Learning from the Voices of Faculty: An Analysis of the Impact of Shelter-in-Place on Faculty at San Jose State University in Spring 2020

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Maria Chierichetti joined the department of Aerospace Engineering as a full-time assistant professor in Fall 2019. Her interests lie in the field of aerospace structural design and vibrations, with particular emphasis on developing methodologies for combining finite element analysis and machine/deep learning for structural health monitoring and unmanned Structural inspections in the context of urban air mobility. Maria is also interested in investigating how students learning is affected by external factors, such as COVID-19 pandemic and community service. Before joining SJSU, she worked as a faculty member at Worcester Polytechnic Institute and at the University of Cincinnati. She earned her PhD at Georgia Tech in 2012 working on the monitoring and tracking of helicopter blade deformation. She earned a BS and MS from Politecnico di Milano (Italy) in 2004 and 2007 respectively, with majors in Aeronautical Engineering. She is an Amelia Earhart Fellow – Zonta International Foundation.

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Abstract

This is a research paper based on an in-depth study conducted in Spring and Summer 2020 at San José State University College of Engineering that focuses on the students and faculty experiences during the shelter-in-place due to COVID-19. There were four parts to this study. In this paper, we focus on the interviews of 23 faculty members that taught in Spring 2021 (18 lecturers and five tenure-track and tenured faculty members). Seven women and 16 men were interviewed and they worked in almost every department in the College. The interviews were conducted via Zoom in Summer 2020. The faculty members had a variety of years teaching at SJSU: nine faculty members taught for 0-5 years, six faculty members taught from 6-10 years, two faculty members taught from 11-15 years, and six faculty members taught for more than 15 years. The interviews asked open-ended questions of the faculty members and used a thematic analysis approach to analyze the transcripts. The results of the interview analysis indicate that there were commonalities of experience in Spring 2020 after the unexpected shelter-in-place. Most of the faculty members had never taught online before and they struggled with switching to remote instruction. This paper gives a detailed analysis of the faculty voices about their experiences and present recommendations based on this analysis.

Introduction and Background

As the coronavirus pandemic hit the United States in Spring 2020, San José State University (SJSU) faculty members moved to remote instruction in March 2020 and faculty members promptly adapted their teaching pedagogies to remote instruction. SJSU was among the first to transition to 100% remote learning, and has continued in this modality in Fall 2020 and Spring 2021 with limited hybrid offerings.

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"implicit structures" (pedagogies that develop a moral dimension in terms of professional values and attitudes). According to Eaton et al. [1], some teaching activities in the online environment have "the potentials to cultivate deeper learning experiences, but they can fail to do so if activities are not designed and implemented properly." The rapid switch to online instruction in March 2020 did not allow faculty members to train, plan and reflect upon the best teaching modes for online instruction, unless they had previously taught an online class. Therefore, as with many other researchers, we consider the Spring semester to be an example of remote learning rather than planned online learning [3].

In October 2020, the Chronicle of Higher Education conducted a survey among faculty members in US institutions to gain insights into how the pandemic affected faculty members from a

Morelock et al. [10] created a novel research platform to collect the experience of students, faculty members and staff (for a total of 70 participants, of which 25 were faculty members). The study identifies that students and instructors struggled to recover a sense of connectedness in a remote environment, as well as a disconnect between faculty members' and students' experiences. Students and faculty members faced a range of COVID-19- related challenges within and outside of academia.

The results in this paper are part of a larger study completed at SJSU University which looked at the impact of COVID-19 on students and faculty members [11-13]. We surveyed all the faculty members that taught a class in the Colleg-1 (acu)-42 (n t)-(m)-6 (em)-6 (b)-4 (eoem)-6 gngol4 Tc 0.004rthang6 (

Interview protocol

Our interview protocol was informed by the interview protocol that was used by Pawley [18] at Purdue University. The interview consisted of two questions: "How did you do in your classes in Spring 2020?" and "How did SJSU as an institution do in this transition?". According to Pawley, open questions allow "participants to tell their stories in whatever way they chose" [18]. We have included the prompts below for this interview protocol.

<u>Interview guide</u>
- How did you do in your classes in Spring 2020?
  Prompts as needed: Tell me a little about yourself. Tell me about your experiences at SJSU after the transition to 100% online instruction. Has COVID 19 made any impact on your life? Let's talk about that for a minute; Tell me more about that; So, just to clarify…How did you learn about this? What was important to you? Any regrets? Anything you wish you had done differently? Anything else you would like to tell me?"
- How did SJSU as an institution do in this transition
  Prompts on institutional structures—financial, community service, student support, rules and regulations at SJSU

The interviews lasted about 15-30 minutes. The interview recordings were completed through Zoom cloud, and Zoom automatically created a transcript of the recording. Our team reviewed the transcripts and recordings together to correct errors in the transcripts, which were generated automatically. We then pseudonymized the transcript, masking names, places, ages, organizations, ethnic groups (replacing them with broader racial categories), nationalities, languages, and religious affiliations or communities for those participants who desired it and the names of people participants mentioned. We sent the participants both the original (for their records) and the pseudonymized transcripts to review for inaccuracies or things they regretted saying. The revised transcripts were coded by two persons in the team, a faculty member and a graduate student [19]. The coding was defined using NVivo 12, a qualitative data analysis tool,

a white female engineering educator, an engineering education researcher and an advocate for active learning and active communication. This epistemological commitments and positionality of the interviewer might have affected the follow up questions asked to the participants, although the interviewer kept the follow up question

Results

The majority of the faculty members that were interviewed never taught online before, and were therefore required to transition to the remote learning format with very little preparation and formal training. Faculty members got quickly up to speed in online teaching, attended brief trainings offered by the university during Spring 2020, looked for IT and instructional designers' support, and turned for help to other faculty members. The analysis of the interviews has been divided into four main themes: "Testing and assessment", "Experience", "Teaching approach", "Hands-on laboratories" that will be discussed in the following sections.

Testing and assessment

Testing and assessment has been the main point of discussion during the faculty interviews. We identified the following codes as part of this category:
- Online testing: 15 out of 23 faculty members
- Concerns about Cheating: 9 out of 23 faculty members
- Grading Issues: 8 out of 23 faculty members
- Students had higher grades: 6 out of 23 faculty members
- Students had lower grades: 4 out of 23 faculty members
- Faculty made more exceptions to students: 3 out of 23 faculty members

Faculty members in Engineering are highly concerned about finding assessments that are meaningful and allow them to assess both lower taxonomy and higher taxonomy skills [21]. Most of the faculty members changed their assessment strategies, moving from traditional closed book exams, to open books exams, and experimented with different types of assessment strategies such as open-ended exams, multiple choice or take-home exams. Kyle, for example, discusses the need to experiment with different types of online assessment strategies during the semester.

> *The exam I mean that that was a little bit difficult experience the exam, the first exam, which we did we use Zoom […] Now the second exam that I use a different process. I use the lockdown. […] And then I change it to a multiple-choice question and now with the multiple choice question the computer can generate the answers randomly. - Kyle*

Many faculty members are concerned about students cheating and academic dishonesty, and were not very confident in their ability to truly assess individual students' skills. Faculty members felt responsible about preventing cheating but in many cases, they are not sure about best practices for online testing, or find that it takes excessive faculty members time to prepare the assessment.

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students' push back, with faculty members feeling under pressure about their assessment strategies.

> *And they were saying like why I'm only using this because many other faculty are giving take home exam and I'm the only one who does like who tortures them…– Hanna*

Faculty Experiences in Remote Teaching

The faculty were generally positive about their experiences in a remote mode after the move online in Spring 2020. We included the following codes in this category:
- SJSU acted appropriately as an institution: 14 out of 23 faculty members
- Positive Experience: 14 out of 23 faculty members
- Online teaching and learning difficulties: 13 out of 23 faculty members
- Faculty found easy to transition to online teaching: 11 out of 23 faculty members
- SJSU should provide more support: 6 out of 23 faculty members
- End of semester student evaluations: 3 out of 23 faculty members

Faculty members in general report had a positive experience teaching in the online environment, and considered the transition easy. For some faculty members, online teaching is convenient. The transition to online teaching was defined by the interviewed faculty members as "smooth", "seamless", "pretty easy", "not that hard", "not as challenging", "convenient". However, it is evident from the faculty transcripts that many faculty members just ported their classes to a remote teaching mode without considering best practices in teaching online [1-2].

> *I just continued with the lectures, you know, didn't really skip a beat and it went well and went really well. […] It was good. […] With respect to the class. I think, I think it went fine. […] I was able to get through those this time so I did find the online format, more efficient and it was definitely easier for me. You know, I didn't have to drive to commute and I didn't have to walk over to the class set up the audio visual. […] So I, I liked it." – Fred didn's "smooth",*

"That it helped them, but it was incredibly draining for me because I would be on Zoom for five hours every Monday and Wednesday. I have, a five minute break here and there they go get another drink and use the facilities and rush back and get started again. So, the Zoom drain was incredible…And my students seem to have very similar reactions to having to be engaged with their classes online, whether it was my class or another class but many times I heard that they were struggling to keep up with the dates, because there wasn't always that engagement directly with their instructors and even with the engagement with me. It was hard for them to keep up." – Josephine

Some faculty members noted a discrepancy in their experience as a faculty members and the students' experience .

It turned out that, I thought okay, I thought in terms of delivery from my side, I did not see any difference. But then students did not like it at all. […] They had difficulty and I had to a lot of times I had to go over things repeatedly, they wouldn't get it so it take, it's, most of them did not like that. – Arthur

SJSU as an institution has been effective at how it responded to the difficult circumstances. Many faculty members praised the IT team for the quick transition and the many trainings regarding online teaching resources and software offered to faculty members. At the same time, some faculty members note that SJSU could have been more supportive of their faculty members and students. First, SJSU could have asked faculty members what they needed and how they could be best supported in their teaching, by promptly p Td[(c (4 (of)-7 (J( )Tj2 (l)-12 (o)-10 1gyv (c)4 (ul)-(s)
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- Faculty assigned project: 7 out of 23 faculty members
- Faculty run office hours: 6 out of 23 faculty members
- Internet or Connection issues: 5 out of 23 faculty members
- Faculty used active learning: 4 out of 23 faculty members
- Faculty taught synchronously: 17 out of 23 faculty members
- Faculty taught asynchronously: 3 out of 23 faculty members
- Students were highly engaged during class: 6 out of 23 faculty members

In many cases, faculty members changed their teaching approach *"a whole 180 degree"* (Dolly) as they recognized that the online format requires different strategies to keep students' engaged. The majority of the interviewed faculty members taught synchronously with the same schedule as during in person teaching (17 faculty members out of 23), used Power Point slides to present their lesson plan and recorded their lecture and made it available to students, and had office hours. Eight out of 23 faculty members lectured for the entire class time, finding it difficult to incorporate active learning activities to keep students engaged.

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Preparing for the Fall semester

Many faculty members (11 out of 23) discussed their plans for Fall 2020, which were, for the vast majority of faculty, online. They planned to make changes after the lessons learnt in Spring 2020 both in delivering the class material and in their teaching approach as well as how to conduct labs.

> *I am actually making fairly extensive changes to the way it's being taught and part of that is based, it's it's it's because of the experiences in the spring. I'm gonna I'm making it a lot more interactive. So, students would not have, you know, those who who want to have you know the the opportunity to to take part in in in even during the lectures in a more interactive way. And then the lab part that I mentioned earlier, the hardware lab revamping that so instead of building it ourselves, we identified I've identified a piece of hardware that they could order on the web, which is just as cheap, if not cheaper. So, I think that would be that would also be a little, should run a little, more smoothly. - Bill*

Some faculty members described their plans to move to asynchronous teaching, so that class material and videos can be prepared beforehand, and the class sessions can be used to engage students in problem solving activities, answer questions or meet in small groups to review projects.

> *Okay, I'm going to teach online, but now it will be asynchronous. So, what I'm doing now I'm spending all the time to do some lectures and it will be posted on YouTube. And then I download it to Canvas and then I'm going to make, make some meetings with them because this is a design JT[-(hr)3(on-1 (atdr)4 bTd[(dowm)2 ( )]TJT[(o do s)-1 (om)2 (e)4 Td[(n-15)2 (e c-2 (i)-oM. Tc 0 Tw TjM C P wTJ10 T 0 T69*

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Research Question 2: What was the impact of the switch online in Spring 2020 to lab classes?

The faculty members interviewed found that moving laboratories to a remote mode was difficult. Specifically, the faculty members found it challenging to provide hardware to the students because of campus closure and safety concerns: Faculty members used different strategies to conduct their laboratory activities, like using "a simulator" (Larry)*,* and conducting demonstrations (Cristobal*).* Some faculty members discussed about their frustration on the inability to conduct labs in a safe environment (Edouard).

Conclusion

Most of the faculty members in engineering have always viewed online teaching with skepticism, and prior to Spring 2020, very few classes in the STEM disciplines were taught fully online. A total of 23 interviews were conducted of the impact of COVID-19 on engineering faculty members. The traditional teaching approach was completely shifted by the COVID-19 pandemic and all engineering classes at SJSU transitioned to online learning in Spring 2020, with limited training and planning for the faculty members. As a result, faculty members experienced an increase in workload at a time in which many also experience an increase in personal needs. Faculty members were also challenged to keep students engaged online, and by the organization of hands-on laboratories in a fully online environment.

Overall, despite the challenges, at the end of the semester faculty members shared a positive experience in how they were able to transition their classes. The general positive experience identified by the engineering faculty members is in clear contrast to the experience [(a)4 (2 (o64 (p)-4 ((er)-1ndr

follow-up study at the end of Fall 2020 and the results of this additional study, as well as the comparison with the analysis in this paper, will be presented in future publications.

References
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