RE: STEM Teacher Enrichment Academy submission to the Australian Universities Accord Interim Report

Date: 31 August 2023

I am Professor Manjula Sharma, Director of the STEM Teacher Enrichment Academy. I was at the ATSE Education Symposium yesterday, August 30th, where key points noted by Prof McKane brought to the surface aspects critical to education, in schools and universities. This is a snapshot, I am happy to provide more detail if needed.

1. Inclusion and equity in the school education systems, low SES.

There are a range of programs, outreach/in-reach, formal/informal, f-2-f/online in STEM fields aimed at school students. Yet there are significant number of schools which do **not** participate in these programs. Programs approach them, and there is silence from the school. More than half of the schools in our current regional programs, primary and secondary, have not participated in STEM programs and had no intention to do so. Why don't these schools participate?

- Difficulties with obtaining parental/carer consent. Consent is a necessity and rightfully so.
- Student absentees and attendance issues makes it difficult to organise and disrespectful to presenters.
- Behaviour and emotional issues. I visited one of our schools earlier this month, a couple of students had difficulty writing their name in the morning and were unsettled during our time there. Since we have a whole-of-school-and-teachers approach and are sensitive to local contexts, we were prepared.
- Teachers have not had prior experience, don't know what to expect, hence cannot set student expectations. Teachers need to prepare students for the tasks and presenters.
- Risk assessment of tasks often do not include risks inherent to the context of the school.
- There need to be elaborative back-up plans as so many things may not fall into place.

These schools don't need to be far from a regional centre. One of our secondary schools, enrolment of 450 students, is around 50km away from the regional centre which has a RSL Club where we run our teacher workshops. The teachers tested the waters by asking the students if they would like to participate in a STEM project. All respondents said NO. We are working with teachers to turn this around.

In your presentation you had noted, if I remember correctly, that regional does not have to be that regional, to not participate. You are correct.

2. Inclusion and equity in the school education systems, outskirts of Sydney and pockets in Sydney.

We have a Waiting List of schools for our 2024 Sydney program. Bulk is from the outskirts of Sydney, low to medium SES (ICSEA scores). The Blue Mountains, Gosford, Narrabeen, Mount Annan, Elanora Heights etc. These schools are sufficiently affected by transportation to seek comprehensive whole-of-school STEM programs, engaging parents and community for the long haul. Once again, you are correct, regional does not have to be that regional, to be left out.

3. Inclusion and equity in the school education systems, medium SES.

If we assume a normal distribution, then the group of schools which receive the least attention are the middle bracket, which also constitute the majority of schools. If we push the middle up, it pulls what is below up, and pushes what is above, further up. In the middle are the schools on the outskirts of Sydney and in pockets.

4. Aspiration, what do STEM professionals do and visibility.

There is something to be said for teachers creating their own STEM projects within their local community, solving their own local problems. This makes the teacher and their students mini STEM professionals. Aspirations are seeded and grow. Good to listen to others, great to do it yourself!

5. Teaching and Learning in Tertiary sector

At one stage, there were a sequence of entities which energised teaching and learning in the tertiary sector. These started with the Carrick Institute and ended with the Office of Teaching and Learning. These entities injected new thoughts, motivated teachers, changed practices and set up vibrant communities of practices which pushed the boundaries of the best practices and pedagogies. They had basic essential criteria which cross fertilised and set up mini-competitions to out-do each other in teaching and learning in a collegiate manner, such as multiple universities had to be involved, cross disciplinary, mix of staff etc. Could this value-add to RUC concept? Can this be brought back?

6. Scientists, engineers and teacher educators collaborating

Prof Ian Chubb had speared headed a set of grants which required scientists, engineers and teacher educators to work collectively to improve the teaching of STEM subjects. This had a huge impact, though difficult to measure. It makes a tremendous difference have teacher educators on-board when trying to improve STEM education in schools. Can this be brought back?

7. NSW HSC Bands

ATAR is discussed a lot, and rightfully so. In NSW, particularly for low and medium SES schools the focus is on HSC Bands. NSW DoE has setup a School Success Model which benefits schools in which more students achieve higher HSC Bands. However, the HSC Band Descriptors are different for different subjects. Science subjects require students to apply BEYOND what is in the curriculum, while most other subjects require ONLY what is in the curriculum. In schools trying to have larger number of students achieving higher bands, students are actively manoeuvred away from science subjects. Over time, schools shift away from teaching science subjects. This then affects mathematics, collateral damage.

Finally, humbly, I have put this together very quickly. Thank you for the chance.