

Announcer:

This is the Inclusion Interchange, a podcast from the University of Pittsburgh's Office for Equity, Diversity, & Inclusion. And here's the host of the Inclusion Interchange, Dr. Clyde Wilson Pickett.

Clyde Pickett:

Welcome to the Inclusion Interchange. I'm your host, Dr. Clyde Wilson Pickett, and I serve as Vice Chancellor for Equity, Diversity, & Inclusion, and Chief Diversity Officer here at the University of Pittsburgh. On the Inclusion interchange, we take the opportunity to talk to people across the University of Pittsburgh who are having a positive impact in the fields of equity, diversity, inclusion, and accessibility. With us today is one of our colleagues, Dr. Angela E.B. Stewart. We'll give you an opportunity to introduce yourself to those members of our community who might not know you.

Angela E.B. Stewart:

Well, first, thank you so much for having me. I'm excited to be here and chat with you. So a little bit of introduction to myself. I am in the Department of Informatics and Network Systems and I have a joint appointment in the Learning Research and Development Center. And broadly my work is looking at how do we create more equitable STEM education, with a particular focus in technology as well as how do we teach people to be critical about these technologies? As technologies are continuing to be developed and become more advanced, there is a lot of considerations for racism and sexism as examples of systems of oppression. And so a lot of my work is really in thinking about how do we support people in making conscious decisions about what technologies they're using, what technologies they're creating, and how technologies are part of their life.

Clyde Pickett:

All right, I appreciate you offering that introduction, and of course, we're glad that you're part of our community.

So I guess my first question is this. As you're looking at those technologies, what would you want our listeners to know about the way in which you're moving this work and how they could become better informed on the ways in which assistive technologies can be used to promote greater equity in education?

Angela E.B. Stewart:

Oh, that's a great question. So I think that my number one thing that I like for people to know is that technologies aren't designed in a vacuum, and technologies

are designed as a result of the society in which we live, in the culture in which we live in. And so often people approach and think about computers as being neutral forces, as being this neutral thing that is not making biased decisions in the same way that people are. However, that's not the case because these design processes that we have to create technology is very deeply biased. So I can give you a quick example. So the percentage of Black designers of technology, just even thinking just at the huge technology companies, is very, very low. There are very few Black developers and even fewer when you start to look at the intersections of identities. So Black women or Black queer developers. And we've seen a number of examples of companies developing technologies that ended up having racist outcomes. And part of one of the reasons why people say that this is kind of the case is because there are so few people of color in the development space.

Clyde Pickett:

So as you're looking at that bias that manifests itself in different ways. What I'm hearing you talk about is the way in which developers of technology, their bias manifests itself. And so for instance, we know for instance, digital lenses have a bias against people of a specific skin color, and we know that it could then follow that the ways in which developers are infusing and advancing technology, their own bias, including racism, manifests itself in the way in which technology is advanced on communities. What should we be mindful of in terms of the ways in which we promote opportunities to confront that technology? And as a learning community, what might we do to bring greater attention to those issues?

Angela E.B. Stewart:

Okay. Yeah, great question. So as far as promoting certain technologies, I think one of the biggest things is to be critical ahead of time about design processes. So let me give you an example. So hiring algorithms are increasingly used where you have companies that are using artificial intelligence in order to screen hundreds and hundreds if not thousands of applications, and decide on which applications might bubble up to the top as being the top kind of candidates. You also have other AI applications that are deciding on recruitment websites, should I show this job opportunity to this person or not? And then both of these cases, the outcomes have turned out to be incredibly sexist. For example, women were recommended lower paying jobs systematically compared to men or women were both not shown jobs and also not recommended for recruitment on the recruiter end of the scale.

And so because the people that are using these technologies weren't critical about how the technology was designed, they just kind of took the technology's decision on face value. So where are the problems that happened here In this particular case, there is a ton of data going back to that idea of there's not actually that many Black designers and developers, certainly not that many women designers and

developers. So these AI systems are all built off of looking for patterns and existing data. And so old data sets are used in order to come up with new recommendations. What this AI hiring algorithm is using is looking at old sets of data of who is it that has been successful at all of these big technology companies? And it's been primarily white men that's been hired. And there are markers of that in people's resumes that are not necessarily apparent.

And that's usually what these kinds of hiring algorithms are looking at is their processing things like resumes. And so you have things like what school someone went to is probably indicative of their race, might be indicative of their gender. Things like what extracurricular activities they participated in. So let's say someone has a society of women engineers or National Society of Black engineers on their resume. Both of these are pretty indicative of both race and gender of a person. And so none of these things were historically shown as being part of the profile of people that have been successful at these companies. And that's not to say that Black folks or women or non-binary folks aren't good designers. That's certainly not what it's saying. What we're saying instead, we're saying that the data has been so biased for so long, and so we can't rely on computers to make unbiased decisions if we're just using biased data that represents historical inequities. So as we continue to pull in these kinds of technologies into our practice, I think it's very important to think about what are the limits of these technologies?

Clyde Pickett:

I appreciate you offering that. So I guess my question would be what are the ways in which we better inform those data sets? Obviously part of this conversation is about what's existing and realizing that it really calls attention to the past inequity. Is there a way for us to further infuse, edit those data sets or better use our resources to educate the artificial intelligence, if you will, and to influence the algorithms?

Angela E.B. Stewart:

Yes, totally. So there are a couple of kind of approaches to this, but I think the first level approach is just being initially critical of is this a use of technology we want or not? So deciding on that first pass, is it a good idea for us to use an algorithm for an algorithm or an AI system for hiring screening? And let's say we're deciding that yes, actually it is a good idea. I certainly can see, for example, that a lot of these companies are probably getting thousands of applications, especially as geography is not as big of a deal and how we work. So I could see why it would make sense to maybe use some of these, but after you've kind of done that first pass, right now it's like, okay, we need to actually take a look at what is the incoming dataset look like.

And one big approach that is often used is by analyzing that data set for existing bias on known dimensions. So we know for example, with hiring that hiring is going to be biased on both race and gender. And so since we know that hiring is going to be biased on both race and gender, go ahead and take a look at the dataset before you even train your machine learning model and see what kind of bias do you have in say, this label that says this is a person that you want to hire or not look and see if it is all white men?

Angela E.B. Stewart:

And if it is in that case, try and diversify the dataset. Or you can just rebalance the dataset artificially, for example, by creating a dataset that is approximately equal across racial demographics or gender demographics as an example. And then I think that a final thing that you can do is after all of the training is done, is examine the bias afterwards. So largely how these work is you have a model, you have a dataset. The model is just a bunch of very complicated math that looks for patterns in the data, and then it gives you some prediction. So in the case of the hiring old dataset of who all has been hired for these companies, a model that trains that says, this person should be hired or not based off of the past. So now you're able to make predictions for the future, actually monitor the dataset as you go, or actually monitor those predictions as you go and see, oh my goodness, we're only hiring men, let's actually artificially or, well, I'm saying artificially even though we're already doing this kind of artificial level of hiring, but let's now after the fact, go in and make some corrections to the algorithm.

And then finally, honestly, I think it's really important to decide to stop using something when you've found out that it's biased. So if you find out that your hiring is incredibly biased on race and gender and that the AI algorithm is part of that, then you've got to stop and find something new to use.

Clyde Pickett:

So the appropriate opportunity to take action. You're listening to the inclusion interchange. I'm your host, Dr. Clyde Wilson Pickett, we're talking with Dr. Stewart. We'll take a break and we'll be right back.

Announcer:

For more information about the Office for Equity, Diversity, & Inclusion, visit our website at diversity.pitt.edu or find us on social media at Pitt Diversity.

Clyde Pickett:

You're listening to the inclusion interchange. I'm your host, Dr. Clyde Wilson Pickett, and with me is Dr. Angela E.B. Stewart. We're here talking about the uses

of technology and specifically assistive technology for moving equity forward. And so Dr. Stewart, I'll pose this question to you as we look at assistive technology, specifically AI as a resource — ChatGPT is obviously one of the forms of technology that has been highlighted as a resource. What are the ways in which those assistive technologies can be used to move the equity agenda forward?

Angela E.B. Stewart:

Okay, so I'm excited about seeing ChatGPT out there in the world. However, I think cautiously excited. So for let's talk specifically about ChatGPT. ChatGPT is in a range of what we call generative AI, meaning that it generates new content that wasn't there before. So in the case of ChatGPT, you put in some sort of language-based prompt, let's say, "write me a short story about a frog that lives at the University of Pittsburgh campus." And then ChatGPT will generate new content that's never been written before based on this prompt that you wrote. So I'm actually really excited for the usage of this for things like creativity as an example. So using these kinds of technologies in order to create new things, come up with new ideas that you didn't have before. And I actually think the creativity is deeply related to equity.

The primary reason why I say this is because Dr. Justin Reich has this really excellent book where he talks about the ways that creative technologies that allow students to create new things, to be critical thinkers has predominantly been available to affluent students and white students. And instead for let's say lower income students or Black students or students who are at the margins of educational equity have been largely educated in ways that push them to being workers and push them to essentially be employees for other people. So focusing on compliance to rules as an example. But the more that we can focus on empowering students creativity and their self-expression and their agency, I think is one kind of key way that we can think about equity because now we're no longer kind of systemically trying to get students to be workers, but instead we can systemically support students in being creators of new things.

So that's one reason why I'm really excited about things like ChatGPT. There are all sorts of really fun kind of applications of using it for writing stories or there's generative AI for creating art. For example. One other reason why I'm excited for it from an equity perspective is actually that it can really help students be able to express ideas while not getting held up on the specific language of the idea. As an example. So I teach a lot of students who English is not their first language and they have to do a lot of writing in English as often happens in university settings. And so I've heard from them that using ChatGPT has been so powerful for them because they have an idea and just need some kind of assistance in being able to bridge that idea into a written format that is more conventionally acceptable.

And then you also have all sorts of technologies like translation technologies, for example. Translation technologies are fully built off of AI. So Google has Google Translate, for example, which I use quite heavily when I travel. But I've heard reports of elementary and middle and high school teachers who use these things like Google Translate, especially when they teach students for whom English is not spoken at home. Maybe Spanish is the primary language spoken at home, and they're very adept at expressing language or expressing ideas in Spanish language, but perhaps there is difficulty in expressing ideas in English. And so you can use things like translate to help bridge that for sure, especially if a teacher is not teaching them in Spanish as an example.

Like I said, I am cautiously optimistic. For example, ChatGPT has been shown to produce errors, has been shown to kind of propagate misinformation as well as whenever you ask ChatGPT a particularly political question, sometimes it answers the question, but it is always going to answer it perhaps from a particular viewpoint. And I think it's important for students to be curious in question whether or not that particular viewpoint that answers it from is actually what they think or what they want to reflect.

Clyde Pickett:

So you bring to mind something that it's important for us to consider. So you talked about the way in which information is presented, and you also raised the potential for equity issue in terms of thinking about affluent communities having greater access to these assistive technologies. I'm curious if you could share with us some of the ways in which you've seen communities have been either economically, historically, economically, disenfranchised, or communities that have less access to these assistive technologies be given access, or how are the ways in which we can promote access with these assistive technologies, if you will, for those communities? In other words, how do we get the masses, and particularly those who have been historically underserved by higher education and K through 12 for that matter, the access to these technologies?

Angela E.B. Stewart:

I think that in order to support this idea of access, genuine relationship with the community is very important. So I think academia in particular has had a pretty long history of not treating marginalized communities very well and indeed treating marginalized communities very oppressively. So as an example, I, there's been a long, long history in academia of researchers coming in doing a research study and then leaving and not kind of continuously supporting that. However, in my own work, I use community-based methods where I'm very intentional about thinking about long-term sustainability of how these technologies are used. So as an example, having an internet-based technology is excellent. If you know that a person has regular access to internet, if a person doesn't have regular access to

internet, then perhaps don't use an Internet-based technology. As another example, laptops and desktops are fabulous, however, most people definitely have access to a phone and many people have access to a phone and nothing else as a way of connecting to the Internet.

And so in this case, it's pretty important to have good mobile versions of your technology as an example, and not just focusing on how does it look on a laptop, because I work on a laptop all day every day, but not everyone necessarily does that. And so all of these kinds of considerations are difficult to come up with and understand if you're not in genuine relationship with the community. And so I think it's very important to think about long-term engagement, not just thinking about what am I going to do this month, but instead, what does the trajectory of this look like for five years? What does the trajectory of this project look like after I'm gone? Because certainly I can't necessarily be in a community partner space a hundred percent of the time, and also not indefinitely, but thinking about how do we design for the sustainability of a project?

And finally, I think elevating the voices of those in the community and really having leaders from the community as being core to your project. So as an example, I'm starting up a project with two community partners here in Pittsburgh at Manchester Youth Development Center and Assemble in Pittsburgh. And in both of these, we have staff at the community partners that are both on the senior personnel of the grant as well as on the advisory board of the grant. And we're having regular meetings with them. We're making sure that their ideas are shaping and that it's not strictly just the ideas of the researchers because researchers have limited perspectives. And so it's important to not just value my own perspective, but also value the perspective of those in the community.

Clyde Pickett:

You're listening to Dr. Angela E.B. Stewart, learning scientist here at the University of Pittsburgh, and of course, this is the Inclusion Interchange. We will pause for our last break and come back to finish our time together.

Announcer:

If you have a question or comment, we hope you'll write to us. Our email address is diversity@pitt.edu.

Clyde Pickett:

You're listening to the Inclusion interchange. I'm your host, Dr. Clyde Wilson Pickett. With me is Dr. Angela E.B. Stewart. And so you've talked about some of the work that you have upcoming. This is an opportunity for you to share with our listeners some of the programs and projects and initiatives that you have in the

time ahead. So I'll turn it over to you and let you share with our audience what you have upcoming.

Angela E.B. Stewart:

Sure. I am so excited about so many projects that I've got going on, but the one that I teased a little bit earlier and can talk a little bit about is a new project that I'm getting started with faculty at the Arizona State University and at University of Texas at Arlington. And then also working with our community partners here in Pittsburgh, which are Dennis Henderson and Lauren Brown at Manchester Youth Development Center, as well as Nina Barbuto and Tany Haynes at Assemble. So what's going on with this project? The kind of core idea of this project is that racism in technology education is systemic. Racism in itself, of itself, is systemic, meaning that it's not only about affecting individual people, although that's part of it, but it's also about systems. So racism affects laws and policies. It affects cultural ideas in media, it affects how we discipline people, it affects implementational policy and it affects people's individual experiences.

So because racism is systemic, our need to combat racism needs to be at a system level. And so in our case, we're thinking about a system level intervention for AI education. And in the system level intervention, we are supporting three elements of the system. One is teachers and educators. And so how do we support teachers and educators in transforming their relationships to students, their interactions with students as well as in just how they advocate for and do things in a way that is more equitable. The second part is the curriculum itself. Again, going back to that idea that I mentioned earlier of how so often those who are most marginalized are educated to be workers rather than creators and leaders. So how do we instead focus in the curriculum? How do we focus the curriculum on a space where students can learn to create technologies in ways that further their own agency and further their own self-expression and support their ability to advocate for themselves and their community?

And then the final part of that ecosystem, that kind of systemic level that we're talking about, is the actual technologies that we're using. So how are we thinking about technologies in an AI classroom that are focused on equity? So what are the considerations for how much these technologies cost? How easy are they to use, especially for teachers who often don't have a ton of technical expertise. How do we make sure that there are technologies that they can use that are actually feasible for them to use long-term as an example? And so we're pushing on all three of these levers and trying to figure out how do these three levers work together in order to further equity? And our specific idea of equity in this project is Black girls, and how are Black girls emboldened as AI creators? So again, rather than thinking about learners as consumers of technology, but instead as creators.

And I think one of the other kind of big things I'll say on this is that we're using a inclusive definition of Black girls. And so our program is certainly welcome to Black femmes, Black trans learners, Black non-binary learners, any learners who identify in that space of femme or girl. And so really thinking about how do we create this kind of system level inclusive place for them to learn about technology, use technology in ways that are joyful, in ways that are creative. So I've been working with specifically Manchester Youth Development Center for a few years, and one of the most profound moments that I had with them was, I think last summer, the summer before we were running a robotics camp. And there was one girl who was building her robot, and she was doing all the kind of typical coding of the robot to make it roll down the hallway or make it slides blank or whatever.

But she was really into kind of cosmetology and aesthetic kind of personal aesthetics. And so she had so much fun and joy in creating nails for her robot, and she even made her own little hair salon in the back of the classroom and had everyone bring their robot so that she could do their robot's hair as an example. This was an kind of example for me of watching these girls simultaneously bring things that are important to them, infusing that with technology, infusing that with self-expression. And so really creating these kinds of space or what I'm really, really excited by these days.

Clyde Pickett:

Well, appreciate you sharing that, and I know there's a place for us to find that work online. Would you like to share some of the ways in which people can find you or reach out and find more about your research?

Angela E.B. Stewart:

Totally. So my website is angelaebstewart.com. And then also on Twitter, I am at Angela E.B. Stewart as well.

Clyde Pickett:

Well, Dr. Stewart, thank you so much for being with us. Of course. You are a valuable member of our community and it's great for us to share more about the work that you're doing here on the Inclusion interchange.

Angela E.B. Stewart:

Thank you so much for having me.

Clyde Pickett:

And to all of our listeners, thank you once again for joining us on the Inclusion Interchange. We will see you the next time. Take care and be well.

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