

# Adapting teaching strategies and extracurricular activities during transitions within the COVID-19 pandemic

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## 181st Meeting of the Acoustical Society of America

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### Education in Acoustics: Paper 1aED4

## Adapting teaching strategies and extracurricular activities during transitions within the COVID-19 pandemic

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As the COVID-19 pandemic evolves and changes, it may be necessary to make changes to course delivery modes. Suggestions of contingency plans for teaching a general education acoustics classes and alternative plans for related co-curricular and extra-curricular activities are described. A description of how one academic department handled the COVID-19 pandemic as transitions were made from fully online courses to a hybrid learning model is included. Also detailed is how the pandemic has affected co-curricular and extra-curricular activities for STEM students at a two year college. Strategies employed most recently include online lecture components with on-campus laboratories, virtual seminar speakers, hybrid meetings, and an online collaborative textbook annotation platform. Lessons learned for teaching as the pandemic has evolved are discussed.



## 1. INTRODUCTION

When the call for papers for the 181<sup>st</sup> Meeting of the Acoustical Society of America (ASA) was issued, there was hope that the COVID-19 pandemic was nearing its end. The hope was to discuss how we are teaching as we have emerged from the pandemic. We now know that although the ASA was able to meet in person, the pandemic was not over at that point. Many of us were still teaching in response to the COVID-19 emergency in less-than-ideal circumstances.

This article describes how I attempted to adapt my teaching and co-curricular responsibilities to the shifting COVID-19 situation. A widely circulated poem<sup>1</sup> used the metaphor of this pandemic being like an ocean that we are all in but that our individual conditions are like different boats in that ocean. Overall, I believe that is an apt metaphor.

Teaching through the pandemic has been no exception to the idea that we each have different boats. Even the simple phrase "teaching online" can mean vastly different things to individual instructors. Teaching a course synchronously over Zoom is different than teaching a course asynchronously using only your campus learning management system (LMS). These differences show up as the various boats that we are all using to navigate teaching through this pandemic.

## 2. THE FIRST THREE FULL SEMESTERS OF COVID-19

I'm not thankful for having to live through a global pandemic. Still, if there is a silver lining, it could be that the following question was often in my mind: Is this pandemic giving me the impetus to make changes to my courses? As I reflect on my teaching before Spring Break of 2020, I can now see that parts of my courses were becoming stagnant, and I was somewhat complacent with what was going on in my classes and laboratory activities.

The acoustics course I teach is a 5-credit course, including a laboratory component at a community college. The course fulfills a general education physical science laboratory requirement for students pursuing an associates degree. The course also transfers, as a physical science elective, to all of the four-year colleges and universities in the state of Illinois that participate in the Illinois Articulation Agreement program. However, it is most popular with students pursuing a certificate in music technology and those students applying to our college's program in diagnostic medical sonography.

Shifting courses exclusively online after Spring Break in 2020 meant I could no longer be complacent. My goal in teaching through the end of Spring 2020 was to focus on making the experience as equitable for students as possible. Although I could not know for certain what our students were experiencing, I tried to imagine what challenges they might suddenly be facing. I tried to think about how I could structure the course in the least stressful way. Our students all live close to the campus, so there would not be timezone issues to have to worry about. However, our students tend to have off-campus jobs or non-school responsibilities that take up a lot of their time. Even as many restaurants, stores, and other businesses were forced to close, I could not be certain that my students' schedules had stayed the same compared to the start of the semester. To not disadvantage any student who now had obligations at our class meeting time, I decided to run the class completely asynchronously for the rest of the semester. This was my attempt to show students empathy for their situation.

Our college decided to remain fully online in the Fall 2020 semester. I continued to run the class in an asynchronous format. Although I could use some of the material from the previous semester, I had quite a bit of content to prepare and get put online for the class. The sections of this course did not respond well to the asynchronous format. The course finished with slightly more than half of the students having dropped or failed the acoustics course. Prior to COVID-19, the Fall semester would typically include two full sections of 24 students per section. The total number of students enrolled in this course at the start of the Fall 2020

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semester was 36, spread over two sections. Only 15 student finished with a passing grade. The remaining students either dropped the course or failed.

To improve the situation, I ran the course in Spring 2021 in a format that our college called "Synchronous Hybrid". Each section met online with me for one hour each week. The rest of the course was delivered online asynchronously. The completion rate for students in Spring 2021 was much higher than in Fall 2020. Still, it is not clear that these students were particularly happy with how the semester worked.

The Fall of 2021 was the first time our acoustics class was allowed to be back on campus since the pandemic started. The college administration made the decision to run all laboratory parts of the class in-person and all lecture parts of the class online. We were also limited in our class sizes to half of the pre-COVID enrollments to encourage social distancing.

I came to understand that every change in the course delivery modality would cause unanticipated work on my part. Each semester, I believed that the changes we were making were for the benefit of the students that semester. Yet, I didn't think about how making the changes would lead to added work hours on my schedule.

Each semester I was in a cycle of repetitive tasks. First, I was still posting new content, which would lead to emails from students, and finally, there were assignments to be graded. This cycle would repeat, usually while I was falling behind on more than one of the three tasks.

What was missing were the opportunities to provide meaningful feedback to students. In my view, giving meaningful feedback is the essence of teaching, so it often felt like I wasn't really teaching.

### **3. CO-CURRICULAR AND EXTRACURRICULAR RESPONSIBILITIES**

In addition to my teaching load, I have some co-curricular and extracurricular responsibilities that I have maintained during the pandemic. As of the Fall 2021 semester, I was the Advisor for the college's chapter of the Phi Theta Kappa Honor Society, a Co-advisor for the Science Club, and the Co-PI for a National Science Foundation (NSF) funded Scholarships in Science, Technology, Engineering, and Math (S-STEM<sup>2</sup>) project.

#### **A. UPDATING MY MENTAL MODEL**

Although there is naturally some overlap between the students in the different programs and organizations I supervise, I have always treated each as a separate entity. I intentionally used a mental model that the students in each group were siloed apart from each other. As more of my attention was pulled towards changing my classes each semester for a new delivery modality, I realized that I needed to find a more efficient way of interacting with the students in the co-curricular and extracurricular programs.

What ended up working best was to stop thinking of the students in the programs as inside separate silos. I replaced that mental model with that of a salad bowl. Not every student in each program belonged to the others. Still, there was enough overlap that I could rely on students in one program to help inform students in the other programs about planned activities and events.

#### **B. STEM SCHOLARS PROGRAM**

One of the programs that I am involved with is the STEM Scholars Program. This is a 5-year project funded by the NSF through their S-STEM program. The project involves five faculty members from the Department of Natural Sciences and support staff from around campus. It is a collaborative effort, and we all work together to make the program serve as many students as possible.

The main goal of the S-STEM program is to provide scholarships to traditionally underrepresented students in STEM who also demonstrate financial need and academic achievement. Our STEM Scholar

program provides a \$2,000/semester scholarship to students intending to major in any STEM discipline and expressing an intent on transferring to a 4-year college.

Additionally, students receiving the scholarship are supported by faculty mentors, a seminar series with invited speakers, monthly field trips to labs or science-related sites in the area, and regular meetings with their mentors. The meetings also introduce the students to various college resources that they can use. Our STEM Scholars program also provides some funding for students to participate in summer research opportunities at the college.

Part of our S-STEM project was designed to measure how students' metacognitive skills changed as we worked with them to think about the learning process. As a part of this, we required the students in the STEM Scholars program to keep a reflective journal. We encouraged the student to focus their journal writing on reflecting on how the learning process in their classes was working for them. We would try to provide guidance by having regular discussions between the students and their faculty mentors.

### C. SUCCESSES AND CHALLENGES FACED DURING THE PANDEMIC

Before COVID-19 disrupted our STEM Scholars program, we saw that our STEM Scholars students had high participation rates in the monthly field trips. One of their favorite field trips was taking hands-on demonstrations to the local middle schools. Like many of our STEM Scholars program activities, field trips were canceled for over a year due to the pandemic. Also, before COVID-19, our summer student research program steadily grew the number of students participating. But when the pandemic started, our summer research program was shut down for summer of 2020, and only a tiny fraction of the number of students participated in summer 2021. Finally, before the pandemic, we asked our colleagues in the department to gather survey data from students in their classes.

Since the pandemic's start, we had fully transitioned to holding events and meetings exclusively online (we use Microsoft Teams) for over a year. All of the co-curricular and extracurricular groups on campus had to be online for this time. We noticed that the STEM Scholars students appreciated having continuity in their community established through the regular meetings held before Spring Break of 2020. Having guest speakers give presentations via Microsoft Teams allowed us to extend invitations to people further away than speakers we had invited before the pandemic. Another adaptation to the STEM Scholars program included encouraging students to keep online journals instead of handwritten notebooks.

In making the needed adjustments due to COVID-19, we identified the most significant challenges to our STEM Scholar program. One major challenge was the need to develop new ways to recruit students into the STEM Scholars program, especially since enrollment at the college dropped during the early stages of the pandemic. We changed our recruitment strategy from blanket advertising across the college campus to targeting students enrolled in the introductory STEM classes with high grade point averages. Our old way of recruiting was based on the idea that we might be catching some undecided students considering pursuing a STEM major. By asking students who already show that they meet much of the criteria for the program to apply for the STEM Scholars program, we increased the number of STEM Scholars in the Fall of 2021.

Although an increased number of students entered the program during the pandemic, we had difficulties building a sense of community while exclusively meeting online. The students with us before the pandemic have all completed their coursework here. They have since transferred to four-year colleges to complete their degrees. Many students recently coming into the program have outside obligations at our regular meeting time. These obligations make it hard for them to participate in our meetings or attend the virtual seminar speakers that we have invited to present since the pandemic's start.

We attempted in the Fall of 2021 to offer hybrid meeting options. Students could choose to participate in the meeting on campus or remotely. We purchased a device with an integrated camera, microphone, and speaker designed to work in a large meeting room and give remote meeting participants a more immersive experience to encourage the hybrid option. The device, called the Meeting Owl Pro<sup>3</sup>, is shown in Fig. 1, and



**Figure 1:** The Meeting Owl camera/microphone/speaker system intended for facilitating hybrid meetings.



**Figure 2:** Screenshot from a Microsoft Teams recording using the Meeting Owl. The Meeting Owl view is in the lower left quadrant of the window.

a screenshot from a meeting using the device is shown in Fig. 2. The overwhelming majority of students attending the meetings chose to participate online rather than on campus. It seems we needed to provide students with incentives to participate on campus. At the least, we should have hosted events and meetings when they were already on campus. In practice, this was difficult to accomplish.

Our biggest identified challenge was that, prior to COVID-19, much of our STEM Scholars program relied on classes held in person and for students and faculty to meet together. Even the primary survey used for assessing our program makes multiple references to students working with other students face-to-face. As our campus transitions back to being more fully in person, we will be re-implementing, using masks and social distancing, components of the program paused during the pandemic.

#### 4. LOOKING AHEAD

The end of the Fall 2021 semester approached, and it was clear the pandemic had not ended. It was also clear that our college had begun the transition towards regaining more in-person classes and interactions with students. I will try to keep using some aspects of the courses that I developed during the pandemic, and there are many aspects that I will be glad to stop using.

I plan to transition my acoustics classes to a flipped classroom model, using the many videos I recorded during the pandemic. I will ask students to watch the relevant videos before coming to class. This will free up time in the classroom to apply the concepts to questions and problems in preparation for in-class assessments.

I plan to keep using Microsoft Teams to communicate with students. However, I will not emphasize its use as much as I have in the past three semesters. In my opinion, traditional online LMS discussion boards too often lead to artificial conversations between students, which are essentially meaningless. I prefer to see students use communication tools (e.g. Microsoft Teams) similar to how I use them with my colleagues. I have the responsibility to teach them how to effectively use these tools.

One of my beliefs is that students need to be taught how to read critically. One of my weaknesses is that

I have struggled to do this effectively. Perusall<sup>4</sup> is a collaborative annotation tool I started using during the pandemic. It has been a step in the right direction and is something that I can use post-pandemic.

Doing online laboratories is no substitute for the actual lab experience, in my opinion. Having online labs was appropriate at the height of the pandemic but is not something I'm planning to continue using. Additionally, I developed alternative assessment formats during the pandemic to discourage outright cheating while encouraging students to think deeply about the course content. For the students who bought into the alternative assessments, I feel that they benefited by actively engaging in their learning of the material. But the format was too time-intensive for me to continue using post-pandemic.

I have found that the students I see achieving their best are the ones I have been able to connect with personally. I am continually relearning that forming relationships between myself and my students and encouraging student-to-student interactions is essential to do early in the semester and with intentionality. I think I didn't necessarily have the appropriate level of intentionality before the pandemic. It is something that I will continue to work on beyond COVID-19.

Constantly changing how my acoustics class was delivered over three semesters during the pandemic meant that not all the intended topics were covered sometimes. My goal was to be teaching students how to think critically about acoustics. I had to be okay with sometimes not covering all the intended content. This has to be okay for a post-COVID-19 world, too.

## 5. CONCLUSION

As I have started to transition within and beyond the COVID-19 pandemic, I realize that seemingly minor changes can cause me as much work as the initial shift to online teaching. I didn't anticipate that going from an online-only course to a hybrid approach would be more work, but there were hidden aspects that I had failed to account for.

I have seen that the most crucial step for increasing student success is forming positive relationships with students in my classes and other programs. The difference between a student dropping a class and hanging on to finish the semester is sometimes just a matter of me taking the time to have a short conversation with them. This is something that I knew before the pandemic but found challenging to keep at the forefront of my mind. I continue to work on becoming better at this.

Lastly, I try to remind myself that all of us are on a different path through this pandemic – whenever possible, I try to respond to my students and colleagues with empathy.

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