

What We're Learning About Learning

A podcast by the Center for New Designs in Learning and Scholarship
Georgetown University

Season 3 Episode 4

Supporting Undergraduate Research

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KIM HUISMAN LUBRESKI: Welcome to What We're Learning About Learning, a podcast about teaching and learning created and produced by the Center for New Designs and Learning and Scholarship, also known as CNDLS at Georgetown University. I'm Kim Huisman Lubreski.

JOE KING: And I'm Joe King. In this podcast series, we bring you topical conversations from across the higher ed landscape. In this episode, we'll be discussing undergraduate research.

KIM HUISMAN LUBRESKI: You'll hear from Lauren Tuckley, the director of the Center for Research and Fellowships, and three undergraduate students. We'll start by hearing the students' enthusiasm for research and the details of their projects. First, you'll hear from Zachariah John, a sophomore in the School of Foreign Service, who is studying Science, Technology, and International Affairs with a proposed concentration in Astrobiology and Space Relations.

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ZACHARIAH JOHN: My freshman fall, I was able to join. Through the Laidlaw Fellowship here at Georgetown, I was able to do some independent research over the summer, studying these astrobiological samples that are from lava tubes in California. And these mineral samples serve as an analog to subterranean samples on Mars. So we're studying how life exists in these extreme environments to see, OK, could life have existed, or does life still maybe exist in caves on Mars? It's really exciting, and I'm still involved in the lab right now.

JOE KING: We also talked to Sarah Watson, a senior in the School of Foreign Service, studying Regional and Comparative Studies.

SARAH WATSON: Most of my research at Georgetown kicked off doing the Kalorama Fellowship in the summer of 2022. I had the opportunity to travel to Nepal for 2 and 1/2 months. And while I was in Nepal, I was interning for a newspaper in Patan, south of Kathmandu, called Nepali Times. And I was also writing my own research paper on the geopolitics of Himalayan water and issues of water insecurity in South Asia.

KIM HUISMAN LUBRESKI: And lastly, we heard from Dominic Pham, a senior double majoring in Biochemistry and Comparative Literature.

DOMINIC PHAM: My first project was an inorganic chemistry lab. So basically, I was studying this molecule called ammonia. And I was trying to see if this molecule was a viable carbon-free fuel source. Then, my sophomore year, I switched to a different lab that was more biologically focused. And I study a really important molecule in our cells, and I try to look at its 3D shape and see how its shape informs its function.

JOE KING: As you've just heard, Georgetown University is committed to supporting undergraduate research and has well-established programs, fellowships, and infrastructure in place that encourage and support that research. For example, the Undergraduate Research Opportunities Program, also known as GURAP, is an application-based program that provides opportunities for students to work with a professor for approximately 60 hours over the course of one semester, and upon successful completion, receive a notation on their transcript.

There are also numerous research fellowships that students can apply for during a semester or over the summer in domestic or abroad locations. If you're interested in learning more, check out our show notes. The Center for Research and Fellowships serves as the hub of all things undergraduate research. As the center director, Lauren Tuckley helps students learn about opportunities, connect with faculty, and get started. We talked at length with Lauren about undergraduate research, starting with a very basic question. What is research?

LAUREN TUCKLEY: It's part of the hidden curriculum in a sense, even for those that are the most highly skilled researchers at the undergraduate level. So first of all, at its very core, we'd like to think of research as a process and not a product. So research is something that is a habit of mind that cultivates critical thinking and examination of how something is the way it is and how we approach certain or core problems in a way that is informed by traditions and histories and academic communities. So ways of thinking and knowing that we inherit.

So, in a sense, we think about helping students understand that research is a process that allows for knowledge building, aggregation, and expansion. The misconception-- and sometimes we see implicitly the way that this operates in the curriculum or in the classroom-- is that research is one of these things where you read a lot of content, and then you have your subject matter, OK? And then you're given research articles. So you're given research, a product, the product of research. You're being taught to engage with that information, to make connections across other research papers.

And then they have, oftentimes, these research papers, and the research papers are more of a synthesis of ideas across the content that they've been asked to have a command of over the course of the class. So what we're really seeing in ways that research is really getting in the classroom is from this product-based way of engaging with the output of research.

So what we've tried to think about is, how do we look at class design, course design, program delivery, even workshops that make this explicit, how do we think about what the process of knowledge building looks like? Because it's that process that once a student learns, it's fungible. It can be moved from discipline to discipline, question to question. But really, we want to help students engage with the idea that research is what is known, how it is known, and how you can add to a community that's producing that work.

KIM HUISMAN LUBRESKI: So we wanted to know how students got involved. The three students we talked with found their way to undergraduate research in different ways. Here are some of the reflections, starting with Zach, followed by Sarah, and then Dominic.

ZACHARIAH JOHN: I'm expanding out from just DNA, RNA extractions to metagenomics, maybe some mineralogy studies. We'll see. So, yeah, it's been pretty awesome the past year or two. There's such a grand purpose behind the research. OK, how can we study life in the most extreme of environments, and how can that help us in the future? It's pretty awesome.

SARAH WATSON: One of the challenging elements of research in the social sciences, particularly for undergraduates, is that it can feel somewhat unguided, somewhat individually based. But again, I think it's really helpful for me to be doing that now and realize that I have the capacity to do that now because everyone thinks differently. And some people prefer to have a very structured system and need to have-- and maybe even do greater research because they have that support. Whereas in my situation, I'm developing it myself and independently.

And I think it's gratifying because at the end of the day, it's your work. You developed it with a lot of people, but you can put your name on it as something that you decided was important. And that's the benefit. The downside is, it's really hard to explain to other people what I'm doing. But the benefit is, I've got to be very curious.

DOMINIC PHAM: My research has really complemented my coursework really well. I think especially in high school, before I knew what research was, science was interesting to me, but I think there was a disconnect between-- science is supposed to give us insights into how the natural world works. And there was a disconnect for me between what I was learning in class, which was mostly either out of a textbook or through a PowerPoint, and then how that actually relates to the real world.

And I think my research experience has filled in that gap a little bit. It's given me more perspective on the things I'm learning in class. And so I think that without my research experience, I would not be interested in my classes as much as I am because that research experience has been a really big source of motivation for me to learn more in the classroom.

JOE KING: These students recognize how their research experiences have benefited them personally in profound ways, but they don't have the advantage yet of looking back to examine the longer term impact. So we asked Lauren, who has been doing this work for more than a decade, about transferable skills and the long range impact of research opportunities on undergraduates.

LAUREN TUCKLEY: If you would like a career that has longevity, advancement, and remuneration, upward social mobility, we're thinking about the knowledge economies. And knowledge economies operate fundamentally through how information is considered embedded in its local domain, meets certain needs or exigencies, is used for particular purposes.

If you're unaware of information processes generally, then you are unable to engage in the information economy or jobs where you need a certain skill set that research, even academic research, teaches you. The moment you're learning about how do we know what is known, how do we critique what is known, how do we advance what is known towards a certain end or objective that we find valuable a goal? Once we can teach students how to do that, even if it's through academic disciplinary, research is the moment they then become equipped with the research as a habit of mind that then becomes valuable in the information economy, where you can get those jobs that will require and demand that skill set. And if anything, even if potentially, you did a thesis, you didn't like it, you're like, OK, I'm not going to be a historian, but I did a history thesis. Like, you've learned something about information literacy that's both a value for your workplace setting, but also as an informed citizen.

KIM HUISMAN LUBRESKI: To get a better sense of how to connect students with meaningful research opportunities, the Center for Research and Fellowships recently administered a survey asking undergraduate students a series of questions about their experiences with research methods and curriculum in high school and at Georgetown.

LAUREN TUCKLEY: One of the things that sticks out to me is the idea that if a student answered that they didn't participate in a research experience at Georgetown, we asked why is that. And time and again, what we saw, the highest rated selection from that survey was, I didn't know about it, or I didn't know how to start. So that tells us that we have a call to work on both allowing students to understand how research functions at Georgetown, like how to get engaged, so opportunity awareness.

We hope the Center for Research and Fellowships can help coordinate opportunities and be a connector versus us trying to design a whole bunch of programs or change things. We really want to help make that connection process operate well. So that's one part. How do we do that? How do we make sure that really important information gets to those who most need it?

But at the same time, that's great. Like, I got the announcement that Dr. Logg needs a research assistant, but I didn't know it was valuable to me. So the other is a much more challenging question for the Center, and that's how do we communicate the importance and necessity of undergraduate research to our students, but then also to our faculty.

JOE KING: Because the survey highlighted this mismatch between opportunities and opportunity awareness, we talked with students about their own stories and what suggestions they have for other students who want to get involved. Zach was very proactive and started looking for research opportunities while he was still in high school. He reached out to Professor Sarah Johnson, a renowned planetary scientist and a professor in both the Biology Department and the Science, Technology, and International Affairs Program in the School of Foreign Service.

ZACHARIAH JOHN: I was looking at universities all across the country. Where could I do this research? What labs would align with this interest? I eventually found Sarah at Georgetown here in the State Department, and I thought, this is perfect I got in back in March, and I emailed her in May, asking, hey, I would love to be a part of this lab now. [LAUGHS] So would you help me do that? And she said, hey, let's talk in the fall.

I ended up meeting up with her in October. She was super excited to hear about my interest in Mars exploration as well. They actually had an opening in the lab, and so my freshman fall, I was able to join. And over time, it's just expanded and ballooned out.

KIM HUISMAN LUBRESKI: Dominic, the Biochemistry and Comparative Literature major, drew on his own experience to share some words of advice for students interested in getting involved in undergraduate research.

DOMINIC PHAM: I think a big piece of advice I would have is to try not to feel intimidated as much as you can. I felt very intimidated about a lot of things. And in hindsight, I wish I had been a little more forward and a little bit more confident with myself, going through things, and also to really pursue what interests you, because going to a university like Georgetown, you have so many different research opportunities to explore so many different interests that I wouldn't really have known if I didn't go to Georgetown.

So for my Comparative Literature major, I'm doing an honors thesis. And so I've been undergoing like a yearlong research project, and I'm studying postcolonial literature from Singapore and Vietnam. And basically, without a lot of these research experiences or experiences that I've had in the classroom, I would never have thought that I could study something that I was actually interested in and that had something to do with my own personal identity and channel that in an academic setting.

JOE KING: Sarah talks about how she became interested in undergraduate research after she got to Georgetown.

SARAH WATSON: A lot of students did research. And I thought, that sounds cool. I want to do research and do something new and contribute to new academia and material that's occurring right here at Georgetown. But I didn't really know what that meant. And I think, especially in the social sciences, which is my area, you don't really know what research is going to look like. Is it qualitative interviews? Is it quantitative data collection? How do you do research in the social sciences?

So for me, doing the Kalorama Fellowship definitely was this introduction how to be a researcher. What does that look like? I found out about the Kalorama Fellowship through the Center for Research and Fellowships. They are very supportive of undergraduate research and have a team that I think is extremely helpful for any student interested in research opportunities.

Having applied for many research fellowships through the center, I honestly think that every Georgetown student should have that experience of working with the team there and developing a proposal, and also just receiving that mentorship and support that comes through the Center because it's hard to know how to do research. How do you collect sources? How do you feel comfortable reaching out to strangers and asking to interview them or to meet with them? What does the peer relationship look like or mentorship?

KIM HUISMAN LUBRESKI: Research shows how important both meaningful research and mentorship can foster a sense of belonging. Listening to Lauren and the students' stories highlighted the key role faculty play as mentors and how that relationship becomes one of the most important aspects of the undergraduate experience. Sarah Watson has partnered with several different faculty members at Georgetown.

SARAH WATSON: When I was doing the Kalorama Fellowship and spending time in Nepal in 2022, I was mentored by Professor Donatella Lorch, who is an international correspondent and had lived in Nepal for many years. And she was here at Georgetown, teaching a course on Global Journalism. And she's actually the person who introduced me to this concept of South Asia's slow-moving climate crisis, glacier melt in the Himalaya, and all of the very long-term implications of those issues.

So I worked with her in terms of just learning about the issue and being connected to people in Nepal who were doing climate journalism. Since then, I've made Himalayan water my main thesis topic, and I have a thesis mentor in Dean Mark Giordano in the School of Foreign Service. And it's been so much fun to work with Professor Giordano because I know that this topic about water insecurity and water politics is something that he cares a lot about and has written about.

And so it's fun to be able to share what I'm doing in my own research and get insights about what to do next. And I think it's just fun to have professional relationships with other professors at Georgetown who are really excited about what you're doing and make you feel like maybe you're on the right path because if they seem excited about it, maybe you should be excited about it, too. But I've also received a lot of support and mentorship just from professors in terms of just reaching out and being like, hey, this is what my thesis is on. What can your academic discipline lend to it?

So I've talked to professors, really, from all around the university, including Professor Elizabeth Grimm, who was teaching my International Law class last semester. Just in office hours, she lended me a lot of advice and feedback on my thesis. And we talked about it in terms of the international relations elements of water insecurity and border conflicts over water.

So I think what I've learned about the relationship with mentors is that it's not just a one-on-one situation. You don't just have one thesis advisor or one research mentor. You have a network of many mentors.

And ideally, Georgetown is a place you can develop that. Because I have professors who teach my thesis class who I meet with weekly. I have Professor Giordano as my thesis advisor.

But I also have just my professors from the classes I'm taking who can lend a lot of insight and advice. I remember talking to my professor, Donatella Lorch, during office hours in the first few weeks of her class and saying, oh, yeah, I'd love to go to Nepal one day. I'd love to do research there. And she just looked at me and said, OK, why don't you? Go next summer. Let's make it happen. Let's figure out how it's going to work.

And it took six months to figure out how it was going to work, but it happened. And had I not had that experience in Nepal, I would be doing something so different with my life. So it was life changing. That one conversation with my professor changed my life and set a trajectory, what I'd end up doing for the next four years.

These are really impactful, powerful moments. And I'd thank all the professors that I've had who have shaped that curiosity and been so encouraging, even professors who have read a five-page essay I wrote as a sophomore and emailed me and said, hey, I loved the ideas you had on this. I'd say that having structures of feedback is really important.

JOE KING: Zachariah, the SFS student working on astrobiology, echoed the formative experience he's had in the care of his faculty mentor.

ZACHARIAH JOHN: The only faculty I've officially worked with is Sarah, and I would also say, yeah, I think it's really important to have a faculty mentor that works well with you and fits your interests well. Sarah has been awesome for me. She's just been such a great help and even, yeah, getting internships, thinking about the future, thinking about career, guiding my research, she has been, arguably, one of the most key relationships I've had at the university, beyond just telling me what to do in the lab. That's really expanded into a, hey, this is how you should be thinking about the future of your classes, or this is how you should steward your time. How am I going to align myself? Where should I be interning? How should I be orienting my research in a way that's beneficial?

Yeah, she's been super critical in all of those decisions. Yeah, and she's just been, yeah, super kind and gracious and gentle with me, as I've even struggled and navigated through balancing school and research and extracurriculars and spiritual interests and such. And yeah, that's been really sweet.

Yeah, so we meet pretty regularly. I see her at lab meeting every week. And she makes sure to keep tabs on how I'm doing personally and how my research is going. And she's been able to, yeah, work with me if I'm having a pretty tough couple of weeks during the semester, or if I have more leeway to do more work. I am really grateful for the impact Sarah's had on my life. And I think if-- yeah, beyond just like being a source of information or even a guiding help, being a, "hey, I'm here for you as a person" undergraduate student. I think so much of who I am is formed by older role models in my life.

And the PI, if you are doing undergraduate research, is just such an important role model to have, especially as an undergraduate student. It's a prolonged relationship, oftentimes, beyond just a professor that you have for a semester. I think it's critical, whether that means-- like for me, it was understanding the big picture and being motivated by the big picture, or if it's actually just enjoying doing what you're doing on the day-to-day, I think learning to even just be joyful in the ordinary is really important.

KIM HUISMAN LUBRESKI: Dominic mentioned that mentorship can happen in the smallest of ways, too.

DOMINIC PHAM: It was really little things that my faculty mentors did or people in my lab did that really impacted me. It was very much in like the day-to-day interactions that I had that kind of allowed me to

have a transformative research experience. And I think now that I do research very often, I take those things for granted. A lot of the things that I'm just used to now, like all the experiments that I do that I've just gotten really used to, I take for granted all of those things that were really impactful to me when I was just first starting out.

JOE KING: We realize how much these students are using these experiences to think about their future after college. Sarah and Dominic both plan to pursue graduate work in their respective areas of their undergraduate research.

SARAH WATSON: And I think doing the Kalorama Fellowship and having my first crack at research was really helpful for deciding, yes, this is something that I want to do. This is something that I'm really interested in. Maybe I want to get a master's in this and maybe even a PhD in this. Yeah, so very essential to me and creating that groundwork for what I'm going to do next.

DOMINIC PHAM: I think my research experience and my faculty mentoring experiences have been instrumental in developing a career trajectory for myself after undergrad. So right now, I'm applying to PhD programs in Biochemistry and Biophysics. And basically, without my research experiences, I would not even consider doing science as like a career option. And then after I get my PhD, I can see myself having a career centering research, whether that be in a biotech or pharmaceutical industry or in academia.

And I think a lot of the conversations that I've had with my faculty mentors have really been impactful in creating that vision for myself. And they've given me a lot of really interesting advice about what it is to have a career in science, what it's like to pursue graduate study for five, six years and whatnot.

KIM HUISMAN LUBRESKI: And those plans take us back to the formative role faculty play in shaping their students' skills, interests, and opportunities, even when they aren't directly involved in the research project.

SARAH WATSON: I'm sure my professors in my sophomore year didn't realize that the ideas they were giving me would lead to my master's dissertation and maybe a PhD dissertation. So the things that you say are very valuable, they really hit home. And for undergraduates, many of us, if not all of us, dreamed of going to Georgetown. What we hear from our professors really does shape what we're about to do with our lives.

JOE KING: Ultimately, faculty have great power to craft the student experience, even on an individual level. The research opportunities that are available to students bring together the skills they acquire in all of their classes and ask them to think across disciplines. And research can also lead students in exciting new directions, as Zach shared.

ZACHARIAH JOHN: I would have said, coming in, I knew exactly what I was going to do and how I'm going to do it, and that whole plan is out the window. And it's only been a year and a half. But it's almost like an onion has been peeled back, and my truer self is figuring out what I want to do. And research has been like the knife, just cutting those layers away.

KIM HUISMAN LUBRESKI: We hope you've enjoyed this episode of What We're Learning About Learning. For articles and links on the impact of undergraduate research, please check out our show notes or visit our podcast website at cndls.georgetown.edu. This episode was made possible by many people at CNDLS, including Molly Chehak, Eddie Maloney, David Ebenbach, Sophia Grabiec, Eleri Syverson, Noah Leiter, and Stefanie Chae.

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JOE KING: And I'm Joe King. Thanks for listening.

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