

Spring 2020 Student Survey

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There are four parts to this study. Part 1 was designed to survey all Spring 2020 students and faculty in the SJSU College of Engineering about their experiences after the move to 100% online instruction in March 2020. The SJSU team submitted an IRB application and it was approved on 5/28/20. There were 6,674 students who were enrolled as engineering majors in Spring 2020; each of these students was sent the survey through Qualtrics. The first email with the survey was sent on 6/1/20 with follow-up emails on 6/7/20, 6/15/20, 6/21/20, and 7/3/20.

Background

The impact of COVID 19 has led to a dramatic increase in the number of surveys sent to students about the impact of this pandemic on their lives. Daniels et al (2020) [1] analyzed the early results of a survey sent to students at multiple institutions about the impact of COVID on their experiences. The researchers, from Georgetown University, analyzed the responses from the 516 students from 28 countries who answered the survey in the first week. 479 students completed the question asking about their psychological well-being; if these respondents, 79% reported feeling “worse” or “much worse” than before COVID 19. Also, 78% felt their ability to pursue their academic goals was “worse” or “much worse” than before COVID 19.

The Higher Education Data Sharing Consortium [2] also created surveys for students, faculty, and staff about the impact of COVID 19 on their lives. As of May 18, “34,250 students at 64 institutions have responded to the student survey. About 3,000 staff members from 17 institutions have responded to the staff survey as well as 1,500 faculty from 15 institutions have completed the faculty survey.”

For our student survey in this study, we looked at the questions that were developed by the researchers at Georgetown and HEDS to develop our own student survey. Because many of the engineering classes at SJSU include laboratories, projects, or other group experiences, we wanted to create our own survey to ask students about these experiences.

[1] Daniels, B., Das, J., Hamza, A., & Leydier, B. (2020). Covid-19 diaries: Early impressions from an online questionnaire.” In Veena Das and Naveeda Khan (eds.), Covid-19 and Student Focused Concerns: Threats and Possibilities, *American Ethnologist* website, May 1, 2020, [https://americanethnologist.org/features/collections/covid-19-and-student-focused-concerns-threats-and-possibilities/covid-19-diaries-early-impressions-from-an-online-questionnaire]

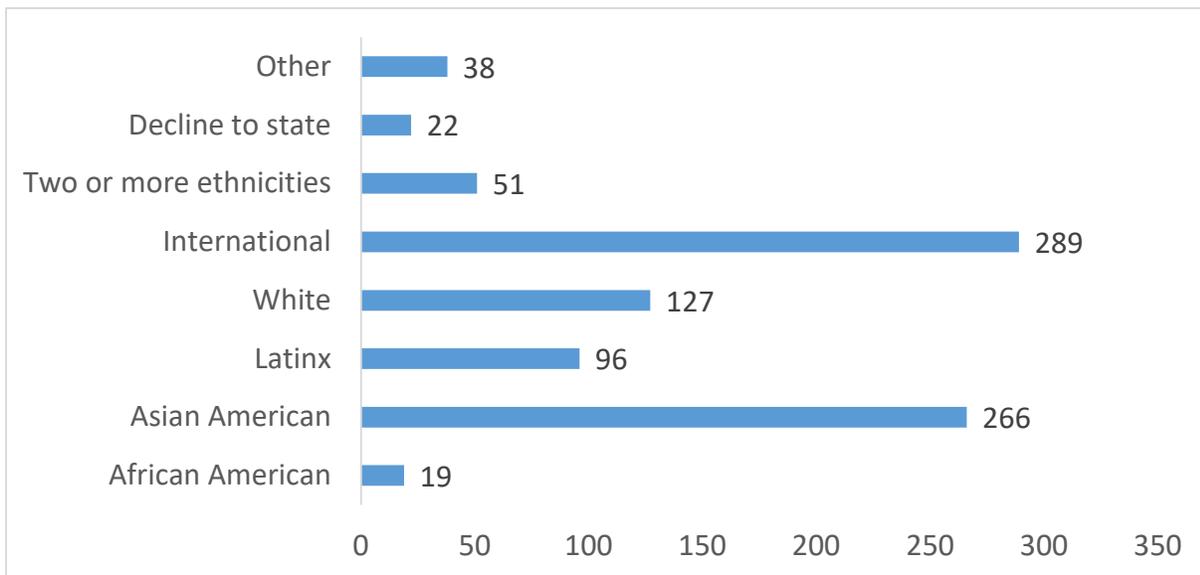
[2] Higher Education Data Sharing Consortium (2020). COVID-19 institutional response surveys. Available: <https://www.hedsconsortium.org/covid-19-institutional-response-surveys/>

Results

Demographics

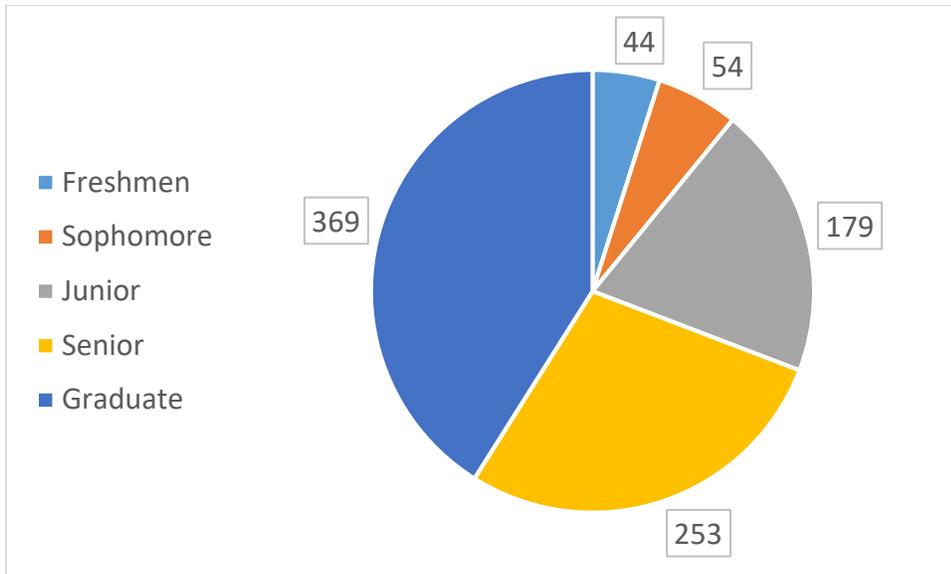
Overall, 314 female and 582 male students responded to the survey. As can be seen in Figure 1, a high number of international and Asian American students responded to the survey. Also, approximately 1/3 of all students responding were first-generation students: 313 students were first-generation compared to 592 students who had one or more parents who earned a college degree. Also, the students who responded to the survey had good GPAs; of the 906 students who answered this question, 734 reported GPAs of 3.0 or better.

Figure 1. Ethnicities of students who responded to the Spring 2020 College of Engineering COVID Survey



The majority of students responding to the survey were upper-division and graduate students (see Figure 2).

Figure 2. Grade levels of students who responded to the Spring 2020 College of Engineering COVID Survey



There were good responses from students from all departments in the College. Overall, over 900 students indicated their major. Figure 3 shows the distribution of responses by major. Because of privacy issues, we did not include the number of student responses in a major if it was less than 10 students.

Figure 3. Major of students who responded to the Spring 2020 College of Engineering COVID Survey

Aviation and Technology		Computer Engineering	
Aviation	25	Computer Engineering	109
Industrial Technology	47	Software Engineering	171
MSQA	<10	Electrical Engineering	102
Aerospace Engineering	35	General Engineering	<10
Biomedical Engineering	68	Industrial and Systems Engineering	
Chemical & Materials Engineering		Industrial and Systems Engineering	49
Chemical Engineering	40	Engineering Management	32
Materials Engineering	16	Human Factors/Ergonomics	<10
Civil Engineering	86	Mechanical Engineering	113

Question 12 asked the students to indicate how many of their in-person engineering classes moved online after the shelter in place in March 2020. Most students had several engineering classes move online. The number of engineering classes moved online as reported by the students were: no engineering classes, 22 students; one engineering class, 89 students; two engineering classes, 148 students; three engineering classes, 267 students; four engineering classes, 194 students; and five or more engineering classes, 178 students. These results are not surprising since more upper-division and graduate students responded to the survey.

Question 13 asked students about working, either on-campus or off-campus. About 1.2 of students worked during Spring 2020 with most of those students working part-time.

Figure 4. Responses to the question: What is your work environment?

Responses	Number	Percent
I work fulltime in a job outside of SJSU	80	8.9%
I worked fulltime in a job outside of SJSU but I lost my position or my hours were cut	23	2.6%
I work part-time in a job outside of SJSU	138	15.4%
I worked part-time in a job outside of SJSU but I lost my position or my hours were cut	87	9.7%
I worked on campus before the COVID 19 pandemic and still work at a distance	77	8.6%
I worked on campus before the COVID 19 pandemic but lost my position	62	6.9%
I did not work during Spring 2020	411	45.8%
Other	19	2.1%
Total	897	100%

Living Environment

The next questions asked students about their living environments. Question 15 asked students if they were living with anyone over 65 or with anyone who was at higher risk for COVID 19. Most students (702 responses, 80.6%) did not live with a person with high-risk factors but 169 (19.4%) students did. Although the percentage is low, it still represents a large number of students. 40 students were living with someone in a medically imposed quarantine compared to 830 students not living with a quarantined individual (Question 16).

A large number of students had to care, either part-time or full-time, for children or the elderly during the shelter in place. 104 students reported that they had to care for either children or the elderly full-time and 83 students reported that they had to care for either children or the elderly part-time.

Most of the students surveyed lived in the San Francisco Bay Area as shown in Figure 5. Few students lived in either other states or other countries.

Figure 5. Student Responses to the Question: After the shelter-in-place order in March 2020, what was your living situation?

Responses	Number	Percent
I now live in the San Francisco Bay Area	668	77.0%
I now live in California but not in the San Francisco Bay Area	143	16.5%
I now live in other state (in the United States)	19	2.2%

I now live in another country. If you wish to indicate the country, please do so here	21	2.4%
Decline to state	11	1.3%
Other	5	0.6%
Total	867	

Most students are going to continue to live in the San Francisco Bay Area in Fall 2020 if San Jose State continues with 100% online classes. Of the students who live in another country, the following countries were indicated: India, Kuwait, Thailand, China, Taiwan, Vietnam, Malaysia, Australia, and the UAE.

Figure 6. Student Responses to the Question: If San Jose State continues with 100% online classes in Fall 2020, where do you think you will live?

Responses	Number	Percent
Most likely, I will live in the San Francisco Bay Area	611	70.5%
Most likely, I will live in California but not in the San Francisco Bay Area	135	15.6%
Most likely, I will live in other state (in the United States)	25	2.9%
Most likely, I will live in another country	34	3.9%
Graduated either in Spring or Summer 2020	24	2.8%
Decline to state	22	2.5%
Other	16	1.8%
Total	867	

Impact of COVID 19

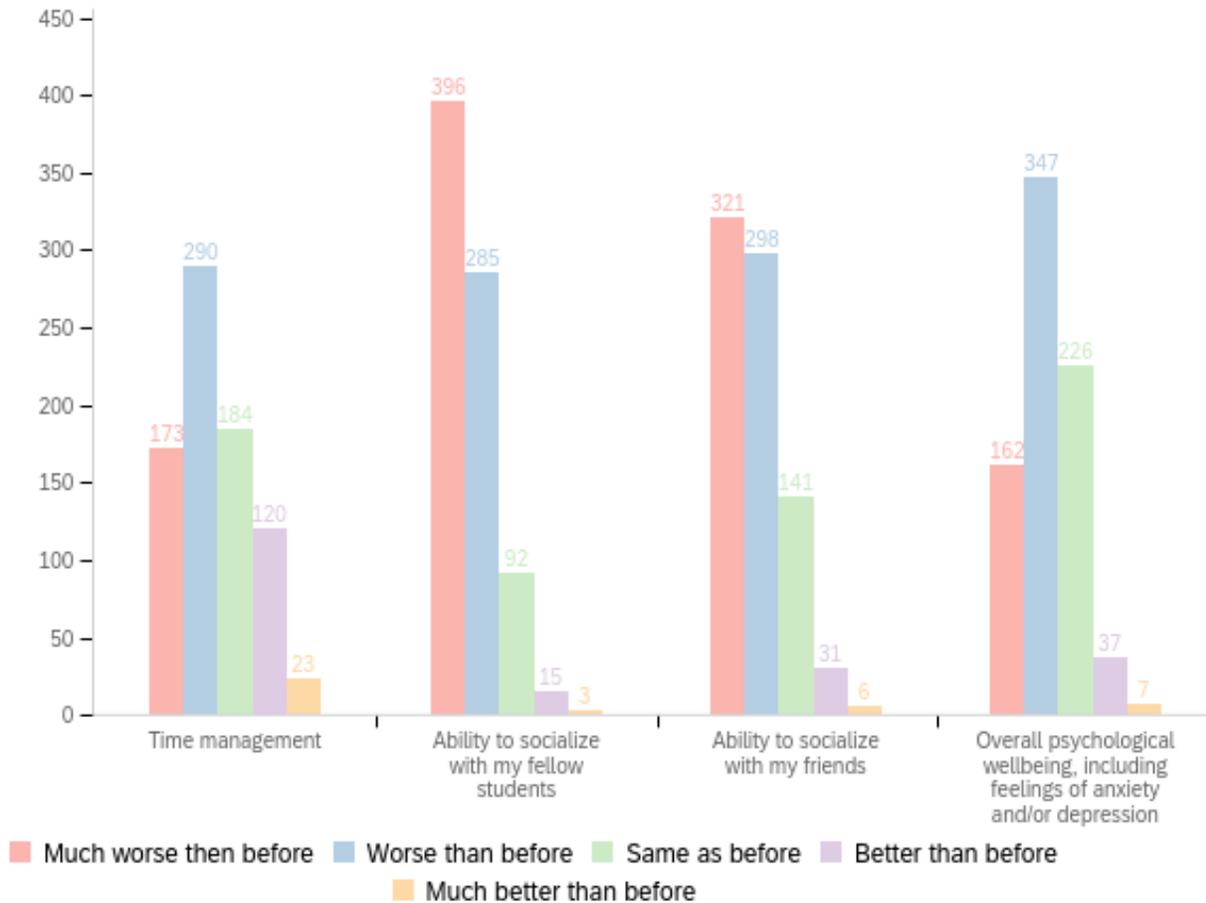
The survey asked the students about their non-school experiences and problems they had after the imposition of shelter in place. Almost 20% of students had difficulties with their living conditions after the COVID 19 shutdown and 22.5% had difficulties in traveling.

Figure 7. Student Responses to the Question: Since the shelter-in-place order in March 2020, have you experienced any of the following?

Responses	Number	Percent
Adverse discrimination from people	34	3.9%
Difficulties due to changes in your living conditions including losing your normal place to live	168	19.4%
Difficulties in traveling	194	22.5%
I have not experienced any of these issues	426	49.3%
Decline to state	42	4.9%
Total	864	100%

The Student reported feeling worse or much worse in a several areas including time management (58.6%), Ability to socialize with fellow students (86.1%), Ability to socialize with friends (77.7%), and their overall psychological well-being (65.3%). This finding is troubling since it indicates the mental well-being of the students.

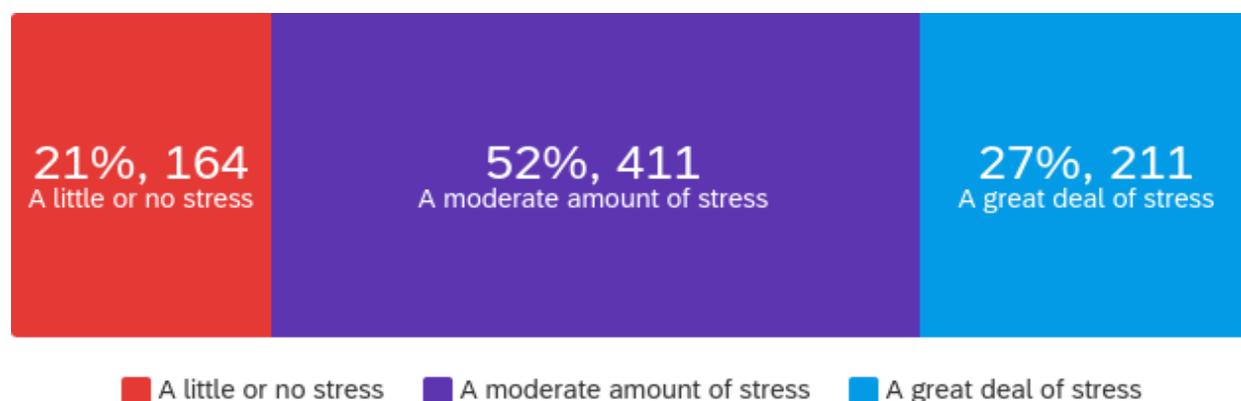
Figure 8. Student responses to this question: Relative to your life before and after COVID 19, how would you rank your current...



We followed this question with more directed questions about student stress. 79% of students reported either a moderate or a great deal of stress related to the shelter in place (see Figure 9). This is a very high number of students. Faculty need to take this into account when working with students in the Fall 2020 classes. According to Sahu (2020 [3]), “The COVID-19 outbreak has disrupted the lives of many people across the world. The worldwide rapid increase of infected cases has created a sense of uncertainty and anxiety about what is going to happen. It has also caused a tremendous level of stress among the university fraternity, inclusive of students. This stress may lead to unfavorable effects on the learning and psychological health of students”

³ Sahu, P. (April 04, 2020) Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. Cureus 12(4): e7541. DOI 10.7759/cureus.7541

Figure 9. Student responses to Question: Overall, how much stress are you feeling about the consequences of COVID 19?



We gave students the option of giving more details about the stress they were feeling. We included an open-ended question here--Please help us understand the diversity of experiences by sharing any further information on your quality of life here. Faculty sometimes underestimate the amount of stress that students felt during the shelter in place. Some specific responses to this question are shown below. All the student responses are in the attached file.

“When the Shelter-In-Place orders came into effect, I felt a great deal of fear and helplessness. During the first few weeks of sheltering-in-place, my body physically ached from the anxiety and it was a struggle to get myself out of bed to attend my online classes.”

“Online courses were handled horribly. The professors treated online courses exactly the same as an in-person class, rarely using new utilities available to them.”

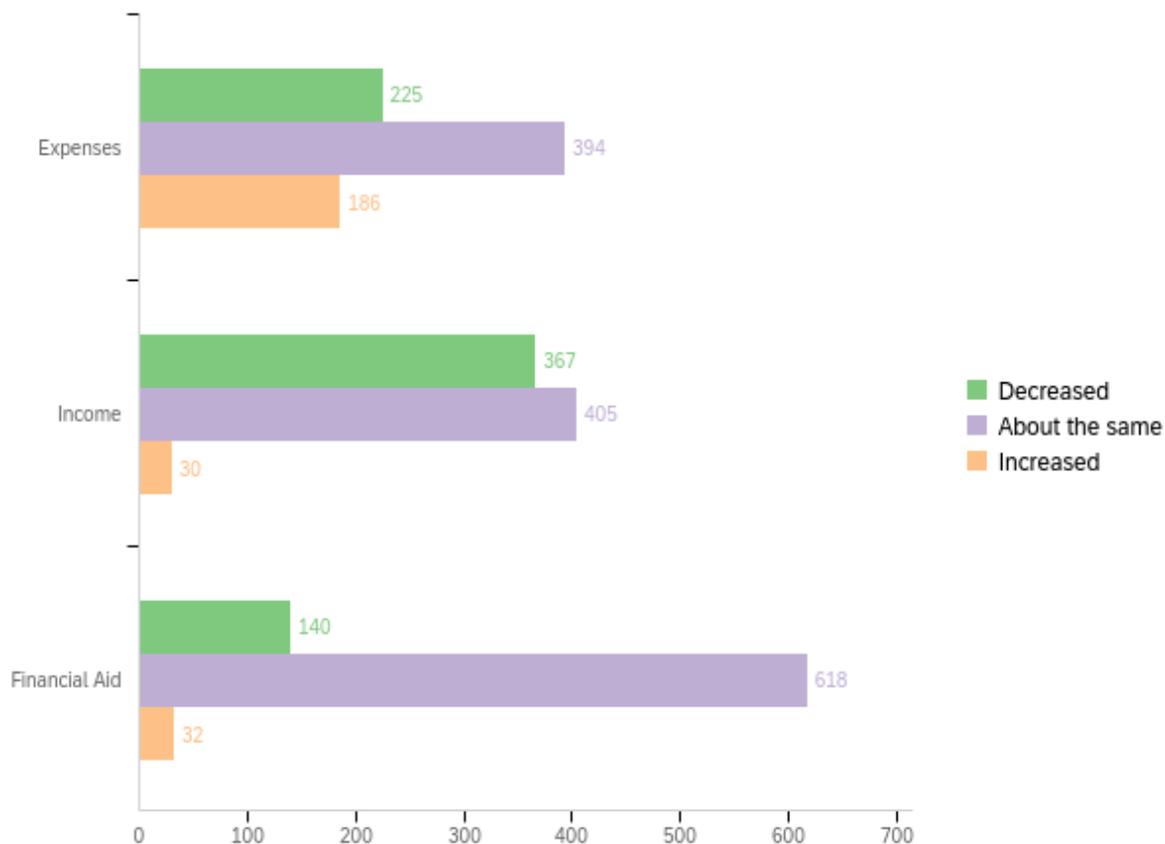
“I cannot learn with the online format. I require in person and face to face instruction in a learning environment to learn and retain knowledge. Additionally, the stress of remaining isolated at home is wearing my mental health to a very unhealthy state.”

“Unable to work, unable to shop at stores, unable to take my kids out, seeing negativity constantly from the president and strife. Too many distractions and responsibilities at home, too stressful to focus at home.”

“I am very disturbed by the response from professors with this pandemic. My mental health has been deeply impacted due to the many stressors put upon me from this pandemic including losing my job, housing, unexpected expenses, dealing with a terminally ill family member, and the vulnerability of having a preexisting health condition and no health insurance in the midst of a pandemic. I did something I have never done before and reached out to my professors explaining that I was struggling with my coursework due to my mental health. One professor was amazing and worked with me, while the others were less than apathetic.”

In the next question, we specifically targeted six areas that might have been impacted by COVID in Spring 2020 in response to this question. Relative to your life before and after COVID 19, is there any change in the following for you this semester in expenses, income, financial aid, debt, having a safe place to sleep each night, and having enough to eat each day. For three of these areas, a high number of students indicated that there was a decrease since COVID 19.

Figure 10. Three most negative factors that students reported to this question: Relative to your life before and after COVID 19, is there any change in the following for you this semester in expenses, income, financial aid, debt, having a safe place to sleep each night, and having enough to eat each day.



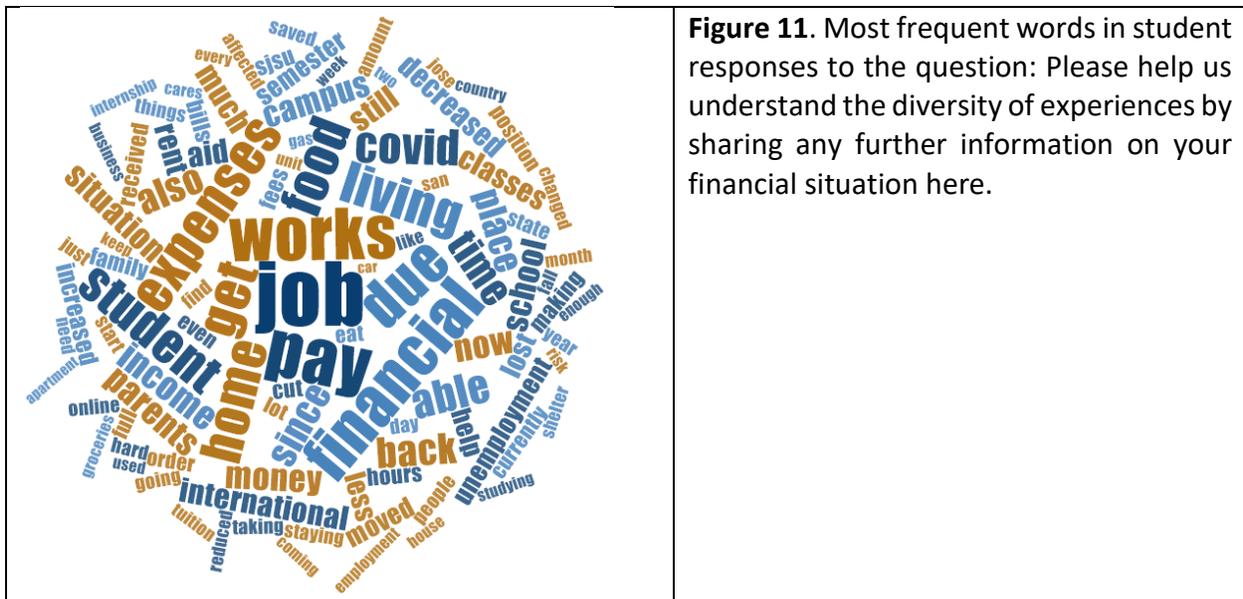
We asked students to give us more details on their financial situations through an open-ended question. As expected, the most frequently mentioned word was job(s) followed by pay and work. Many students either lost an internship because of COVID 19 or had a reduction or loss of a job. 56 of the 79 responses were either moderately or very negative. International students had specific concerns related to the shelter in place in Spring 2020. All the responses to this question are included in the attached file. Some specific responses from international students are shown here.

“My experience after starting school in Fall 2019 has been moderate due to the COVID-19 situation and slow response from decision-making body, I am facing a lot of issues in

studying, looking for an internship, and facing economic hardship with a lot of international students like me. As there are no flights to our home country, we have to stay in the bay area paying almost the same rent as before having no source of income.”

“I’m an international student and now I have graduated. I cannot work in the US due to visa restrictions until I get a full-time job related to my major. Moreover, every other day I get rejected from the companies telling me that they need only Green Card or Citizens or they don’t sponsor F1 visa (international student).”

“I’m an international student and I came here because of the quality of teaching and this online teaching is not that quality. So I think the tuition fee should be less than the trailing semester as there is no in-class study for us, instead, we would have study back there in our home country and studied online class instead of studying here.”



Overall, SJSU College of Engineering students was pessimistic about the next few months, Fall 2020, and their long term plans (see Figure 12). For each of the time frames given, most students felt worse or much worse about the future.

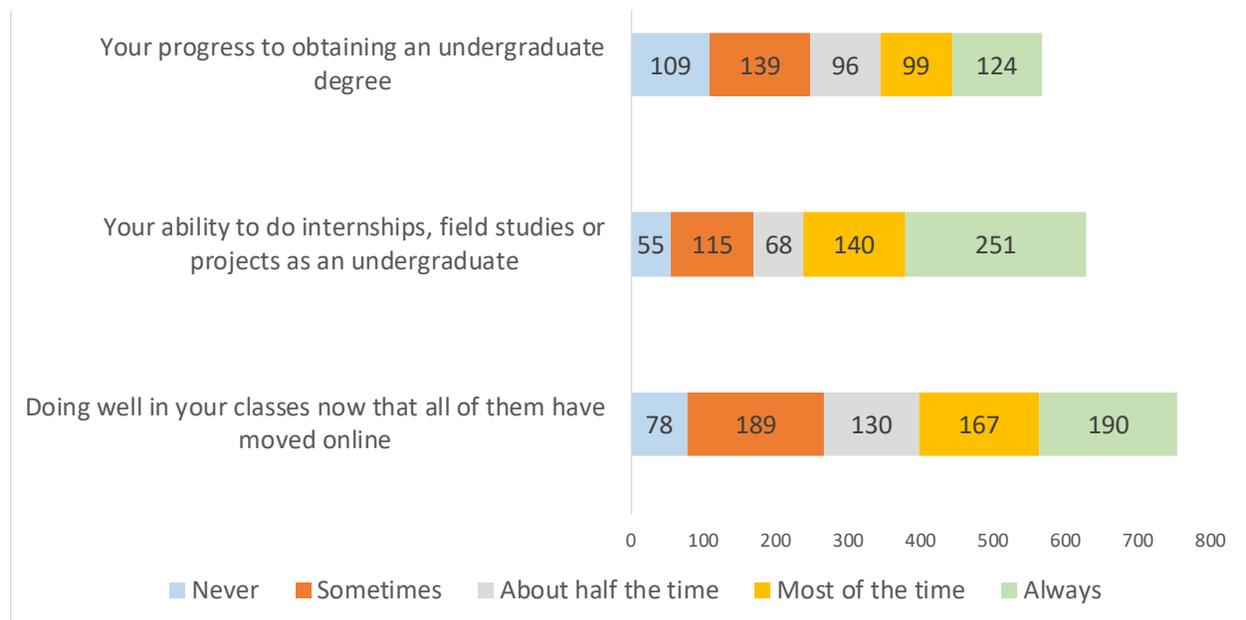
Figure 12. Student responses to the question: Compared to before COVID 19, how do you feel in general about:

Question	Much worse than before		Worse than before		Same as before		Better than before		Much better than before		Total
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
The next month	111	14.1%	297	37.6%	310	39.3%	63	8.0%	8	1.0%	789
Your summer plans	293	37.2%	301	38.3%	146	18.6%	37	4.7%	10	1.3%	787
SJSU's plans to continue online in Fall 2020	167	22.5%	201	27.1%	267	35.9%	68	9.2%	40	5.4%	743

Your longer term plans	143	18.3%	297	38.1%	289	37.1%	34	4.4%	17	2.2%	780
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SJSU Engineering students had significant worries in several areas (as shown in Figure 13) including their progress to degree, ability to get internships, and doing well in their classes which were now online.

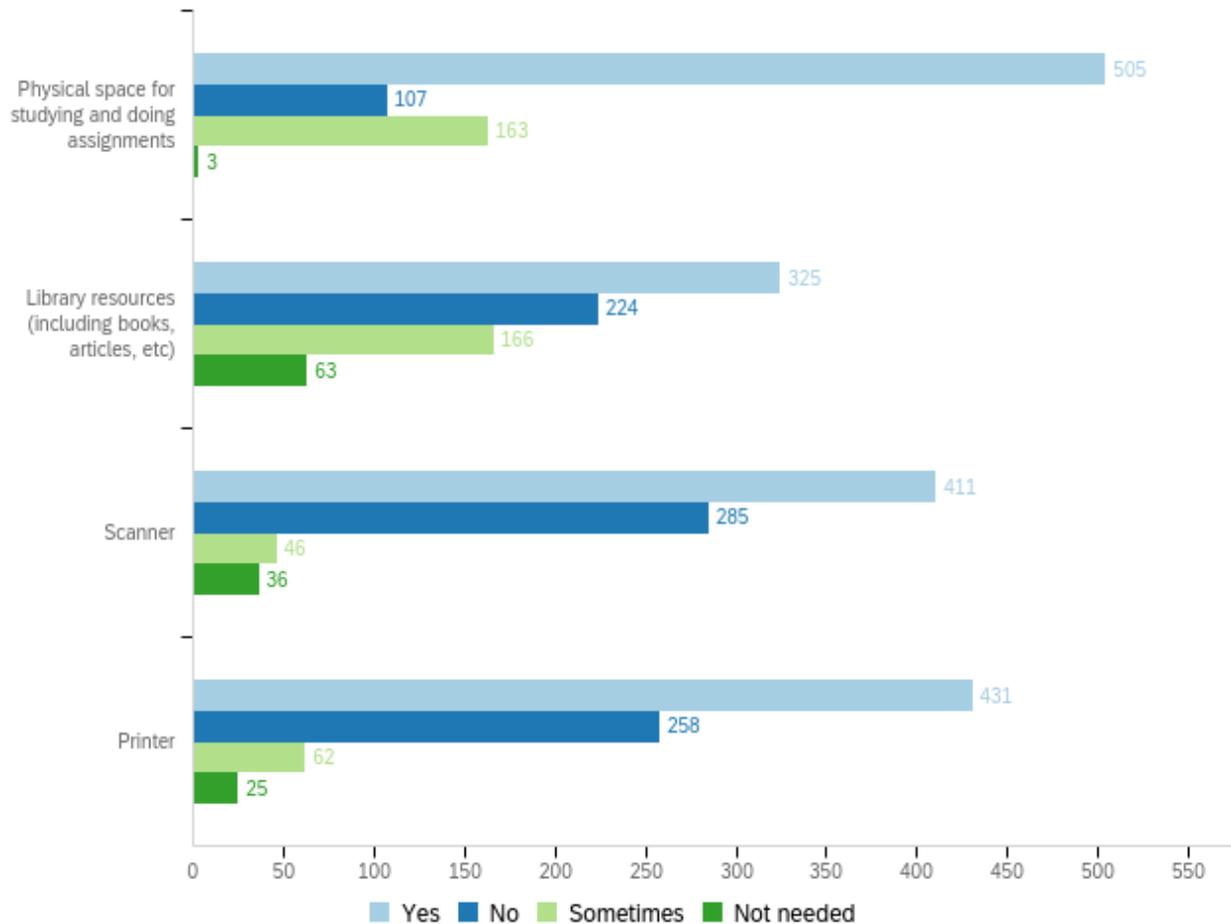
Figure 13. Student responses to the question: Given the unexpected changes in course instruction after the spread of COVID 19, how often do you worry about the following



Access to Technology

Because we live in Silicon Valley, we assume that all of our students have access to computer technologies that they might need during online learning. This is true of computers or laptops (737 out of 779 students responded yes) and enough Internet access for doing classwork online (656 out of 778 students responded year). However, a high number of students do not have access to a printer, scanner, a physical space for studying and doing assignments, and library resources (as shown in Figure 14 below). This is particularly important since many faculty had students print out their exams, scan the completed exams, and upload or email them.

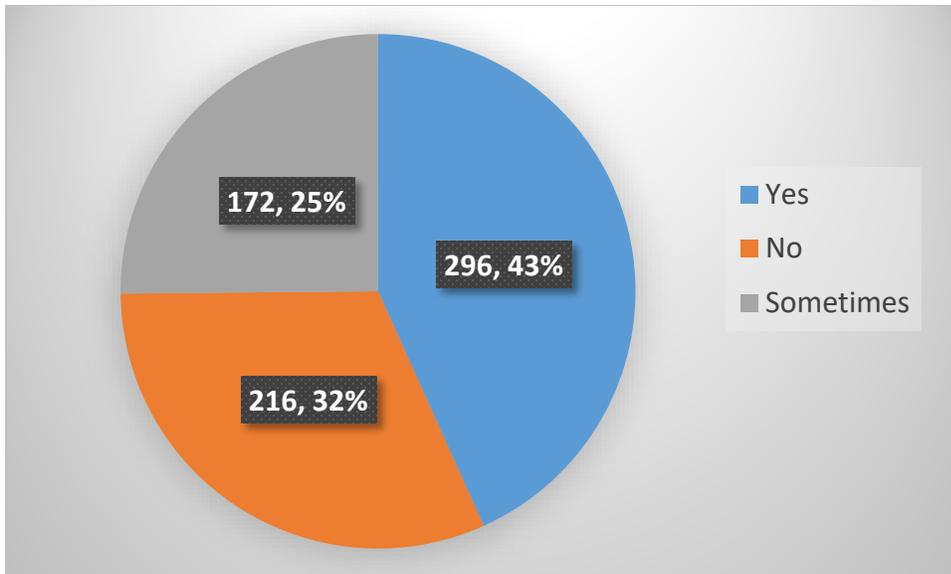
Figure 14. Student Responses to the Question: Do you have access to the following resources to support your remote learning?



Students also mentioned the need for engineering-specific software like MATLAB or SolidWorks and software that is available for both Windows and Mac computers. Students were split on whether they witnessed more academic dishonesty online. 265 somewhat to strongly disagreed, 262 were neutral, and 237 somewhat to strongly agreed that there was more academic dishonesty due to exams being offered online after the shelter in place.

Students reported that they needed more time to study after the move online in March 2020. 43% of students reported they needed more time and an additional 25% reported they sometimes needed more time (see Figure 15).

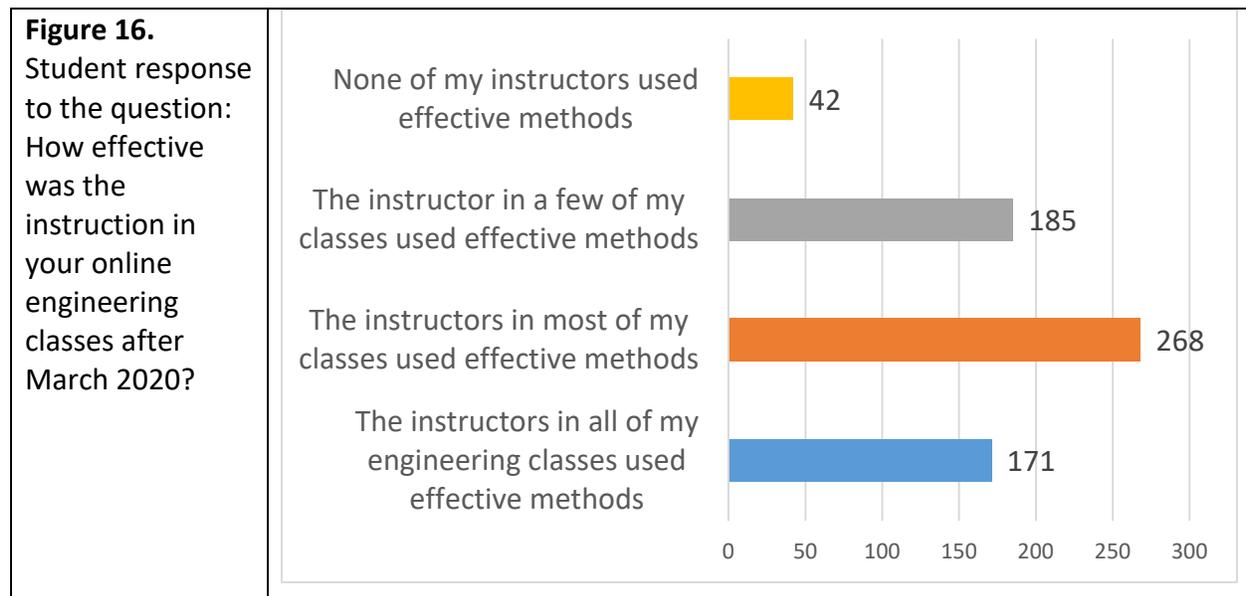
Figure 15. Student responses to the Question: Since the move to online instruction in March 2020, have you spent more time studying the required material in your courses?



Instructional Environment in Spring 2020

Most of the students (65.3%) responding to the survey took three or more engineering classes in Spring 2020. This is not surprising since most of the students responding were upper-division and graduate students.

Students felt that most or all their engineering professors used effective teaching methods after the unexpected move online (see Figure 16). 34% of the students felt that their engineering instructors did not use effective methods in all their classes.



Students gave some suggestions on how online instruction could be improved (all student responses to this question are included in the attached file). The top six categories of suggestions were (1) record lectures and post online, (2) use active learning in online classes, (3) utilize better online teaching methods, (4) use Canvas and Zoom more effectively, (5) better communication with students, and (6) give/use more practice problems.

(1) Record lectures and post online. The largest response was a request for faculty to record and post videos of lectures. Most students asked for this because of connectivity issues. For example, one typical student commented: "Upload all online lectures/labs that are attended on Zoom. Even though this might discourage attendance, sometimes Wi-Fi cuts out, or there is an unexpected situation at home that can't be ignored. In these cases, it is easy to lose track of lectures and become lost and confused for the remaining time."

(2) use active learning in online classes. The second suggestion that students made was to increase the amount of active learning in online classes through polls, breakout rooms, small group activities, etc. One student made the following comment.

"Professors need to facilitate conversation. I think that is the single most important, key important factor. Professors should not be talking into a camera and mike for x-many hours, and believe they did an effective job. And for goodness sake, if they ask the class, "any questions", and there're no responses, please do not assume everyone gets it. Obviously, people are not entirely comfortable with online platforms and so aren't taking as much initiative to ask questions as they might in person. Maybe with time as people get acclimated, that would change, but I hope we don't necessarily have enough time to acclimate to online - I hope we return to in-person well before then. I think it's incredibly naive of a professor to assume everyone in their class understands the discussion if no one responds. They need to coax the class into participating. If that sounds like an uphill battle, congratulations - that's a facet of the problem."

(3) utilize better online teaching methods. The third category was to use better online teaching methodologies. In some ways, this category overlaps with the student desire for more active learning online. There was a general feeling among the students that instructors looked at online instruction in the same way as in-person instruction. According to one student, "Some could have taken the time to learn more effective methods of teaching than sticking to one way." Another student commented:

"Many instructors in XXX do not typically work with the most high-tech equipment. I think what was more apparent while everyone transitioned to remote learning was the inability of some professors to adapt, as well as a lack of understanding that the effectiveness of their teaching had significantly decreased. It would be much more effective to spend extra time on material, especially difficult material, and ensure that it sticks and makes sense, rather than push through to make deadlines. I feel like I speak for many in that, it seems like since the quarantine began, we were essentially teaching ourselves everything."

(4) use Canvas and Zoom more effectively. This item relates to better online teaching methods as well. The students felt that some instructors were not utilizing these tools effectively. For example, some instructors asked students to email their homework assignments. Students felt that uploading to Canvas would be more secure and allow students to “know” that their assignments were received. In line with better communication, students want their instructors to use the Canvas calendar and announcements to keep the students informed. As far as Zoom was concerned, students believed that faculty were not using this tool to its fullest potential.

“My instructors could have incorporated more of Zoom's functions into the lectures, like the draw tool. I had a few classes that utilized this function and it made the class way more interactive.”

“I think it would be cool if the college of engineering offered a sort of webinar to help professors use Zoom and other online tools effectively (if there isn't already) as there were always some issues in almost every class.”

(5) better communication with students. There were also student concerns about communication from instructors. Most instructors have never taught online, so they don't realize the importance of frequent communication with students. According to a study done of over 2,000 undergraduates [4], effective communication and instructor availability are hallmarks of both good online and in-person classes.

“It is also very important for me to be able to get clear instructions from them or at least communications from them at least every other week.”

(6) give/use more practice problems. Students recommended that faculty do more practice problems live during lectures, perhaps using a digital whiteboard, rather than show PowerPoint slides the entire lecture. Also, students requested more real-world examples of what's mentioned in the lecture. As one student noted. “I would have liked more practice assignments, it's more difficult to focus in class and the same amount of weight is given to the exams, so having more, smaller assignments to act as a grade buffer and practice for exams would have helped dramatically.”

Interactions with Faculty

We asked three questions related to student interactions with faculty after the move online in March 2020. According to the students, most faculty were very available (32%) or somewhat available (51%) for office hours after the shelter in place. A small number of students indicated that faculty were only available a little (14%) or not at all (3.4%) for office hours. Mirroring the results on office hours, most

⁴ Glazier, R. A. & Harris, H.S. (2020). Common traits of the best online and face-to-face classes: Evidence from student surveys. Paper presented at the American Political Science Association Teaching and Learning Conference, Albuquerque, New Mexico, February 7-9, 2020. Retrieved from <https://preprints.apsanet.org/engage/api-gateway/apsa/assets/orp/resource/item/5e2f9610cd361a001afed294/original/common-traits-of-the-best-online-and-face-to-face-classes-evidence-from-student-surveys.pdf>

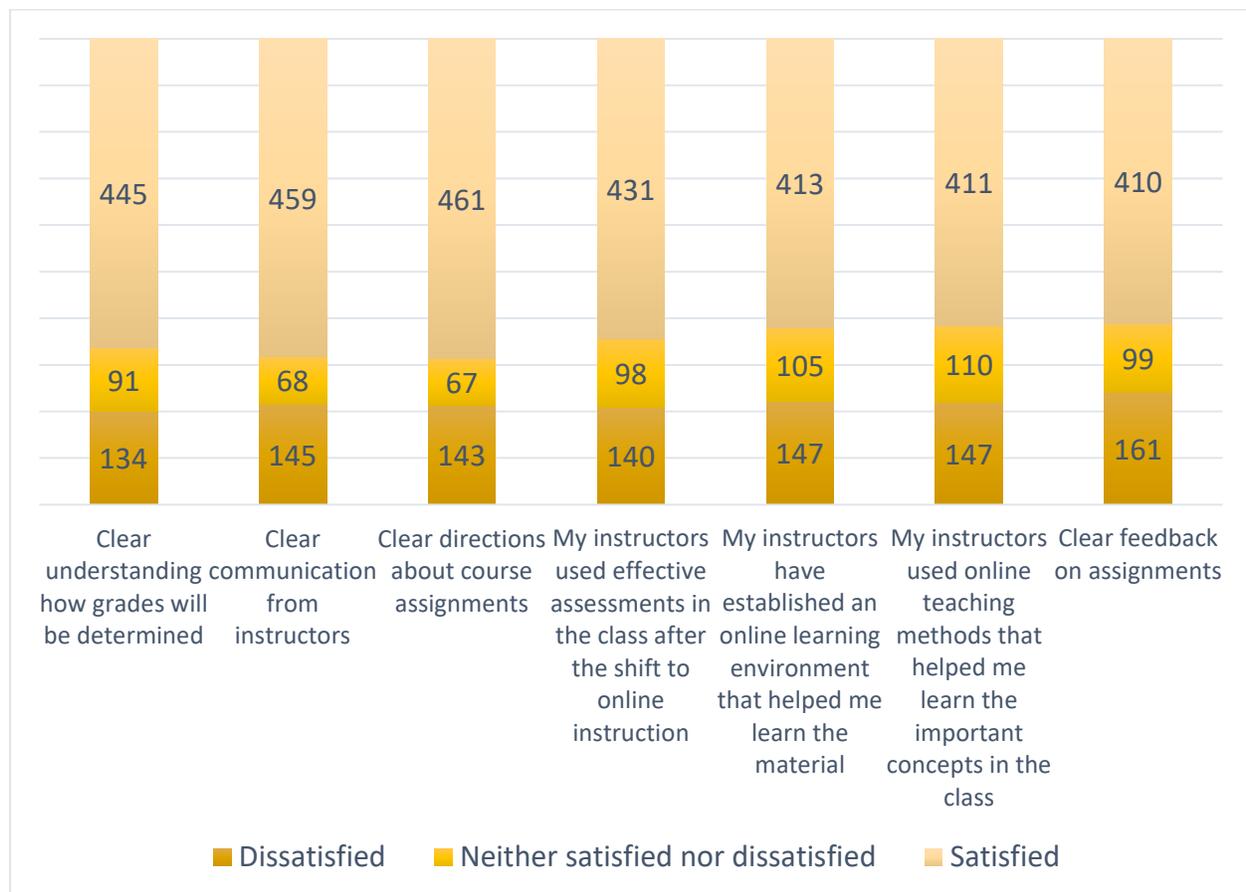
students felt that faculty were very helpful (37.4%) or somewhat helpful (45.5%) when the students met with them online after the shelter in place.

The last question we asked was the overall level of student satisfaction with the quality of their faculty interactions last semester in Spring 2020 after the move to 100% online instruction. Most students responded that they were very satisfied (17%) or satisfied (55%) with the quality of their faculty interactions. 28% of students were either dissatisfied or very dissatisfied with their faculty interactions. This result indicates a possible area for improvement.

Most and Least Successful Engineering Class

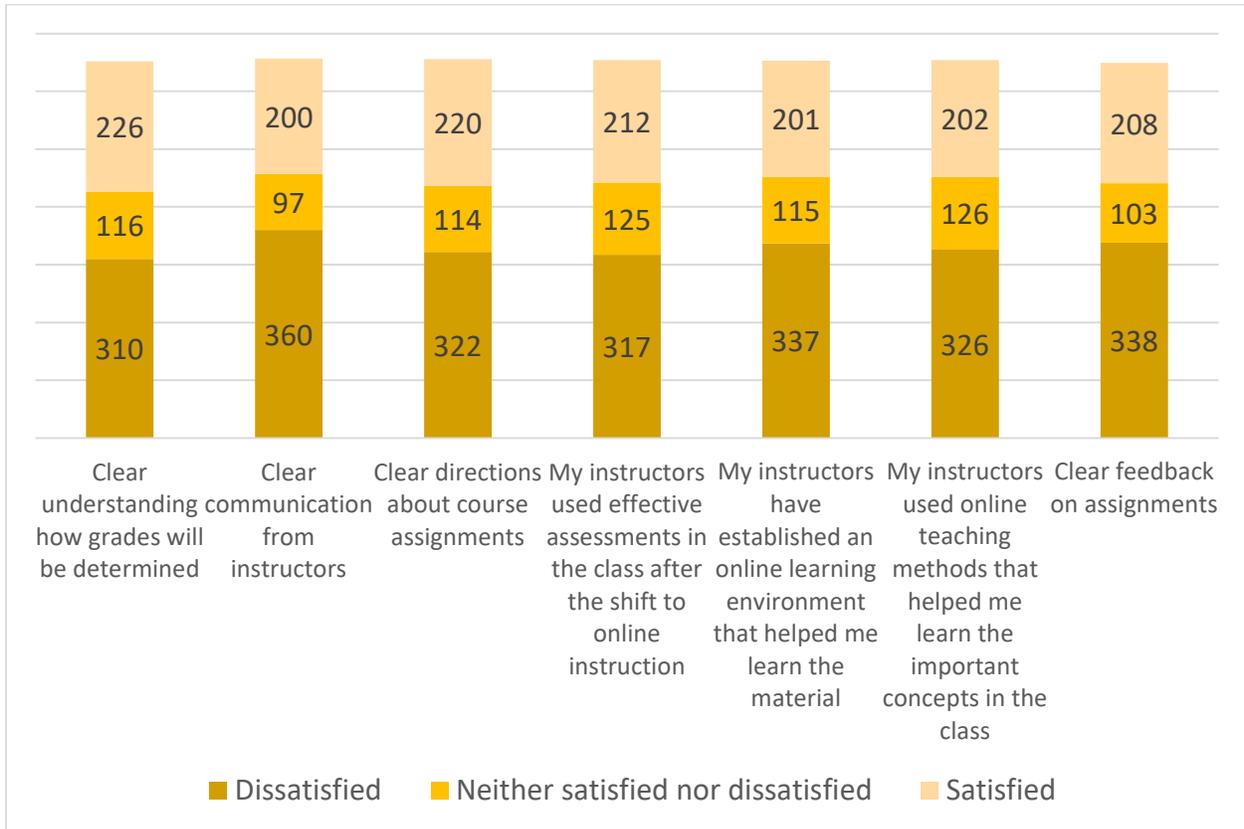
To get more details about the learning environment in Spring 2020, we asked the students questions about their most and least successful engineering class. The majority of students, when responding to the most successful engineering class, were either slightly, moderately, or extremely satisfied with their experiences in these classes.

Figure 17. Student responses to questions about their most successful engineering course. Consider your most successful (unexpected) online engineering class in Spring 2020 to answer this question. How satisfied are you with the following since March 2020?



The student responses were reversed when they responded about their least successful engineering class. Approximately 50% of the students who responded were dissatisfied in all categories when considering their least successful engineering class (see Figure 18).

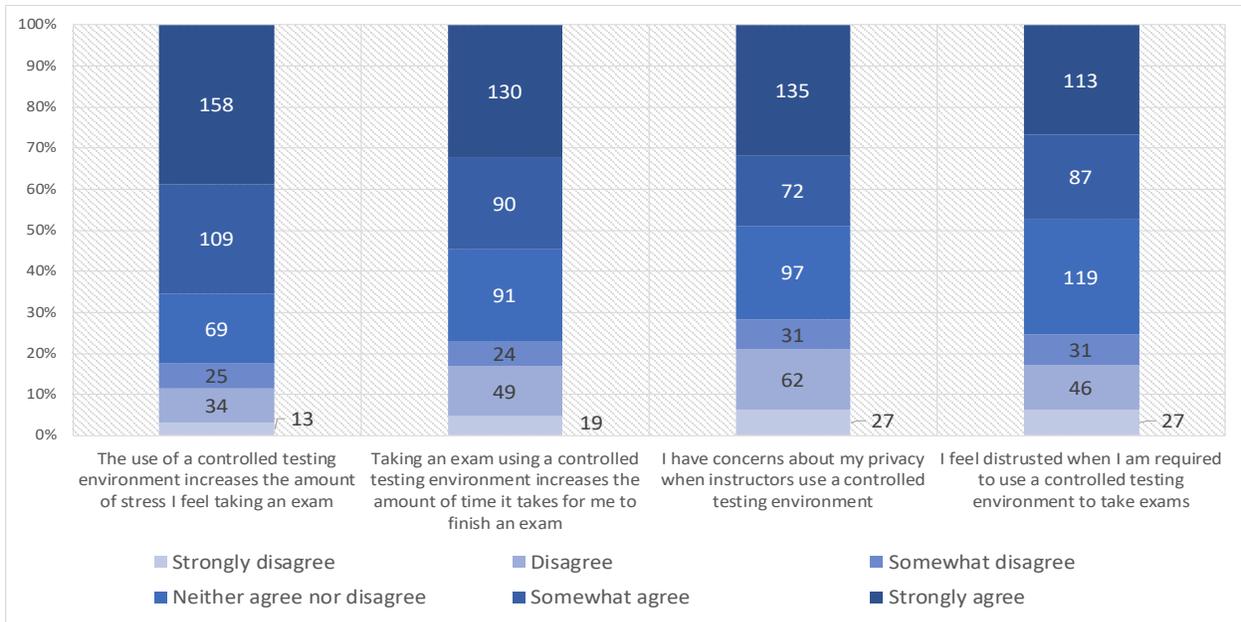
Figure 18. Student responses to questions about their least successful engineering course. Consider your least successful (unexpected) online engineering class in Spring 2020 to answer this question. How satisfied are you with the following since March 2020?



Testing

Of the 680 students who responded to the testing question, most (520, 76.5%) had at least one of their instructors use a controlled testing environment (for example, LockDown Browsers, ProctorU, or Proctorio) to take exams. From the results, most students had issues with the use of controlled testing environments. 72% of students agreed that the use of a controlled testing environment increased their stress when taking an exam. Students (63.4% agreed) also felt that the controlled testing environment increased the time it took to finish an exam. Figure 19 shows the student responses to this question.

Figure 19. Student responses to the questions about the use of controlled testing environments.



Lab Classes

The last questions asked students about their experiences in lab classes after the shelter in place. Only 260 students reported having any lab classes in Spring 2020: 143 students had one lab class, 68 students had two lab classes, and 49 students had three or more lab classes. As can be seen in Figure 20, students felt that their instructors did a good job with the lab assignments after the move to 100% online.

Figure 20. Student responses to the Question: Consider your most successful (unexpected) online engineering laboratory class in Spring 2020 to answer this question. How satisfied are you with the following since March 2020? If you only took one lab class, you should answer this question based on this class.

