



Access to Quality STEM Education in Conflict-Affected Regions Podcast Transcript

Host: Alex Gilliard, Communications Manager, The Lakshmi Mittal and Family South Asia Institute. Harvard University

Guest: Dominic Mao, Lecturer and Assistant Director of Undergraduate Studies (CPB/MCB), Harvard University

Dr. Mao, who received his own early education in Manipur — a state in northeast India that remains under political conflict — shares his insight on the role of cross-cultural mentorship in dispelling preconceived notions and how to open doors to new opportunities for students from these regions.

BEGIN TRANSCRIPT

Alex Gilliard: Hello, my name is Alex Gilliard, and welcome to this episode of the India in Focus podcast, brought to you by the Mittal Institute at Harvard University and the Times of India.

Today, we are joined by Dominic Mao, a lecturer in Molecular and Cellular Biology at Harvard University. He has founded and runs the Program for Scientific Inspired Leadership in Manipur, India, for the past two generations, which seeks to establish a cross-cultural learning platform and make it accessible to students in underprivileged regions. Dominic, thank you so much for being here.

Dominic Mao: Thank you for having me.

Alex Gilliard: So, can you tell us more about the Program for Scientific Inspired Leadership?

Dominic Mao: So, the Program for Scientific Inspired Leadership or PSIL is an education outreach program, where the teaching team executes a curriculum that is based on the scientific process. And by that I mean observations, hypothesis, questions, testing, evidence, all of that, all the way to communicating your results or findings or presentation. So, what PSIL does is it brings together three groups of people, individuals, the Harvard undergraduates, high school students in Manipur, and college students in Manipur that are interested in teaching.

So, the Harvard undergraduates, in close collaboration with the college students in Manipur develop and deliver a curriculum that is rooted in the scientific process but also emphasizes the liberal arts philosophy that Harvard is known for.

Alex Gilliard: So, what led you to focus on working with the high school students of Manipur?

Dominic Mao: Uh, so I have a rather weird background. My folks are Chinese but I was born and raised in Manipur. I lived 16 years of my life there, so I received my early education there and I know for a fact that the region is an under-resourced part of India. So, having gone through the early education system there, and now that I am a teacher, I am able to identify certain areas for improvement in the education space. And when I started teaching in Harvard, I started thinking about this, I was communicating with my network back home to see if, which things have changed, which things have improved, which have

worsened, and I was able to get all this information remotely.

Operationally, I can function there with relative ease because I have this extensive network of professionals having lived there for 16 years. And there's this interesting little tidbit that at our meeting of the Harvard team with the Chief Minister of Manipur, it was surprising to see that he still remembered the only Chinese Mao family from Manipur, which was my family.

So, PSIL works not just with high school students but also college students. So, like I said, these are the other group of individuals we are targeting. And this time around, PSIL 2020, we also targeted parents. So, there was a session with parents because when you talk about the education space, you have to talk about all the stakeholders and parents are a huge part of that space.

Alex Gilliard: So, what role do you think cross-cultural mentorship can play in helping the students of Manipur?

Dominic Mao: In general, cross-cultural mentorship, it exposes students to diversity in every sense, and this is great at dispelling preconceived notions about people, places, and cultures. So, let me give you a few examples.

So, some participants, these are high school students, they told me how they found the Harvard students to be great role models. The reason being, Harvard students are only a few years older than these participants. So, these are Grade 9 and 11 students that are eligible to apply for PSIL. So, the Harvard students are only a few years older and the participants told me that these Harvard students have traveled all the way to teach them, and in doing so they have helped them dispel some myths, that to be successful in life one needs to focus only on one studies, so these are some of the prevailing myths locally that if you want to succeed, you have to just stick with your books, you should not waste time on extracurriculars for example, that's another big thing that goes around.

But the Harvard team, with their diverse range of interests both inside and outside the classroom, really emphasized to the local students that how important it is to be well-rounded. On the other hand, the Harvard team commented on how resourceful the students from Manipur were and how they never complained about anything, which is not a trivial point at all.

Alex Gilliard: So, during this duration, what were the biggest takeaways from your experience leading this program in Manipur?

Dominic Mao: So, this was an assumption going in but now that we've done two rounds of this, we know for a fact that when you bring groups of students together, they will learn from each other and they will inspire each other. So, that was one big takeaway message.

One thing that we did not foresee or anticipate was this ripple effect of our efforts. For example, there was this non-profit, they don't have a non-profit status yet but in philosophy, they are a non-profit, this group called MitSna, they kickstarted into action after hearing about PSIL from the TV interview that I did back in January 2019, and these are a group of students who lead education efforts in the state. They make educational videos, some of their videos are, I think their videos collectively have around 8 million views, last time I checked, for sessions. So, they invited me to do a talk with them and I was

very surprised when I learned that they got into action after hearing the interview and essentially, you never know what other effects you have, whatever efforts you put in, there will be these ripple effects of those efforts. And then of course students are the same everywhere, whether it is highly resourced places like Harvard or under-resourced places like Manipur, the students are the same. They are very curious, they're eager to learn and they're full of energy.

Alex Gilliard: So, one question that I had as you were speaking about this is, those students that you were working within Manipur in this iteration, were any of them the same as the last time?

Dominic Mao: No. So, we want to maximize the number of students that we are able to reach and so the students are, the participants are allowed to participate only once. It's also a logistical thing, I mean, the 10th and the 12th grades, there are these huge state exams that everybody just stays at home and studies for. So, that's the reason we have only 9 to 11-grade students that are able to participate because we don't want to distract the 10th and 12th-grade students from their exams. We had one participant from last year that we brought on this time on the staff. So, she was able to experience both sides of PSIL.

Alex Gilliard: So then, from what you've observed through the program, what institutional changes do you feel are necessary to improve or change the education system in India?

Dominic Mao: Right. So, currently, there's still a huge focus on exams. Families pay a ton of money for what they call a private tuition, so this is tutoring aside of your school hours. So, basically it's just tons and tons of class time, which is focused on scoring well on exams. So, that needs to be evaluated because the value of those exams, how well do they evaluate students, things like that. Then there is this trifurcation of three streams: the Sciences, Arts, and Commerce, and this happens right after 10th grade. That needs to be seriously evaluated, for example, I've always loved poetry but it was not possible for me to explore it as a student because I was a science student, and the same for history. Once, you are dedicated to a stream and 10th grade you're talking about somebody who's 15 or 16, you cannot do anything else so you're dedicated to that stream. Somebody who picks arts for example can never become a doctor. So, the decision you make when you're 15, it's just not fair, it's not practical. I think there should be more focus on active application-based learning, all of these transferable skills, group learning.

Most of the students that we have taught so far, which is over close to 200, so about 150, not a single student said that they have done group work before. So, group work was a new concept for them and it makes sense because the schools are so focused on preparing the students for the exams, they don't have time for anything else, right. Of course, my message to the students, the schools would be not to wait for the system to change, right, they need to prepare the students for certainly for the impending exams but they should also bear the responsibility of preparing the students for life. So, they need to equip them with transferable skills, which the exams don't necessarily do.

Alex Gilliard: And so, that's what a lot of these courses at the Harvard students routine create a very diverse set of topics that they bring into the classroom.

Dominic Mao: That's right, we focus not only on the science content but we focus on critical thinking skills, we focus on all of the soft skills, what people call soft skills.

Alex Gilliard: So, how do you envision the program can be implemented in other areas throughout India?

Dominic Mao: So, while developing the curriculum and the program itself, we actively made sure that we do not require a whole lot of stuff to run the program. So, for the past two years, we needed only a classroom for every Harvard teachers' lab. So, every Harvard teacher will get about 15 students, a space to hold their section and then auditorium with a projector, where everyone gets together and the Harvard teachers are able to deliver their specific topics, modules.

And push comes to shove, we can even do away with the projector. Of course, projectors are easy to acquire and they do make things easier. So, for one of the lab exercises on nurturing discovery, we gave each student a foldscope, which is this paper microscope that has a resolution power of two microns and it costs less than two dollars. So, when we developed a program and a curriculum, we were very mindful of it being able to scale up easily and also being able to be appropriated by any school or any tuition that wants to run the program.

So, that said, all you need to run the program is a group of enthusiastic people and it can be done. So, we welcome anybody to reach out to us and we'll be happy to share the curriculum, we'll be happy to share all the resources that we have. In terms of us expanding, there are, we've done two rounds of PSIL, the second one was, it had significant improvements compared to the first one. So, although there's more room for speaking, at this point, I think we have a pretty good model of operating. If we have to expand, we can go in many different directions, we could expand in terms of multiple sites and I am speaking with the Telangana government at the moment for the state to be a potential site and the other way to expand would be to increase the duration. So, now we have four to five days in January but we could think about an eight-week program in the summer or something like that.

Alex Gilliard: So, what did you change between the first iteration and the second? Anything significant?

Dominic Mao: Operationally, yes. We made the second iteration a residential program. So, the first time around, we only had 10 AM to 4 PM every day. So, for the second, what we found that structure, we found it to be pretty limiting because we get the students only for that short duration. We are not able to do much, so we made it into a residential program so that the Harvard students and the participants all lived on the same campus and we were able to go from 8 AM to 9 PM. So, we were able to do a whole lot, the students could really dive deep into their group work. So, last year we would give these group exercises but then they would just, they would depart for their homes at the end of the day, so by making it a residential program, we were really able to make the curriculum more rigorous, we were able to do more things with the students. And one thing that we couldn't do the first time around that we did the second time around was to give the students the opportunity for multiple iterations of a particular thing. So, that's when we heard a lot of the students that participated in the first round tell us, they said by the time we got what we were supposed to do, it already ended and so they had a lot of heartburn and they said 'Oh, if we could do this again then they would really participate.' And so, this time around we could see whenever we repeated certain things, then we'd get more and more of participation from the students.

Alex Gilliard: So, then what do you see is the future of the program moving forward?

Dominic Mao: I would hope for the schools to incorporate something similar. It doesn't need to be called PSIL, it can be a complementary program. So, they need to focus on their state boards or whatever, they can do that but also offer students this one thing on the side. Whether it be incorporated into the classroom or not but I do want the program to be, our program PSIL, to be supported by state government for example. Because buy-in from the authorities is very critical for scaling up in the true essence.

Alex Gilliard: So, what other initiatives are you currently working on?

Dominic Mao: This takes up a lot of my time, so, I do have to say that I'm really lucky to have a position at Harvard where I can teach Harvard students, that's my primary task, advising and teaching Harvard students. And then, in my free time, I'm allowed to develop an even, I'll have to write some grants, but then obviously I've been given the seed grants to run the side project but then in the process what I've realized is that there is a need for an entire mentoring network, which I am kind of working towards. For example, all the teaching staff that we have on the India side, so mentoring them for whatever they might need, I'm able to do that. So, I'm not able to answer emails from people in Manipur but I won't have time to do that, so what I do is, I pass information onto, let's say applying to grad schools. So, I passed on that information to my teaching team and then they become the point people for dispersing that information. So, if people emailed me instead of just ignoring the email because I don't have the time, I can just forward that email to my people and they can pass it on. So, it would be nice to have a good network that is self-sustaining of individuals that come forward and they have been helped by some mentor and they just want to pay it forward. So that is something in the works but mostly —

Alex Gilliard: Well, it sounds like it's becoming a very large network over there, which is great. But thank you so much, it sounds like a fantastic program, we're so excited to see the third iteration of it. So, thanks for speaking with us.

Dominic Mao: Thank you, Alex.