Ivory Toldson:

Hello everyone and welcome to another episode of Collaborative Strategies for Inclusive Change. This is an official podcast of the NSF INCLUDES Coordination Hub. This podcast highlights projects and partnerships that build inclusivity in the nation's STEM enterprise. My name is Ivory Toldson, your host. I'm formerly a co-principal investigator for the INCLUDES Coordination Hub. I'm a professor at Howard University, and I also represent the QEM Network who is an official NSF INCLUDES Hub partner.

Ivory Toldson:

This podcast highlights how collaborations and partnerships address inclusivity, equity and broadening participation. And it also draws attention to pathways, policies, opportunities, and practices that address institutional barriers to equity, inclusion, and broadening participation in STEM.

Ivory Toldson:

Today, we have someone who is perfect to talk about this topic. We have Dr. Casey W. Miller, who's the associate Dean for Research and Faculty Affairs in the College of Sciences at Rochester Institute of Technology. He is also an experimental physicist focusing on nanoscale magnetic materials and related devices. He earned his PhD from the University of Texas at Austin. He also did his post doctoral work at the University of California, San Diego. And he is a recipient of the prestigious NSF Career Award for Young Investigators.

Ivory Toldson:

But the most important thing for this conversation is that he is one of the PIs of the NSF INCLUDES Inclusive Graduate Education Network Alliance. Also known as IGEN. IGEN is a very popular and successful program that partners with many other universities and scientific societies to increase the number of underrepresented and minority physical sciences. So why don't we start with you just telling us about IGEN. How did you all build this momentum and what is the purpose of your Alliance?

Dr. Casey W. Miller:

Well, thanks for having me on, Ivory, and it's a great opportunity to communicate to the community, all the neat stuff that's happening in IGEN. IGEN's goal is to increase, as you said, the fraction of students from historically underrepresented groups in the physical sciences who earn PhDs. We started this as a pilot. We were one of the NSF Pilot Awards, and we were going around trying to see what we could do with faculty change, if we could help faculty change their practices. And then as that ended up happening, we were able to bring on more partners. We also were part of a ... one of our partners was the American Physical Society who had established a bridge program. And we were trying to see what we could do by combining these items.

So we have effectively, a multifaceted approach right now that leverages professional societies in the different physical science disciplines to reach prospective students, faculty who are their members and PhD programs, other stakeholders in the area. A major component of IGEN is our bridge programs, and we have these across the country in the physical sciences, meaning physics, chemistry, and geology, at this point, our geosciences.

Dr. Casey W. Miller:

And the main goal here is to help support students get into graduate school, they were overlooked by the traditional graduate recruitment and admissions system. An eligibility component is you had to have been rejected or not apply to graduate school. These societies have come together to do bridge programs and related efforts. They have a no cost application portal at this point for any interested student who wants to go to graduate school in the physical sciences. Any bridge partner then can look at their application. And this is working really well. These students are persisting at about a 90% rate, which is way above the national average. And it's remarkable considering that these students were overlooked by the system.

The second major component that we have in IGEN is intended to address that system that is overlooking these strong underrepresented students. So we host workshops for campuses across the country and get in there and try to help the faculty learn how they can become more inclusive in their graduate admissions processes. From selection, through admissions and into mentoring. On the last part, we're working with the Center for Improvement of Mentored Experiences and Research, CIMER, out of Wisconsin, University of Wisconsin. And they're helping to develop workshops for faculty and scientists and national labs to learn how their mentoring practices can create or not create an inclusive working environment for underrepresented students.

And all of this is founded on research. So we are using evidence based practices. And the third major component of IGEN is a research hub that's led by Julie Posselt at the University of Southern California. So that work spans issues affecting entry all the way through to post-doctoral transitions. And more importantly, this whole research effort is helping to produce the knowledge base that can help sustain all the efforts that we have in IGEN now.

Ivory Toldson:

I'm first struck by you are one of those pilots that turned into an Alliance. There's a lot of developmental design launch pilots out there, a lot of great ideas. But unfortunately, a lot of them don't make it to being an Alliance. So, happy that you were able to make that step towards being an Alliance.

Also, your bridge programs and the support that you have and getting students into graduate school. But you also talked about finding the flaw in the system. So it wasn't just about fixing the students. It wasn't at all about fixing the students because they have this 90% success rate. So their lack of success without the support had nothing to do with them, it had something to do with the system. And so you talked about addressing that system and you address that system through the research and also an analysis of the process. We also read some things about a holistic review trainings and inclusive practice hub. Does that have something to do with you addressing the system?

Dr. Casey W. Miller:

What we do in the Inclusive Practices Hub in conjunction with our research hub is, Julie and I have developed these workshops as part of that pilot. And we've gone out and delivered these workshops to faculty, to try to help them realize how they can improve their admissions systems. And through the years, we've had a lot of feedback from a wonderful group. Facilitators that are now joining us to help scale up the delivery of these workshops. Because Julie and I, even through our career, couldn't hit all the institutions.

And these workshops, they're targeted specifically at STEM faculty. It starts off with data which STEM faculty like. And then we talk to them through the research, the social science research about what's wrong with the traditional admissions process and why it is complicit in the continued under representation of women and racial minorities in STEM and graduate school, generally speaking.

So then we present this concept of holistic review and how programs can enact that. So holistic review is one that is comprehensive, contextualized, systematic, and it's permeated by equity mindedness throughout the entire process from the start. And so our approach here has been to visit schools where we have multiple physical science departments interested in these workshops. And then we open it up to the whole campus. And it's interesting that only about half of our participants are from STEM or from the physical sciences. So there's a large body of interest out there that's emerging as we're going across the country. Our external evaluator found that 85% of the partnering programs have changed the way they have done things because of involvement with IGEN. Two thirds of those departments felt that their programs were ineffective in enrolling a diverse group of students before they participate in IGEN. So we're having an impact.

Ivory Toldson:

You talk about equity mindedness and that's so important. Because it's not just about practices, it's about a mindset that you have. But you also mentioned that they're able to convert that mindedness into some effective practices. Can you tell us some of the practices that you've observed? Like what are some of the things that they're changing to promote more equity and reducing some of the biases in their process?

Dr. Casey W. Miller:

So the number one thing is programs are adopting, effectively, a rubric to help guide their process. Often graduate admissions historically has been an ad hoc process. And that is just the Petri dish for bias. So by making the selection process systematic through the use of a rubric, and then contextualized by each element that's in the rubric having a specific definition. And looking at more than just traditional metrics, looking at the student in more of a whole context. Then these folks are able to process the same group of applicants, but then they end up with increased diversity in the folks that progress through their process. Of course, that doesn't happen accidentally, it's very intentional.

Ivory Toldson:

You also mentioned that you all have some peer review articles and perhaps some other dissemination strategies. What are some of the things that you all are using to get this information out beyond the ones who are directly in contact with you?

Dr. Casey W. Miller:

Well, these kinds of projects are a little bit long-legged, I guess I would say. It's hard to pull the data on a short time scale. So we don't have long term outcomes yet, but we do have some observations that we've published as part of the pilot study. For example, we showed that although programs articulate a desire to have increased diversity in their programs, the actual system they used filtered out all the underrepresented students in the very first stage. And so as a result, they didn't increase their equity or

their representation. But then when those programs start using rubrics and then the process does what they want it to do in the sense of increasing equity.

Other ways we're getting this out is basically by our team of facilitators. So we've got 10 trained facilitators at this point who are able to go out to a lot of campuses and communicate these workshops to them. Julie and I also have another NSF funded project called The California Consortium for Inclusive Doctoral Education, where we're engaging with graduate schools in California. And doing very similar things, but it comes at the problem from a slightly different approach where we're trying to empower the campuses to do this work for themselves. And then that will lean to some sustainability, we believe, in this. And already, I think two thirds the participating programs there have articulated plans to actually institutionalize the approaches that we're using.

Ivory Toldson:

For everyone who's listening, I want you to think about all of the graduate programs that you're associated with. The ones that you are teaching at, the ones that you graduated from. Really, I'm just going to be honest, think about all the lies that we've told ourselves about why we don't have diversity in our programs. Because a lot of times we are thinking about the under preparation of the students. When we really should be thinking about our own practices and methods. We need to practice what we preach. And just like Dr. Miller told us, we need to look beyond these traditional methods. We really have to redefine, what is tradition? Whose tradition is it? And so, as we really examine ourselves, we can start to think about what we can do, not what they can do, not what the applicants could do. But what can we do in order to create a more inclusive system, 90% plus have the potential to get graduate degrees in STEM.

Dr. Casey W. Miller:

What we're finding is that the STEM faculty, they're largely unaware of evidence based practices that can increase equity in their programs. One of our workshop participants said, "I know a lot about chemistry, but I'm not an expert in admissions or learning. Many of the other things that are really important to evaluating best practices. I'm not conversant with that literature." So we're basically playing a catalyst for faculty, like the one I just quoted. Who they want to do more, but they just don't know what to do.

Ivory Toldson:

And I want to thank you once again, Dr. Miller. And thank you to everyone who's tuned in. Please continue to follow us on all of the social media outlets. This is collaborative strategies for inclusive change from the NSF INCLUDES Coordination Hub. I'm Ivory Toldson, I'm your host. And I will look forward to collaborating with you all in the future.

Speaker 3:

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