

Race and Ethnicity hub:
Building representation in STEM

Tracie Farrell, Chris Sanders, Azizah:

SPEAKER: So, one of the things that John wanted to start the talk with about today was the diversity in our lab. And this is not the most recent picture of our lab. We actually took another one last week. But it's really important for us as an institution.

Diversity is not something to be tolerated in our field. It's a necessary ingredient for innovation, but more importantly, in working in the field of technology, which is so hugely influential, it's a matter of representation and social justice. So, it's really important to our lab.

But it also matters for a future generation of technologists and scientists who are coming up in the world today. I didn't want to repeat to you some of the information statistics that you've probably heard over the course of several presentations in the last month about the numbers of Black professionals working in STEM or Black students studying STEM subjects.

What I wanted to do today is to underline a hugely important this community has been thinking about the users of technology in the communities that develop around them. So, Mark Dean at the lower right corner, he created loads of patents for IBM in the early days and helped to shape the accessibility of computing with the first gigahertz chip.

And then Alan Emtage, who was inspired to provide resources to students who are trying to access information on the web, he developed one of our-- he was widely regarded, actually, as the first Search engine. And then Jay-Anne Lopez who developed an online community of tens of thousands of users with Black girl gamers with an inclusive perspective on gaming that doesn't just extend to the Black community, but also to wider other marginalized communities. And then finally, Kimberly Bryant, who founded Black Girls Who Code, she created an environment where young Black women can feel welcome in technology and can build the skills that are needed with mentors that they trust.

So, we need to be holding on to a nurturing similar efforts everywhere across the University, because that's kind of who we say we are as an institution. So, this summer, we started to

follow the advisement of Black student organizations to look at some of the previous work done at the OU and a bit wider abroad about the experiences of Black students in STEM.

And we realized that so much of what's done to address the experience of any marginalized community is put back on the community, to learn how to study in a new way, or seek help in any way-- when, really, what many students are asking for are systemic changes, structural changes, cultural changes. Students have asked for increased institutional awareness, which includes serious efforts to decolonize curricula in teaching.

And I don't know if you saw the presentation with Mustafa last week, or if you plan on visiting the one later today, but research does show that curricula are more likely to reflect the demographics of staff rather than students. And so that's something that has to change.

In addition, students asked for improved pastoral support, and access to educators who are able to host meaningful conversations about race in the classroom. And finally, students are asking for pathways to equity-- which are not always about providing the same opportunities for everyone everywhere but providing opportunities that actually help to resolve some of the existing structural and systemic barriers to participation.

So, at KMi, we're involved in all of those institutional internal efforts to shape the way support students at the OU. But we wanted to be that place where students want to study, and maybe even work.

And the nature of our lab means that much of our teaching is done through mentorship with graduate students. So, we had to think of a good opportunity for mentorship in our lab. So, when we were thinking about the kind of opportunity that we wanted to provide, we decided to provide basically what every intern wants-- a personalized, paid, professional internship that can actually result in something concrete.

Not every computer scientist comes to the field by sitting in a basement making code all summer long. Lots have to work. Some have families. Some come to the subject later on in the game. And we wanted our future intern to have the time and the resources to make something.

That's a value in our lab. It's a value across computing and engineering. So we wanted her to have more in our portfolio than she came with, and be able to learn new skills from the people in our lab.

Of course, we also wanted Azizah to have fun, to enjoy the computing experience and really most importantly, to help her with her career. We also snuck in a bit of research methodology. We worked on a paper with a Azizah that we helped publish.

And this was our first summer of doing this. So, there's a lot of scope for improvement, but we're really excited about what Azizah started. And it'll be up to her to tell her you, and her mom tell you, if we've achieved our goals. And we've invited them here today to kind of do that.

So, I'm going to do that in a few moments. But, first, just a few ideas for the future of the scholarship. Number one, we have to start finding creative new inroads with young people. We need to find ways of allowing them to meaningfully experience and experiment with a career in STEM. So many young programmers will come to university already knowing quite a bit about computing. And we want to help to provide opportunities early on.

And following the advice from BAME students at the OU, we want to provide that appropriate training for mentors, so that they can understand and listen to the young people that want to work with us. So of course, we need to start implementing the scholarship in a more structured way, collect data that can tell us how to improve it.

And, obviously, we're going to have to do a second cycle of the program. So one of the things we wanted to say is that if you know somebody who'd be interested in either an initial work experience-- or, if they have a bit more skill, a summer internship-- you can get in touch with me. I put my email on the final slide.

So just a little bit of background on the project that Azizah worked on. We have a project called COINFORM at KMi, which is headed by a professor of web science, Harith Alani. And we've been working on the subject of misinformation for quite a number of years. We had another research assistant, who's also an OU PhD student right now-- Martino Mensio-- who developed this service which connects to international fact-checking network-- which has some standardized ways of providing fact checks in the community.

And this service can detect those fact checks and their corresponding misinforming claims on Twitter, when they refer to a specific URL. Sorry, if that's a bit technical. But if they're connected to the database, MisInfoMe can find it. And it can also provide some credibility assessment of sources using our web tool. Two of the ones that we use are called NewsGuard and Web of Trust, that help to provide a credibility score for different online sources.

So, what we decided to do is to extend this as part of a HIF project, and experiment with creating a conversational interface for interacting with fact-checking information-- as a potential learning opportunity.

We had already met Azizah, because her mom had set up a work experience for her, in which she helped us develop an Alexa voice skill-- something we'd never done before. And we were absolutely floored with her skills. And we really wanted to hire her to extend that work in this project.

So now I'm going to hand over to Azizah and Chris, to tell you a little bit more about that. And I'm going to put on the first slide-- unless, Azizah, if you want to take over, just let me know when to move the slide forward.

AZIZAH: Well, the first word, I'm just talking about how I got into coding. Near the start of high school, I started learning Python and JavaScript-- and was quite interested in it. I think a little bit more Python than JavaScript, because I was already learning-- there was already a course for it in our school, but I didn't really start to take it. I chose different subjects for my GCSEs. I think kind of near the end of high school, I got like-- so you have to do work experience. I worked with the Urban University for a week. And it was really good. I think I coded something to do with data. I can't even remember now.

But, yeah, and I guess there [INAUDIBLE 8:42] up. I don't know if I texted-- not texted, but emailed Tracy, or if it was the other way around. But it did end up [INAUDIBLE 8:52] the site, which we worked on this whole thing. How do I change the slide?

SPEAKER: [INAUDIBLE 9:00]

AZIZAH: Oh. In the process of making this board, the originally-- well, I'd say we originally wanted it to be on Twitter. There was a bit of confusion at the start, but then we did come up with a plan. So, we mapped it out. And we wanted to make something accessible for people, so it's easy to understand-- like for new people-- for people who don't have any experience online.

And originally, I made it in Python. So, when I started creating the board, originally I used Python. And I think we put it on the internet, it went to JavaScript. And the way it works is that-- wait. Yeah, OK, I was on the wrong slide. The way it works is that a user will kind of put in a Twitter name-- so a Twitter username.

And then it will search MisInfo databases for an accurate score of how trustworthy the-- I don't know how to describe it apart from trustworthy the account is. And then it'll come up with a

score. And per what he tells you-- if it's a low score, if it's related to misinformation-- if it's higher, it's not. And it will tell the user, instead of just giving you the value-- which further makes it more accessible and more understandable for people. Wow, [INAUDIBLE 10:54].

OK, so that helps us make a start in providing better tools for people to make [INAUDIBLE 11:02]. It was also a starting point for us to start thinking about how misinformation can affect other people on the internet. So, if someone saw something, they'd leave that. And they'd tell other people. And other people would believe them, because they're friends and stuff like that. And misinformation can make a big impact on people's views of things, especially politics and stuff.

I know that a lot of young adults and girls-- especially from BAME-- are excluded and unable to access STEM and STEM learning. And this opportunity was-- well, it was really good for me. And at the moment, I'm currently studying in Oaklands, which is in Welwyn Garden City.

And I think with this experience mainly-- because I didn't really know what course I wanted to do. After doing this internship, I kind of knew I wanted to do something code based. So I ended up doing games design. And-- then I'm kind of hoping that from now on there's going to be more stuff. Like, I'll be more inclined to work with the Open University.

CHRIS: Hi, everyone. I'm Chris Sanders. I worked with KMi development team. And I was brought in just to help as Azizah with any support that was required in getting the MisInfoMe bot kind of up and running.

So, when I came into the project, it was nearly complete. So, the code Azizah's done in Python works brilliantly. So, it was mainly about kind of getting it onto a platform, so that we can kind of showcase it-- which is sometimes the more boring aspect of getting it onto a server, asking for Twitter support, and things like that.

So, most of it was already done. So, I was kind of only just to support [INAUDIBLE 13:10]. So, looking at this slide here. So, the idea originally was to get a Twitter bot, that could respond to instant messages or direct messages. Or you could at it, and it would respond to you with information about anything that you asked about.

So, if you asked about a Twitter account, it could respond with a short piece of information-- a summary on that Twitter account. And if you asked for more information on how it gets the information, it could also respond with. So that was the initial idea. So that's where we wanted to head to.

Unfortunately, some of the challenges with Twitter is it takes a long time to get Twitter [AUDIO OUT] apply for [AUDIO OUT] an account. So, to get your code on there for them to allow you to talk to Twitter in that manner, it is quite a few hoops to jump through-- which is not the fun aspect of this kind of coding work.

So, yeah. So, at the minute the Twitter bot connects to the MisInfo API, which Azizah has already discussed, and it does respond to you as if you were a user to it. So, the idea was to get it onto a platform where external users could now use it. So, if you want to go on to the next slide, Tracy.

So instead, because we were running a little bit out a time at the end, we wanted to get something to showcase. There was a bot put onto our KMi intranet, which all of the staff in KMi can see and interact with. And it kind of works exactly like the Twitter bot. So, you can type, hello. You can put in a Twitter account. You can talk to it. It has a wide range of responses.

I like the fact that Azizah put in that if you [AUDIO OUT] Twitter account. So, if you're looking to analyze a large Twitter account, in the meantime, you can talk to the bot and ask it questions. All the code was done for this. So, it has a wide range of responses, depending what you ask it. It was very flexible work. And this is all packaged very nicely in Python, as well, to the point of where we can use it in multiple different applications.

The theory behind it and the work used to develop it is great. So, yeah. So, at this point, when I came in to look at the project, it was just to get a working demonstration-- which we now have. It's up and running on KMi's internet right now. And there is lots of further plans for use for this bot and going forward.

I do find that the benefit of the online tool at the minute, though, is obviously with a lot of people working from home, working remotely, we are looking at more social ways to interact with people. We'll interact with things. So, I think these bots are going to become more and more useful. A lot more people are visiting our internet, to socialize and things like that.

So, we're trying to get a lot more tools like this out there, so that people can connect. And obviously misinformation in this day and age is a massive-- not an issue, but a massive subject. There's lots of misinformation out there. And as many tools as we can get as possible that can help a user, or someone analyze a tweet or analyze any piece of information to help them make a decision is great.

So, one of the main things I wanted to talk about-- just going on to the next slide-- is, what's next? Because although-- I mean, I love working on fun projects. It was really great to come on to this, because it's a really exciting project. It's not what I do daily.

So, it's great to work on something that is exciting like this, but I didn't want it to just stop. So, I wanted this work to carry on. And I think at the current count is there's at least three kind of spinoff projects that are going to work from the code that Azizah's is done.

So, I think our own development team are going to use a bot. We're going to implement a bot on our own Twitter feed, that will have automated responses. It won't be hooking up to an API, but it will be able to respond in normal. We're going to keep this on the internet, so that it works as a Twitter bot, so people can analyse tweets. We are going to get it on Twitter. We are still working on that. It's part of a project that I'm on.

So, we do want to get it there. It will just take time. And one of the boring aspects of the job is that some of these things just take time to get access and to get a server ready and things like that. The code is all still there.

And then thirdly, we thought about implementing [AUDIO OUT] the code that Azizah's done can easily be put into a Chrome extension, which would mean it could analyze anything on the page. So, if you apply the extension to a web page you are on, it could scan the page, find any Twitter links, find any misinformation, and give you a summary on it. And that was another spinoff project, that we thought would be very interesting for us to pursue.

So overall, I mean, it was really great to work on this project. I did not do any of the code for it. It is Azizah, and it is all working perfectly. These screenshots here show-- the one on the left is just a static internet homepage. And the one on the right is me analysing my own Twitter page. Hopefully, not too much credibility.

My credibility is still quite high, I think. I have to be careful what I'm tweeting. But it works really well. And I can tell people have been using it. We keep a log of that. This is, like Azizah said, is a JavaScript version of the code, just so it can work on the website. But it is exactly the same as what we will use when we put it into Twitter.

And so, it's been fantastic to work on this project. I think it's really exciting to see someone be able to come in and do something like this, that has an instant benefit for the lab and for people around it. And it's a jumping off point for a lot of people, to see this kind of work and the ideas that go into it-- and the passion for this kind of work.

When you're in a meeting with Azizah-- and Tracy, there's a lot more ideas that kind of spin off from this. So, it's always exciting to get new projects like this and to be able to work on them. So personally, I really enjoyed working it. And it's going to carry on further.

So that's kind of all for me at this point. But, yeah, I thought it was a fantastic piece of work, and I was happy to help with it.

SPEAKER: Yeah. So, in case you missed the plug, Azizah-- is looking for another internship, now that you've just learned about what a brilliant work that she's done. But then we'll pass it back to Gania for her comments.

GANIA: OK. Yes. I am obviously this lump here. And I am also a PhD student researcher at the OU. And my research has been largely in policing, since 2015. So, I also work with the Centre For Police Research and Learning, although I'm in computing and communications, mainly.

When my daughter needed to find a work placement, her school didn't have a lot of opportunities available in STEM, or technologies. What I could see, from the brief that they sent home with them, was that they wanted them to do something that would introduce them to the workplace in an area that they had interest in. And the list that we received from the school, of potential places, were things like working in a butcher shop, working in a supermarket, or superstore, or gaming store-- where they sell games and stuff like that. But nothing really focused.

And I thought, she spends a lot of time on the computer. I think it's one of the things we have a lot of disagreements about. And each time I ask, well, what are you doing, she shows me a whole load of stuff. And I don't code in Python. I don't like Python at all. So, to me it's a jangled mess, whereas to her it's meaningful.

So, at that point, I started to speak to a couple of people in my own department, or in my sub-department, in critical-information studies, as well as the team. And they mentioned that actually the OU does offer-- although perhaps not widely advertised-- the OU is website is a bit of a dig through to find kind of space, as it were.

But we did have opportunities at the OU. And I was connected with Tracy. And I think we had a couple of discussions, where she really just wanted to know, very helpfully, what Azizah was most into. She wanted to know what Azizah likes to do, what she likes to learn.

And she offered to tailor something around that. And that was how it was Azizah [AUDIO OUT] work or started to do her work placement at the OU.

I think what was important here is that the KMi responded to my request within hours of me asking if they could organize a placement. The other thing is that they mobilized a team of people, the moment that they discovered what it was that Azizah liked to do.

They mobilized a team really quickly. They were able to communicate with her in an understandable way. And they more or less just drew her in. It was like she had acquired several aunties all at once. And they all kind of rallied around her.

And I became like the surrogate mom, more or less, while they kind of mentored her and supported her and built on her skills and continued to identify her areas of strength. Now that, of course, has led into the summertime, when she came forward again, or when we got information from KMi. And I think Tracy and Azizah actually stayed in touch over time and talked to each other.

So, when this work opportunity came up in the summer, it was something to grab with both hands, because we were in lockdown. And we were at that point where people had-- the novelty of not working and not doing anything but eat and sleep had started to wear off.

So, it was a great opportunity. And moving on from that, I would say that-- again, without going back to the statistics, just like Tracy mentioned earlier on, there has been a distinct and notable absence of intentional support to make STEM more inclusive.

And when people talk about diversity and equity of opportunities, what is important is to include the young persons who are often not able to reach or attain or access learning and professional development in STEM. You could, for example, think of the fact that a family that's from a BAME background, where I'm educated, but some people aren't that educated or web savvy.

These opportunities are sometimes advertised on the internet. They're advertised in a very, very closed circle, where other people may not even know that there are opportunities to intern, how much more for someone from BM background to get in through that door and actually learn something.

And what's important is to understand that a lot of young people nowadays are very interested in technologies. They're very interested in science. And they're very good at critical thinking and analysis.

And we need to figure out a way, without shifting into what one might call negative-- or should I say, positive discrimination-- without doing that, we need to figure out a way to actually stretch our arms even further and bring people from this background into STEM, for them to

grab these opportunities-- have them afforded to them at the same level and on the same scale as people from other communities.

For me as a lone parent, and with a family from an African background, we're all too aware of negative labels. And this opportunity, it's created a chance to attach a positive label to BAME. As you've heard from Chris and from Tracy, the coding was pretty much all done by Azizah.

I was remarkably surprised, to be honest, at how devoted she was once she had to task. It wasn't just about the task. I think it was also about the environment and the people that were around her, that were mentoring. They were able to motivate her to do things that I can't do myself. She was actually getting up and trying to do stuff. And she was trying to work late, like a business executive, as well.

And I think that that's a really, really positive. And it helps to shift the spotlight away from having people from the Black African background, or from a lone-parent family being associated with problems or difficulties or with a limited capacity to attain academic or social footing. It opens up a window where she has changed negative words into positive words. Instead of problems, we're talking solution. Instead of difficulties, we're talking about excelling. And instead of having limited capacity, I would say that she has unlimited capacity, and that she has had a door opened. By the time she came to go to college, when we went to do the interviews, she was like, I know what I want to do now, Mom.

And doing all of this work-- this internship-- it helps me. And then over the summer, doing the extra work, she was like, I'm now very sure that this is what I want to do. And that means that she's learning in an environment where she's, again, supported and still being supported by the OU. But importantly, that she's learning something she wants to learn and something that she's had a good taster of before she goes into it-- so that she's got better chances of doing well.

Now, as I said before, one of the issues is that there's not enough opportunities, or the opportunities are designed to inadvertently exclude or cut out chances for mentoring and learning for people who are considered BAME. And overall, I would say that it's positive that the KMi took on this particular role at this time.

And I think that they should serve as an exemplar for other departments and other faculties within the University, in terms of creating more and more of these opportunities and reaching out-- whether it be from inside the OU to outside, and working with parents like myself, or working with other individuals from within the Black, the Asian, and the minority ethnicities background, to make sure that we keep bringing our young people to learn-- and helping them to develop and keep [INAUDIBLE 28:07] STEM to them.

Because it's important for us to represent goals. It's important for us to represent people from the Black background. It's important for us to represent any group of people who have traditionally just been described as something negative and left there to fester, into doing positive things.

As I said before, it's helped us prepare for her future work. It's helped her to actually develop writing skills, as well-- time management, task management. And also, the mentoring has been valuable. And for me personally as a PhD researcher and a parent, I'm also too aware-- because my research is in policing-- how hard it is-- what kind of limitations and barriers.

The ones that you experience, and you can talk about-- the ones that you don't even know how to articulate them in words, that these barriers are there. Even though it's hard to articulate them without sounding like a bag lady, there are difficulties for us to get into the places that we want to get to. I know the difficulties, and I know the challenges that I faced when I started to get into policing-- and how difficult it was for me to get through that door.

And then once you're through that door, there's that challenge of constantly having to prove yourself and constantly having to earn people's trust. And it's not as easy as people think it is for BAME community members to consider learning, working, and research in STEM.

And in this month, where we as academics think and we consider the ways in which we can improve the effectiveness of diversity activities, I'm pleased that we can talk about and discuss how important it is to catch our young people early, to present them with opportunities that are meaningful, that are positively influencing the development, and that help them to consider STEM as an option for the future.

And that's pretty much it, really. I think I should end there, because I know that we're behind with time-- with about five minutes here and there. As I say, I'm really, really thankful that my daughter got this opportunity. I think it took a lot of the burden off my shoulders, of sitting with her and trying to figure out what she wanted to do-- and being sure that it was what she wanted to do.

Because unlike my generation, where we took what we were given-- and perhaps, maybe, we weren't as feisty-- the younger people, they tend to be very, very different. And if they're in learning environments or in courses or in vocations that they don't like themselves, they are less likely to succeed. And if they don't have the right mentoring, even if they're in what they want to do, again, the likelihood of succeeding while staying in that industry is even more limited.

And it's really great that the OU has given her that opportunity to learn and grow, as she has-- and to mature out, as well, into the young lady that she is today.

Thank you very much.

SPEAKER: Really, really appreciate those thoughts, Gania. Thank you very much. Yeah, with that, we just wanted to say, thank you for listening to us.