

Transcription

[00:00] [music]

Derek Bruff: [00:06] Welcome to “Leading Lines,” a podcast on educational technology from Vanderbilt University. I’m your host, Derek Bruff, director of the Vanderbilt Center for Teaching. In this episode, we feature an interview with Ben Rydal Shapiro, a postdoc at the School for Interactive Computing at Georgia Tech.

[00:21] I met Ben when he was a graduate student at Vanderbilt, and we had some really great conversations about learning space design. Ben was trained as an architect and he brought that perspective to his PhD research in Vanderbilt’s Space, Learning and Mobility Lab, also known as the SLaMLab, where he combined that architectural perspective with the learning sciences and data visualization to do some really amazing projects visualizing how learning and engagement happens in relation to the physical environment.

[00:48] For instance, if you visit his website, benrydal.com, you’ll see some visualizations of families moving through exhibits at Nashville’s Country Music Hall of Fame, showing how the family members interact with the exhibits and each other across time and space. It’s a fascinating window in a place-based learning.

[01:05] Ben is interviewed by my Vanderbilt colleague, Cliff Anderson, Associate University Librarian for Research and Learning. Cliff works at the intersection of a lot of fields, too, including library science, theology, and computing, so he was well-equipped to discuss Ben’s multidisciplinary approach to educational technology.

[01:20] [music]

Cliff Anderson: [01:24] Welcome, Ben, to the Leading Lines Podcast. It’s really great to have you here.

Ben Shapiro: [01:27] Absolutely great to be here, Cliff.

Cliff: [01:30] I'd just like to start off, maybe, by asking you to introduce yourself to our audience and just say a little bit about your career path to this point.

Ben: [01:37] Let's see, I'm originally from Bay Area, California. I feel like I've traveled all over the place. I went to undergraduate university in Vermont. Spent a year abroad in Denmark. Ended up in Portland, Oregon, after graduating and then the past five or seven years been in Nashville, Tennessee, and now I'm down in Atlanta.

[02:00] That's kind of the geographic travels I've been on. Then professionally I started in architecture. I was really passionate about designing schools. That's what I pursued as an undergraduate degree.

[02:12] Always loved teaching. Always loved working with educators and ended up going back to pursue graduate education at Vanderbilt's education school, primarily looking to understand how to design schools better, physical spaces in schools.

[02:27] Now I actually found myself in a field called the Learning Sciences, which studies learning, and teaching, and designing new types of environments for learning and teaching in interesting ways.

[02:38] Currently, I just started a position at Georgia Tech in the School of Interactive Computing. I've expanded to thinking about bringing computing and learning and education together, particularly in the design and evaluation of physical learning spaces.

Cliff: [02:54] I can't wait to ask you more questions about that. It sounds fascinating. Can you tell us a little bit about the lab that you're working in at Vanderbilt. It's called the Space, Learning and Mobility Lab and it sounds really unique. What were the kind of problems that you were dealing with there?

Ben: [03:08] It's a really wonderful place. It connects to a lot of work that's going on at Vanderbilt in education, in digital humanities and computer science. The SLaMLab is led by a few wonderful faculty who have been my advisors.

[03:25] One is Rogers Hall. Another one is David Owens. The third is Andy Hostetler, and

Doug Fisher is another faculty which recently joined.

[03:34] It really provides a space for students, faculty, and anyone on or off campus, to think about geography, learning, people's movement and how that's at all relevant to how we design educational technologies and systems.

[03:52] For me, a lot of the projects coming out of that lab, one was titled Bridging Learning in Urban Extended Spaces. What we were focusing on was developing all sorts of ways for people to make and take tours of their local city.

[04:07] Other things that came out of that lab, I really love this one study by a former student and now faculty member named Katie Taylor. She, in summary, had young students design their own bicycles, attend a national's bike workshop.

[04:23] They built their own bikes, and then they were able to move around the city in different ways. She was showing how it impacted their learning in all sorts of ways.

[04:32] There's some interesting research coming out of the lab. Primarily for me, it's a wonderful space that just brings different disciplines together to push the bounds of what learning and education can be like for kids, particularly, historically marginalized populations and taking an equity-oriented lens on learning. It's a big thing for the lab.

Cliff: [04:53] Sounds like a great place to do your dissertation. I know the faculty you're talking about. They are excellent people to work with. I'm envious.

[05:02] You yourself have been promoted to something called Interaction Geography. I've seen some great examples, and I wish we could demonstrate them on this podcast.

[05:10] We'll point people to your website, about how that concept can help analyze how people learn in institutional settings, for example, in museums. Can you talk a little bit about what Interaction Geography is?

Ben: [05:22] Absolutely. For me, it started off as my dissertation but also an experience. I was in Australia for about four months. They had something called the Building Education Revolution which was a \$16 billion policy to, basically, put a new building in every middle school—almost every middle school—or remodeled buildings.

[05:45] It resulted in new physical learning spaces across the country, both schools and in libraries. It also raised huge questions about, "Why does the physical environment matter for learning? How can we evaluate these spaces?"

[05:58] For me, that started this idea of interaction geography is, on one hand, a really new method to interpret, describe, and represent or visualize people's interaction, particularly as they're moving across spaces like classrooms, or museum galleries, or even urban environments.

[06:19] It's also a really new approach to start to think about issues in the social sciences, digital humanities and, of course, the field I'm more or less in, learning sciences.

[06:28] The approach brings together a lot of different methods in architecture, in studies of people's interaction and conversation and also, more recently, studies of social media. What it does is part of it, again, is a bunch of methods that visualize people's movement, conversation, and social media activity over space and time.

[06:51] Then, also, developing a lot of ways to interpret these really complex interactive visualizations, representations in new ways to come up with some insights about how we design physical spaces, how we design learning activities that promote better learning for kids in schools or visitors to museum galleries. That's a large, broad space.

[07:13] This term, interaction geography, there's a lot of folks in education talking about the role of space right now. This is giving a set of methods, giving a lens to think about why those questions are important and how to design educational spaces a bit better to accomplish certain goals for folks.

Cliff: [07:31] From what I've seen, it's something that we should all be thinking about in terms of designing a space. It's that classical problem of if you design a space, but there's none of these beaten paths that don't necessarily follow your design. You've shown a way to actually expose those and help people to design better iterations of a learning environment.

Ben: [07:49] [laughs] That's great to hear.

Cliff: [07:54] Another term that you've used in some of your work is micro-geography. I suppose it's related in some way, but it's also about attending to spatial settings and how

that can improve learning outcomes. What is micro-geography?

Ben: [08:09] A big amount of work, as I see it, in whether it's computer science, information visualization, architecture, urban planning, it looks at developing methods to study space and movement; but it does so at a large scale, across cities or even if we're looking at people's interaction in a museum gallery. It's just describing where people go at the scale of a whole gallery space.

[08:36] For questions about learning and education, that isn't helpful. [laughs] It's helpful in that you could ask questions about where and when learning occurs, but you can't really describe, for instance, social context of learning in any detail.

[08:51] This term, micro-geography, is very much in contrast to these larger scale perspectives. For me, the interaction geography idea is very much giving a more fine-grained scale, a fine-grained look of people's movement, of people's interaction, of space that actually fits education research in a really great way, I hope.

[09:16] Another thing the term, micro-geography, starts to get at is...a lot of people have said, "We need to study whether it's learning or controversial policies like New York's Stop-and-Frisk program," just related to other work I've pursued.

[09:30] The point is we need to study these things across scales. A lot of my work in interaction geography is trying to go across these scales of micro to macro and developing new ways for people to do that.

[09:42] It's just hard. Collaborating with others, super important to do that, but our real hope is to be able to ask questions at a really small scale, then jump out and revisit those questions at a large scale and vice versa.

Cliff: [09:56] That's really fascinating. You've done a project that may exemplify some of that model of working at different scales called the Reshape Project. If I understand it correctly, it's studying how students live and experience the environment when they're at university, both at the university itself, but beyond and into the city. Can you talk about that a little bit?

Cliff: [10:20] Absolutely. There's a lot of things that inform this particular project, certainly from the SLaMLab. The general idea is of this and of previous work is how can you use

people's personal mobility as relevant learning and teaching material in classroom environments.

[10:39] That came out of Rogers Hall and Katie Taylor's work, two people who've really been pushing that. So, what Reshape is, it's a computational environment or, if you want the academic term, it's a computer-supported collaborative learning environment that allows people to go out over the course of a week and collect their physical movement across the city and then they come back.

[11:04] We've done this a lot in classrooms. They come back and visualize their movement in really dynamic ways, in 2D and in 3D, over different types of base maps. In Nashville, for instance, we use maps that show racial distribution, maps that show the highway system back in the 1960s, the design of the highway system, as well as modern-day traffic maps.

[11:26] The point of it all is that it allows you to look at your movement in really, really different ways and ask questions. Very relevant social studies education is a big thing we push.

[11:38] One thing that learners or people using this environment learn to understand is how the history of their city and how, for instance, the traffic system was designed to marginalize certain type of communities by putting highways through certain neighborhoods.

[11:53] On the other hand, it helps people think about the challenges associated with urban planning and design. In some sense, it provides a way to have really critical conversations without, as I see it, getting upset at each other.

[12:07] It's a really productive way to visualize things in a manner that allows critical conversations to occur that are important to social studies education.

[12:17] Recently, I've been trying to use Reshape as a map-based learning environment to actually teach kids how to program on maps, using maps and their own personal data to think about how to write code and start to think about computational thinking in programming. That's new, but that's kind of the mess, though. [laughs]

Cliff: [12:38] That'll be fascinating when you're ready to show some of that.

Ben: [12:40] I hope. Just starting to work on it.

Cliff: [12:42] That's a great topic. That leads me to your own experience in terms of developing the technology expertise to carry out some of these visualizations. If you go to your website, again, there's these great visualizations that support these projects. Obviously, that takes a lot of investment in code and technology yourself. How did that come about in your own work?

Ben: [13:07] It's great question and one I'm really passionate about, increasingly so and certainly working...There's so many people that are passionate about similar topics as I'll touch on in a second. For me, it started with my parents way back. Both were software engineers. My dad loved software. My mom hated software.

[13:25] [laughter]

Ben: [13:25] She always wanted to be a writer. She's all about digital humanities. Growing up in the Bay Area, I watched my mom be successful as a woman in computer science. One of the few women doing some serious CS work out there. Watching her be successful in a way that she never really enjoyed, but she did it for us, as kids.

[13:52] Then I watched my dad, who just loved code, and loved software, and was a great software developer. A lot of those things allowed me throughout my life, but certainly more recently, to not be afraid to engage in computer science. They certainly empowered me to not be afraid to learn different types of languages and whatnot.

[14:14] Learning the program is, as I see it, hugely empowering, and anyone can do it. I really believe strongly in that. A guy named Mark Guzdial has been influential on my view of how kids can learn to program and ways to support doing that.

[14:32] A big thing is what languages allow you to accomplish tasks that you want to accomplish. It leads, for me, a lot of visual-based languages are really powerful in terms of doing the work that I need to do and also teaching kids to program.

[14:49] That's the large-scale things. Being able to pick up new languages is super important. Not being afraid to engage in programming. Talk to others. Ask questions. Ask good and bad questions, so you can improve your programming. That'll be super important.

[15:03] There's just a ton of emerging communities online and other settings that support that. The Processing community, we may talk about that or not, is a great example of that, but there's plenty more.

Cliff: [15:18] Actually, you mentioned the language, Processing. That's one that I haven't used, but it seems like it's got a lot of pickup from new media and visual artists. It's a version of Java, but with a focus on visualization and working with images. Can you talk about that? It looks like a powerful language.

Ben: [15:39] Yeah. I can use that to talk about a lot of issues that I just touched the surface on there. A few things. Processing is, to me and to others, so much more than a language. First and foremost, it's a whole community of people, designers, coders, activists, all sorts of people.

[16:02] Originally started by few folks named Ben Fry and Casey Reas, and more recently Lauren McCarthy and Dan Shiffman. It originally started with the goal of making programming relevant and accessible to visual artists, but it's expanded into much more than that.

[16:18] It is a language that can solve a lot of challenges in really relevant ways today. I also think it's relevant to kids starting to learn to program. It's part programming language. It's actually a whole development environment with a bunch of tutorials. If you've never heard of it and you're listening to this, I totally encourage you to go online and just search processing.org.

[16:41] Everything's free. They make everything free and accessible to folks. They're very much about developing free open-source software that allows people to be creators and producers of whatever they want. I find the people, the ideas, the language is really expressive. It's high level in the sense that it's more abstract.

[17:00] You can write Java code, for those who know what that is, in the Processing development environment. It's a great stepping stone into Java. You can do really complicated projects in Processing. You can also bring in all sorts of libraries and other languages.

[17:15] You can connect with those other types of projects, libraries and languages. I find it, in

some sense, you can do...Some critiques might say, "You can't do anything complicated in it." I would come back and say, "You can."

[17:27] It's a great stepping stone for kids learning their first programming language because it gets them into new areas that are really relevant, whether you're a professional software developer or just someone dabbling in it.

[17:39] I could ramble on a little more, but it epitomizes a great language, a great community, and a great set of ideas that are just relevant to a lot of people beyond just visual artists.

[17:53] Certainly, in the academic or community space, you can get work done with Processing and things like Processing.

Cliff: [18:00] It sounds like it has a great balance between a learning environment and an environment to accomplish the tasks that you're after. I've been working a lot these days in Snap! And Scratch and NET not so much. That's always an issue.

[18:15] You want to teach people computations and how to think about problems from a computational perspective. You also want to give them the tools they need to solve their practical problems. Sometimes, those things don't easily fit together, so processing sounds like a great environment for doing both.

Ben: [18:30] That's really well put. Totally agree with that, Cliff.

Cliff: [18:36] Coming back to a topic, you've been studying a lot about the way that people interact in space and learning environments. I just want to ask you: If you were designing your own ideal university classroom or maybe a broader environment, what kind of things would you add? What kind of things would you design? What would it look like?

Ben: [18:53] Boy!

Cliff: [18:54] Big question, I know.

[18:57] [laughter]

Ben: [18:57] That's a great question. If there are three things I hear a lot of, in terms of

themes about how to design these types of environments, one would be make things like classrooms really, really flexible, with lots of movable furniture and whatnot.

[19:12] A second thing would be take learning and take education and put it in the city, in environments that people actually live and work in. The third is make it connected to all the online social media technologies that people are using these days.

[19:28] Sometimes, some of those aren't all that new. They've been around for a long time, but I think they represent very different communities.

[19:35] My perspective is...are environments that combine those three types of things. I still think there's high relevance for having flexible classroom environments that are locally embedded in communities and actually connect with the types of technologies students are using in their daily lives.

[19:53] One thing is the role of the teacher in all that, the new types of things that have to be expected by the teacher, both in technologies that they can be able to use, but also how they relate to their students. It's really challenging.

[20:07] Space and teaching, obviously really interrelated. Can't think about one without the other. A lot of other people think that, too. It's hard to give an exact design.

[20:21] For instance, a really effective high school that I see, that I just got exposed to out in Atlanta, is a place called Lab Atlanta. It's a very new initiative. It's a semester school. The gist of it, it's basically teaching design thinking, but all out in the context of Atlanta. Using Atlanta, so to speak, as a classroom. It's a really inspiring idea, in terms of the design of physical spaces.

[20:47] They certainly have a school site and classrooms, but it's very much reaching out into the community and connecting those classrooms and technologies into the communities that students live in. I find that a really powerful way to think about the physical design of classrooms or university campuses or just any kind of space.

Cliff: [21:08] That sounds great. It would be interesting to learn more about that school. As we come to the end of this -- of course, it's a podcast in educational technologies --

[21:17] I'm interested, other than Processing, what kind of educational technologies do you use when you're teaching? Maybe, as a corollary to that, are there educational technologies that you draw on when you're seeking to learn something new for yourself?

[21:33] [silence]

Cliff: [21:33] That's a big question, too.

[21:34] [crosstalk]

Cliff: [21:36] You can mention one or two.

Ben: [21:39] It's interesting to think about—it's a great question, for a lot of reasons. One is that, as a teacher, if you are able to program, to build curricula or visual-based visualizations, whether using Processing or Python or whatever, for me, it opens up really exciting and new ways to engage students, communicate content, teach content in new ways, versus if you're using off-the-shelf technologies.

[22:12] It certainly can be great, but they're two really, really different things. For me, in my own teaching, there's a branch of it where I'm programming my lessons. I'm building interactive visualizations using data that students collect throughout the course. I'm using that to teach about education.

[22:31] More recently, I'm teaching an ethics course to computer science students. I'm using that to teach ethical principles to CS students. How would you build certain types of algorithms to drive autonomous vehicles?

[22:46] There's also just standard educational technologies that are really helpful, even a basic one—Georgia Tech recently switched to Canvas. There's strengths and weaknesses of it, but it's a real game changer with how I can interact with and grade students, and other things like that.

[23:05] Also worth mentioning, old-school technologies like Post-it notes. Dave Owens taught me this. I bring a clock or a timer to class, a really effective way to get students and make lessons move, particularly within an hour or a two-hour period.

[23:25] When you're teaching more than 50 or 60 students in a class, the timer's a helpful way to get people to do things. I hope all of that was helpful.

Cliff: [23:34] That's great. You've actually anticipated one of the questions that we always ask our guests, which is, "What's your favorite analog educational technology?" Maybe, Post-it notes? Let's see if you have something else. That's a good one.

Ben: [23:49] Post-its and the clock, or both.

Cliff: [23:51] The clock. It depends if it's analog or digital. Fair enough, right?

Ben: [23:58] Right. [laughs]

Cliff: [23:58] Again, are there articles or books you would recommend for people that are interested in the spatial dimensions of learning things? If you wanted to get started thinking about some of the work that you're doing in this area, that you'd say is essential reading?

Ben: [24:10] That's a great, great question. Certainly, visit the Space, Learning, and Mobility Lab website. It's a fairly good start for certain aspects about that. There are a lot of folks I work with out of the University of Washington that work with a lot of indigenous populations.

[24:29] When you're getting into this topic of space and geography, there are lots of different perspectives on space. Some are Western. Some are non-Western. All are really important. There are really different types of methods to study that.

[24:42] For me, books on time geography, that's a whole discipline from a man named Torsten Hägerstrand. That was some good readings for me way back. Then in education, concepts like place-based education. Super important, super interesting to read.

[25:01] I also find there are conversations that are going on in information visualization, in computer science, in terms of how to just study and visualize movement, or space, or geography. Super interesting, but really different.

[25:16] In some sense, if you use some of those search terms, the books will come up pretty quickly. The important thing, at least from my perspective, is to consider these different opinions on dimensions of space. Also why and how they're relevant to learning. These ones

have different things to offer. I had fun.

Cliff: [25:39] I should also mention, you've got a long list of your own publications and works in progress on your website, which is really helpful, too, for people that are just thinking about where to get introductions to these topics. I'm sure that those have great bibliographies as well.

Ben: [25:52] Absolutely. I'm just getting them out. I would love feedback and thoughts. That would be great. I'll have a few more things coming out. Yes, certainly. The stuff I have up there reviews a lot of these other books and materials out there.

Cliff: [26:07] Coming away from this conversation, I'm just really impressed by your ability to synthesize these different disciplines and make something coherent out of it. You're taking a lot of different perspectives and then you're able to connect them in ways that actually advance our understanding of the learning experience in space. Kudos to that.

[26:26] You've mentioned this a little bit. How are you continuing that work and refocusing it in your current postdoc?

Ben: [26:35] To conclude, a big thing for me is scaling up and making available tools that I've built. A big thing for me is getting a type of business model that allows these things to be free and open-source for other people to use. I'm working on getting further support to do that. That's a big area. I see that being used by educational researchers, these tools, but certainly others.

[27:02] I've done some work on New York's Stop-and-Frisk program. A lot of those tools can be useful for studying phenomena like stop-and-frisk and building better community relations, other than just relying on predictive policing software. That's one chunk.

[27:20] For me, also developing environments that teach kids computer science. Principles of programming is really important and an emerging area.

[27:29] Then a final area that has been really neat to think about with Georgia Tech is to think about the intersection of ethics and computer science and using a lot of the research and tools and approaches that I've been developing to teach ethics to computer scientists in a more engaging and immersive manner. Those are the three big areas as I see it over the next

couple years for me.

Cliff: [27:53] This is fantastic, Ben. Thanks so much for joining us for this conversation. It's been really informative. Your work speaks for itself. I encourage everyone to visit your website and read some of your papers and interact with your visualizations.

Ben: [28:05] [laughs] Thanks, Cliff. It's hard to talk about it without the visuals.

Cliff: [28:08] It is. It's a little difficult., but you did a great job. Thanks again.

[28:11] [background music]

Ben: [28:12] Wonderful to be here. Certainly, I believe in everything that the podcast is about. Thank you. Thank you for having me.

Derek: [28:21] That was Ben Rydal Shapiro, postdoc at the School for Interactive Computing at Georgia Tech and a proud Vanderbilt PhD alum. Thanks to Cliff Anderson for the interview with Ben.

[28:31] I thought I might add that way back in Episode 14 of Leading Lines, we interviewed Katy Börner, professor of information science at Indiana University-Bloomington. Katy was on campus with the traveling data visualization exhibit, Places and Spaces -- Mapping Science.

[28:45] As part of the exhibit's visit to Vanderbilt, the library organized a student data visualization competition. And who happened to receive first place for best data visualization by a graduate or professional student? None other than Ben Rydal Shapiro. He's always doing really interesting work and I'm glad we could have him here on the podcast.

[29:03] In the show notes, you'll find a link to that interview with Katy Börner, as well as links to Ben's work, including Vanderbilt's SLaMLab and processing.org. I really like saying the word, SLaMLab. That's my new favorite acronym.

[29:16] You can find those show notes at our website, leadinglinespod.com, where you'll also find past Leading Lines episodes with full transcripts. We're on Twitter and Facebook, too. Just search for Leading Lines podcast. If you have a moment to leave us a rating and review on iTunes, that would be great. That helps other people find the podcast.

[29:32] Leading Lines is produced by the Vanderbilt Center for Teaching, the Vanderbilt Institute for Digital Learning, the Office of Scholarly Communications at the Vanderbilt Libraries, and the Associate Provost for Education Development and Technologies, John Sloop.

[29:43] This episode was edited by Rhett McDaniel. Look for new episodes the first and third Monday of each month. I'm your host, Derek Bruff. Thanks for listening.

[29:50] [music]