

The Australian Team at CASTIC.

Creating Australian Scientists: Collaboration, Learning and Implementation

By Chloe M Kwan

A sting of Xi'an heat, a flash of a camera light, and the melting of a Sydney winter a plane ride away. Whilst this seems like any old plane landing, this was a recent reality of mine as I had the amazing opportunity from Dr Silburn, founder iSTEM, to represent Australia in Asia's largest science fair: the Chinese Adolescents Science Technology Innovation Competition. A battle of the minds: challenges, both team and individual; pushing you to your limits and testing you: in your grit, perseverance, and not your memorisation of content, but your application of fundamental scientific skills. However, I was also pleasantly surprised by enriching cultural activities: museum visits, award-winning plays, and what I found most amazing: smart, courageous, innovative changemakers. I saw these people smiling, laughing, and exhilarated by challenges that left me in tears, by the thrill of a problem they couldn't solve. I had considered looking into why they pursue science before I embarked on this journey, but it was the feeling of elation that surrounded them, the passion in people's eyes, and their wonder of what was beyond their limits that was what drew me to curiosity; What did they see that I didn't?

During my previous appearance on the ABC Science Show, I spoke about science education, especially from my recent experience as a primary school student, and my current experience as a high schooler trying to traverse my way through why things are the way they are; and not only that- but also how we can change. How we can make better Australian scientists, how we can engage, how we can encourage.

CASTIC served as an opportunity for me to talk to students from other countries, see how their school science worked, and write back about how we can apply their methods to an Australian context; Afterall, any scientist will tell you: collaboration is key. And so, I sat four people down, from four countries, and with four stories. Each of them are interlinked, but they all have their own standouts to them; and most importantly, they all have something that we can learn from them.

The USA

First off, I talked to a student from the USA, who we're going to call Josh. Josh was a good friend of mine during CASTIC, we bonded over the difficulties of the team challenges, and at the end of the competition, the USA team took us Australians to go see the Terracotta Warriors. Josh, someone courageous and creative, we conducted this interview over dinner one night. Josh, a very inquisitive and interested individual, started off by saying science is the study of how the world works, "The more I know about science, the more I know about the world". He presents

a view of science that resonated with me: one of the very essence as to why I pursue science: the question of the “why’s” and the "how's” of the workings of the world. Science at its core is the study of why things are the way they are, and why they work the way they do.

Josh also provided further insight into a world I felt was very different from my own, saying: “most people at my school are interested in science”. This was a bit of a shocker for me. As an American College student rather than a high school student, I was assuming that most people would be pursuing the humanities, but hearing that a good amount of people were actually interested in science and that John felt supported in his interest, I felt a sense of relief. When asked what he thought schools could do to improve student engagement in science, Josh’s response didn’t surprise me. In fact, it was interesting to see how across the sea, in a country where we hear about great scientists, and amazing minds, he said labs.

I think we have built up this image that American schools' science facilities are not lacking. Even drawing on that scene in the movie Wonder, year 5 me was so jealous that these middle-schoolers had a lab and I didn’t. In my previous appearance on the ABC, I mentioned practical science spaces as one of the key strategies that we could implement to support engagement in practical science in primary schools, and I spoke about their importance, even meeting with Pedro Pascal from Rise and Shine and seeing in person their labs for pre-schoolers. And then Josh said something that I felt I couldn’t agree with more: “Labs are what make science engaging.” This touched on topics that I have spoken about, the engagement of being able to do it yourself, see it yourself. Labs are a place where children, even if they are truly oceans apart, can connect. It is a place where they can feel the same feeling, the feeling of trying something and seeing it work, even seeing it fail, but most importantly, seeing it.

Russia

The next day, I spoke with a girl from Russia, a girl we’ll call Evelyn. Having gotten into the competition through an IT pathway, she was a kind yet quiet soul that I got to know. Whilst there was a slight language barrier and sometimes we didn’t know what the other was talking about, what we really could share was smiles, laughter and ideas.

Evelyn is an extremely talented and motivated individual, when were on the bus back to the airport, where we would bid our potentially final goodbyes; when I hugged her I couldn’t help but tear up a little, because despite language and differing interests, we shared something that as young people we really cared about, science had brought us together. When I asked Evelyn about her interest in science, she gave me an answer that made me think. She spoke about creating freely and doing specialised things. She talked big picture and little details, and science allowed her to dive into every part of that. And she was right; I had no doubt that Evelyn was truly unstoppable with her laptop at her side and fingers typing away.

When I asked her about her school, she said that most people at her school were interested in science, but I was surprised to find out that her school doesn’t offer science classes, with students taking extra courses. A school without science where most kids are interested in science? I asked her, “How come?”. And she said that through these courses, they have exchange activities with other students, and they encourage interacting with the world. Something unique to these courses and a part of the reason why science is so popular among her peers. For her, science wasn't just about solo-riding and getting answers right, but it was the exchange of ideas, and the interactions between people, not of certain countries or certain regions, but people from the world and ultimately, people from science. For her a key part about getting students interested in science was “Students can see that science is not about their own

region." I agree, as science is truly the language of the world. And we are people of the world, so we should attempt to speak its language.

These courses meant so much to Evelyn, and me, coming from a country where a lot of science opportunities are limited, especially in primary school, this was a strategy I thought was amazing to engage in. Having more programs, more courses and more ways for students to engage with science outside of school and outside of home. A place for them to meet amazing people, and not only the creation of these places, but the creation of their prominence. And from Evelyn's message I have a message for all Australian students: If you can't find your space, make it.

Zimbabwe

Next, I interviewed a member of the Zimbabwean team, proud captain and founder of his school science club. Methembe is extremely intelligent and was a key contributor to our group during the struggle of the team challenge, but what really struck me was his outspokenness, humour, and ability to bring people together. Which is why it didn't surprise me when I found out that he was also a strong leader and great conversationalist.

A creator and innovator, he gladly told me a story about when and how he got into science: "I was in 5th Grade, and my friend Robert and I tried to fix a broken RC car with our teacher Mr Kapuya." He detailed how he sat in his room trying to fix it, its brokenness being the spark of interest, the exhilaration of a problem he couldn't solve. He detailed this as a pipeline to his interest, a motivation to create.

At his school, he outlined that research and creation in an interest with "quite a few" people in a very large school. This is where he began to create and lead the science club, with an impressive twenty young minds, twenty innovators, and twenty scientists, supported by teachers inside and outside the classroom. With this experience, this is what Methembe said "Schools should start making science actually fun because science is fun". I'm sure any scientist can attest to that, science is a fun and involved subject, especially when you take away the mark scheme and the A star, building a mark scheme of creativity. And he emphasised his point, that you shouldn't wait for an initiative to be presented or an opportunity to fall into your lap.

He emphasised to me: He's not unique, and he's not special, all he has is initiative, he couldn;t find his space so he made it, he took down the walls.

Bosnia

My fourth interview was with a member of the Bosnian team, who we'll call AJ. AJ was also a close friend of mine during CASTIC and we've remained very close as the competition has ended, bonding over bus rides and travel-group jokes, he struck me as a brilliant mind. Unsurprisingly, he did very well in the challenges and took home an honourable award, but what's more is that he was interested, down-to-earth, and an element of every great scientist, extremely funny. When asking him what interested him in science, he said that science was a 'smart thing'. A simple and short statement, but holds a very valuable attitude. Many Australians see science having value as a smart thing that smart people do. Whilst it is true, and science definitely has and attracts people who are seen as conventionally smart, many Australians also see this as a barrier, a sort of brick wall. However, this was not an attitude of Aj's, he detailed that his school was mixed on liking science, as most schools are, but a strong point of his was that whilst his teachers were supportive, he felt that schools could improve by not making science seem challenging and difficult.

Often with science, we see the headlines, the "smart things" like quantum mechanics, or dark matter. However, science still lives in little things such as brewing coffee or flowers in a garden. Science is becoming increasingly accessible, but schools often aren't. Many schools need to drop the barrier, and support students in science. "To make initial interactions more fun and not a brick wall to get around". A key example, he mentioned things that his school did, not to make science seem fun, but to show that science is fun. Initiatives like "European night of Explorers" for students to interact with between schools and communities, breaking down the borders. As well as Science week, often celebrated in Australia with books or maybe a special talk, but celebrated by their schools with experiments to do from biology and chemistry teachers, and projects to present with emphasis on communication and presentation. Showing students that science is not just about difficulty and abstract concepts, but sometimes it's about speaking, showing, and seeing how it works. The why's and the how's of the world. Allowing students to participate, even if they don't choose science as a career. Something all Australian schools can do: break down a barrier of expectations and allow for equal participation in science.

Overview

These four stories left me motivated and taught me many things. They taught me about the world, how people across continents, across oceans, see the world. They taught me how science is real, that everywhere has something that we can learn from. The USA cemented the need for labs and practical spaces, where students can perceive science and how it applies to the fabric of the world around them, for them to see it themselves. Evelyn from Russia taught me about universality, how science is one of those wonderful things that can be seen with every eye, heard with every ear, and written with every hand. How it requires work, collaboration, and communication, how in the world, everyone should be able to picture themselves a scientist. Zimbabwe's lesson of creation, initiative, and building the world that you want to see. We are creating Australia as we speak, and if we focus on the building, and making a space where we can't find one, we can make the next Australian scientist better. Not perfect, not mastered, not just a scientist. We can make the next Australian football player better, the next artist better, the next teacher better. And Bosnia taught me to break down walls, to start talking and to start encouraging. Not just the smart kids, not just the nerds, not every Australian, but every person.