

**Episode 11 – Susannah Howe, Design Clinic Director
Podcast Transcript**

- Harriet Wright: Welcome to the Design Clinic Download. In this podcast, we dig into the experience of Design Clinic teams and classmates through the years.
- Sophie Yates: I'm your host, Sophie Yates, and that's Harriet Wright. We are both graduates of the Picker Engineering Program at Smith College. In this bonus episode, we are interviewing Professor Susannah Howe, who has been the fearless leader of the Smith capstone experience since 2003.
- Harriet Wright: We wanted to start with commending you on your amazing work with Smith, and thanking you for the time and energy you've spent to develop the capstone course with the Picker Engineering Program. Welcome.
- Susannah Howe: Thanks so much for having me. I'm really excited to be here.
- Harriet Wright: For those that don't know, Susannah has spent the past few months interviewing alums from the class of 2005 through the class of 2022. So now we're turning the mic on her and having her answer some questions. So maybe Susannah, in your own words, how would you describe Design Clinic?
- Susannah Howe: This is a capstone course in the engineering program at Smith where students collaborate in teams on projects sponsored by industry and government. And the idea is for students to work as interning, practicing engineers, working with practicing engineers and designing something, and they're designing something for a client and for a sponsor who actually is invested in the outcome of whatever they design, is invested in their education. And they're supported throughout by liaisons from the sponsoring company, sponsoring organization, and also from faculty at Smith. I've often said that when students come in, they take engineering 100, which is the intro class, and Design Clinic serves as the outro class and helps get students ready for life after Smith, wherever that takes them.
- Sophie Yates: I was wondering if you could paint a picture, what was going through your head when you were asked to join the faculty and create this capstone course. What was that like for you?
- Susannah Howe: Daunting and exhilarating. I really was excited about Smith's new engineering program. I was pretty certain that I didn't want to be at a large research university, that I wanted to be at a smaller institution where I could really get to know students well. I wanted to be at the interface between academia and industry with my engineering experience, and this seemed like a really great opportunity. I had no idea what I was getting myself into, but I knew that I wanted to be at Smith if possible. My husband had a tenure track position here in Computer Science, and so we moved to the Valley for that. I had been adjuncting at UMass, which was a good experience in many ways, but wasn't

what I wanted to do, and I think I hit the jackpot really in getting to have this opportunity at Smith. But the capstone course hadn't happened yet because I came in with the first group of seniors, so there wasn't a model to look to.

And I had had my own capstone experiences, both in undergrad and as a grad student, both of which were good for some elements, but more taught me what I didn't want to do in teaching a capstone course than what I did want to do. So I had a lot of learning to do early on in terms of structuring this course and making this experience work. Well, one thing I'll note is that the summer before I started, I went to Harvey Mudd College out in California and visited the folks in their capstone. In fact, they call theirs Engineering Clinic, and the word Clinic comes from them because their founding director probably about 40, 50 years ago at this point, wanted to create a clinical type experience for their engineering students comparable to what medical students get when they have a clinical experience or law students to help get them ready for their practice.

And so I went and visited Harvey Mudd because they were sort of the grandfather of this kind of capstone course, visited for two days and met lots of all the people associated with their capstone and talked with them and toured their facilities and came back and thought, okay, what of these elements do I want to then incorporate here in this Smith program? And I've actually stayed in touch with the folks at Harvey Mudd over the years, and it's been really fun. And now I'm one of the educators who's been in the capstone world for a long time. I'm one of the people who's now helping to talk with other new programs as they're starting and think through their capstone. It was scary at the beginning. I really didn't know what it was going to be.

Sophie Yates: You mentioned you knew you wanted to join the Smith program, especially because your husband was already at Smith. What was it about Smith that made you want to join, and are these aspects still around to this day?

Susannah Howe: Yeah, well, I was super excited about an engineering program at a women's college. That was really a powerful draw for me, but also the small size of Smith was really a powerful draw. I mean, I had done my graduate work at Cornell, which is a really large institution I'd been teaching at UMass, which is a really large institution. Things get very siloed. And I was excited about the opportunity to be in a place that was within a smaller subset where there were connections that I could already see across different disciplines. And I was really excited to help start something new. I mean, the program had started, but it hadn't fully launched. They hadn't graduated their first class and being part of building something and shaping something from the beginning, and there was so much energy. I mean, the faculty who came here early on, and even now, but at the very beginning for sure, there was so much excitement about starting this program, and it was a very intentional group of faculty.

You have to be a special kind of person to come to a place like Smith. And so the people who come here want to be at this kind of place because it's the only one

of its kind in the country. And so people knew that this is where they wanted to be. This is the program they wanted to build, and that was really fun. But we were all so young. I must've been 28 I think when I started here. So I had students in my class who were 21. I was barely older than they were. I had done a graduate work, I'd done a postdoc, I'd taught at UMass for a bit, but I was really young and I looked really young. We all did. Most of my colleagues were all pretty similar age. So I think in the beginning we were full of excitement, but we also knew that we had to build credibility with our students and within the institution and then especially nationally. There was definitely some concern that the program would be branded a women's engineering program, and that was not something that any of us wanted.

We were going to come in and we were going to do engineering in a hardcore way. This was not going to be a program that was going to be soft so that women could do it. This is going to be a program that was going to be amazing so that women would really excel in it. And so there were pieces that were tailored toward building community and being inclusive and allowing a lot of different kinds of learning approaches and having women's voices. And over the years, we've seen that shift to women, more minorities, non-gender binary. I mean, we're really a much broader group, but it's really always intended to be very inclusive environment, enabling learners to check in where they need to, where they want to, as opposed to a lockstep cookie cutter curriculum that's trying to weed people out. And that first class, and even the first couple classes really were guinea pigs in a way. And they also helped us shape the program. And they were really contributing to, here are the kinds of things that they wanted to learn, the ways that they wanted to learn. They gave us a lot of feedback, and many of us on the faculty are still really close with alums from those early classes, which is really exciting.

Sophie Yates: Do you think you've noticed a shift in the way sponsors interact with you from when you were trying to build credibility to now being one of those more established clinic programs?

Susannah Howe: Yeah, I think having the 20 year track record has been really powerful, really helpful. At the very beginning when Smith's program was new, there was some buzz about it and hype about it. And so we had some sponsors who were excited to get involved because they also wanted to be part of that hype and make a connection. So that was the very first year or two, and then we had to prove ourselves. We had to prove what our students were able to do. Here we are in this general engineering program as well, so it's not even got specific disciplines. So we had lots of good conversations with CEOs and people fairly high up in their companies who really understood the intent of having a broad foundational engineering degree, a lot of flexibility, close connections with students and faculty, but people at the hiring front lines were looking for six things on a resume, and our students maybe had four or five of those things, and then a whole slew of other things.

But those weren't the things necessarily that HR was looking for. So we had to really build that credibility and build the capabilities of what our students and alums were able to do. So the longer we have been around, the more projects we've done with more different kinds of companies, the more our graduates have gone off and gone into the workplace and thrived and really moved up in their careers, the easier it has been. And so I'd say at this point, there are still people in the country who have not heard of Smith, but not nearly as many as when we first started. And it's much easier, I think now for me to reach out and say, got this engineering program and this track record. Look at all these companies we've worked for. Look at all these things we've done. Here's where our alums are going to graduate school, here's where they're going to work.

Harriet Wright: When Sophie and I joined the Engineering program, you were either just finishing or just about to start your own sabbatical and your own learning process. Would you maybe tell us a little bit about your sabbatical and what that looked like and goals and what you were interested in learning about?

Susannah Howe: Sure. Yeah. I've had two sabbaticals in my 20 years here at Smith, and I've got another one coming up year after next. I've done a variety of things during those times, but two that are particularly relevant to the capstone and to teaching Design Clinic. One is that I spent some time working in industry, working as a consultant, working for a company, working as an engineer. And for me that was really important because I wanted to be immersed in actual practice so that I could make the connections between what I was teaching and what I was having students do and what's actually happening in industry and helping keep my own skills sharp, seeing what kinds of technology people are using, what approaches they're working with, what client relations look like, things like that. So it's interesting because my educational background is in civil engineering (structural materials), but my sabbatical work has largely been in medical devices.

I think partly because I sort of had a sense of what civil work was going to be like, and I thought this is a chance to learn and try something new. So I worked in laparoscopic surgery device design for a while, and I worked with another time, I worked with a consulting firm and was working primarily with medical device clients, and that was really fun. I learned a lot through it. I came in open ears, open brain, open heart, wanting to just get as much out of the experience as I could. And that was really fun. It's fun to be a student again, but also to realize that many of the skills that I had in one domain transfer well to another domain. So that was one piece was spending time working. And then the other piece that I really enjoyed is visiting alums across the country and shadowing them at their workplaces.

So I again, can get to see what's happening in the workplace. So I think between the two sabbaticals, I've probably visited about 50 different companies across the US sometimes with alums, sometimes with other contacts that I have. And I've sat in on meetings and I've been to product reviews, and I've toured

facilities, and I've talked with a lot of different employees about what skills they look for in entry-level engineers. And I can bring all that back to the classroom and say, okay, well, this is what I'm seeing in industry. I'm seeing trends toward this direction or this direction or these approaches in say, project management, and I want to make sure that we capture some of that in the class. So I think for me, it's helped me stay relevant and has helped the class stay relevant, and hopefully it means that the experience that the students have in Design Clinic is really relevant to them for a wide variety of career paths after graduating.

Sophie Yates: Yeah, for sure. And in your travels to all these different companies, in your work with these companies, have you come up with a succinct list of what you're hoping students take away from DC as they make that same jump that you made in your sabbaticals?

Susannah Howe: I'm not sure I can say it's a succinct list. So the overarching thing is there are many, many things that are connected. And really what I want students to learn is how they can make those connections and how they can learn in new settings and be adaptable, be agile, something that you learn in one class, you can translate that to a new setting. So you learn something in a mechanics class and you can apply it to the mechanical engineering thing that you're working on exactly the way you learned it in class or what you learned, but you are able to extract the key pieces of it and then apply it to a completely new setting. And then if you find yourself in a setting where you really don't know what you're working on that you can, that doesn't stymie you, and you think, okay, I am able to go and learn about this topic.

This is a foundational degree. This is not the end all, be all of your learning, and this is getting you the groundwork so that you can then go on to do whatever it is you want to do. So if you want to go into graduate school, this is going to give you the foundation for that. If you want to go into industry, this will give you the foundation for that. If you want to go and do law or medicine or something completely different, you can still draw on this foundation. We have an alum from our first class who was a rabbi for a number of years and can talk so articulately about how the engineering degree applied to their rabbinical practice. Yes, we teach some tools and things, but we're really teaching the process and the ability to learn new things and the recognition that you can't learn everything in college at all, but you can learn how to learn. And if you learn how to learn, then no matter what setting you're put in, you will be able to thrive and adapt and make connections.

Sophie Yates: For sure. You're speaking to a lot of your professional development work and the sabbatical work being in engineering. I was wondering if you've done any professional development work on the educator end, or maybe they're all intertwined?

Susannah Howe: Oh, that's a good question. I'm part of a lot of engineering education conferences, and so that would say less so in my sabbatical, but just more so as

a continuous thing. I've done a variety of different workshops. I've both given papers and read things about other educators so that I can try to do my work the best of my abilities. That's an ongoing professional development. Honestly, just being in this setting and having a chance to teach to the class multiple times. I mean, the class itself repeats every year. The structure is the same, but the experience is different every time. And the projects differ, the clients differ, the students differ. And so I am constantly revising and revamping. I rarely teach the same thing two times in a row the exact same way because I'm always learning from what to do. And so just having had that breadth of history behind me. Also at Smith, I mean, this is a community of faculty who are really dedicated to teaching.

If they weren't, they wouldn't be at an institution like Smith. And so there's a lot of sharing that happens across the faculty. And so I'm learning from my colleagues all the time as well. And most recently, I spent three years halftime in the Class Dean's office. So I was only teaching Design Clinic halftime, which meant that I was supported by two other faculty in the engineering department. And we've had other faculty involved in Design Clinic in various ways over the years, mostly as coaches for the teams. But this time for the past three years, I've been working with Aaron Rubin and Mike Kinsinger, and the three of us were collectively the Design Clinic Teaching Team, working together the whole time. And I learned so much from them. I'd been teaching this course by myself for 17 years and to then have the experience of bringing new people on board and then really co-teaching together and learning from each other and hearing their perspectives and their questions and their suggestions. That was really fun. So that was additional learning

Harriet Wright: Because Design Clinic has been this class that you've taught for so long as students, we never got the chance to really get to know you until we reach the Design Clinic class. So the question is, what lesson brings you the most joy to teach in Design Clinic?

Susannah Howe: There are so many different pieces that I really love doing. I think I always like teaching a new topic the first time, but I'm also really scared whenever I do it. So I always wonder how is this going to land? And have I built up enough rapport with this class of students that I can launch a brand new topic? I like taking a topic that I've taught one way for a while and then completely revamping that. I like incorporating alums and their experiences and perspectives into my teaching, whether that's a case study or working with them on a particular workshop or a approach. I think maybe the topic that I didn't ever expect that I would teach, it didn't seem obviously apparent to me that would come into an engineering design class, but that I've been doing for a long time now, and that I think has had the, at least most vocal feedback from students is this class on negotiation. There was a book that came out early on in my teaching, maybe 2004 or so, called *Women Don't Ask*, and somebody pointed this book out to me and said, why don't we ever learn about this?

And I am not a skilled negotiator myself. I don't have formal training in negotiation, but I had a guest speaker the first time round, and then I sort of put it together in a workshop format. And it's been really fun to learn it through teaching it. And probably a couple of times a year, I hear back from alums who will say, thank you for teaching me this topic because I went out and I negotiated in my job and I got this raise, or I got this piece that I asked for, and I would not have felt empowered to do so had we not had this class. And so I think that's the one I feel really excited about because I never had any classes on this myself. And I think it's really fun to have students have their eyes opened to, Hey, this is something you can learn about. This is something you can do more of. You can advocate for yourself, and here's some strategies as to how to do it. And I've since had some more negotiation training in other professional development settings. And it's fun to see the kinds of things that I do in the class be affirmed in these professional trainings where people are doing similar kinds of things and similar approaches. And I think, okay, I think I'm doing this right and I think it's working, and it's not something I would've expected to teach, but I really love doing it.

Harriet Wright: That is awesome.

Sophie Yates: Yeah. Looking back over the program and you've changed things and I'm sure have altered as different groups of students come through, is there any aspect from those original days that you wish you could bring back to the classes you teach now?

Susannah Howe: Yeah, that's a good question. I don't think so, because I think if I wanted to bring them back, I would've brought them back. But the core of Design Clinic has stayed the same for the 20 years. It's students working in teams on projects with companies. It's two semesters long. They're doing weekly meetings with faculty, weekly meetings with liaisons. They do various presentations, design reviews, all of that element in the soup has stayed the same, but over the years it's a little bit like a board game with expansion packs. So there's a core game that has stayed the same. I and other faculty involved have added on various things over the years, and it's gotten to be bigger and bigger and bigger with more different elements of things. But the core is still very much the same. But we've added on space now. We have this Design Clinic lab. We've added on roles where different students, they rotate the role of project manager, for instance. We've added on more connections across different teams. We've got cohorts, we did some shadowing. We've made connections with alums that we hadn't had before. So there are various pieces that have gotten added to it to enrich and enhance the experience. But the core game is still, it's still the same.

Harriet Wright: Following along that analogy, what is the next expansion pack that you see coming? What is this next evolution of Design Clinic that you hope to install? If we can get a sneak peek about the future?

Susannah Howe: Yeah, that's a good question. I am not sure. I guess we'll sort of see as it starts to unfold. One piece that I certainly starting to see a pattern of is more direct connections with alums. So when we started the program, we clearly didn't have, we had alums of Smith, but we didn't have any alums of the engineering program. And as the program has grown, we have a bigger and bigger population of alums, and they are excited and eager to get involved and stay involved in lots of different ways.

Sophie Yates: What do you see for 20 years from now looking forward?

Susannah Howe: Wow. Oh, that's such a good question. Well, I'd like to think that the core game, the base set has enough staying power that it too will be continuing for another two years. I wonder whether be more international projects, maybe more projects or more connections across other institutions. We've done a couple of those over the years, but maybe that's something that we would grow. Prior to the pandemic, I would've said, I wonder if things are ever going to go remote now that we've sort of experienced that. And Smith has reestablished itself as a place-based face-to-face education. I don't know that I see Smith shifting over to many more remote possibilities. So I'm not sure that's something where we would go. Oh, I know. I do have an idea. This is something I've been thinking about for a long time, is finding ways to connect Design Clinic with other departments, other majors, other capstone experiences.

There are not a lot of other capstones at Smith. Statistical and Data Sciences has one. Math used to have one. Environmental Science and Policy has one, but the concentrations - that's sort of like a minor at Smith - have capstones. And so the students are working on capstone projects sometimes in teams, sometimes not. And I see us heading to a point where there's a broader slate of capstones across the college, and there could be connections between them. Like first year seminars, all students take a first year seminar. Maybe all students are involved in a capstone in some way, and maybe there are elements of Design Clinic that feed across that. So I'd love to see that in 20 years. I think that could be really fun because I think the power of the learning that comes from this open-ended, external accountability, team-based project is so powerful. And I keep hearing that from alums when they reflect on their experience and what they learned and what transferred to their careers that it's something I wish for all students.

Sophie Yates: We've talked a lot about your identity within the engineering program, your identity as an engineer and a educator. Are there any other facets of your perspective and identity you'd like to talk about?

Susannah Howe: Well, I've really appreciated being at Smith and being involved in so many different aspects of the campus. I've been on a lot of different committees across the campus. I've had a stint now in administration working as a Class Dean. I've been on the advisory board for lots of different centers, the Teaching and Learning Center, the Design Thinking Initiative, the Conway Entrepreneurship Center. So a variety of areas. And I really liked being able to

make connections between what I'm doing in my teaching and even in my scholarship with what's happening in these kinds of committees and these other experiences. So I think something that I really found rewarding in my career is that although I'm firmly grounded in the engineering program and this teaching of Design Clinic, there have been all these different doors and opportunities that have opened either connected to that or unconnected, but that helped form me as a whole person and the kinds of things that I like to do.

Harriet Wright: For those that don't know, Susannah, she is someone of many talents and hobbies, some of which are saxophone playing, home improvement, big reader. How have these non-academic hobbies helped you lead Design Clinic?

Susannah Howe: Being in a jazz band, I play baritone sax in a jazz big band. I guess that's being in a group setting and collectively producing music together means you have to be aware of everyone around you. You can't just be the one big voice. And so I think that certainly helped me in teamwork settings, thinking about blending in with everyone else and recognizing the value of all the different voices. And it's just really relaxing is really fun too. Home improvement. I just like projects. I like planning projects. I like doing projects. I like being hands-on. It's a direct correlation to project management, to designing and building things. I mean, I love working with students in Design Clinic and watching them as they're building things, but when I do home projects, I get to have my hands involved as well, which is really fun. I am a big reader, but actually, I really should say I'm a big listener because I do a lot of books on audio books partly because I can multitask, so I'll listen to books when I'm driving my kids' places, or I'll listen to books when I'm running.

I actually don't spend a lot of time reading physical books, partly because at the time I have time at the end of the day when I'm sitting reading a book, I just fall asleep. But if I can listen to something... And so I think the multitasking has also been really helpful. How to fit lots of pieces in. I've got a lot of interests and I have to figure out how to carve more hours in the day so that I can do all of them. And so if I can stack a couple things on top of each other, that works really well.

Sophie Yates: Well, thank you, Susannah, for joining us today, live in the DC Lab. And thank you, Harriet, for doing this with me.

Harriet Wright: Thank you, Sophie. It's been such a pleasure to sit here with you, Susannah, and get to talk about the last 20 amazing years here at Smith.

Susannah Howe: And thanks to you guys for coordinating this. I am flattered and honored that you would want to put this together, and I'm really excited, and it's been fun sharing this with you and fun sitting again in the DC lab, taking us back to those experiences. I love this job. I love what I do. Thank you for letting me share that.