Transcript is computer-generated and not reviewed for accuracy.

Moving the Needle – Episode 49

Transcript

00:00:00 Scott Riley

Welcome to moving the needle casual conversations about ways big and small to impact student learning.

00:00:07 Scott Riley

Brought to you by the faculty Center for Teaching and learning at the University of Maryland, Baltimore. I'm Scott Riley too. Let's move the needle.

00:00:19 Scott Riley

Welcome back to moving the needle. Have you ever wondered what makes a great teacher truly stand out?

00:00:24 Scott Riley

What strategies do they use and how do they develop them? In this episode we explore the journey of an award-winning educator and through her experiences will uncover how mentorship, thoughtful practice, and passion for learning come together to shape extraordinary educational experiences. I'm thrilled to be joined by Doctor Sahar Alame.

00:00:44 Scott Riley

Assistant professor of STEM Education in the College of Education at the University of Kentucky, she holds an MA in science education and a PhD in curriculum design and instruction.

00:00:54 Scott Riley

This year she received the Great Teacher Award from the University of Kentucky for her impactful work in two areas supporting K through 12 teachers and students and constructing and evaluating scientific explanations and helping them develop informed understanding of science and its nature, particularly in the context of socio scientific issues. Doctor.

00:01:15 Scott Riley

Welcome to the show.

00:01:16 Sahar Alameh

Thank you. Thank you for having me.

00:01:19 Scott Riley

Really.

00:01:20 Scott Riley

I'd like to start.

00:01:21 Scott Riley

By talking about your background in education, you have this really rich background. Can you walk us through where your journey started and how you got to where you are today? An award-winning educator?

00:01:31 Sahar Alameh

I actually come from a family of educators, so teaching was part was part of my world. My father was an electronics and physics teacher. But in the vocational education back in.

00:01:43 Sahar Alameh

And my mother was a chemistry teacher. Elementary and middle school chemistry teacher, and later she became a supervisor in Lebanon's public schools. And I am the youngest of four. My dad used to call me his physics trophy because he tried with every one of us and it it worked out with me. And I think I decided to be a physicist.

00:02:03 Sahar Alameh

Even before I even understood what that meant, and now I do know that physics is everything. So yeah, I I did understand what that meant, and I'm hoping we'll talk more about it. But anyway, after earning my bachelors degree in physics, I taught high school physics, chemistry and mathematics for about 8 years.

00:02:22 Sahar Alameh

And during that time, I completed my teaching diploma and my Masters in Science Education. So it was then when I really discovered that even though I really loved teaching, and I'm interested in how we teach and what we teach. But I was also interested in how kids learn and the ways by which they progress. So it was.

00:02:44 Sahar Alameh

Then when I discovered OK, I want to work with teachers more than students.

00:02:49 Sahar Alameh

And I want to see how we can maximize education by working with teachers. And one way that I describe what I do, especially with my journey, is education. I like to describe that I teach teachers how to teach. It's the Triple T's, which is really a lot of what we do. And I really, really then.

00:03:10 Sahar Alameh

After a few years of that I then it was when I became really fascinated by, OK, what is it that we need? What is it that we're what we're doing in the science classroom? And I started this philosophical questions, and I actually moved to the US in 2014 to pursue my PhD.

00:03:27 Sahar Alameh

And philosophy of science. So I wanted to pursue and I took as many courses of philosophy as I could, but it was then again with the philosophy. It was all the explanation of the constructs of things, and I wanted to go all more practical. Oftentimes, as I was a teacher, when we would.

00:03:47 Sahar Alameh

Them give feedback to something that the students say we often say correct or incorrect, right? We don't give much more than that, so I wanted to basically make sense of that, and this is where my work in my doctoral work led to me working with scientists, teachers and students. Having them explain natural.

00:04:07 Sahar Alameh

Phenomena around the world and seeing what it is that they do when they.

00:04:11 Sahar Alameh

Lane and that really led me to working with also when I talk about my teaching career, I've had all sorts of students. I've had students who are kids, students who are high school, but I've had students who are teachers. I've had students who are scientists. So I think my journey is, if I were to describe the richness of it is that I've had.

00:04:31 Sahar Alameh

Students, not just of different ages but of different backgrounds of different purposes, all basically towards improving science teaching.

00:04:41 Scott Riley

Wow, that is amazing because of everything that you've done, you recently won a great teacher award.

00:04:48 Scott Riley

Tell us more about that.

00:04:49 Scott Riley

What is the award mean to you and?

00:04:52 Scott Riley

What was your initial reaction when you heard about?

00:04:54 Sahar Alameh

The award. Ohh I was very, very surprised. I was very moved. I did not even know I was nominated. They do not tell you. Usually they either surprise you in class or in a meeting. And I was surprised during a department.

00:05:08 Sahar Alameh

Meeting it's about 20 faculty of us there, and when the UK Alumni Association came in, you do know that this is the Great Teacher award which is only 6 professors in the entirety of the university. And I was like, ohh definitely it wasn't me.

00:05:23 Sahar Alameh

Uh, but then my my name came out and I was like that is. Wait, what? And what made it really meaningful was finding out that the student who nominated me was Cindy. I really liked this award specifically because it is student nominated, right? So it is exactly. It manifests what I usually do when I'm empowering.

00:05:43 Sahar Alameh

My doctoral student Cindy is my PhD student. I've always encouraged her to advocate for herself and for others. Cindy has had to do so many decisions she she's a Department of Defense stem teacher and she recently left the US to work in Turkey and Ankara, Turkey for Department of Defense School.

00:06:03 Sahar Alameh

And her and I had talked about.

00:06:05 Sahar Alameh

She can still pursue her pH. D She can still even do her research from abroad and.

00:06:10 Sahar Alameh

Little do I.

00:06:11 Sahar Alameh

Did I know that while I'm instilling all of these things in her that she was nominating me for such thing? So to me really that that award was a reminder for me that those little things, that everyday work that we don't usually think about those things.

00:06:25 Sahar Alameh

Matter the small moments, the after class conversations, these efforts to make them feel relevant and supportive. And I think that's what really, really that award means to.

00:06:36 Scott Riley

Yeah, I agree. You're highlighting the unseen impact or the unmeasured impact that many faculty have on their students. And so I'd like to actually talk a little bit more about the students. Cindy, who nominated you, there's this really compelling, really emotionally evoking video where she talks about what you taught her and.

00:06:57 Scott Riley

To quote her, she said she taught me to take risks, embrace challenges and the power of yes.

00:07:02 Scott Riley

And I'm curious, how do these ideas impact your approach to developing the informed views on science and nature that when you call the teaching teachers how to teach science and nature? How do these ideas impact that approach or your approach to it?

00:07:19 Sahar Alameh

Yeah. Thank you for this question, because really the beauty of my work is that my research and teaching are in constant dialogue and because I'm in the College of Education, usually the challenges and the questions that come up in the classroom, in my classroom, on college, they often lead.

00:07:39 Sahar Alameh

To my research inquiries.

00:07:41 Sahar Alameh

And the insights that I gained from research directly inform how I support students and teachers, so there's really hard to separate what we do in terms of of what we do in the STEM education field. So I think the synergy that I have between theory, practice and even mentorship is what shaped me into the educator.

00:08:02 Sahar Alameh

I am today and I think.

00:08:03 Sahar Alameh

That's that's really what it is. So like a.

00:08:06 Sahar Alameh

Lot of what?

00:08:06 Sahar Alameh

I do focus is not just on students. Conceptual understanding of science, knowing the facts, knowing the science, but on how science works. And we call this as you referred to in your question, the nature of science and this really informs everything I do even.

00:08:23 Sahar Alameh

In my mentorship, so basically this entails how scientists so students get to learn not just the pieces of evidence, but how scientists find evidence how scientists even use evidence we.

00:08:37 Sahar Alameh

Discuss those biases that you could have the same set of evidence, but different scientists looking at this and they reach different conclusions. How is that even possible? And I think sometimes in class when we forget to talk about this, we get students very different, very distant on how they think.

00:08:56 Sahar Alameh

That's how science is like and this is.

00:08:59 Sahar Alameh

There, the trust in science starts eroding. This is where information and misinformation starts, and even the conspiracy theories that we hear about. If you remember, during COVID we would we were the masking versus non masking and I would have these

conversations with high school students and even with high school teachers who would be like yeah.

00:09:19 Sahar Alameh

Fauci Anthony Fauci has this $5,000,000 grant from China and they are building and they are making these masks in China, so there must be some.

00:09:29 Sahar Alameh

And I would basically tell them I'm in the culture of education, not even in medicine. And I have more than $5,000,000 grants this 5 million grant is not in my bank account so but they don't know, they don't know how grants work. They don't know what it means to be funded by a certain entity. And this is part of science, right? So I think this is really, really important to talk about.

00:09:50 Sahar Alameh

And this is really what we do and before COVID and this is really I think I find this very interesting, educators and researchers used to make up activities, we would call, we would make the magic box or the black tube to basically just model for students how scientists might.

00:10:09 Sahar Alameh

Make inferences or they can make conclusions for things that they cannot see. What COVID did to us is we don't need to make these fake scenarios anymore. The pandemic really showed us how science actually unfolds in public with politics, with uncertainty, with data.

00:10:29 Sahar Alameh

With misinformation, with real consequences. So my work really focuses on making these connections explicit for students. My work really. I've had so many teachers tell me I wish we could just do science and not politics. And this is a one hour discussion about hey, science is politics.

00:10:47 Sahar Alameh

You can't do science without politics. Or can we? And like we start talking about what it is that like for example, I have couple huge grants right now, research grants and both of them are on water and wastewater. And I do talk with teachers and students about why is it that we are researching water and saying not something else. And this is very much driven by the funding.

00:11:09 Sahar Alameh

Agencies, by what our needs are, so we also have to talk about these that shape science like.

00:11:16 Sahar Alameh

Around what we live around these Times Now, sometimes we are limited by the research that we can do so this what I'm talking about here is a third part of the time that we need to spend in the classroom. Now. It's very easy for me to say that because teachers will not be able to design these learning experiences.

00:11:38 Sahar Alameh

For themselves and do it, and this is basically what my role is we develop learning materials and learning experiences for teachers that are aligned with the standards. So for example in Kentucky, we have the Kentucky academic standards for science that are.

00:11:55 Sahar Alameh

They follow what we call the next generation science standards and almost every state in the US Now either adopts the NGS or or modified version of the NGSS, and I would love and one aspect, one very important aspect of this that I do also is the multidisciplinarity.

00:12:16 Sahar Alameh

So when we talk about the real science, I can't show them real science if I'm not working with engineers. If I'm not working with scientists and with doctors, and this is basically what we're trying to do is the science in the community. And I think at this time there's a lot.

00:12:32 Sahar Alameh

More openness to that kind of collaboration that wasn't before, and this is basically one of the grants research grants I'm on now. It's the escape center. And this is a multidisciplinary center with from biomedical engineering, public health education.

00:12:52 Sahar Alameh

And bioinformatics and we basically all together are working to complete all different facets of the research and often time education is forgotten and now it's an actual piece that we really need to translate this research that scientists and engineers do.

00:13:09 Sahar Alameh

To to the next generation of students and scientists.

00:13:13 Scott Riley

Yeah, it's very clear you have a passion for this topic and I really want to highlight that you have shined a light on the fact that there's this far reaching and layered impact of science in multiple layers of our society and more importantly, that there's a gap in the.

00:13:31 Scott Riley

Education of those layers, right? Why do we only or why can't we just teach science? Because it's connected to so many things. You kind of have to teach it for other things. And so I'm curious. You talked about your journey of discovery, learning that you wanted to teach teachers how to teach. And this topic coming up.

00:13:51 Scott Riley

Of teaching science education through.

00:13:53 Scott Riley

Or very broad and multifaceted lens. How did that idea come about? How did you say to yourself? OK, I know I want to teach teachers how to teach, but what am I going to teach them in science? And this is, you know, how did this idea come about?

00:14:07 Sahar Alameh

This is this is such a broad and important question, so there's ample of research about what the nature of science is. We have researchers have been calling for the.

00:14:17 Sahar Alameh

That the way to teach or for to attain real understanding of science and what science is like. It's not just to teach facts. I still Remember Me as a student and then me as a physics teacher having to teach that very painful concept that took a full week.

00:14:38 Sahar Alameh

And I don't know if you'll remember it or if you'll relate about calculating the volume of an irregularly shaped obj.

00:14:45 Sahar Alameh

And it's basically dipping it in water and we spend so much time just finding the volume of that rock. And I never understood why I do that. And it's not just where am I gonna use this in real life? No, no, no. It's beyond that, right. It's it's beyond. Even making teaching science fun and engaging.

00:15:05 Sahar Alameh

It's it's beyond that fast bang science. I think the idea is we really there is a need now to to move the needle right. There is a need for change which comes about where what are we doing.

00:15:21 Sahar Alameh

Wrong. Where did we leave? Like there was so much mistrust of science, especially among adolescents who basically use the Internet and sources of information all the time. But what is it that they're using is very problematic. How much do they believe of the science that they see? Whether.

00:15:40 Sahar Alameh

Yeah, with three.

00:15:42 Sahar Alameh

Remember, with treatment and vaccination around COVID. So I think those ideas came up from there. What if we use what we already have and bring it to the classroom? And what's even more, we've collected data actually from from high school students in rural Kentucky shortly after COVID.

00:16:02 Sahar Alameh

About the sources of information that they use during COVID, and as you might expect, the sources were government health agencies and the news and mainstream media.

00:16:12 Sahar Alameh

Less than 1% of the students reported that they use science teachers. These are like the science classroom, was never reported, even though it's supposedly the number one thing that they look for. And that is telling us something, right? So I think this is where these things, like the point is.

00:16:32 Sahar Alameh

We don't need to make up fake scientific scenarios anymore to tell the students. Imagine I have this. I think science is around us. Students see that and I think it's our job to help teachers use those scenarios in meaningful and culturally responsive ways. I could say that.

00:16:50 Sahar Alameh

Teachers need to use these in the classroom. I think we need to be faculty need to be that connectors in the College of Education to help them. OK, this is what we're doing in the real world. This is how you can probably translate it into the classroom or one way to translate it in the classroom.

00:17:10 Scott Riley

Agreed. And I want to.

00:17:12 Scott Riley

Focus on something you mentioned. You talked about a couple of the challenges associated with approaching a project like this, the mistrust from the students, the reluctance from the teachers with respect to, I want to just teach science. So I'm curious, were there any other challenges you've faced when approaching this research topic?

00:17:32 Scott Riley

Any unique challenges for this unique topic?

00:17:35 Sahar Alameh

I love this question. Yeah, one challenge is that students and often teachers come in with fixed ideas about science, right? Like there's one scientific method. I have so many teachers telling me. I teach them the scientific method that we ask questions. We collect data, we interpret data. And it was later on that they discovered that.

00:17:56 Sahar Alameh

There's no one way of doing methods. Sometimes we don't even have data, so sometimes it doesn't start with a question.

00:18:02 Sahar Alameh

Right. Other things that are challenging are that science, science should always be objective and apolitical, but us humans are who we make it so. So it's that isolation of what science is, right and and in in, in that study that I was talking about, we also surveyed what students during COVID.

00:18:23 Sahar Alameh

What they are interested in learning about in the classroom when it comes to COVID and pandemic, oftentimes we don't include students in the teaching process. So in one of the studies we asked them. But here's this. It was in a rural area very the the least.

00:18:40 Sahar Alameh

Interesting topic of interest for these students was vaccines. They did not want to learn about vaccines, and when I interviewed them, it was the church. They cited the church multiple times. They cited their parents. And research does tell us about vaccine hesitancies in rural Kentucky, in rural areas, basically, where?

00:19:00 Sahar Alameh

It's close knit communities more and they have their own like ideas right after the teachers tell you that. Ohh, we hear something in the church and they tell you keep what the science teacher tells you in school to yourself.

00:19:15 Sahar Alameh

And just don't extract it to others right to outside of the class. So I think this is this is a big challenge that, yeah, what do you do to that? I've heard even teachers say that during COVID I am a science teacher. I knew I had to distance, but I still had to go to church. I still had to go see my family. And this is science.

00:19:37 Sahar Alameh

That's the beauty of all of this talk is how do you balance this? How do you have these conversations in the class? And it is, it is challenging and I think this is my, this is where I basically my passion comes in is we can.

00:19:54 Sahar Alameh

Provide materials to help them have these conversations. I use examples from the history and philosophy of science I use like like debates over atomic theory or the transition from Newton to Einstein to show that even in settled science, ideas evolve and the the evolvement of idea is something that they're not.

00:20:17 Sahar Alameh

Used to in science and I think this helps teacher feel more confident in supporting students in thinking critically, especially if it's different than what they are supposed to teach in class.

00:20:30 Scott Riley

I think that's a really great way to overcome the challenge that you're describing. This concept of evolving ideas because I very much remember in high school science class that it was very rigid. We learned these exact things and so.

00:20:45 Scott Riley

I think there's.

00:20:46 Scott Riley

A strong connection, or resonance, between the idea of allowing.

00:20:51 Scott Riley

Religion and science to work together under the concept of evolving ideas. Right. Science is no by no means perfect, and it's continuously.

00:21:00 Scott Riley

Building but it is also the reason that we have such great health outcomes in medicine. Why we drive really fast cars or can fly in the air in multi ton. You're talking about physics earlier we we literally fly in the air because of science using multi ton metal tubes which I've never seen a bird like that so.

00:21:20 Scott Riley

Science is doing something right. So.

00:21:22 Sahar Alameh

We survived the pandemic because of science.

00:21:24 Scott Riley

Absolutely. You know, I think that's a more, much more current and relevant. Yeah. Example. That's wonderful kind.

00:21:30 Scott Riley

Wrapping this all together, I'm curious and I know other educators would be curious to what advice would you give other educators who aspire to make a significant impact and achieve similar recognition?

00:21:42 Sahar Alameh

So I do a lot of research on scientific explanation, which is answering why and if I were to give advice, it's.

00:21:50 Sahar Alameh

Stay connected to your why focus on the students in front of you? Let your research and teaching speak to each other, and I know this is not always easy.

00:22:00 Sahar Alameh

See, but collaborate. I've I've come. I've been in academia for five years, and I know collaboration doesn't always come easy across disciplines. But I do think collaborating not just with other academics, but with teachers, with the communities, and even in my case, I collaborated with wastewater treatment plants.

00:22:20 Sahar Alameh

I wanted to get data real data from nearby wastewater treatment plants, so I collaborated.

00:22:25 Sahar Alameh

With them, we even have a lesson called H2 pool for a group of teachers, and it's what it is about waste water. So I think real change happens through partnerships and sometimes those partnerships are very messy and I really think we should remember that recognizing that innovation isn't always flashy.

00:22:46 Sahar Alameh

Isn't always so.

00:22:48 Sahar Alameh

Pretty right? Sometimes it's just listening. Sometimes it's just staying. Sometimes innovation is so simple. I've worked recently with lab technicians who would go to horse farms and sample basically waste from horses. This is this was the most innovative.

00:23:08 Sahar Alameh

Saying I wish high school students would see that. So I think that's my biggest advice for educators would be.

00:23:15 Scott Riley

Wonderful. And I also like that that highlights that science isn't always glamorous.

00:23:19 Scott Riley

But it will have an impact even if you have to dig in the dirt. I'll say a little bit.

00:23:25 Scott Riley

Doctor Lam. I've got 1.

00:23:26 Scott Riley

More question for you and it's one that I like to ask many of our guests. What do you think is moving the needle in education right now?

00:23:35 Sahar Alameh

I think it's teachers. The world is not seeing it, but I think what's moving the needles.

00:23:40 Sahar Alameh

Our teachers and a place based community informed science context, especially when those teachers are addressing real issues when they're talking about water.

00:23:53 Sahar Alameh

I wish we would not just talk about that water cycle that we all remember in that textbook where we never have that river with the beach, with the land all together. But we are talking about that. So I think teachers are the ones who are moving the needles away, hopefully from misinformation.

00:24:12 Sahar Alameh

When students see that science connects to their lives, I think this is where we can make the change.

00:24:18 Scott Riley

I really like that the idea of connecting science to real things that are happening in our students and mentees lives well. Doctor Lama, thank you so much for joining us today on moving the needle.

00:24:29 Sahar Alameh

Thank you. Thank you so much for having me.

00:24:34 Scott Riley

Thank you for joining us today on moving the needle. Visit us at umaryland.edu/FCL to hear additional episodes, leave us feedback or suggest future topics, we'd love to.

00:24:47 Scott Riley

Hear from you.