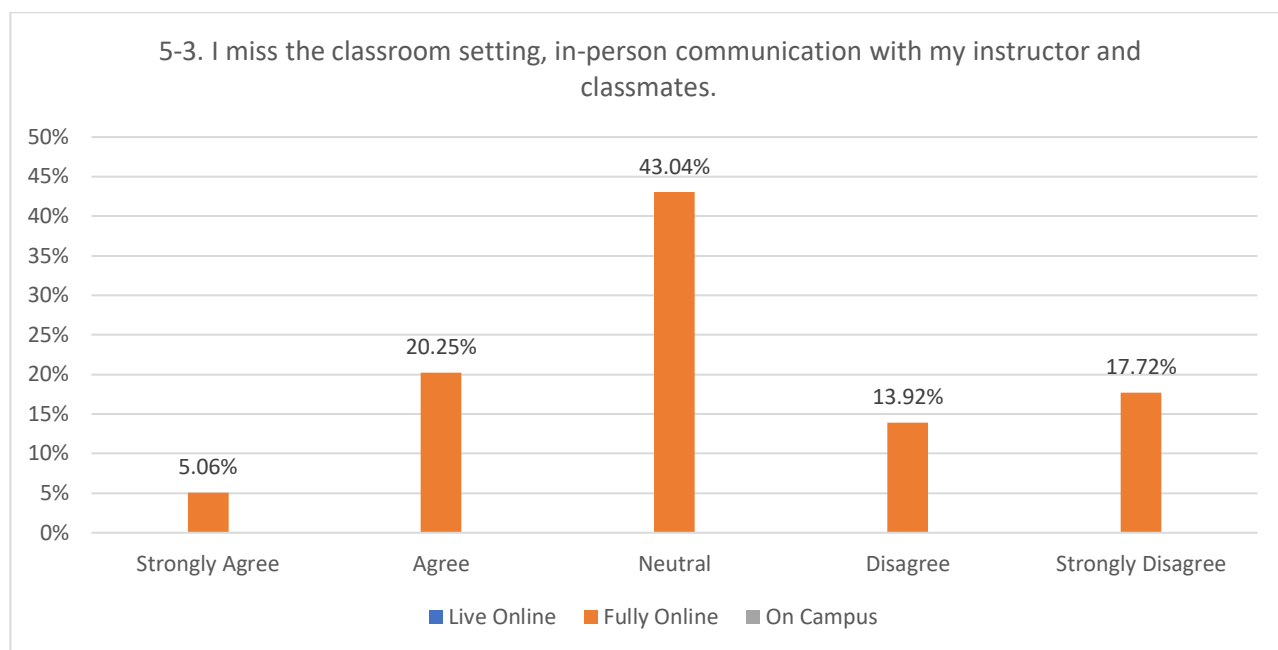
- 5-1. I chose a Fully Online class (Section number will start with WW. e.g., Math 140 WW1) because...



- 5-2. My learning/mastering the course material in this Fully online (ww session) class is ...



- 5-3. I miss the classroom setting, in-person communication with my instructor and classmates.



- Question 5-4. What are your concerns or challenges regarding your current a fully online (WW sections) math class?
- A total of 42 responses were received.

Time management/learning skill	# of the responses
Not enough time to keep up with assignments/turn in on time	3
Busy work/personal schedule	11
No time to go to office hours	1
Fully online learning style	# of the responses
Prefer in-person but schedule doesn't work	3
Need hands on help/visual learner	4
Don't know how to search for information/help	3

Communication	# of the responses
Every question needs to go through email	1
Hard to get feedback/response	3
Lack of communication/collaboration with classmates	2

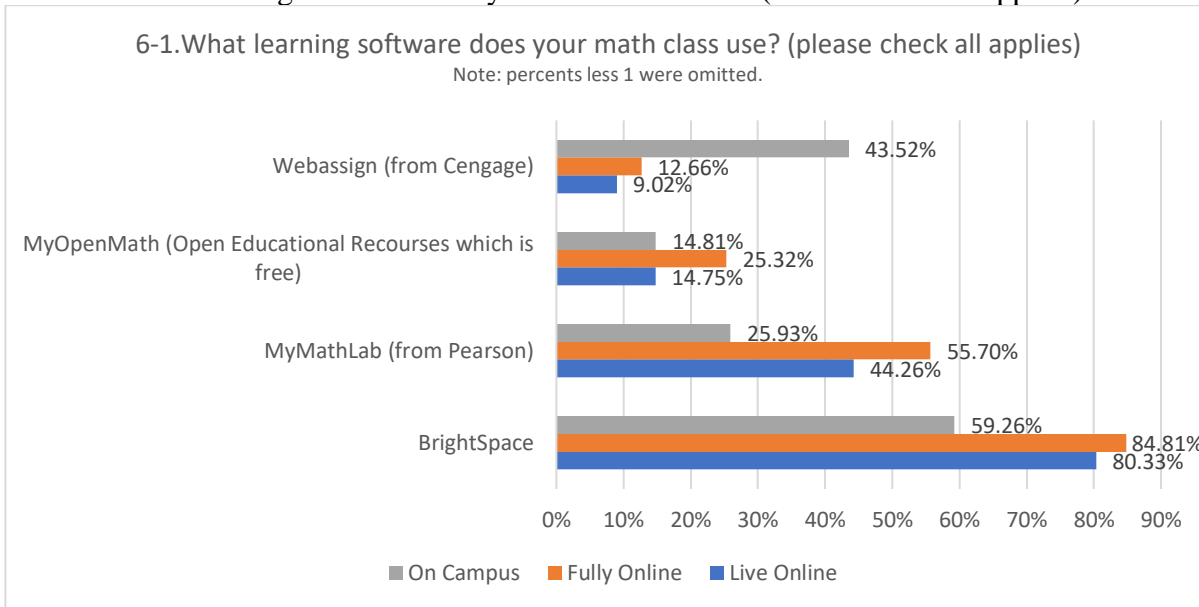
Tech issue or others	# of the responses
Software/app related issue	1
The class is not transferable	1
Personal illness	1
Hard to balance high school events and math course at ccc	1

Content	# of the responses
Content is too much/ too difficult	3

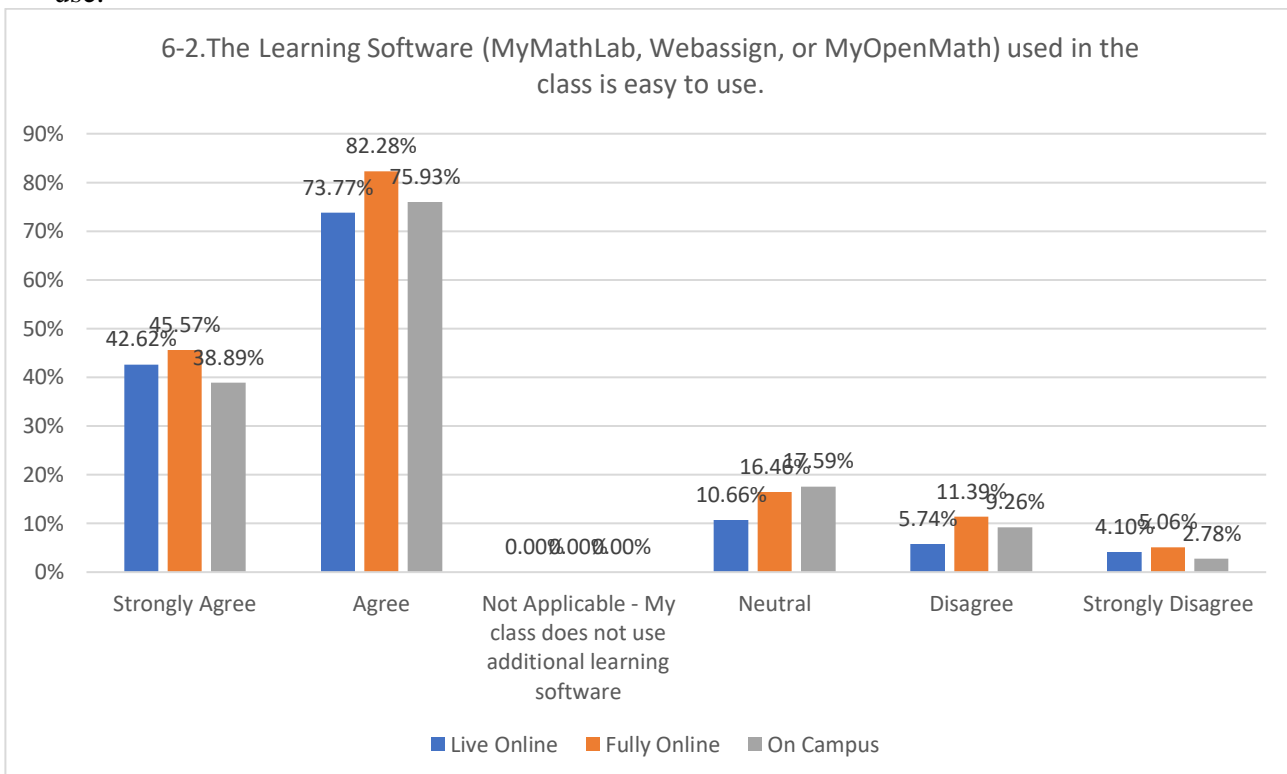
Content sequence issue (question(s) on quiz/exam is not covered at the time)	1
Can't retain information in long term	1
Subject didn't break down/present as the questions on quiz/exam	1

Related to Student's attitude	# of the responses
Hard to find motivation to do the work	1

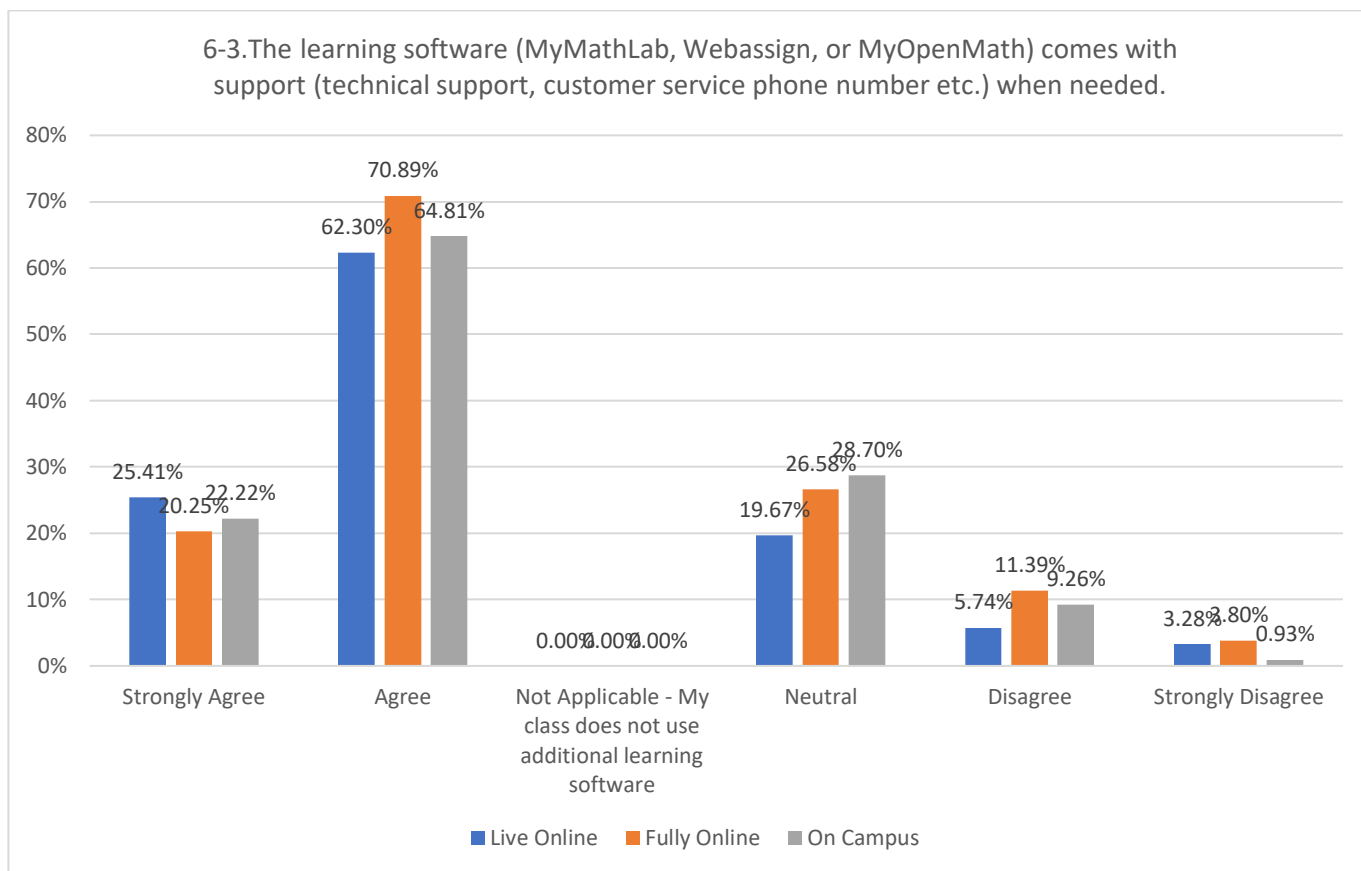
➤ 6-1. What learning software does your math class use? (Please check all applies)



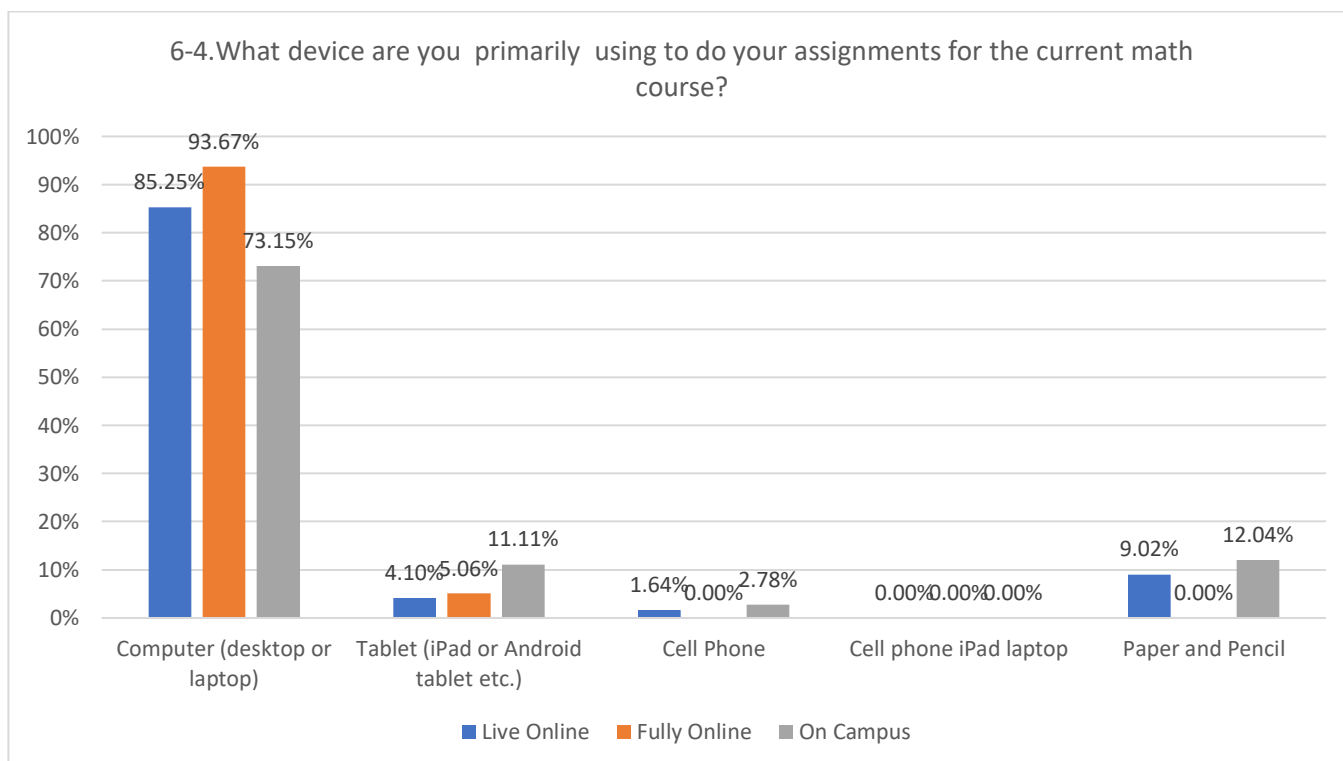
➤ 6-2. The Learning Software (MyMathLab, Webassign, or MyOpenMath) used in the class is easy to use.



- 6-3. The learning software (MyMathLab, Webassign, or MyOpenMath) comes with support (technical support, customer service phone number etc.) when needed.

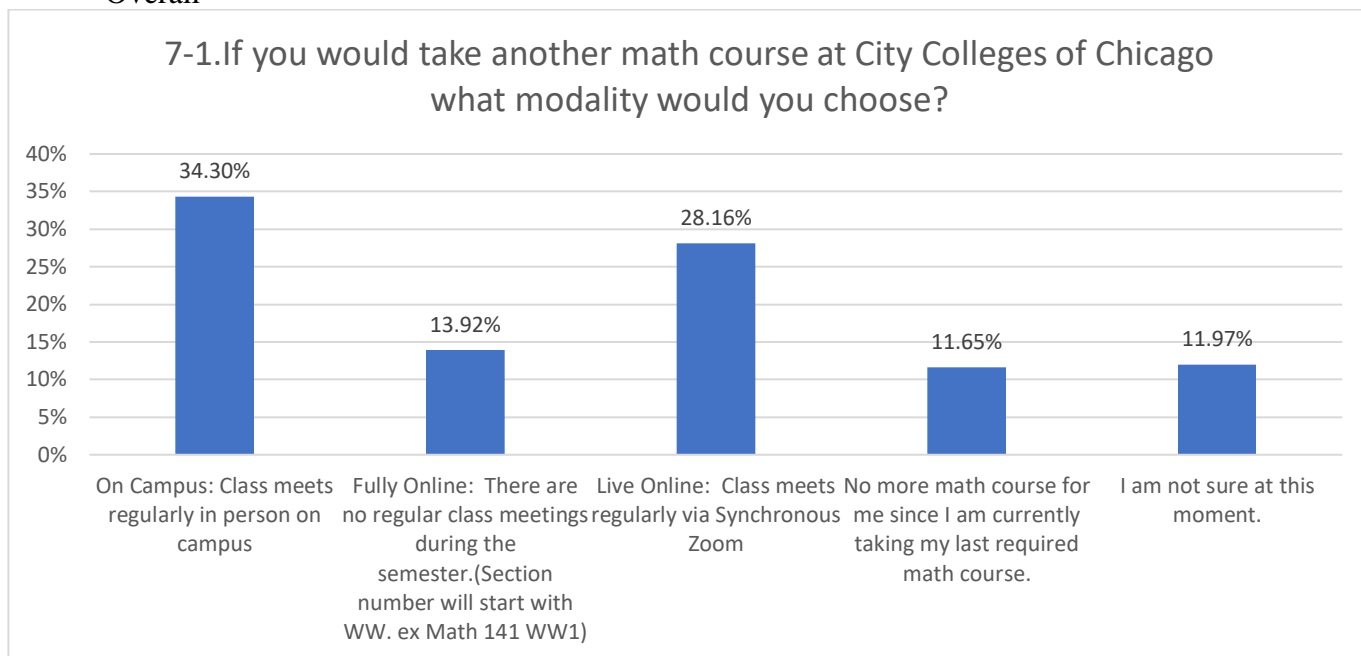


- 6-4. What device are you primarily using to do your assignments for the current math course?

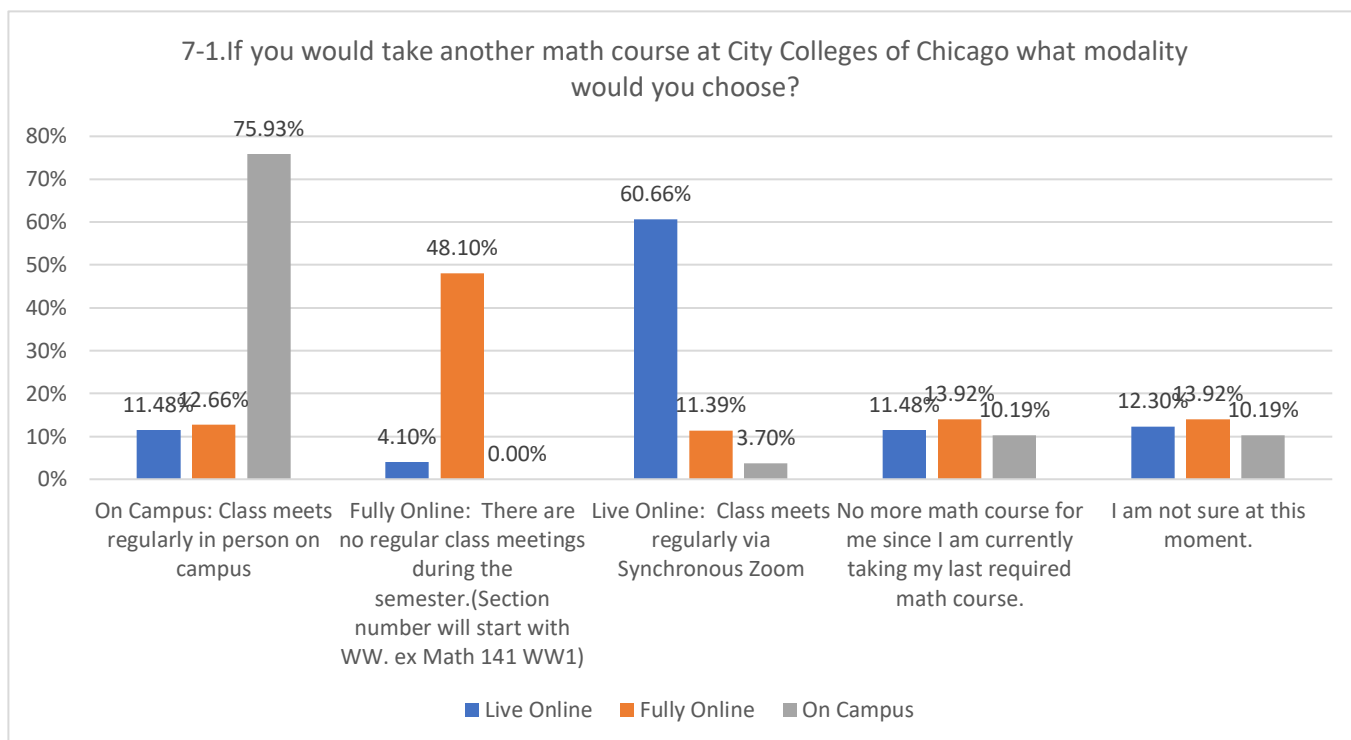


- 7-1. If you would take another math course at City Colleges of Chicago, what modality would you choose?

- Overall



- Break down into different modalities.



- Question 8-2. Do you have any other suggestion(s) to help us improve the survey for the future students?

Here are some sample written responses divided into different categories.

- Suggestions for improving the survey.

1	Add a question about "comfortability with math"
2	Add a question about "what students believe their confidence level in their math skills/ability to be and how this may impact their choice in choosing class modality".
3	List out the type of issues in classes and not just leave it open ended questions.
4	Add question about "how often students participate in the class (Zoom, f2f and fully online)".
5	Add an open-ended question about "write up ideas for easier communication in Zoom or fully online classes".
6	Add a question about the professor or add a section to leave remarks about the professor.
7	Add a question to ask, "One flaw about the class and one positive note about the class".
8	Add a background question includes student's "age".
9	Add a background question includes student's " personal experience with Math."
10	Permit multiple choices for the devices sued by students.
11	For the modality question, add more options of "In-person and fully online", "In-Person and Zoom" and "Zoom and online"
12	Add a question to rate the class/lectures on the scale of 0 to 5 stars. 5 is the best score.

- Suggestions to teachers

1	To understand students with disability process/learning things differently.
2	To make sure the syllabus schedules is consistent with the due dates on Brightspace and external assignments platform.
3	To teach different ways for different topics which would provide more understanding and gives students flexibility on how they can solve different problems.
4	Provide more information on tutoring
5	Provide more problems and more study guides

- Suggestions to School

1	Keep getting great instructors that's interested in our education
2	Have more online tutors for students enrolled in Zoom live or fully online courses.
3	Keep offering the Zoom live classes which is helpful for working people and students who have kids.
4	Keep offering the fully online class which is helpful to students who have a complicated work schedule.
5	Have classes use OER for books and assignments to save cost for students.
6	Offer Hybrid Classes modality
7	Provide multiple hard copy of the current book for each offered course at Harold Washington College library.

- Suggestions to future students

1	Just do the best that you can. If you are struggling with math go see your professor or other tutors on the 4th floor or by appointment.
2	If you cannot have control of yourself to focus well you're at home than online classes will be a struggle for you.
3	Always try to be interactive with your classmates and professor

➤ Challenge or technology issue during the survey

1	just some WIFI difficulties but that's all on my end that was easily fixable
2	My internet was a bit shaky, but it should be fine.
3	Occasional wi-fi outage

➤ Comments about this survey

1	None. The surgery is simple and to the point.
2	Nope, was easy and straight forward I feel
3	No, good selection of straight forward questions.
4	no, it was a fast and easy survey.
5	I think it looks cool and amazing.
6	N/A You guys are doing great!
7	Survey is easy to understand
8	I have no suggestions; the survey covers everything.
9	I think this survey is good, I really don't see any flaws.
10	I think everything has gone smoothly so far, no suggestions from me.
11	I believe the survey is fine and well put to say with the information asked for.
12	Nope, no suggestion needed, who ever created this survey did a good job making the questions direct and very understanding, straight forward!
13	no, it was self-explanatory

## VI. Supporting Evidence-Based Change (Use of Findings)

We learned a lot from this assessment project. Many of the faculty collaborated and worked together to develop the assessment tool.

During week 10 of the Fall 2022 semester, we invited students who enrolled in any math course including Foundational Study, Various levels of Algebra courses, Trigonometry, Finite Math, Calculus sequence courses, and Linear Algebra. It involved a total of 93 sections, 45 instructors and 1822 students as potential participants.

We decided not to do a pilot but did a full roll out assessment during Fall 2022 semester. We had potential participants of 1822 students. It involved a total of 93 sections, 45 instructors. At the end, we received 345 survey entries with 309 unique/valid responses. We collected considerable amounts of data which

gave us a snapshot of students' learning across the board with different learning modalities. We also found areas we could do differently to improve future updated survey or other assessment projects.

- *Modify/update the survey.*

Overall feedback for the survey is overwhelmingly positive. Students felt it was well designed and easy to follow and complete it.

What can we try next time?

In addition to updating the answer options for some of the questions on the survey to include all the scenarios, we could add additional questions on the following areas.

1. Background questions (e.g., age; math learning experiences etc.).
2. Students' experience about Math (e.g., the comfortability with math; confidence level about math learning etc.)
3. Comments regarding the class/lecture (e.g., pros/cons about the class; rate his/her participation level for the class; give an overrating for the class etc.)
4. Provide an opportunity to leave remarks about the professor.
5. Provide an opportunity to leave suggestions on easier/better communication with teachers/classmates.

- *Advertisement/marketing*

During week 10 of the Fall 2022 semester, the department assessment liaison sent an email containing the detailed instructions of the assessment tool/survey to the involved faculty (45). The assessment liaison also generated a sample email to students sent to the involved faculty to help the workload. A weekly reminder email was sent out in the following weeks. We encouraged faculty to award extra credit to students who take the survey.

What can we try next time?

We did not plan to go to in-person class sessions or join targeted Zoom meeting sessions to recruit the participants due to large number of involved sessions (93) which is the total of the math session offered during the Fall 2022 semester. In addition to the email blast and extra credit, we could also host a short informational session to include full-time faculty as well as adjunct faculty to explain the assessment and related logistic process.

- *Delivery mode*

We created the survey in Google Forms, and it was sent as a link to faculty. The faculty posted the link on their Brightspace course shell or emailed the link directly to students. Students may have lost the email or had difficulty finding the link under the course announcement if they did not complete the survey soon after receiving the link/email.

What can we try next time?

We plan to seek help to create a Brightspace module that could be included/inserted into any involved faculty's course shell directly.

- *Open-ended question grading*

There are open-ended questions on the survey to let students express any concerns or challenges regarding his/her current learning modality (On Campus, Live Online, and Fully Online) for enrolled math classes. There is no "correct" answer. It took a long time to read every answer from all the responses. We need to consider finding an efficient or creative method to grade this part especially when we have over 100 or more valid responses.



- *Math Department (HWC) offering courses' modality.*

#### Current:

For the snapshot of Fall 2022, total of sections (93) were offered including

1. On Campus (Class meets regularly in person on campus): 39 sections (42%, 39 out of 93).
2. Live Online (Class meets regularly via Synchronous Zoom): 39 sections (42%, 39 out of 93);
3. Fully Online (There are no regular class meetings during the semester-Section number will start with WW. e.g., Math 141 WW1):15 sections (16%, 15 out of 93).

#### Result on survey:

From question 7-1. If you would take another math course at City Colleges of Chicago, what modality would you choose?

- 76.38% of survey participated students will still need to take another math course.
- **Among those students who will take another math course at CCC campus(es),**
  - 44.9% would take On Campus course,
  - 36.9% would take Live Online course,
  - 18.2% would take Fully online course.
- **If we breakdown into different modalities for those students who will take another math course at CCC campus(es).**
  - For who is current taking On Campus course  
95.4% would still prefer to take On Campus for the next course.  
4.6% would prefer to take Live Online for the next course.
  - For who is current taking Live Online course  
79.56% would still prefer to take Live Online for the next course.  
15.06% would prefer to take On Campus for the next course.  
5.38% would prefer to take Fully Online for the next course.
  - For who is current taking Fully Online course  
66.67% would still prefer to take Fully Online for the next course.  
15.78% would prefer to take Live Online for the next course.  
17.55% would prefer to take On Campus for the next course.

#### What should we offer for the future course(s) in different modalities?

Comparing the current offering, the snapshot of Fall 2022 (On Campus-42%, Live Online-42%, and Fully Online16%) data with students' preference from the survey result (On Campus-44.9%, Live Online-36.9%, and Fully Online 18.2%), we can see the percentages are very close which tells us we did good job on the current offerings regarding the different modality.

For future offerings, I would suggest slightly decreasing the Live Online sections AND slightly increasing the On Campus sections and Fully Online sections.

## Success Factors

Faculty from our department were motivated and worked collaboratively during the planning and deployment of the project, developing the assessment tool, and encouraging students to participate in the survey during the fully roll out stage. It was a great experience working as a team. The math department continues to commit to assess students' learning situation and attitude towards the learning modalities for math courses.

# Recommendations

I would recommend continuing to offer all current learning modalities (On Campus, Live Online, and Fully Online) for all our math courses for the following reasons.

1. To meet needs from different groups of the students with various life situations.
2. To reach out to all the potential students and increase our enrollment numbers.

Based on the feedback from the survey, for future offerings, I would recommend slightly decreasing the Live Online sections AND slightly increasing the On Campus sections and Fully Online sections.

I would recommend the student service department to work with the math department and tutoring center to seek more tutoring options for students in Live Online and Fully Online courses. Here are some potential options.

1. Offer more tutoring opportunities via Zoom.
2. Extend tutoring time daily.
3. Expend tutoring opportunities to Saturday and Sunday
4. Divide Zoom breakout rooms by the level of the courses.
5. Increase the number of tutors during the peak time.
6. Select alternative online tutoring services with reliable 3<sup>rd</sup> party vendor.
7. Offer the option of a live tutoring session instead of just emailing the question.
8. Increase the number of free hours for each student.
9. Contract discounted price for students who used all their free hours.

I would recommend that our math department attempt the assessment again in the Fall 2023 semester while we are slowly offering more On Campus courses for the semi-post pandemic stage. It would be helpful to compare new data with the data collected from Fall 2022 to have a better understanding of students' learning situations and the preference of the math course modality. The results from this survey would help us with planning future course offers strategically to better serve our students in our department.

I will propose this recommendation during the department meeting which will be held before the end of Spring 2023 semester. I will gather any suggestions/recommendations from the Math faculty to plan the departmental assessment task for the Fall 2023 semester.

- Here are the comparisons between English and Math for some similar survey questions.



