

## Episode #5: Interview with Dr. Aaron Thomas, Director of Indigenous Research and STEM Education (IRSE) at the University of Montana

Dr. Ivory Toldson:

Hello everyone, and welcome to another episode of Collaborative Strategies for Inclusive Change. This is a podcast series from the NSF INCLUDES Coordination Hub, where we highlight projects and partnerships that are disrupting inequitable systems to improve diversity and inclusion in STEM education and careers.

Dr. Ivory Toldson:

I'm your help host, Dr. Ivory Toldson, representing the QEM Network, Howard University, and the NAACP. The QEM network is a partner in the NSF INCLUDES Coordination Hub. This podcast features interviews with STEM education leaders, primarily from NSF INCLUDES-funded projects that highlight innovative collaborations to drive inclusivity in STEM.

Dr. Ivory Toldson:

Today, we have the perfect person to interview because he's done outstanding work on creating opportunities for Native American researchers. Dr. Dr. Aaron Thomas is Associate Professor and Director of the Native American research laboratory and indigenous research and STEM education at the University of Montana.

Dr. Ivory Toldson:

Dr. Thomas has a long history of directing NSF and NASA-funded research projects in the field of chemical engineering and increasing degree matriculation for Native American and Alaska Native students in STEM fields.

Dr. Ivory Toldson:

He's a member of the Navajo Nation. Aaron earned his BS in chemical engineering from Stanford University and a Ph.D. in chemical engineering from the University of Florida. He is a recipient of the prestigious NSF career award, which is given to young faculty in science and engineering. Most importantly, for this podcast, he is a principal investigator of an NSF INCLUDES' design and developmental launch pilot, the American Indian Traditional Sciences Experience. So thank you so much for being here, Dr. Thomas.

Dr. Aaron Thomas:

Yes. Thanks for having me on today.

Dr. Ivory Toldson:

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Oh okay. Now, I have the opportunity to visit The Standing Rock Reservation about five years ago when I first became the president of the QEM Network. It was an eye-opening experience. And I realized that you don't really get a clear understanding of the promise and potential and the people at Indian Reservation until you actually go there. So can you start off just telling our listeners a little bit about what Indian reservations are like and why it might be important to visit?

Dr. Aaron Thomas:

Well, first, I can say many reservations, they are actually quite different. They have some similar characteristics, but even here in Montana, some of the reservations may be a little bit more economically developed and others may not quite be so. Some are quite rural and some might be very urban.

So we have all of that here in Montana, but I do feel it's important to actually step on a reservation, talk to tribal members, talk to teachers, talk to tribal council members, and just to get a sense of some of the challenges and also some of the successes that they experience in their communities.

Dr. Ivory Toldson:

Now, you're leaving in the American-Indian Traditional Science Experience.

Dr. Aaron Thomas:

That's correct.

Dr. Ivory Toldson:

Tell us a little bit about AITSE. What are the main goals?

Aaron Thomas:

So one of the main goals is first is to continue to develop relationships with, in this case, it's the Flathead reservation, which is just north of our campus. Really looking at creating opportunities for Native American students that reside on that reservation. So engaging both schools, and also that there's a tribal college that's also on the reservation as well. And looking at creating lasting change for our students.

So after conversations with those that were on this reservation, specifically with the education department for the Confederated Salish and Kootenai tribes, it was determined that they wanted to bring science fairs back to middle school students. And so we decided to go ahead and assist in that effort by establishing a science fair, having someone that actually came and visited the students once a week to work on their science fair projects.

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We didn't want to create more work for teachers or anyone else that was on that campus, so we had someone specifically that came and helped with student science fair projects. And then at the end, we would have a community science fair event that we held at the local tribal college.

Dr. Ivory Toldson:

You mentioned a lot about developing relationships, creating opportunities, engaging schools, including tribal colleges. And this fits in well with the collective impact framework that all NSF INCLUDES' projects fit under. Can you describe how your project specifically implemented the collective impact framework? Because a lot of people get a little confused about how to operationalize it. So how did you formulate it in your project?

Dr. Aaron Thomas:

Well, it was important to us because it was further developing trust within our partners. This isn't something that all of a sudden, we, one day had a conversation. We've had conversations for a number of years on how we can best move more native students into STEM fields. And so doing the collective impact first required many conversations beforehand. And not me to come in and say, "I think this is what we should do." It was more, "What do you think would be best for your students?" Or, "What do you think would be best for your communities?" And so just listening to them.

And it's also important just to have multiple contact points with these students. So it's not just one person or two people, but having different people being able to work with these students in different capacities, whether that's through being a teacher, whether that's being through the tribal education department, a tribal college faculty, a tribal college student. Whatever that may look like, it's nice to have different contact points for these students and working as a collective, as a collaboration for a singular goal.

Dr. Ivory Toldson:

Yeah. That's very well put. A lot of things that you said doesn't really pop up when you read the formal explanation of collective impact. You hear about mutually reinforcing goals and shared metrics by developing trust. That was the first thing you said. That's something that has to be front and center, especially when you're working with communities like the native community or the African-American community where that trust has been broken by systems throughout their existence.

Dr. Ivory Toldson:

You also talked about these multiple points of contact. I think that's also very important. So, can you talk a little bit about some of the key outcomes of the work, and how have you disseminated these outcomes to the communities that you're serving?

Dr. Aaron Thomas:

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I think some of the key outcomes maybe weren't exactly what was put in our proposal. And when we did implement a science fair, we did actually have a science fair event. We took winners from those events to, in this case, was The Jet Propulsion Laboratory in California. For some of the students, that was the first time they ever were outside of Montana, some of the students' first time ever on an airplane. So that was exciting to see.

But beyond that, it was more of instilling opportunities for these students and giving them a belief that there's a little bit more maybe outside of what they think they can do. And seeing them be successful in their projects, even though at multiple times during the year, they thought there'd be no way they were going to be able to complete them. I think that was eye-opening.

But more than that, this has also led to other opportunities outside of INCLUDES. So it's led to different programming that we've had with these communities, with these students. So even though the grant was ending, we have developed other programming for these students, for them to come back and continue to engage. So that was also a key outcome as well.

And how this has been disseminated, we're still working on that. We just finished our final year. I had planned many conferences to go to and present. And of course, with COVID, all those got either shut down or went remote or however they happened to try to continue on. So we're still working on that a little bit. As you can imagine, COVID had a large impact on our program, so we can no longer visit the schools once that hit. So we're still working on more of the dissemination of this information.

Dr. Ivory Toldson:

Yeah. Thank you for that. You mentioned the science fair twice, so it sounds like that was a very impactful experience. And I know with these design developmental launch pilots, it's not a lot of resources there, but it's enough to create a spark. And it sounds like you all leverage that to create new programs, maybe programs that's not funded by the original project, but things that's impactful for the community.

Dr. Ivory Toldson:

So just to close us off and come full circle, you talked about a lot of different things like developing a sense of community. And you talked about the students that you worked with creating opportunities for them and instilling that sense of pride that comes from competition and leaving your community to understand the world around you. A lot of projects, a lot of programs, and a lot of principal investigators may be interested in working with Native American and indigenous students. What are some of the key elements would you say is important to consider when you're working with a native population?

Dr. Aaron Thomas:

So one of the key ones I believe I already mentioned was trust. Trust needs to be developed with these communities. And that may take years. So to me, it all starts with a visit and it all starts with conversations. And those conversations, at least to me, shouldn't center around, "This is the

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project I have for you," or, "this is what I think you should be doing." It's more just listening and sitting down and saying, "This is what we would like to do. This is what we would like to collaborate in. And what are your thoughts? What are you seeing? What are some instances of success that you've seen around this? And, if you had some funding, what would you do with it?"

And then just coming together and saying, "Okay, let's find some opportunities then for us to work on this together. And form some other partnerships and bring other people on board." And for those that are thinking, "Oh, there's one upcoming, and I'd like to work with this tribal group, but I haven't contacted them yet," that might not be the time. It might be the time maybe to start the conversations and to look for another funding opportunity that's further down the road. But it's really, again, trying to develop that trust as much as possible, first.

Dr. Ivory Toldson:

These are some very strong recommendations and we've learned so much from learning about AITSE. Did I say it right?

Dr. Aaron Thomas:

That's right.

Dr. Ivory Toldson:

Okay. AITSE, the American Indian traditional sciences experience. If you don't know about that project, please click on the link that we will provide on this podcast episode and check out the other episodes that we have, where we've talked to some outstanding STEM education leaders across the field who's doing some amazing work to create a more diverse and inclusive experience for STEM learners and STEM professionals. Thank you all so much for tuning in. And I will hear from you next time.

Speaker 3:

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