



Queensland University of Technology

Response to the draft *Engaging Queenslanders in science strategy (2021-24)*

Queensland University of Technology (QUT) welcomes the opportunity to comment on the draft *Engaging Queenslanders in science strategy (2021-24)*.

QUT applauds the Queensland Government's leading work in public engagement with science, building on the Government's clear and vivid recognition both that science is done better and produces better outcomes for everyone when the public engages with it, and that Queenslanders are more keen than ever to engage with our state's world-leading science and research. While we believe the draft needs more work, we vigorously support the intent and purpose behind the exercise and offer the following commentary with a view to helping further improve the Strategy.

Top line response

The draft is still quite preliminary, since it consists primarily of statements of intent and promotion of current programs, and requires further work to transform it into a mature, functional strategy with a defined path forward and measurable indications of progress and success. That need not be a problem – in fact it furnishes the opportunity for further targeted collaborative input. We would recommend holding a focused invitational think tank exercise with key subject matter experts to help evolve the draft into a mature strategy.

We recommend the following specific improvements to the document as a whole:

- To guide effective implementation, all four goals need to feature specific objectives and key performance indicators against which progress can be tracked and success measured.
- The absence of new programs is notable – if there is scope for new programs that would obviously be warmly welcomed, but if it is simply a reality that they cannot be advanced under current conditions then that fact might as well be addressed overtly, since it will not be missed by readers.
- In light of the above, the draft relies extensively on existing programs, so it would benefit greatly from data and analysis of their effectiveness, to demonstrate the implicit grounds for confidence that they are contributing to the strategy's goals.
- Attendance and engagement data are essential to support the broad “built it and they will come” philosophy embedded throughout the strategy.

One critical element that is missing from the present draft is integration with the HASS disciplines, which have two distinct but equally important roles to play in the success of any science strategy:

1. As partner disciplines providing the ‘human touch’, through the contribution of expertise in the ways that people engage with, interrogate, relate to and absorb new knowledge – helping to bridge the gap between broad public audiences and the cutting edge of the physical and natural sciences; and

2. As complementary fields of expertise in their own right, which also create knowledge within particular domains of experience using bespoke methodologies, alongside and often intersecting with the empirical sciences.

Goal 1: Increase student participation in science subjects and promote science career pathways

The challenges of engaging young people in science are likely to be much deeper than outlined. The actual and perceived barriers will need to be considered and evaluated in light of evidence to provide confidence that such deeper issues will be adequately addressed.

There are particular challenges in the diversity and inclusion domain. For example:

1. There is a disconnect between the statement from the Chief Scientist and the rest of the document. The articulated aim of “promoting diversity in science by boosting participation of people in the community that are currently under-represented in science” (p1) – which QUT fervently supports – is not clearly supported by any of the initiatives, which gesture only faintly towards diversity and inclusion. There are no apparent explicit diversity and inclusion KPIs associated with this aim, which the experience of any number of domains indicates are essential to making real progress.
2. In relation to gender diversity, there is the issue of encouraging more girls to consider studying STEM disciplines (in which the gender balance is significantly skewed towards males) but this must be considered in tandem with what happens at the other end of the pipeline. The just-released [STEM Equity Monitor](#) shows that there are significant systemic inequities present within the Australian context, e.g.
 - (a) Five years after graduating, men with a STEM qualification were 1.8 times more likely to be working in a STEM-qualified occupation compared to their women peers. There is a significant gender pay gap between qualified men and women working in STEM.
 - (b) The gender pay gap in STEM-qualified industries was \$28,994 in 2020 compared to \$25,534 across all industries. A plan that doesn’t acknowledge these sorts of challenges seems incomplete at best.
3. Similarly, there is a need to address the challenges faced by rural indigenous students with no connections with main centres where the universities are based. The strategy requires a specific plan to engage these students and support them for success throughout, in order to overcome the barriers to further education.
4. The strategy would benefit from a clear connection with the Widening Participation activities that are undertaken by Queensland Universities. The new model for Widening Participation funding specifically relates to increasing participation from low socio-economic areas, regional participation and promoting diversity and inclusion. Queensland’s STEM Widening Participation initiatives are reasonably mature, and it would benefit the strategy to connect and leverage these.

Goal 2: Increase participation in citizen science to protect the environment and grow scientific literacy

This Goal is well developed. QUT would be pleased to contribute two case studies of good citizen science projects, our [Virtual Reef Diver](#) and [The Australian Cancer Atlas](#).

Goal 3: Increase science and innovation collaborations to grow Queensland's science community

This goal is significantly underdeveloped. It could be substantially enhanced by developing the idea that engaging Queenslanders in science can be achieved by engaging Queensland industry (in the broadest sense of the word) in science. The strategy would benefit greatly from an overt, detailed industry-engagement component, with details of specific schemes and incentives for industry to engage with discoverers and providers of scientific knowledge, such as universities and CSIRO. Such an aim would dovetail nicely into federal government objectives, and could leverage and harness Commonwealth funding. For example, at QUT we have recently been thinking about the optimum design of industry internship schemes for postgraduate students. QUT could provide several industry-related Case Studies for this section if revised along these lines, centred around our industry connected work in the Future Batteries CRC, hydrogen production, CO2 capture, fruit fly control and Reef Restoration and Protection, to name a few.

Goal 4: Increase engagement between community, community leaders and scientists across Queensland

This Goal would seem to be a facilitator for the previous three goals, rather than a distinct and discrete goal in its own right. The efficacy and impact of the three existing schemes mentioned in Goal 4 are not obvious, nor is the relationship between these Schemes and the previous three goals. While the high-level sentiment of Goal 4 is worthwhile, we should be careful that science and scientists are not portrayed, even inadvertently, as “saviours” of communities and economies, but rather, as a resource within society that is easily accessible, easily understood, and adds value. Engagement needs to be community-led and responsive, not didactic and authoritarian, with scientists telling communities how they can solve their problems. “How can we help” should be our mantra, and a co-design approach to impactful projects relevant to those communities should be strongly promoted.

Engaging Science Programs

The purpose of the inclusion of this list (pp. 11-12) in the strategy is unclear. It risks leading some readers to form the impression that we have already solved the problem, in which case the need for the strategy could be unclear. On the other hand, if the list is intended to show progress towards the strategy, it would benefit from clearer indications of how the programs relate to specific goals and from hard evidence of their efficacy. It is also unclear whether or not these programs are up for review and evaluation as part of the strategy, and whether there are plans to leverage and integrate these more directly as part of the strategy.

QUT absolutely recognises the value of engaging Queenslanders in science and in scientific thinking, and we stand ready to engage fully with the OQCS on the further development of this strategy, as well as the promotion of science and research more broadly.