

# Needfinding and Empathy Work

## Interview Summary

### Interviewee no. 001

Participant 001 constituted our expert interview. This individual is a professor in the Graduate School of Education at Stanford. In addition to teaching at Stanford, this participant has 15 years of experience teaching in California high schools and is well-versed in both classrooms and research fields. They offer great insight into the classroom as well as research on the cutting edge of educational technology.

One key observation the interviewee made was that if you have a classroom of students engaged with their cameras on, you often find that once their camera turns off, they are gone for the rest of lecture. One of the most difficult tasks for teachers in this online learning environment is keeping students' attention, especially in classes that aren't recorded. This teacher also made a key distinction between classroom engagement. They had said that the best way to engage students is to offer multiple platforms for them to engage, whether that is speaking up in the larger class, smaller group sessions, using the chat feature, or maybe interacting with an exit ticket, offering a variety of possible interactions gives every student a good opportunity.

In terms of social anxiety, this teacher made an interesting comment about social anxiety in the classroom. This interviewee mentioned that anxiety usually comes from not knowing what to do, or say in a risky environment to the student. This can best be alleviated by offering scaffolded questioning in breakout rooms with small group sessions where the risk is low and the students are directed. Oftentimes teachers will simply leave students with the "talk about this" prompt and this leaves anxious students unsure about how to interact.

This participant also described a time when they were screen sharing a video, and their bandwidth was overused such that their screen completely froze for about ten minutes. The rest of the class could still see this interviewees video, but the teacher found it anxiety-inducing that they had no feedback on what they were saying or doing, and instead they had to carry on the class as though speaking to a black box.

### Interviewee no. 002

Participant 002 is a college senior at Dartmouth studying Government and English. This student plans to attend Harvard Law School in 2022, so his transition to online learning has been particularly stressful in preparation for his future academic journey.

One of the key challenges for Participant 002 has been connecting with peers outside of class. He expressed that for close friends, he Facetimes or Snapchats them sporadically. But for classmates in a remote setting, he feels indifferent because when he is in class,

he is there to learn, and not necessarily there to “chat up a conversation.” So in some way, he likes Zoom in that he can focus on school.

Student 002 is always looking to make new friends, but emphasizes that over Zoom it's simply hard. For example, in his Chinese class. If he had that class in person, he “probably would be friends with those people.” He thinks that there is a “bonding experience” that he knows for a fact he is not getting over a virtual setting.

A public speaker at heart, this student feels the most anxious when he is unable to read the classroom -- seeing facial expressions and body language. While it's possible to do so in a physical classroom from any vantage point, he can't do that on Zoom where there's 20 people per screen and this is a large classroom. At some point, he described he felt as if he were talking to the void.

All in all, this students' frustrations came mostly from not being able to make friends in a virtual classroom, which has helped him focus in school and finish his last year. To some extent, he described this as being “good” for him, but recognized that its the only thing that he can do in a remote setting.

### **Interviewee no. 003**

Participant 003 is an engineering student from MIT. This student is a current senior who has lived at home since his school was shut down. To this day, this student expresses particular academic challenges due to the lack of resources that he would otherwise get by living on or near campus.

As a senior, he mentioned that his top priority for the semester is to have fun with the classes that he is taking and enjoy the content, despite the many hurdles he faces. For example, this student has financial and family responsibilities that he needs to worry about. Thus, in general, he has not tried to make new friends. He only attempts to maintain his existing friendships by playing video games over the weekends.

His study habits have shifted by becoming more impromptu and self initiated. For example, this student messages friends in the same class right after a session and organizes “PSET parties.” In these sessions, he first asks what time they are available and then they connect over Zoom, where they keep their video and audio on. In general, this student seeks to only work with small groups of people, people who he already knew before the semester started.

His biggest fear is the quality of education for future engineering students at MIT. Given that he is currently taking electives, he is not too worried about the final outcome. However, he worries about the incoming freshman or sophomore whose building blocks are relying on purely online classes.

### **Interviewee no. 004**

Participant 004 is an engineering student from Vanderbilt University. This student is a current senior who has spent significant time working in the tech industry and is adept at detailing the technical aspects of the software he is using. This student is currently dealing with the online learning environment and has specific opinions that are relevant.

Participant 004 thoroughly enjoyed the chat aspect of the classroom before and after class when in the in-person environment. That is something that this student has missed, and they feel that it has impacted their relationship with other students in the classroom. The student doesn't feel comfortable using the chat feature within Zoom because of fear of privacy issues within zoom and the possibility of the professor being able to view all of the commentary. Similar to other students interviewed, participant 004 felt that breakout rooms were hit or miss, and had often had very awkward interactions within the breakout rooms. This student prefers to have classes recorded because they use it as their primary study tool. This allows them to work through the material at their own pace and pause, rewind, and fast forward as necessary.

This conversation ventured into anonymity in the classroom and how it has the potential to limit social anxiety if a student doesn't have their name attached to comments made. Participant 004 then responded that this may enter into the "danger zone" of comments because you have no responsibility for what you're saying. It was important for us to remember that even in trying to limit social anxiety, we should also be aware that there has to be some medium for accountability.

The most impactful story that this congenial student told me was about a specific time when they were placed in a breakout room with other individuals who had their screens turned off. He worked to start an interaction but was instead met with muted audio and blank screens. This seemed to be a common experience for students but is still an interesting idea that should be addressed.

### **Interviewee no. 005**

Student 005 is a senior at Texas A&M University. She is a premed student and is majoring in Spanish. This semester student 005 has been going through the struggle of being a new transfer student (she used to attend The University of Mississippi), along with the impact that Covid-19 has had on her health ever since contracting the virus in early September.

Student 005 has found it hard to focus during online class environments. During synchronous classes, she finds herself often browsing the internet on different windows, whether it's going through social media, reading her emails, or working on other coursework. However, if she ever misses something or needs help, she tends to not stay in touch with classmates that she is not already friends with. She does attend virtual office hours if she needs to receive help with an assignment or course material. On another note, in her asynchronous classes she finds herself constantly behind and needing to catch-up.

One time, student 005 was attending a live Zoom lecture and had to call her dad. She dialed and had an in-depth conversation with him, all while her microphone and video were turned on in Zoom. She was mortified because the entire class had been able to hear her private conversation, and this also signaled to her professor that she was not engaging with the lesson. Another unfortunate event on Zoom happened to her as she was driving to Mississippi with a friend and connected to her Spanish class (via Zoom) from the car. Student 005 found it hard to pay attention because her friend was playing music and she also forgot to put up a Zoom background. Eventually the professor asked her a question and student 005 had no idea what she was being asked about. She expressed having felt anxiety due to a lack of preparation. Moments such as these are the main reason she feels anxious about online classes: “anxiety inside festers from a fear of making myself look bad.”

Our conversation with student 005 uncovered some interesting insights regarding student anxiety and study habits in online environments. She is an outgoing person who likes to stay in touch with friends and also gets distracted easily. To combat this, she shared that she is an active believer of the [Pomodoro method](#) in order to get things done. Also, while student 005 is not necessarily embarrassed about asking questions in lecture, she is definitely deterred from doing so given the “awkwardness” of online lectures: she emphasized that speaking up in live lectures is “just about manners and knowing when is a proper time to interrupt and speak up.” All in all, she has concluded that with in-person settings her anxiety is around a 3 out of 10, but that in virtual classrooms “it is a solid 8.”

### **Interviewee no. 006**

Student 006 is a senior at Carnegie Mellon University majoring in Math. She is currently living near the CMU campus in a house with several friends. She has struggled plenty with enjoying her online educational experience, and expressed a lack of interest in online coursework.

Student 006 often relied on in-person office hours in order to better understand course materials and receive help on assignments. She feels anxiety when using Piazza and Canvas as her sole tutoring aid, given that “trying to communicate and understanding communication purely through words is difficult.” She has gone to office hours via Zoom, only when she’s desperate and Piazza and Canvas were not enough. Student 006 never speaks up in class, and she shared several stories of times when she has chosen re-watching a lecture over asking a question in a live lecture. She claims she “doesn’t want to interrupt the flow and ask a question that could be seen as ‘dumb’ in front of everybody.” Also, she does not message in large class group chats, such as those on Slack or GroupMe, since she would rather message a friend in the class or get help from someone who has already taken the course.

Student 006 did share a number of successful actions that professors have taken in order to increase student participation in online courses. One of her instructors had the class change their nicknames in both Zoom and their class’ grading scoreboard, so

everyone's names were something unique and special. Student 006 thinks this was "pretty cool," and she chose the name of her favorite artist, Benito (Bad Bunny). In addition, she likes it when professors make use of the Zoom "Go faster" or "Go slower" buttons, since it is a semblance of student-teacher interaction.

### **Interviewee no. 007**

Participant 007 is a current senior at the University of Oregon. They have yet to begin classes as the University of Oregon was set to begin classes on the 28th of September. Participant 007 was still accustomed to distance learning from the Spring term of the 2019-2020 academic year. This participant has large opinions about the online learning environment and has felt personally disenfranchised from the experience.

Participant 007 has felt severely frustrated with their experience in office hours. The student has specifically felt troubled by other students showing up to office hours asking about the entirety of the homework, and the CAs being significantly overwhelmed, such that they can't properly conduct a feasible office hour environment. Participant 007 said the wait times were atrocious and for complex problems it was difficult to receive insightful aid. Participant 007 also mentioned the difficulty found within breakout rooms. Some breakout groups performed significantly better than others mostly because of the students present in the group. Various breakout rooms could be found with all students muted and no cameras on. There was no interaction within these breakout rooms and this was severely frustrating to participant 007. On the other end of the spectrum, participant 007 found that solid breakout groups could be formed and be rather productive. Participant 007 found that the groups that performed better generally included people that participant 007 had known before the class began. One key here is that knowing the other members of the breakout group significantly impacted the likelihood that the students had a good experience, according to participant 007.

Many of the quotes from participant 007 revolved around the fact that office hours were horrendously managed, and that breakout groups were variable depending on the students within that group. One insightful comment from participant 007 was that there was so much uncertainty about what was actually going on within the breakout rooms. Many professors had simply stated that they should discuss the current topic without any prompting questions. Another insightful comment was about how problematic certain professors Canvas pages are to navigate. In some classes, it is impossible to find the notes, slides, or other necessary material, so sometimes the student instead chooses not to do the reading because it's already so difficult to find.

Participant 007 detailed a specific experience about the small classroom environment in a language classroom. Even though online, the students had spent multiple years together (as it is a small department and small class sizes where the cohort moves through the courses together) in the in-person format. This meant that when joining the lecture, people already had a general idea about each other, and in the breakout sessions it was much easier to communicate with each other because they had spent time together prior to the online environment. Another compelling story from participant

007 was detailed previously in their poor office hours experience. In summary, participant 007 went to office hours with a simple question, but the CA was overburdened by students wanting to relentlessly ask questions, almost in hopes that the CA would guide them through the entire homework.

### **Interviewee no. 008**

Participant 008 is an advanced placement chemistry teacher at a high school in Oregon. They have worked for twenty plus years in high schools teaching a variety of classes. This teacher is also working toward their Ph.D. so they have experience as both the online learner and online teacher. This teacher is also exceptionally relevant because teaching the sciences, and more specifically lab based classes, would be exponentially more difficult than lecture based classes, so it is important to hear their perspective.

Participant 008 gave many interesting comments surrounding the use of Zoom and Canvas. This teacher also mentioned significant details about lab usage in the online learning environment. One point was that in order to do a lab successfully, this teacher would have to go to the lab, record the full lab from multiple angles, edit the video, then create questions and instructions for the students. The participant said this turned a 2 hour lab into a 16 hour preparation, video-making experience. Thankfully this teacher is technologically savvy, but for other teachers this wouldn't even be possible without significant training and purchasing new equipment. This participant detailed the lack of interoperability with chemistry symbols between different web browsers and online systems (ie from MS Word, to Google Drive, to Canvas). The teacher talked about the difficulty in making Canvas quizzes. The autograding is a nice feature but the GUI is atrocious in terms of capabilities to actually design and create a good quiz. Then, with respect to Zoom, this teacher described many challenges in breakout rooms, interactions, and "Zoom purgatory". Breakout rooms are great for small discussions but the key is that the students actually use it to discuss. This also corresponds directly with interactions. This participant explained how it is so difficult to interact with students and have them interact with the class when they are muted and have their video off. You have no idea if the student is even on the other end of the screen. Now on a different note, this teacher explained something they liked to call "Zoom purgatory". This is where a student is unfortunately dropped from the zoom meeting for a variety of reasons (wifi connectivity, device dies, etc) and then when they try to sign back in, they must wait in the Zoom waiting room. This is a great tool to keep out people who aren't students because the teacher has full authority over who can enter the room. But for students who are dropped from the meeting, they must then wait for the teacher to notice they are in the waiting room before re-entering the room.

Participant 008 mentioned how students who have their wifi drop out midway through class enter into "zoom purgatory". This is because each classroom is required to have a password and waiting room as determined by the school district, so a student trying to reconnect must put in the password and then wait for the teacher to move them out of the waiting room. This means that a student not only misses valuable time while they wait

to be noticed by the teacher, but the teacher is also seriously distracted while trying to help the singular student sign back into the classroom.

### **Interviewee no. 009**

Participant 009 is a high school language teacher who has over 20 years of experience in the classroom. They are not the most technologically adept, and so they offer an interesting perspective from other participants who have a better understanding of the technology being used.

This teacher requires that students have their cameras on and they have mentioned that it does increase positive interactions in the classroom. This teacher has a very interesting way to use the whiteboards as well. Because they have almost all of their students with their cameras on, this participant has a larger desire to use gallery mode because they value the visual feedback from their students. So this teacher often uses the Zoom whiteboard feature or screen sharing to teach students, but she finds that this then restricts her ability to use gallery mode. Because Zoom whiteboards and screen sharing reduce your gallery view to a panel view, this teacher often resolves to using a physical whiteboard. This teacher also mentioned significant difficulty navigating between zoom breakout rooms. The participant said it may take 10 or more seconds to move between rooms which is wasted time, and they wish they could have a feature to more seamlessly move between breakout rooms. Another key feature of Zoom that this teacher adores is the universal broadcasting to breakout rooms, although they do wish that the broadcasting could be more permanent for the students.

One insightful comment this participant made was that many students don't "show up ready to learn". When attending in person school, you must show up reasonably dressed, and sit in a physical desk away from your bed, most often facing the teacher. In the online classrooms, many students show up in pajamas, without showering, and watch class while they lay in bed. This isn't conducive to a productive learning environment.

### **Interviewee no. 010**

Participant 010 is a newly graduated history/english professor at an Oregon high school. This teacher offers a different perspective from other teachers because this participant is significantly younger, fresh out of college, and has much less experience in the standard classroom manner in-person. This teacher has also worked very hard to attend to the needs of socially anxious students and has had no requirements on camera/audio use. Instead the students have full choice in their camera use.

This teacher mentioned that the majority of the questions they received came from student emails. Participant 010 found that students would never click the raise hand feature in the participants tab of Zoom but instead wait for the end of class to ask their question. It is difficult because students often share questions, and these students are more afraid of interrupting or speaking up. This often means the teachers will have to answer similar questions multiple times for the different students. Another important note that participant 010 described was the difficulty in making Canvas lessons. Generally,

when you want the students to write something, you ask them to get out a piece of paper and have them write something down. Now, you must prepare the transition for the students to start writing on a different document, get a Canvas submission in place (to make sure they actually did it), and be prepared for the students to randomly drop off from the call because they don't find it relevant. One note that the teacher wanted to make explicit was that they felt online learning "is awful" and they are severely frustrated with Canvas's lack of documentation and worthy tutorials. It is quite difficult to get a good Canvas page up and running, then maintain it, and have it effective for students. Also there is no repository for the full functionality of Canvas from what this teacher knew.

Classroom management is easy because there is no classroom to manage. Instead of the students who would shoot rubber bands at each other, or chit chat in the back of the class, they have no ability to interact physically. This is nice that the teachers don't have to worry about the physical piece that comes with being in a classroom, but it comes to significant detriment to the students not being able to interact at all, and the teacher not getting any direct interaction with students as well. This teacher has had significant issues getting the students to turn on their cameras by choice and actively engage with the other students in the classroom. This teacher has detailed personal problems in working with a small class where nobody has their camera on, and nobody wants to answer the question posed. It is a very difficult environment to try and foster a community as well as actually educate these students.

### **Interviewee no. 011**

Participant 011 is a freshman at Stanford from Vancouver, Canada and is living on campus. Her first experience at Stanford is a stark contrast from the typical freshman dorm community and energy and living in evgr-a has not provided a warm welcome to new college students.

She initially had some shock as to how Stanford conducts online classes, and the lack of support from her teachers and professors has been extremely disappointing. None of her classes use Piazza, and the only way that she can ask questions is in office hours or by email. However, everyone goes to office hours, and the prof can't manage 40+ kids in OH - she says "it just turns into lecture". About Zoom in general, she feels an obvious distance from her peers from her computer screen and the attempts made to turn class back to normal aren't very effective. She commented, "you never want to open up to someone you're never gonna see in person". Especially in Frosh 101, a small in-person class that was meant to allow international students to keep their visas has turned to Zoom, and she has found it difficult to take activities like meditation seriously. She also "doesn't want to hop on another zoom call to talk about feelings."

She does struggle with social anxiety slightly and that has only been heightened over Zoom. Not being able to read a room and people's energies has had a huge impact, "when there's 40 other students, you don't know how they took what you said." While she tries to ask questions in the chat, those aren't answered or even seen during a time where that would make sense. At the same time though, she feels that maybe people

with social anxiety would benefit since they can focus on school, rather than social interactions with their peers.

She is quite content with her small, discussion-based classes like French. The professor has structured activities even for breakout rooms and everyone is engaged. This cannot be said, however, for her math class, which is lecture-based. It is a lot harder for her to stay engaged, and not having much support or practice problems available has been a huge transition from high school.

Finally, social interaction has been quite a challenge in the Stanford grad housing. She mentioned that she “doesn’t even know her neighbors or any of the RAs on the floor”. One time, when she was sitting outside socially distanced with her friends, a stranger took a picture, likely with the intent of “snitching” on them.

### **Interviewee no. 012**

Participant 012 is a freshman at MIT, though he is currently attending online classes from his home in Seattle, WA. While he finished his last semester of high school online, transitioning into university has been lackluster and unexciting, especially socially.

He is quite apathetic about school, going on to say that he doesn’t care about classes very much and has found it incredibly unmotivating. Zoom classes are often attended without videos and audio turned off, and if Zoom goes into breakout rooms, he immediately leaves. He has also said that asynchronous lectures are hard to stay on top of, and yet having recorded lectures available is even less of a reason to attend live lectures. He is taking many core classes with almost the entire freshman class, and some of them assign pset buddies each week. Where this could be a place to get to know a peer, they change every week and this has been frustrating for him since most students end up working on them on their own and only coming together as a formality. He has, however, found that the infrastructure itself for online learning has been quite good, and he notes that this may be because MIT has already had MOOC frameworks. Additionally, having received ipads from the school, taking tests and notes has been seamless and a great improvement from the high school learning environment. While he would like to work with friends, he says “it requires 10x more effort to work with other people” and “sometimes it’s just easier to work by yourself”. One key insight was the way students help each other online. All classes are using Discord, and if he is working on a pset several hours before the deadline, students will be online. He will join a channel where one person is available and they would try to answer any of the other questions that he had. They would then work together, and when the other student leaves, our student works by himself while still on the Discord channel. When another student comes in, they start a conversation and he tries to answer any questions that they have. This unstructured, unproctored passing down of knowledge is very common for all classes and some of it exists, he said, “because a lot of people already use Discord”.

### **Interviewee no. 013**

Student 013 is a freshman at San Diego State University. She is originally from Texas and even though living in the SDSU dorms was optional, she chose to do so because she wanted to maximize her chance to meet people during her first year of college. Overall, she is doing well with her mental health but kept repeating the word “frustrating” when describing her first month as a university student.

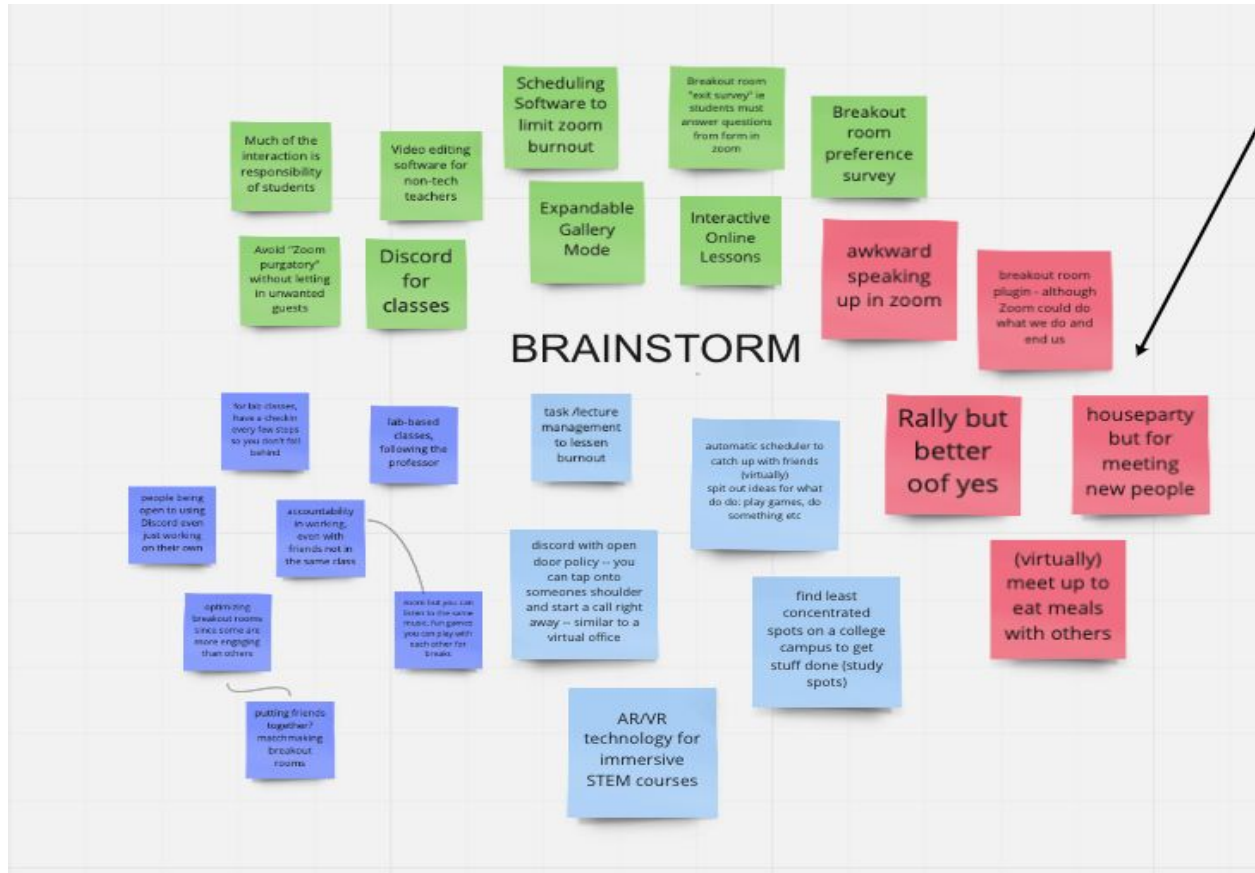
Interestingly, some of student 013’s courses were in-person at the beginning of the semester. However, given the rise of on- and near-campus Covid-19 cases, the university decided to move all of its courses to an online format. She typically speaks up in her small Zoom classes (those of around five or ten students) but almost never speaks up in large Zoom lectures (those of around 150 students). When she does speak up or ask questions, she does it with the hope to get the lesson moving and finish the lesson faster. She expressed having “Zoom burnout” from back-to-back-to-back lectures, especially since the entire time you are expected to be engaged in front of your screen. The burnout is exacerbated by professors seeming to lack empathy, since she feels that instructors (falsely) believe that students have extra free time in online education and thus assign a large load of homework. She feels that assignments have a fast turn-around and that she has no days off; this may be a factor of transitioning from high school to college, but nonetheless she expressed a desire for professors to understand that students can get drained with online school. Student 013 has found herself worrying about her dorm’s WiFi connection, constantly missing meals, suffering from headaches, and feeling overwhelmed.

One thing that she has enjoyed is getting to know people in the few in-person settings she has access to: on her dorm floor, in a group she joined named *Women in Science & Engineering*, and while attending church. It’s hard to make friends in virtual settings, so student 013 has spent most of her social time with the friends she’s made in person: they walk around and get to know their campus, drive around San Diego, and often eat together. However, awkward social interactions still abound. She shared a story about a time when she was walking around campus and made eye contact with a girl she had met over Zoom. Even though it was clear that they had both recognized the other, neither made a move to acknowledge the other. Again, student 013 felt “frustration because [she] wants to be talkative but it’s hard” to do so.

Starting the university experience during the pandemic has definitely been hard on the freshmen. They are torn between avoiding awkward Zoom settings and wanting to make new friends during their first year. In Zoom breakout rooms, student 013 “tends to be the most vocal in breakout rooms and get at least some names to get the task going.” However she also tends to “feel ignored if someone has no camera and microphone,” which is quite common. Finding ways for the freshmen to get acclimated with every facet of college, both social and academic, should be a priority of universities.







[https://miro.com/app/board/o9J\\_kk8zHys/](https://miro.com/app/board/o9J_kk8zHys/)

## Summary

### Key Insights

A key insight that our interviews highlighted was the lack of student engagement in online lectures and classrooms. It is very easy to turn the camera and microphone off in Zoom and disengage from lectures, as well as dropping off from the call to avoid entering a breakout room. Also, different students have distinct modes of interaction on Zoom: some are afraid of speaking in front of audiences while some may not pay attention and would rather stay quiet. Unfortunately, Zoom gives lectures a very transactional dynamic: students log on, instructors give a lesson, and then students are expected to complete assignments based on the lesson topics. There's no hand-raising or easy interaction with classmates sitting near you, as in a physical lecture hall. This "transaction" lends itself to students being able to attend lectures without needing to give anything in return – in this case, engaging real-time with the instructor and their classmates.

Another important insight from our interviews with teachers showed the lack of functionality present in Zoom. Some teachers wish that they had a better way to poll students outside of a one question poll while everybody is in the main room. Some wish they had an expandable gallery view, instead of being limited to the five person panel, when using the Zoom whiteboard or screen sharing. Another interviewee mentioned that Zoom lacks fluent movement between breakout rooms for the teachers, which is time wasted. There is also difficulty for students who have poor internet connectivity, where they may be constantly waiting to be brought in from the waiting room by teachers. This variety of problems present with Zoom helped us come to the conclusion that Zoom was meant for meetings and hasn't been designed specifically for classroom, teacher-to-student interaction.

Alongside these, we talked at length about the difficulty present in lab classes. How is it that teachers are supposed to conduct proper science experiments when students don't have access to the materials, and the teachers are required to use recordings. What is a non-technically savvy teacher expected to do. It is not likely that a teacher without reasonable technical knowledge could be expected to record (with multiple angles), edit the video, and then post to an accessible place, in order to have one successful lab. This entire process is lengthy and time-consuming, yet teachers are now expected to do this for every lab they have in their lesson plans.

Finally, a key insight was the unstructured work sessions culture on Discord. There is a huge opportunity there for people to work together but not many people seem to use it.

The chain of people helping one another and passing down knowledge is obviously prevalent in person and very organic. Discord channels seem to come close; no awkward scheduling times across different time zones or communication necessary. This is something that Nooks is attempting to do, but it seems like only office hours are using it, and it's not a student gathering place. It seems like someone or something needs to get the ball rolling, once there's a network of students working on Discord, others will flock to it.