

**Episode 10 – Zipline DC2122**  
**Podcast Transcript**

Susannah Howe: Welcome to the Design Clinic Download. In this podcast, we dig into the experiences of Design Clinic teams and classmates through the years. I'm your host, Susannah Howe, from the Picker Engineering Program at Smith College.

This episode features four alums from the Class of 2022: Kirsten Appell, Kalyani Weiss, Harriet Wright, and Sophie Yates. Their Design Clinic project with Zipline was on the design of an anti-icing solution for Zipline's unmanned aircraft.

So I'm just delighted to have all of you here with me today talking about your experiences since graduating this past May. And you are the 19th class to graduate from Design Clinic, and it's really exciting to hear about what's happened with you as you go forward into life after Smith.

So I thought we might start by having you each introduce yourselves and talk about what you've been doing since graduation.

Sophie Yates: My name is Sophie Yates and after graduation last spring, I lived in Colorado for a summer and explored the Rockies, spent a lot of time outside. And then I moved five minutes down the road from Smith and started work as a mechanical design engineer in Holyoke. The company I work for, it was through a connection through Susannah, actually at Cofab Design. And we do physical prototyping and physical product design of all sorts of things, including medical devices as well as consumer products, full range of physical prototyping.

Harriet Wright: My name is Harriet and after graduation, I went to Seattle for a little bit where I grew up, and then I joined a company called SLR where we're... It's an environmental consulting company and so I am a civil engineer for them, but mostly what I do is actually a lot of field work. So I'm in the field looking at streams. We do a lot of old mill demolitions and so that's in Hartford, Connecticut. But I actually work... I live in Hartford, but I work in the Springfield office and I'm all up and down the Pioneer Valley and upper Connecticut regions looking at old textile mills primarily. So I'm kind of just running around in the woods all day, taking lots of pictures and notes and I've really enjoyed it so far.

Kalyani Weiss: Hi everybody. I am Kalyani Weiss and after graduating I spent the summer traveling and having fun for a little bit before in September I started work with Boeing commercial airplanes. So I moved to Seattle, Washington and I work on the seat electrical integration team. So basically what I do is I work with seat suppliers and with airline customers to determine what sort of electrical options they want for their passenger seats and then work to get those integrated onto the actual airplane.

Kirsten Appell: My name is Kirsten Appell. I almost immediately started working for a company called ASML, which you've probably never heard of, but it is part of the semiconductor industry and is behind making the machines that make computer

chips. I am a mechanical engineer. I work on the EXE 5000 project, which is ASML's newest lithography system. Primarily I work as a mechanical designer, but I've also been doing a lot of the integration work for making the very first of these systems.

Susannah Howe: All right. So let's take it back to last year when you guys were all working together on a project in Design Clinic. And why don't we have one or all of you to collectively talk about what the project was? What was the title, who was the sponsor, what did you do for it?

Harriet Wright: So we worked with a company called Zipline, and they were originally a startup company, but then they've really grown, especially while we were working with them. And they're a company that does drone delivery of different products and services, and we are primarily working on creating an anti-icing technology or system to help do drone deliveries during high icing condition flights.

Kirsten Appell: Quick summary of icing is basically if you're flying in cold temperatures with a lot of humidity, ice will start to build up along the critical surfaces of your aircraft. So the wings, your nose, fins, or rudders, anything like that, but particularly the wings. And when you build up ice on the wings, it changes the shape of the air foil and the shape of the air foil is critical to keeping the forces that are acting on your plane in balance. So if they start to change wildly due to something building up on them, your plane will no longer stay in the air. So that's why keeping ice off is so critical. And it's why Zipline was asking us to do this project.

Susannah Howe: Let's talk about what your expectations were coming into Design Clinic and how did the reality match those expectations?

Kalyani Weiss: One thing definitely that surprised me about Design Clinic was just how open-ended the project ended up being. We kind of just got thrown into this huge project and they were like, "Okay, here's something we need. You've got a year, give us something."

And we spent, honestly the first two months just trying to figure out what it is that we were supposed to do, what we wanted to accomplish, what we thought was feasible for a full year. That was a really cool experience because I had expected Susannah and the rest of the DCTT [Design Clinic Teaching Team] to kind of tell us, "here's what it is that you need to accomplish. Here's some deadlines" or whatever. But it was really mostly on us to figure out what it was that we wanted to do on our own. I thought that was cool.

Harriet Wright: My biggest expectation going into the class was a little biased by some of my peers that were not at Smith because the traditional capstone idea in my head is kind of a little project that doesn't actually have a lot of real world applications or it's very hypothetical or it's kind of something that a company will send off and it's not this intensive process and it's kind of a thing for students to do to get company connections. And I kind of assumed Smith would be like that. And then we started and then I realized it was actually a very real project with a very real company with

very real deliverables and deadlines and expectations. And I think my headspace going into it was kind of like I wasn't expecting this to be such a real, quote unquote real experience. But instead it just was so real and so important and I just really, I felt like we were part of the company and working with the company and I just really was not expecting that in our project.

Sophie Yates: I guess something I didn't expect, kind of the opposite of your question. Something I didn't expect was the way we were treated by Zipline as just another one of their teams and that we were just considered in their mechanical engineering orbit. And the connection with our liaisons was very much just like, "You're a team, you know what you're up to, let us know at our weekly check-ins," but not a lot of micromanaging from them and a lot of trust of, "You know what you're up to, where you're going."

It was very cool to have such ownership over a project and have such trust and kind of elevating us to the point of we were engineers at that company. And although we were in this semi-internship kind of role, it was very much a fun way to experience that level of responsibility and understanding of the engineering space that their company was operating within.

Susannah Howe: That's a great segue into thinking about you transitioning to life after Smith, and I'd love to hear you talk about what skills you learned in Design Clinic that you've already started to use since graduating. What have you found has transferred from your Design Clinic and your Zipline experience to your life after Smith?

Kirsten Appell: Definitely the project leadership. The ability to look at a very open-ended project that I don't really know how to solve. I don't have a roadmap. The things that I'm working on now in industry, I'm not necessarily given a roadmap. I'm given a goal and I in many cases need to figure out my own roadmap to get there. And that was exactly the way Design Clinic was.

Sophie Yates: I definitely know the project management skills and the developing Gantt charts and timing of projects and pacing, that's all been very direct. And in my position, I'm very self-directed, self-managed. So all the skills of knowing how to manage my own time and my own project work and then bringing it back to a bigger team has really been a direct correlation from Design Clinic where once we took ownership of our small part of the team project, we were self-directed. So a lot of that similar time management skills.

Kalyani Weiss: So much transfer, more than I expected, to be honest. My degree is not in electrical engineering. I just have a general engineering degree and even my technical depths, I was not really focused on electrical engineering. So when I got this job, I had a moment of panic. I was like, "Oh my God, what am I going to do? I'm not qualified for this. I'm not an electrical engineer."

But then I took a step back and I remembered, "Well, hold on. I just spent an entire year working on developing anti-icing solutions for drones." This was something that

a year ago I'd never even heard of. I didn't even know that this was a thing. And yet I was able to actually spend this year figuring out what we were doing with this team and coming up with legitimate solutions by the end of it. And so going into this job knowing, "Okay, maybe I don't have a lot of experience in electrical engineering specifically, but I know how to take on a problem. I know how to think about these things. I know how to start from the beginning, self-learn, self-teach, and kind of figure it out as I'm going."

That was a huge confidence booster for me and so far, at least it's been true. I more or less know what I'm doing at my job.

Harriet Wright: Something that Design Clinic really taught me was kind of how to interact with coworkers and peers that are your age and whatnot, but in a coworker setting. And so it was a very hard skill for me to learn during Design Clinic, but now I feel like it has really helped me in my career so far.

Kalyani Weiss: I'm just so grateful that we learned how to talk to different stakeholders, how to understand design requirements and how to communicate those requirements to engineers, but also to non-engineers. Because all of that has just been huge for my success in my job.

Susannah Howe: So what would you say was your most memorable or impactful Design Clinic experience?

Harriet Wright: I can dive into what may be an obvious one for those that know our Zipline project, but our team did end up going to North Dakota to an icing facility. It was just so memorable because we were in this... It was in February and it was very cold and we were in North Dakota. And at least for me, one of the most memorable things was we took turns driving with our liaison. We really got to talk to her about her work and her life and her kind of passions and what she's up to and how Zipline is for her. And we pulled crazy hours in North Dakota. We worked a ton, but it was a really memorable kind of 30-minute drive with her, back with our liaison back and forth from where we were staying to where the facility was. That was just a very memorable time for me.

Sophie Yates: I agree with Harriet that there's a lot to be said about our North Dakota experience and adventure perhaps, but I think part of it for us was learning both the independence allowed in particularly Design Clinic and with the company we were partnered with. They were very self-directed teams and independent teams. So we showed up at this facility with a few of our own experiments as well as with kind of, I don't know, the hope or the expectation that they might tell us experiments they wanted us to help with. And instead they very much were like, "Cool, what do you want to do here? What do you want to do while you're in this space?"

And left us to experience what we needed to get out of our research and experience their research that they were ongoing at that facility in a very direct way.

- Kalyani Weiss: Yeah. I mean, North Dakota was a huge one for us because that was sort of a culmination of a whole bunch of work for us getting to actually show it to our liaisons, try it out on the actual... The drones were called zips, so trying things out on the zips. It was the middle of the night and it had finally started snowing, and so we all jumped up as quickly as possible, try and get the zips loaded up to start flying them in the snow before it went away. Just that energy was... It's almost indescribable. It was just a really cool moment.
- Harriet Wright: We had a really, really good time together as a team. I think it just was a great team and we just laughed and had an awesome time often.
- Sophie Yates: I think a different angle of funny moments was in our lab we did a lot of what some might call wet testing, we might call ice testing, of our various designs that we were trying to use in the field but didn't have access to icing conditions all the time. We had a lab setup that included a lot of buckets on shelves full of ice water combined with some gravity principles to get a really nice icing condition in a freezer. And just the series of contraptions that had to exist at any given time to make our experimental setup work. It was definitely... got many laughs and many moments of, "Oh my gosh, what on earth are we doing here?"
- Kirsten Appell: So we spent a good portion of the year scavenging the school for spare freezers with which to do our experiments, and we ended up getting ones that were on loan from various departments, one of which came from the biology lab. A biology lab, not sure which one. And they brought it over, they put it in our lab, cool. Turned it on, went to open it, and there was a package in there and it was labeled "mosquitoes". And I'm so incredibly glad that they were frozen. I remember looking at it and just closing the freezer and then cracking up.
- Susannah Howe: So with the benefit of hindsight, how do you see Design Clinic fitting into your overall engineering experience at Smith?
- Harriet Wright: I see Design Clinic fitting in very... as a very pivotal moment for me. I think a lot of it is because when we were at Smith and through school, most of our degree was during COVID, so a lot of remote classes, a lot of challenges with learning. Starting my senior year, we're back in person. I'm doing Design Clinic, I'm working with this fantastic team on this really interesting project. It just really confirmed that my choice to kind of push through a lot of the challenges that I had during COVID and during remote school to get the BS [degree] and continue on with the capstone course was absolutely worth it.
- Sophie Yates: I think that Design Clinic really fulfilled truly what a capstone should be. And I started at Smith with the goal to be an engineering student. I came in first day of first year and went and sat through Dr. Guswa's talk where they told you what the classes you were going to take were and Design Clinic was that block on the bottom of the paper that was "senior year: Design Clinic".

And so to kind of fulfill that arc through COVID a lot of things that were unexpected, but to fulfill that arc and go all the way through Design Clinic, really it capped it off. It was a lot of the skills I had learned in technical depths classes. It was a lot of passions that I didn't know I had in engineering and then suddenly realized that I was really passionate about, and it was a lot of that confidence building like Kalyani said, and just this culmination of all of the various tools and things I had picked up along the way over those four years to fill up the end of the arc, the end of the undergraduate career.

**Kalyani Weiss:** Throughout our engineering degree, I feel like we learn a lot of skills and we have them in all these random buckets floating in our head. We've learned how to present, we've learned how to do a... balance an equation. We know how to do all of these random things. But then we get into Design Clinic and that's when it actually all comes together and we're able to put those things into something real and something concrete, and we're able to learn how all of those skills work together. It's not just, "Oh, I can do this thing and I can also do this thing." It's, "I can do these things together and use them to create a final product and to present that final product and to communicate that final product," and all of those things working together. I guess that's what Design Clinic was for me. It was the integration of everything that we had learned in our previous three years.

**Kirsten Appell:** It definitely pulled everything together and also forced us in new directions, and I'm really grateful that we got the chance to do that. Those are the kind of projects that I'm working on now, projects that require everything. That's what your job is.

**Susannah Howe:** So what advice do you have for future Design Clinic students to make the most of their experience, especially as you have just made the transition yourselves to the world after college?

**Harriet Wright:** I would say definitely learning how to keep your things organized, your documents and your reports and your papers and your folders and your photographs. There's just so much organizing that you have to do in order to stay on top of your projects and your work and your assignments.

**Kalyani Weiss:** I think I would just like to reiterate again how important learning those soft skills are, and I think Design Clinic is a really great place to be able to do that. Learning how to communicate, learning how to talk to different groups of people, different types of stakeholders, learning what to share and what to hold back and how to do that ethically. And I guess also learning how to write, learning how to present. All of these are really, really important skills and in your career, a lot of times that's going to get you noticed. It's just really important to have those skills and being able to develop those skills while still in college puts you at an advantage compared to your other peers who are just starting out their careers. So definitely take advantage of the opportunity to learn those things.

**Kirsten Appell:** Don't be afraid to manipulate the project into what works for you. Limit it or take it in a new direction or go to your liaisons and say, "Hey, this avenue isn't working for us. Can we explore this instead? Or can we do this thing?" Chances are they're going

to be open to it. They want you guys to learn as much as you want to learn, and they want you to have fun with it, so make it fun.

Sophie Yates: I think my advice maybe is that Design Clinic is very important and very consuming, but it's important to recognize that it's not everything as a senior in that you need to have space for all the other fun, goofy things you do as a senior. And Smith is such a special place to be a student at. So recognizing how special that is and how special it is to enjoy all those other things that go along with being a senior and particularly a senior in the engineering program. It's a lot of other opportunities that coexist.

Susannah Howe: Excellent advice. Anything else you want to share? Any other things you haven't had a chance to bring up that you want to make sure we capture?

Sophie Yates: I think just generally, I'm very grateful for the experience and recognizing a year out how a lot of those memories of stress and it's not going to be done on time. Those feelings have faded. And just the general positive moments, the goofy moments, and the feeling of gratefulness of... I was very fortunate to have this experience and I'm very grateful for your guidance through this experience and continually into the workforce that you're so active with connecting with us and connecting with all your past alums. So yeah, just grateful to be part of this community now and continually.

Harriet Wright: Having this deep community and deep sense of belonging. Even if I don't know exactly what job I want to have forever still, I know that I still belong to this team of engineers and this community of engineers and I'm really am really so grateful for that.

Susannah Howe: Yeah. And I am so appreciative of you being part of this community because it is alums like you that help keep it going and keep it supportive, and it makes such a difference for the current students to have the connections with the alums and for you as new alums to have connections with older alums. I think that for me is what has made my job so rewarding over the past 20 years is building this community and being able to be a part of this community and learning from and giving to and growing with the community. So thank you so much for all of your contributions so far, and I know your continued contributions in the years to come, but a special thanks for being part of this podcast and sharing your experiences. Thank you guys so much.

Harriet Wright: Yeah, thank you.

Kalyani Weiss: It's so good to see you. Thank you.

Susannah Howe: Thank you. Bye.

Sophie Yates: Bye.