Democracy's College

Episode 10: Diversity in STEM

Welcome to the Democracy's College podcast series. This podcast focuses on educational equity, justice, and excellence for all students in P-20 educational pathways. This podcast is a product of the Office of Community College Research and Leadership, or OCCRL, at the University of Illinois at Urbana-Champaign. Learn more about OCCRL at occrl.illinois.edu.

In this episode, Edmund Graham III, from OCCRL, talks to Dr. Dimitra Jackson, an assistant professor for Higher Education at Texas Tech University, about diversity in STEM.

Edmund Graham III: Well first, Dimitra, thank you for taking the time to share your thoughts and reflections on such an important topic. We will get right into it. Dr. Jackson, most of your research has focused on adult learners in community colleges, particularly enrolled in STEM areas of programs of study. What led to your interests in this area of studying STEM in the community college context?

Dimitra Jackson: It was sort of a perfect storm, I guess. To put it into context: I took some community college courses while in college, only because some of the courses did not line up with scheduling and what I needed to graduate. In college, I started off in regulatory science but left that and pursued something different. Community college and STEM was always in my background. When I got to Iowa State I worked with Frankie Laanan. When I got to Iowa State with Frankie was when everything started to come together, because his research was on that very thing. After working with him, it became a personal venture, to say the least. It was something that I was connected to personally. I took it on as my professional venture almost like I was answering some questions about myself through the voices of participants. I have been doing it ever since, that has been my research.

Edmund Graham III: That is actually pretty cool. Your background set you up for something that you probably did not expect from your teaching style. It came full circle.

Dimitra Jackson: Exactly. Yes, literally.

Edmund Graham III: We know that a significant number of students of color earn CTE certificates, and given the overlap of CTE programs of study in STEM areas and opportunities for high student demand, can you unpack why there are not more students of color persisting, transferring, and earning degrees in STEM?

Dimitra Jackson: I definitely think it goes back to the K-12 environment. If we really look at how students are prepared, it's very different from how we were prepared when growing up, or I should say how I was prepared when growing up. We took field trips. We were exposed to things. The K-12 system had more money to bring in speakers and different individuals who could do experiments with us. It looked different; the make-up and the structure of the educational environment was different. Now students [rarely] if ever take field trips. While this is understandable given different funds and all of that, it does put our students at a disadvantage, because they are limited to what the institution, whatever it may be, can afford them. These very students, who are exposed to little, they then are expected to move on and declare a major. At what point do they learn about the different activities? Not just careers, but the activities that are associated with some of these careers. Unless they are able to get this information on their own, because it is not part of the K-12 curriculum, then they just make informed

decisions. They make those decisions, decisions that are the most comfortable, or ones that their friends are doing, or ones that their parents say they should do, or the most common ones. A lot of times they are not the best options for them, one, and number two, there are options that they may not be so satisfied with later, once they do learn what they could have done had they chosen a different path. Definitely, exposure through the K-12 system, and in addition to that I would say mentors who look like them. Not just direct mentors like teachers and advisors, but some of those individuals who can come in and speak with students, mentors who don't even know that they are mentors. Someone just may see them and say "I want to be like him or her," or "I like what she's doing or what he's doing." So exposure, diversity among individuals who students have access to in the educational system, and the last thing I would say is fostering interests that are already there. So often we have this perceived notion of "you're not that good in math, so I think you probably should go in this direction or don't even think about that," when we really should be saying: "Oh you want to do that? Okay, here are some resources to help you do that." When we look at the disconnect between the K-16, K-20, and then where students ultimately end up, when they come to choosing a degree and beyond.

Edmund Graham III: So what role does structure or systemic dysfunction play?

Dimitra Jackson: It's definitely there. Think of some of the cultural dynamics. We have to look at, number one, the background of the students and how they are even coming to where they are, because most of them are coming from backgrounds where both parents may or may not be working but they are doing the best that they can. They are trying to put their children on a good path with the knowledge that they have. We look at the educational system and then the cultural background of some of the students. It's almost like we are looking or hoping the educational system is structured in a way that will advance the students and not get them on the same path. Then we will end up with, a hundred years later and we are still in the same place. So what is happening here? Are we just missing the mark? The other piece of that is they need to understand, we need to understand, that students are taking on way more adult responsibilities earlier than what we had to. My whole thing was go to school, you focus on school, you don't have to work. School is what you do. School is your job. That is not the case now. Students have siblings they are taking care of. They have parents they are taking care of. They are expected to work around the house or an outside job. The structure of our homes, the structure of our educational system, and how the educational system is responding to some of these different structures in the home and in the cultural backgrounds, is a huge disconnect. One is not responding to the other, so we get these students out there that are just like "ok, I'm here, now what," and we are trying to advise them.

Edmund Graham III: Can you speak to that disconnect?

Dimitra Jackson: In addition to the information earlier about field trips and how that's not the way it was, when we look at the disconnect, we are not starting early enough. If we really think about it, the things that children are interested in, they are still related, whether it's blocks, playing in the dirt, building things. But somewhere along the line we have this idea of what a child should be doing. We will tell a female child, "don't play in the dirt, you'll get dirty," instead of saying, "okay, let's build this with the dirt." I think we move them too quickly from the very things they are interested in, right? I think when we look at college readiness, all of that impacts whether they are even ready, not just academically, but then in that self-identification: "I've been steered from this, I've been steered from that. Who am I and what I am supposed to be doing? How do I fit into this educational context? What

degree am I supposed to pursue, and once I finish that degree what career am I going to get?" Too often we have students choosing and majoring in different degrees without a clear path to where they are going to end up. There are too many college recipients without a comparable career. And then there are student loans that have to be paid back. It is almost like a cycle. We are creating a cycle of students who get degrees, take out loans to get degrees, but don't have a comparable degree to pay back those loans, not to mention they don't even know what they want to do with that degree. The cycle just begins and it continues. This is actually where I feel my book comes in, because it focuses on the old childhood phrase, "what do you want to be when you grow up?" It takes that spin and focuses more on what you want to do, so more the activity piece of it, getting the students excited about the skill part of it. These students really do not know that there are a host of other things, more then what you see on TV or social media. There are a wide variety of careers that you can do in STEM. So, it got me thinking, maybe we need to focus on what students can do and not necessarily what they can be. The book series itself is titled, *Exploring STEM with Teele and Guba*. Teele and Guba are the main characters of the book. I was going to say children, because I feel like they are children, but they are characters. They do not have a specific ethnicity or race, they are just diverse. There is reasoning behind that: I wanted students to be able to see themselves in the characters, not just say, "that is the Black character." No, that's not. That is just a character from a diverse background. For one that may mean the character is Latino, they may be Native American, or they may be Pacific Islander, they may be Black, whatever that character means to you, I want that student to be able to see themselves in it. Currently there is one book in the series and it is entitled, *Teele and Guba's Exciting Escapades through STEM*. The book itself, it goes on different escapades of STEM activities and things that students can do. There are more books in the meal, but this is the first one, and it is in English and Spanish.

The structural piece I think is super, super important. If you think about it, a lot of times when we see certain individuals who may say, "that's them, that's not me, that's not for me," when we build these networks around us that our children have easy access to, it becomes close to them. They are able to own it, to have some ownership of that, "oh yeah, that's such and such," and it doesn't appear to be so elitist. That is the norm for them. "That is attainable for me. That is something I can do. That's not the other. That's for me too." It was important to me to put it in Spanish as well for several reasons. One, I did want it to speak to a broad range, a broad group, because my area is diversity. So that is important to me. Language falls under that for me. Because it comes in both, I want children who read the book to understand that, "I don't just have to know English. I can pursue other languages as well." If I know the book in English it will be easier for me to translate it over into Spanish. The series itself just takes a holistic approach to educating students of color in STEM, in reading, and language.

Edmund Graham III: How do you build upon a children's book and translate that to middle school, secondary, post-secondary, etc.?

Dimitra Jackson: There have to be opportunities for students to learn about STEM, especially when we are looking at best practices. If we within the educational system do not provide that, we are doing our children and our students a disservice, because we are putting them out there to make decisions without having a clear knowledge base when they are making the decisions. I would definitely say opportunities that are built into the curriculum, opportunities for students to learn about STEM and other careers as well, and not just the academic piece, because if students are able to see a specific career at the end, then when the math or science gets difficult they have the motivation to push through it, because they can see, "oh yeah, this is what I want to be, this is what I have to do." The other

I would say is diverse mentors across the curriculum, and not just in certain sectors, but across it, so students can see people at every stage of their educational journey. I think that is super important. It goes back to what you said about creating structures and networks around students so that they can see people doing good things who look like them. The other I would say is when developing the curriculum it should definitely build. So often we see students who may transfer from the community college to the four year and they lose courses, they lose credits. What we don't understand is that for a lot of these students, it's time and it's money. So it gets expensive and super time consuming. They have families, and they have jobs, and they have other responsibilities outside, but they still want to get a credential. So making sure that when students go through the system there is some type of alignment to where one builds on the other, and they are not left having to take additional credits or lose some.

Edmund Graham III: You are walking in your calling. What call of action would you make to others as it relates to those who are interested in equity-minded approaches to diversifying STEM education and increasing pathways into community colleges?

Dimitra Jackson: Starting at any point is good, because there are gaps at each point. Now, starting early is always more impactful, when students are at that impressionable stage, so definitely start early and be consistent with it. The next would be to be aware of interests of not just children, but even once they get into elementary school and high school. Be in tune with what students are saying they are interested in. Help them foster that. Provide resources for them to foster that. They are looking to us to guide them. It's only right and it's only fair that we listen to what they are saying and provide opportunities that align with that, so then they can be a success story. The other thing would be we have to be intentional on our discourse and our implementation of programs and services for students. A lot of times we implement programs and services because we think that they are beneficial for students. Then we find out that that's not really what our students need. If we listen to them we would be able to understand what they need and we can provide programs that respond to those needs, whatever they may be. The last thing is we have to hold our educational systems accountable to educating our students holistically. It is not just about academics. It is about preparing them to move on, not just to complete a degree, but to move on to the next degree if they choose or even a career, and then ultimately be productive citizens. Our students spend a large majority of their time in the educational system for them not to be prepared in the end. To sum all of that up, I think that we shape our future, and what we want our future to look like, by how we intentionally prepare our students and our children.

Edmund Graham III: Thank you Dr. Dimitra Jackson for spending this time with me this morning. Thank you.

Dimitra Jackson: Thank you, thank you!

For more information about diversity in STEM. We recommend that you visit Dr. Jackson's faculty profile for a list of recommended readings. For more podcasts, links to today's recommended resources, or to share your comments and suggestions, visit occrl.illinois.edu/democracy or send them via Twitter @occrl. Tune in next month when Dr. Anjalé Welton from OCCRL talks with Amanda Bergson-Shilcock, the Director of Upscaling Policy at the National Skills Coalition, about policy trends and resources that support adult learners. Background music for this podcast is provided by DubLab. Thank you for listening and for your contributions to educational equity, justice, and excellence for all students.