

Ivory Toldson:

Welcome everyone. Thank you for joining us with Collaborative Strategies for Inclusive Change. That is a podcast series, the official podcast series for the NSF INCLUDES Coordination Hub. The Coordination Hub Podcast highlights projects and partnerships that promote inclusivity in the nation's STEM enterprise.

Ivory Toldson:

The purpose of this podcast is to highlight how collaborations and partnerships address inclusion, equity, and broadening participation challenges, and bring inclusive change.

Ivory Toldson:

We also draw attention to pathways, policies, opportunities, and practices that address institutional barriers to equity, inclusion, and broadening participation in STEM education and careers. My name is Ivory Toldson. I'm a co-principal investigator for the INCLUDES Coordination Hub, professor of Counseling Psychology at Howard University, and the president of the Quality Education for Minorities Network.

Ivory Toldson:

Today, we're delighted to have Dr. Karen Marrongelle. She is the head of the Directorate for Education and Human Resources for the National Science Foundation.

Ivory Toldson:

She has a background of a deep commitment to diversity, equity, and inclusion, as a university administrator, and now as a federal agency executive. She has served as the dean of the College of Liberal Arts and Sciences at Portland State University, and she is the co-author of the book, *Having Success with NSF: A Practical Guide*.

Ivory Toldson:

In your book you discuss international and national research collaborations to pursue and gain NSF awards. NSF was founded on that premise of collaboration to accelerate broadening participation. Can you share with us some examples of coalitions and collaboration that have been successful in building the types of partnerships necessary to broadening participation?

Dr. Karen Marrongelle :

Thanks Ivory. It's such a great question, and really gets to the core of NSF INCLUDES. At NSF, we operate with the understanding that to make progress on the most challenging problems in science and society it really takes multiple perspectives, and bringing multiple people together to make advances on these problems and issues. And that is part of the underlying philosophy of NSF INCLUDES.

Dr. Karen Marrongelle :

And so let me highlight a couple of examples of where we have first partners brought together to make forward progress on some of the issues that the NSF INCLUDES projects are addressing. First is the Inclusive Graduate Education Network or IGEN. And this has an innovative mix of professional societies, universities, and national labs. And what I really like about this partnership is that it targets the transition points that can be so problematic for students and even graduates.

Dr. Karen Marrongelle :

So getting into graduate school, getting through graduate school, getting a job. And so bringing in professional societies like the American Chemical Society or the American Geophysical Union, they are providing the frameworks for bridge programs for students to enter into graduate study.

Dr. Karen Marrongelle :

And they also have the influence of a lot of members. Bringing in the national labs is thinking about the career trajectory for students who are in undergraduate graduate school. And what they've done with the national labs in this project is focus on inclusive mentoring practices in their labs.

Dr. Karen Marrongelle :

So ensuring that once a student gets to graduation, once they're entering the workforce, or taking on internships, that there is mentorship that is relevant for the student, and is going to be beneficial for the student. And of course they have experts on mentoring research to assist with this.

Dr. Karen Marrongelle :

And then finally, the third piece of this partnership is the universities themselves. And the project has done an amazing job of examining admissions practices to graduate school. So for so many of us who have been to graduate school, we know that the admissions process is not very transparent. It's pretty opaque, and that then lends itself to bias entering and going undetected.

Dr. Karen Marrongelle :

And so IGEN has really doubled down on unpacking what happens in the admissions process, and trying to ensure that there's more transparency and less bias in that process. Another project is the stem push network, and the goal of this, this is also really innovative, researchers at the University of Pittsburgh, through a design and development launch pilot, recognized that for so many students, especially students who live in major cities, there's access to a whole variety of pre-college STEM programs.

Dr. Karen Marrongelle :

Students take advantage of these, and they thrive at them, but then they apply to universities and are not granted admission. So there's a disconnect again at these critical transition points between students thriving in these STEM opportunities in their backyards, and then admissions to universities. And so they've developed a partnership that involves a pre-college stem program, so partners like the Chicago Botanic Gardens, or the Arthur Ash Institute for Urban Health ,or the Pittsburgh Parts Conservancy.

Dr. Karen Marrongelle :

And they're working with the Middle States Association to accredit these pre-college STEM programs. So they're speaking the language of college admissions through Middle States while working with the pre-college STEM programs that are established out there to set the bar for what it takes to offer programming to students, and then for those students to gain admission to universities.

Ivory Toldson:

And in that same vein I want to talk about collaborative infrastructure because the projects that you talked about, it takes a collaborative infrastructure in order to achieve the objectives. We talk a lot about collective impact with NSF INCLUDES, and having this collect impact to diversify the nation's STEM

leadership. And we had a conversation yesterday when INCLUDES talked to more than a hundred program officers. And one of the program officers asked, "How do we know when collective impact is really leading to broadening" participation? How do we take that from a theory to reality?"

Dr. Karen Marrongelle :

I think one example that absolutely comes to mind is Bob Moses' Algebra Project. If you're not familiar with The Algebra Project, it's on the one hand, a philosophical approach to mathematics. So it's having high expectations for students, and providing the supports to reach them. So, Bob began this journey by working with students who were the lowest performers on state math tests, and he made them college ready by the end of high school.

Dr. Karen Marrongelle :

And he did that by doubling up on mathematics, by making mathematics relevant to their lives, and by listening to the students. So I think this is an example that gets down to a one-on-one relationship with a teacher and a student, but this has applications to all of our partnerships, listening to the people involved. And that's exactly what Bob did in The Algebra Project.

Dr. Karen Marrongelle :

And then he scaled that up by the developing this very innovative curriculum, that was, I think by today's standards, we would say, "Oh, this is a culturally relevant pedagogy. It's a curriculum that connects to students and the places that they live, it connects to the mathematics in the world around them, rather than treating mathematics as some abstract set of rules.

Dr. Karen Marrongelle :

So a recent NSF funded project partnered The Algebra Project curriculum with four HBCUs, with Virginia State, Dillard, Xavier, and Lincoln. And then four school districts that are closely aligned with those four HBCUs to scale up, to study the scale up implementation and assess the efficacy on a larger stage of The Algebra Project Interventions.

Dr. Karen Marrongelle :

And I say that this took decades because the actual project work started several decades ago in the 1980s.

Dr. Karen Marrongelle :

And so to get to a place today where there are some efficacy studies happening, and there is studies going on with, what does it take to implement? This takes a variety of partners. So it takes certainly the vision of Bob Moses. But then the educational researchers, willing participants in schools, and really getting through the long journey of test casing, whether this works, and how it might work, and what might be causing it to work. So another example that comes to mind is the SimCalc Project, which Jim Kaput began again several decades ago in the Boston Public Schools. And he was looking to democratize access to calculus, and his vision was middle school students can learn the concepts of calculus even before they have fluency with algebra.

Dr. Karen Marrongelle :

And again through many decades, through partnering with Stanford Research Institute, they ended up test casing their curriculum in a randomized control trial throughout the whole entire state of Texas.

Ivory Toldson:

You know, just thinking about math, and seeing that as kind of this test case of how we can democratize education, how we can use innovation, how we can listen to students, how we can not just focus on those high achievers as getting all the attention, but look at the lowest achievers because many times the lowest achievers, they think in this unique way.

Ivory Toldson:

And so if you give them the concepts, they can use it in creative ways that some of these more linear thinkers can't. What do you think are some lessons learned about implementation strategies and dissemination of findings? And also, what do you see as the evolution of the INCLUDES program?

Dr. Karen Marrongelle :

I think we continue to see evidence that collaborative change strategies are effective mechanisms for advancing broadening participation goals. So for instance, after two years of funding in the design and development launch pilots, close to 90% of the projects reported changes, positive changes in STEM attitudes for participants. And these include increased interest in pursuing a bachelor's degree in STEM, very importantly, increased self-efficacy in STEM, and an increased belonging to the STEM discipline.

Dr. Karen Marrongelle :

So these are all we know, that these are critical factors to not only attract individuals to STEM disciplines and STEM careers, but keep them engaged in their pathways to their STEM goals.

Dr. Karen Marrongelle :

Also, 80% of the launch pilots reported that partner organizations made advances in broadening participation. And these ranged from increasing understandings of broadening participation strategies, to more specific outcomes like adopting inclusive admissions practices. So we are seeing the reach and the change for partners and really on the ground.

Dr. Karen Marrongelle :

And at this point we have close to 1200 partners in NSF INCLUDES. And I mean, when you think about the scale of that, it's amazing. And these partnerships span academic institutions, government organizations, schools, and school districts, business, and industry, and community, very importantly, community organizations.

Dr. Karen Marrongelle :

So we are really reaching a wide, wide variety of partners through NSF INCLUDES. I think some other lessons that we have learned, and continue to learn from the NSF INCLUDES projects is the importance of investing time to build relationships. And this enhances the ability to scale and support for instance, student leadership and projects, and really develop the knowledge and skills needed to continue progress and broadening participation.

Dr. Karen Marrongelle :

I think this cannot be understated. We talk a lot about partnership, but to really get down to the nitty gritty in partnership, each of the partners has to understand what they're coming to the table, what they hope to gain, but importantly, where they can flex, and where they can change things within the way that they operate, and the way that they do business. We're of course, very excited about the NSF includes coordination hub, developing shared a shared measures framework, and a dashboard to accompany that. And this is going to be a key way that we're documenting the reach of NSF INCLUDES, and will enable our ability to showcase broadening participation success strategies more broadly.

Dr. Karen Marrongelle :

And then as I think about NSF INCLUDES into the future, we will continue to invest in new alliances in order to address more broadening participation challenges. So we're constantly evaluating the speed of projects that we have, the alliances that we have that span the country and span the disciplines, and look at places where we still need to make more progress.

Ivory Toldson:

One of the big takeaways that I got from the things that you said is that INCLUDES is more than a bunch of funded projects. It's a collaborative effort which really puts at the center of it the people who are going to benefit from those projects. So everything from listening to the students when it comes to mathematics, to really thinking about the relationships that are built, and the communities that are served when looking at the INCLUDES ecosystem is all very important. And I think the future of INCLUDES is bright. So I want to thank you so much for being our first guest on collaborative strategies for inclusive change.

Ivory Toldson:

I think that we've all learned so much, and we all have really listened to not just the direct charges that you gave us, but just the spirit in which you've given the information makes us all think and reflect on how we can do more to collaborate more effectively for the purpose of helping as many people as possible to broaden participation in STEM to those who haven't been served very well by the status quo. So thank you so much for joining us.

Speaker 3:

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