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March 26, 2022

Dr. Ian Mitchell

Head of Computer Science

University of British Columbia

2366 Main Mall, Vancouver, BC V6T 1Z4

Dr. Mitchell,

Please find enclosed the Feasibility Analysis of Hybrid Course Delivery within Computer Science at the University of British Columba. I have learned a significant amount about hybrid and in-person course delivery in preparing this report. It is my belief that staff from other departments could benefit from reading this report as well. Thank you for your support throughout the research process.

While challenging in some respects, students have come to appreciate certain aspects of online learning introduced during the COVID-19 pandemic. With the re-introduction of in-person learning in recent months, students have seen these benefits removed from their educational experience. It is proposed that a hybrid course delivery model is introduced within the Computer Science department at the University of British Columbia, to combine the beneficial aspects of online learning and in-person learning.

Hybrid course delivery does require additional student support effort on the part of instructors, however, this is effort well spent. In switching to a hybrid course delivery model, commuting students would have the option to save time and money on transportation by viewing lectures at home. ESL students would benefit from the ability to re-watch recorded lectures, and shy students would feel more comfortable participating in online sections. This change would positively impact the lives of many students and improve the overall educational experience within Computer Science at the University of British Columbia.

It has been my pleasure to perform this feasibility analysis. I would be more than happy to answer any questions that you have. Please feel free to reach me by phone at +1 (234) 456-7890 or by email at clements.alexander@outlook.com.

Sincerely,

Alexander Clements

FEASIBILITY OF HYBRID COURSE DELIVERY FOR COMPUTER SCIENCE AT THE UNIVERSITY OF BRITISH COLUMBIA

for

Dr. Ian Mitchell
Computer Science Department Head
University of British Columbia
Vancouver, British Columbia

by

Alexander Clements
UBC Student

March 26, 2022

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1. Abstract

Over the course of the COVID-19 pandemic, students have found there to be several benefits associated with remote learning, including time and expense savings with respect to transportation, and increased flexibility in watching recorded lectures. While the re-introduction of in-person classes has brought with it the positive social interactions of university classes, it has also taken away many of the online learning benefits enjoyed by students. To address this, it is proposed that a hybrid course delivery model be adopted for Computer Science classes at the University of British Columbia, combining advantageous aspects of both in-person and remote learning.

The feasibility of adopting a hybrid course delivery model within the Computer Science department at the University of British Columbia is based on three criteria: time and expense savings for commuting students, student demand for this course delivery model, and the effort required to set up and run courses in this delivery model.

Results of a survey of fifteen Computer Science students at the University of British Columbia indicate a strong demand for the adoption of a hybrid course delivery model. Majority of the students surveyed identified the potential for significant time and monetary savings given the option to attend classes from home. Interviews with two Computer Science professors indicated that the effort required to adopt existing material for in-person classes to the hybrid model would not require significant effort.

It is recommended at the Computer Science department at the University of British Columbia pilot the adoption of a hybrid course delivery model for its courses. To maximize the success of the pilot, it is further recommended that the following approaches be utilized:

- Creating exams that are written in-person to reduce the effort required by Professors and TAs to test online exam administration software.
- Running lab sessions in-person where physical hardware is required, otherwise provide in-person and online sections.
- Providing a dedicated online lecture section for courses.
- Ensuring that lectures are recorded and posted online for students.
- Leveraging educational forums such as Piazza so students can answer each others' questions, thereby reducing the additional workload on TAs and Professors.

2. Introduction

a. Background

In the early stages of the COVID-19 pandemic, universities across Canada sent students and professors home as a preventative public safety measure. To adapt to the situation, software tools providing video conferencing and screen sharing capabilities were used to facilitate a remote method of course delivery, wherein the entirety of courses were conducted over the internet, including lectures, labs, and exams. The remote method of course delivery, while challenging in many respects, did introduce a significant convenience for students and professors at the University of British Columbia (UBC) in the form of time savings. Commuters gained hours of extra time during the weekdays not having to travel to the university, providing them with the opportunity to spend more time on course work, extracurricular activities, and general wellbeing. Commuters also found that they were able to save money on transportation expenses, not having to commute to the school. As the pandemic nears its conclusion, the University of British Columbia has reintroduced in-person course delivery. This has brought students and staff back to the classroom, and simultaneously reintroduced commute times, expenses, and removed other conveniences of remote learning. On certain days, students and staff can find themselves commuting for much longer than they are required to be on campus.

b. Report Purpose

Combining the positive aspects of remote and in-person learning would provide benefits to students and professors alike. It is proposed that Computer Science courses be converted to a hybrid course delivery model, wherein courses are partially delivered online and in person. Computer Science courses would make excellent candidates for hybrid course delivery due to the nature of the material, which can be effectively adapted to both the in-person and online course delivery formats.

c. Methods of Investigation

To conduct the investigation, fifteen Computer Science students answered survey questions pertaining to commute duration, commute expenses, and their experiences with online and in-person courses. Analysis of the responses provided insight into the demand for courses in the hybrid delivery model, and the benefits that students stand to gain from the adoption. Two instructors in the Computer Science department at UBC were also interviewed to assess the benefits and challenges of transitioning existing courses to a hybrid delivery model. Together, interview and survey results were analyzed to determine the feasibility of adopting the hybrid course delivery model within the Computer Science department at UBC.

d. Limitations

There are two major limitations in this investigation. The first is with respect to the sample size of the student survey. The survey reflects the input of fifteen students, which may be too small to be reflective of the entire Computer Science student population. The second limitation is with respect to the number of Computer Science instructors interviewed. In this investigation, two professors were interviewed, and so similar opinions may influence the overall findings and provided recommendations.

e. Scope of the Inquiry

The scope of this report covers areas required to assess the demand and feasibility of fitting Computer Science courses to a hybrid course delivery model. This includes investigation of the benefits, demand, challenges, and resources required make the switch to this model. This also includes relating these findings to the existing body of research surrounding remote and in-person learning. This report therefore covers four major areas of investigation:

1. An assessment of UBC students' commute times and transportation expenses.
2. The effectiveness of online and in-person learning, as perceived by UBC students.
3. An exploration of the challenges and resources required to create a hybrid course.
4. A comparison between the investigation results and the existing body of research surrounding online learning.

f. Report Conclusions

This report concludes by commenting on the overall feasibility of transitioning Computer Science courses to the hybrid course delivery model, and by providing a series of recommendations for maximizing the impact and success of this transition.

3. Data Section

a. Commute Data Summary

The first area of inquiry is in relation to Computer Science students' commute experiences. This area of investigation provides an understanding of the time students spend commuting to the university, as well as the extent of their commute expenses. Research in this area provides insight into potential time and monetary savings for students, should they be provided the opportunity to participate in classes remotely.

i. Commute Durations

Ninety three percent of students surveyed indicate that they are living off campus and are required to commute to the university each day. Figure 1 displays the average commute times reported by students.

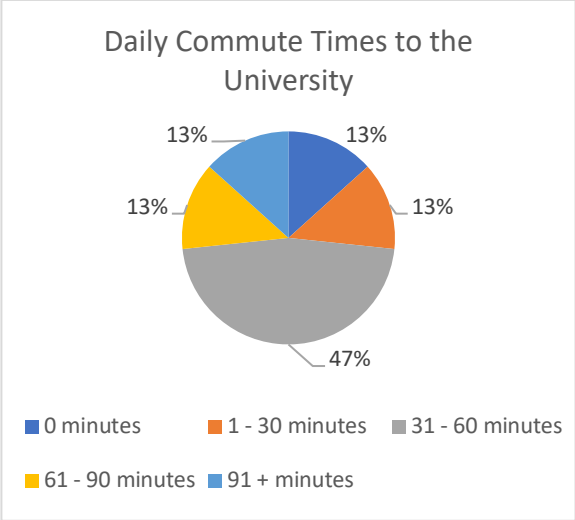

Figure 1: Commute Times for UBC Students

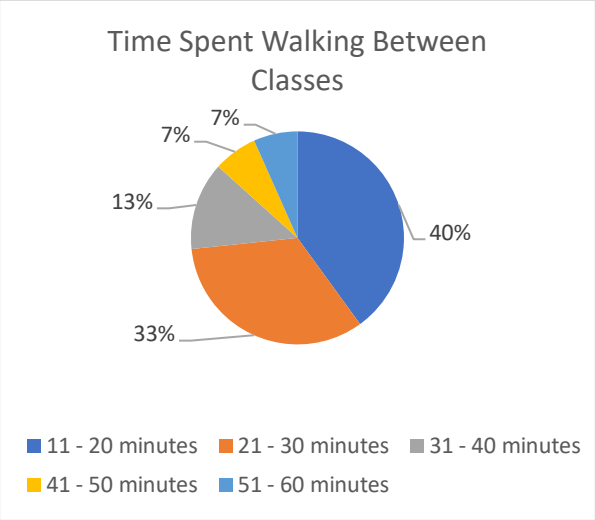

Figure 2: Time Spent Walking Between Classes for UBC Students

The survey results indicate that on average, students spend between 31 and 60 minutes each day commuting to campus. Surveyed students also report spending between 21 and 30 minutes on average walking between classes. Results from this portion of the survey are displayed in Figure 2. Together, combined with the average commute time to campus, students are spending between 52 and 90 minutes commuting throughout the day when required to be on the university campus, yielding a weekly total commute duration ranging between 4h20m and 7h30m.

ii. Transportation Expenses

Transportation expenses are similarly investigated in the student survey. It is understood that students are provided with the option to take advantage of the U-Pass transit card to minimize transportation expenses. However, students commuting to campus through alternative means may incur additional costs. Of the students included in the survey, 40% reported no additional monthly transportation expenses. The distribution of reported transportation expenses is displayed in Figure 3. Results indicate that roughly half of students stand to benefit from saving transportation expenses, were they provided with the option to take classes from home.

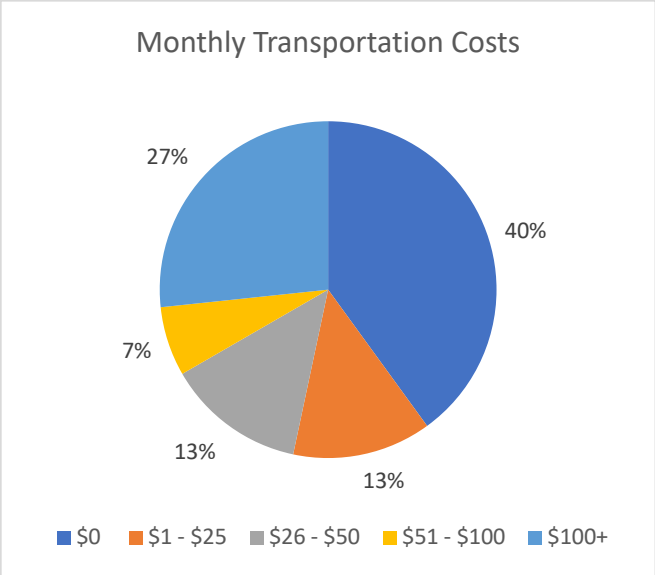

Figure 3: Distribution of UBC Student Monthly Transportation Expenses

b. Opinions on Distance Learning

Gaining an understanding of student and professor opinions on distance learning is important in establishing the demand for a hybrid course delivery model and assessing its potential for success. It is important to determine whether students would be interested in participating in classes remotely on occasion, and to determine how effective they deem the online learning approach to be. It is similarly important to understand the benefits from the professors' point of view. Student survey responses, as well as interviews with UBC Computer Science professors Jessica Wong and Dr. Karina Mochetti are used to assess both points of view on the efficacy of remote and in-person learning.

i. Effectiveness and Benefits of Remote Learning

Survey results in Figure 4 indicate that most students believe remote learning on its own is the least effective method of course delivery. However, remote learning is not without benefits. Students note the following benefits of remote learning:

- In addition to saving transportation expenses, students are also able to save money on food by preparing meals at home.
- Several students enjoyed the flexibility of being able to watch recorded lectures at faster speeds when they preferred.
- Time normally spend commuting could be re-allocated to getting a better sleep, allowing them to perform better the following day.

Interviews with Dr. Karina Mochetti and Jessica Wong indicate that some benefits from the instructors' perspective of remote learning include:

- Providing recorded lectures allows students speaking English as a second language with the opportunity to review lectures to fully understand the material.
- Shy students are much more comfortable speaking up and asking questions in the online video chat than they are during in-person lectures.

ii. Effectiveness and Benefits of In-Person Learning

Survey results in Figure 4 indicate more students believe they learn more effectively when participating in classes in-person. Benefits of the in-person method of course delivery identified by students include:

- Establishing stronger personal relationships with classmates and professors.
- Being in a physical classroom at a designated time helps to focus on course material.
- The classroom setting provides more effective opportunities to collaborate with classmates, which in turn helps to reinforce learning.

Interviews with Dr. Karina Mochetti and Jessica Wong indicate that some benefits from the instructors' perspective of in-person learning include:

- Supporting Teaching Assistants (TAs) is significantly easier in person.
- In-person labs are more engaging for students. This is especially the case where physical hardware is used as part of the lab activities.
- In-person class discussions are much easier to facilitate. Students are more willing to speak with each other if sitting in a group in-person rather than in online breakout rooms.

iii. Student Preferences

Majority of students surveyed would prefer the option to attend classes partially online and partially in person. Few students indicate that they prefer to attend classes wholly in-person. Figure 5 displays the results of this portion of the survey. These results indicate that there is a strong demand from students to be provided with the flexibility of attending classes either in-person or remotely. Figure 4 displays the distribution of the student reported efficacy of the course delivery options.

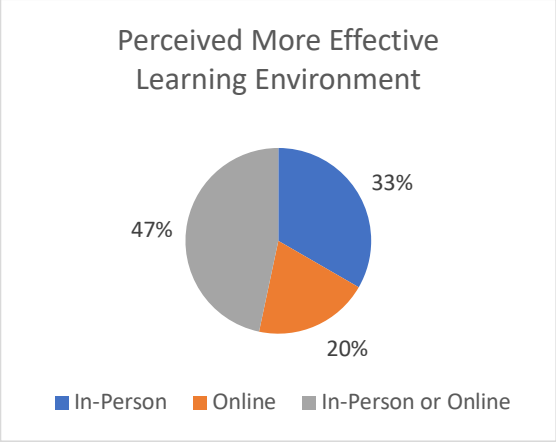

Figure 4: Perceived More Effective Learning Environment

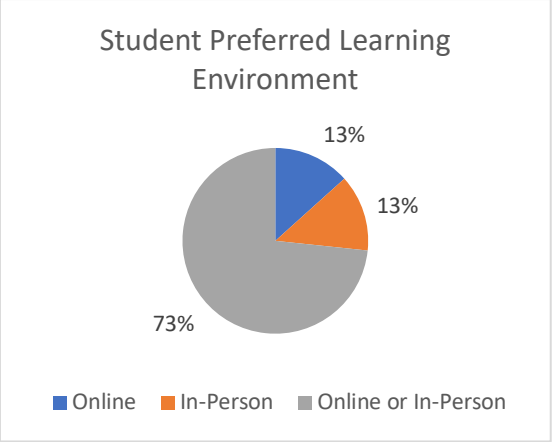

Figure 5: Student Preferred Learning Environment

Interviews with UBC Computer Science professors Jessica Wong and Dr. Karina Mochetti indicate that some professors prefer to teach in-person courses, while others do not have a preference, so long as they are given adequate time to prepare for the semester.

c. Comparison of Existing Research Against Survey Findings

To form a valid set of recommendations using the data from the conducted survey, the results must be compared against findings from similar investigations. This will help to identify the most heavily favoured components of online learning and in-person learning. A set of recommendations can then attempt to maintain these aspects when proposing a hybrid learning model. Less emphasis can be placed on maintaining aspects of a given course delivery in places where there are inconsistencies across studies.

Three additional studies surrounding student sentiment of online learning during the COVID-19 pandemic are examined as part of this comparison exercise. These include a study involving a survey of 3,839 students in Germany, a study which performed a survey of 138 students from universities in Finland and India, and a study based on a survey of students at the University of British Columbia Okanagan Campus.

i. Similarities Between Existing Research and Survey Results

Several sets of similarities exist between the results of the survey conducted in this investigation, and the results of surveys conducted in external studies. In a survey of German students in 2021, students indicated they had saved significant amounts of time staying home for classes (Hoss et al.). These findings were also found in a survey of students at universities in Finland and India (Tulaskar and Markku). Another similarity expressed by students in each study was that they enjoyed the flexibility regarding time management, a by-product of asynchronous online classes (Hoss et al.). In a survey of students at the University of British Columbia Okanagan campus, students expressed that recorded lectures offered a benefit to learning, as it provided them with the ability to watch the lectures when they wished and allowed them to control the speed of the

lectures (Riley and McNeil). Each of these were positive attributes of online learning expressed by students at the University of British Columbia Vancouver campus.

These findings indicate that a hybrid course delivery model should attempt to include offerings of asynchronous classes and recorded lectures to maintain aspects of online learning that most significantly benefit student learning.

ii. Differences Between Existing Research and Survey Results

Between the studies and the survey results in this investigation, several inconsistencies are noted as well. The existing research indicates that students are not pleased with the overall learning experience and are not keen to continue remote learning following the pandemic (Tulaskar and Markku). This contrasts the results of the survey in this investigation, which indicate that there is a further demand to continue online learning in some capacity. This difference could exist because of the initial emergency adoption of online learning. It is possible that students have adjusted to this new method of learning. Additionally, the adoption of a hybrid model will render this difference irrelevant. Students that prefer to learn in-person will have the option to attend classes at the university campus.

The external surveys also indicate that students have difficulties with self-studying, self-organization, and self-discipline in the remote learning setting (Hoss et al.). This was not identified as a problem area within the survey results in this investigation.

d. Hybrid Course Setup

To obtain an understanding of the effort required to set up a hybrid course, two interviews were conducted with Computer Science lecturers at UBC, Dr. Karina Mochetti and Jessica Wong. These interviews provide additional perspective on the benefits and challenges encountered by the introduction of an online course component to existing in-person courses.

i. Resources Required to Set up Hybrid Courses

Both Professors interviewed state that technical Computer Science courses not requiring a discussion component are well suited for both in-person and online delivery. Additional resources required to set up an online component to an existing in-person course can be focused into two areas:

- Creation of online exams. This requires increased resources compared with in-person exams. Similar to in-person learning, exam questions in the online format need to be written and evaluated by Teaching Assistants (TAs). The software used to facilitate the exam then needs to be tested, which adds additional effort compared with written in-person exams.
- Training of TAs. Training TAs in the online realm is more challenging and requires more effort than in-person. Additional resources are required to set them up for success in the online

environment. It was noted that teaching individuals how to effectively teach concepts to students is much easier in the in-person setting.

Throughout both interviews, it is noted that existing lecture courseware for technical courses can be easily adopted to the online environment. In setting up a hybrid course, this would not require additional effort to change. Courses that make use of programming-based in-class activities can also be run effectively both in-person and online.

ii. Resources Required to Run Hybrid Courses

Running a course in the hybrid delivery model also requires additional resources compared to the in-person delivery model. Through the interviews, it was revealed that the following areas would require these resources:

- Offering student support outside of designated lecture time. It is noted that with recorded lectures being available, students who do not participate in the synchronous lecture offerings more frequently post questions to Piazza, an anonymous online forum in which students can ask Professors and Teaching Assistants course-related questions. Additionally, professors can find themselves answering questions based on recorded lectures. This requires the professors to review the recordings to determine what the students are asking about. This takes more time than answering questions during in-person lectures.
- Assisting students with Office Hours questions. It requires more effort from Teaching Assistants to debug programs when they are not able to simply point at areas on the students' screens or take control of their mouse to look around.

The findings indicate that student support is the main component of hybrid course delivery that requires additional resources. It is possible that assistance from additional course TAs will be able to offset this increased resource demand.

4. Conclusion

a. Summary and Interpretation of Findings

The hybrid course delivery model provides an opportunity to combine positive aspects of in-person learning and remote learning. The educational experience can be enhanced for students, while simultaneously allowing them to save time and money on commuting.

Survey findings in this investigation were corroborated by existing research surrounding online learning. There is a strong demand from students to have the option to participate in courses online and in-person. Students stand to benefit from significant time savings (between four hours and twenty minutes to seven hours and thirty minutes per week on average), financial savings, and course components made popular during online learning such as asynchronous classes and recorded lectures can enhance their educational experience. Students would similarly maintain the benefits of increased social interaction of in-person classes.

It is also found that majority of the additional effort required to set up courses in the hybrid format primarily surrounds student support. Increased time is required in tending to students who have more questions in the online component of the course. Increased effort is also required in setting up Teaching Assistants in the remote environment. Computer Science courses lacking a group discussion component integrate well with the remote delivery format and the in-person format. These are therefore excellent candidates to be run in the hybrid delivery model. Course instructors express mixed opinions on transitioning to the hybrid delivery model. However, it is noted that providing adequate notice of the transition would help to reduce the stress related to course preparation on instructors.

b. Recommendations

Please consider the recommendation of piloting the hybrid course delivery model with several Computer Science courses. For maximizing the impact, it is further recommended that the following approaches be adopted:

- Creating exams that are written in-person to reduce the effort required by Professors and TAs to test online exam administration software.
- Running lab sessions in-person where physical hardware is required, otherwise provide in-person and online sections.
- Providing a dedicated online lecture section for courses.
- Ensuring that lectures are recorded and posted online for students.
- Leveraging educational forums such as Piazza so students can answer each others' questions, thereby reducing the additional workload on TAs and Professors.

Hybrid course delivery has the potential to significantly benefit the educational experience of all students and can help to save time and money for students who do not live on campus. The

hybrid course delivery model can modernize education, and the UBC Computer Science department can be at the forefront of this.

5. Appendix A – Survey Results

Question Number	Question Text
Q1	I live:
Q2	The amount of time I spend commuting to the University each day is:
Q3	The amount of time I spend walking between classes each day is:
Q4	My transportation costs each month total (excluding U-Pass):
Q5	I find that I learn more effectively when I attend class:
Q6	If provided the option to attend classes either online, in-person, or both, I would prefer:
Q7	Provided I could choose the number of days per week I would attend class in person (given the option) I would choose to come to the university:
Q8	The aspect of remote learning that I find to be the most effective is:
Q9	The aspect of in-person learning that I find to be the most effective is:

Table 1: Questionnaire Question Numbering

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Off Campus	1 - 30 minutes	11 - 20 minutes	$100+	In-person or online	To attend partially online and partially in-person	3 days per week	Saving time on commute!	Better personal interactions!
Off Campus	31 - 60 minutes	21 - 30 minutes	$0	Online	To attend partially online and partially in-person	2 days per week	Remote learning allows little wasted time and is perfectly suitable for CS classes due to the nature of what we study	I pay a bit more attention in class
Off Campus	31 - 60 minutes	11 - 20 minutes	$0	Online	To attend wholly online	3 days per week	No need time to come to class time saving and energy saving	No
On Campus	0 minutes	11 - 20 minutes	$0	In-person	To attend partially online	3 days per week	Being not restricted to a set schedule, and	Being able to interact with your peers

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
					and partially in-person		able to plan more efficiently.	and build connections.
Off Campus	1 - 30 minutes	21 - 30 minutes	$100+	In-person	To attend partially online and partially in-person	5 days per week	That I can wake up 5 minutes before class so that I can always get enough sleep	That their are people to directly collaborate with in my learning
Off Campus	31 - 60 minutes	21 - 30 minutes	$26 - $50	In-person or online	To attend partially online and partially in-person	3 days per week	being able to rewatch lectures at my own speed	being in class helps me focus, seeing other people
Off Campus	91+ minutes	11 - 20 minutes	$0	Online	To attend wholly online	2 days per week	Set your own schedule with recordings	Interaction for courses which require group discussion (e.g stat 300)
Off Campus	91+ minutes	31 - 40 minutes	$100+	In-person or online	To attend partially online and partially in-person	3 days per week	Saving time by not having to commute to school. Being able to watch recorded lectures	Being able to interact with other students and Tas
Off Campus	31 - 60 minutes	21 - 30 minutes	$1 - $25	In-person	To attend partially online and partially in-person	3 days per week	The ability to choose when and where I want to attend classes	The ability to interact with classmates / professors directly
Off Campus	31 - 60 minutes	31 - 40 minutes	$26 - $50	In-person	To attend partially online and	2 days per week	Saving time and money on commuting. Learning	Easier to connect with professor and classmates, easier to ask

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
					partially in-person		from the privacy of my home.	questions and follow up after class.
Off Campus	31 - 60 minutes	11 - 20 minutes	$1 - $25	In-person or online	To attend partially online and partially in-person	3 days per week	Time used to find study spots, or buy food can be used to just study and work at home. Also I save money by making lunch/coffee at home.	Being able to talk to classmates and run into acquaintances. Having access to good desks/study spots so I can focus better on work (I don't have a good desk at home).
On Campus	61 - 90 minutes	21 - 30 minutes	$51 - $100	In-person or online	To attend partially online and partially in-person	2 days per week	Being able to watch recorded lectures, not having to spend long times commuting to the campus.	I find that it is more engaging and requires me to pay attention more. It is also nice seeing other students and the professor face-to-face.
Off Campus	61 - 90 minutes	41 - 50 minutes	$100+	In-person	To attend wholly in-person	5 days per week	You can eat and not wear clothes.	It is very beneficial to connect with your peers. Also as an extrovert, I have more energy to learn when surrounded by people.
Off Campus	31 - 60 minutes	11 - 20 minutes	$0	In-person or online	To attend partially online and partially	3 days per week	It's asynchronous nature and the flexibility	The commitment and motivation to learn the material

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
					in-person			
On Campus	0 minutes	51 - 60 minutes	$0	In-person or online	To attend wholly in-person	4 days per week	Asking and answering real-time questions about the material in Zoom chats without disrupting the flow of lecture	Being able to see the projector screens, lecturer, and work on my own screen all at the same time without tiny windows

Table 2: Questionnaire Responses

6. Appendix B – Interview Results

a. Interview with Jessica Wong

1. Can you describe the benefits of delivering a course online that are not present in in-person course delivery?
   - Students that were previously uncomfortable with speaking up in the classroom to ask questions now feel comfortable asking questions in the online chat in video lectures.
   - Anyone who speaks English as a second language can review the lecture material in lecture recordings.

2. Can you describe any benefits of delivering a course in person that are not present in online course delivery?
   - In-person courses allow professors to receive visual feedback. It is much easier to tell if students understand the concepts being taught by the looks on their faces.

3. Is there a format of course delivery that you prefer?
   - Prefer the in-person method of course delivery and expect that most professors have the same preference.

4. In General, does the online method of course delivery introduce any challenges? Any additional costs?
   - Overall, it takes roughly two to three times more effort to deliver a course online. This includes time spent answering posts on Piazza.
   - It takes more effort for Teaching Assistants to help students, which further makes it challenging to budget their time throughout the duration of the course.
   - Providing recorded lectures seems to act as a safety net, allowing students to fall behind. It has become increasingly common to answer questions about early material later in the course (e.g., directly before the midterm exam).

5. Based on your experience, do you imagine it would be feasible to deliver courses both online and in-person simultaneously? Why or why not?
   - It would be possible, were there resources available to support this.
   - It would become very difficult for professors if the workload were to increase while the available resources to support the hybrid courses do not change.

6. If it is not feasible to deliver every Computer Science course in the hybrid format, are there specific courses that would be feasible?
   - The technical Computer Science courses are well suited for online and hybrid delivery.
     - This includes the courses that involve a significant amount of programming.
     - There are version control and collaboration tools available, it is easy to share the screen during lectures.

- Introductory Computer Science courses would not be well suited for the hybrid learning approach.
- Courses with a physical lab component would be difficult to conduct in an online / remote format.

b. Interview with Dr. Karina Mochetti

1. Can you describe the benefits of delivering a course online that are not present in in-person course delivery?
   - Students are very comfortable asking questions anonymously. After introducing an anonymous question forum for questions during lectures, the number of questions asked per lecture skyrocketed. This provided much more feedback for courses than even seeing the faces of students. It provides real-time feedback as well, which can be used to change the pace of the lecture, or the content covered. Getting this type of feedback is not possible during an in-person lecture.

2. Can you describe any benefits of delivering a course in person that are not present in online course delivery?
   - Seeing the faces of students is the best thing.
   - The classroom environment can't be replaced. There is a social aspect that is important for the class.

3. Is there a format of course delivery that you prefer?
   - It's hard to say, there are benefits to teaching in both formats. The main thing is that I don't like big changes partway through the semester. For example, starting online and then moving to in-person after a few weeks is not great. This disrupts the flow of the lectures. Staying in-person or online for the entire semester is much better.

4. In General, does the online method of course delivery introduce any challenges? Any additional costs?
   - Not seeing the immediate responses of students is difficult. When teaching in-person you get used to seeing facial expressions as you cover the material.
   - It can be hard to get students' attention since you are just a window on their computer screen. You are competing with Facebook and YouTube for their attention.
   - Breakout rooms in video lectures and labs do not work unless there are Teaching Assistants available to facilitate the discussions. Students on their own can be shy and may not want to speak up if unprompted.
   - Delivering online courses would not really require additional costs if enough notice was provided to professors to prepare for it.

5. Based on your experience, do you imagine it would be feasible to deliver courses both online and in-person simultaneously? Why or why not?

- It would be feasible as long as professors had adequate time to prepare before the start of the semester.
- No additional work would be required to update Computer Science course material, because the lectures can be conducted basically the same way online and in-person.
- Lab components for some courses would not be suitable for online delivery, especially if they require hardware. There is no software that can fully replicate the experience of working and troubleshooting with computer hardware and circuitry.

6. If it is not feasible to deliver every Computer Science course in the hybrid format, are there specific courses that would be feasible?
    - Most Computer Science courses could be conducted online and in-person, with the exception of the labs requiring hardware.
    - Courses that involve lots of discussion would not be well suited to online, but there are few Computer Science courses like this.

7. Works Cited

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