



Science & Technology AUSTRALIA

**National Regional, Rural and
Remote Education Strategy
Framing Paper**

7 February 19

To the Regional Education Expert Advisory Group,

Thank you for the opportunity to provide feedback to inform the National Regional, Rural and Remote Education Strategy.

Science & Technology Australia (STA) is the peak representative body for more than 70,000 scientists and technologists in Australia through our member organisations, including associations and societies, research institutes, and research strategy bodies such as councils of deans.

Our mission is to connect science and technology with governments, business, and the community, to enhance the role, reputation and impact of science.

A key policy focus for STA is improving the level of STEM skill throughout the Australian workforce. It is estimated that Australia is creating STEM jobs at 1.5 times the rate of non-STEM jobs. However, the proportion of STEM qualified workers is only increasing by 15%/year compared to non-STEM workers at 26%/year¹.

This is a national priority that presents a significant opportunity for regional, rural and remote communities to rise to the challenge of training and supporting the STEM-skilled workforce Australia needs, both to make up this shortfall and to thrive into the future.

STA supports the development of a National Regional, Rural and Remote Education Strategy to address the unique challenges of delivering high quality education to students outside of major cities, and we are heartened by the appointment of a National Regional Education Commissioner to oversee the implementation of this Strategy.

In this submission, STA recommends:

1. Use new technologies to provide regional, rural and remote students with better hands-on education resources;
2. Incentivise partnerships between universities, local VET providers and local businesses;
3. Provide professional development opportunities for regional teachers who are teaching out-of-field in maths and science, and incentives for graduates of education and STEM degrees to become specialised science or maths teachers;
4. Ensure more of the Student Services and Amenities Fee is provided to student organisations for use in developing student run equity support groups;
5. Return funding to the Indigenous Student Success Program and ensure the continuation of Indigenous Education Centres;

¹ [“Perspectives on Education and Training: Australians with qualification in science, technology, engineering and Maths”](#) Bureau of Statistics, 2015

6. Provide better resources and training for career advisors to support them to fully explain and encourage the benefits of STEM degrees; and
7. Provide mechanisms for government co-investment in regional research infrastructure

Kind regards,



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Introduction

Strong science, technology, engineering and mathematics (STEM) education plays a crucial role in Australia's capacity to build a strong, healthy future. In a recent submission to the Status of the Teaching Profession², STA outlined a number of challenges and potential improvements for Australian education – with a particular focus on students living and studying outside capital cities³. We encourage the Regional Education Expert Advisory Group to engage with this related inquiry, and the issues raised within it.

The STEM workforce is a key focus for Science & Technology Australia, but the skills delivered through quality maths and science education are applicable much more broadly than the STEM sector. With innovations in science and technology across every sector – in agriculture, communications, environmental management, mining, health, finance, economics, manufacturing and more – the provision of a strong STEM education to all students is fundamental to the prosperity of all Australians, and will create opportunity for innovation, healthcare, and economic development in regional, rural and remote Australia.

Challenge A: There are fewer study options available in RRR areas

What opportunities exist to expand options for further study in RRR areas?

In the 2018-19 Federal Budget, funding was announced for regional study hubs to provide tertiary students with improved resources to facilitate participation in online higher education⁴. STA considers this a good first step towards improving STEM education opportunities for regional students and believes it could form the foundation for a strong suite of resources and opportunities to empower students learning by distance.

An important component of any STEM qualification is the practical, hands-on experience that builds on theoretical concepts. While there are technologies that allow for distance learning and remote practical experience in fields such as programming, engineering or data analysis, there are many fields that cannot be reproduced virtually and are impractical to transport to RRR areas. For example, the study of biology and anatomy is significantly enhanced when students are given the opportunity to dissect and examine biological specimens. While it may not be possible in regional hubs to practice on real specimens, new technologies such as 3D printing can provide regional education centres with the capacity to create their own true-to-life models for dissection. Likewise, virtual reality technology and 360° conferencing could provide valuable opportunities to remote students through virtual campus classes and even virtual field trips through technology like Google Expedition for field-based sciences. Together new and emerging technologies can be used to develop hands-on experiments and activities for all fields of science and maths.

² [“Status of the teaching profession”](#) Parliament of Australia, Accessed January 2019

³ [“Status of the teaching profession”](#) Science & Technology Australia, 2018

⁴ [“Regional Study Hubs”](#) Department of Education and Training, Access January 2019

Recommendation: Use new and emerging technologies to provide regional, rural and remote students with better hands-on education resources

What potential is there for universities, vocational training providers and other service providers to better support articulation between VET and higher education?

While most universities in Australia have one or more regional campuses, the VET sector has a much higher saturation in the RRR communities when compared to universities⁵. In the past, universities have established partnerships with regional VET providers to deliver tertiary courses, but there has been little in the way of Federal support for these programs.

There is great potential for a Federal program that provides investment to support universities to work with local VET providers, with the aim of delivering tertiary courses in subjects such as science, engineering, and mathematics. This program should consider the resources required to employ and train appropriate teaching staff, as well as the cost of supporting VET providers to provide bachelor level courses.

While STA recognises some STEM courses may not be deliverable through this sort of arrangement, it would nonetheless provide important and hitherto inaccessible pathways for regional, rural and remote students to develop deeper STEM skills.

Such partnerships would be further strengthened by including local businesses and industries. Along with partnerships between VET providers and universities, partnerships with businesses would both allow for better integration between tertiary educators and RRR communities. A review into tertiary education exalted the importance of work integrated learning in tertiary education. By incentivising partnerships with local businesses in areas relevant to students like agriculture, mining, and healthcare RRR students will develop skills that are relevant, in-demand and lead to local employment. Incentives for students to undertake work integrated learning like the APR internships could also be provided for students willing to undertake such work in RRR areas.

Recommendation: Incentivise partnerships between universities, local VET providers and local businesses.

Challenge C: Raising aspirations for tertiary education

What actions would help to raise aspirations and support informed career choices for students from RRR backgrounds?

According to the Australian Mathematical Science Institute around one in four Australian students in Years 7 to 10 is taught by an out-of-field teacher at least

⁵ [“Rural and Regional Access to Secondary and Tertiary Education Opportunities”](#) TAFE Directors Australia

once during secondary school⁶. While these teachers are trained educators, they may feel less confident in what they are teaching which has a negative effect on the student's engagement in the subject⁷. To address this nationwide, Australia must provide professional development to existing science and maths teachers who are teaching out-of-field and must incentivise teaching students and STEM graduates to complete qualifications to become a teacher in STEM.

STA has made recommendations to the Status of the Teaching Profession Inquiry outlining potential solutions to the issue of out-of-field teaching but would also like to emphasise that for RRR teachers the ability to undertake professional development is especially important. For RRR teachers, these opportunities may be more difficult to deliver or access. We strongly support giving them the same opportunities as their colleagues in metropolitan areas.

The second obstacle to entry to tertiary STEM education is the provision of limited career advice during secondary education. Career advice is too focused on linking a future degree to a linear pathway into a selected career, and often the full breadth of potential applications of skills in STEM are not given the airing they deserve. STA supports equipping career advisors to advise students on the wide range of potential careers that can come from the study of STEM.

Recommendation: Provide professional development opportunities for regional teachers who are teaching out-of-field in maths and science, and incentives for graduates of education and STEM degrees to become specialised science or maths teachers;

Recommendation: Provide better resources and training for career advisors to support them to fully explain and encourage the benefits of STEM degrees.

Challenge D: RRR often experience multiple forms of disadvantage

What practical steps can be taken to support RRR students who experience multiple forms of disadvantage?

Students that come from rural, regional and remote areas are, in many ways, similar to other students in that they are going to face disadvantage based on their background whether it is as a woman, a member of the LGBTQI community or cultural differences. Unlike other students they are less likely to have localised support networks when it comes to managing these forms of disadvantage. As a result, they feel more isolated and likely to suffer more mental illness than their metropolitan counterparts.

There are two practical steps that can be taken to ensure students from RRR areas are provided with the support needed to manage these forms of disadvantage. The first step is to provide more funding to universities in an effort to bolster mental health services on campus. Universities recognise the

⁶ [“Crunching the numbers on out of field teaching”](#), Australian Mathematical Sciences Institute

⁷ [“Out-of-field teaching in Australian Secondary School”](#) Australian Council for Educational Research, 2016

important role they have regarding the mental health of their students however being able to provide independent and accessible counselling for students, and in particular students facing multiple forms of disadvantage is still a challenge.

The second practical step is to return funding to student organisations on campus. Providing support to student organisations gives them the opportunities to create societies and equity groups. These clubs, societies, and equity groups provide all students that experience disadvantage, including RRR students a greater sense of belonging as well as an improved support network. While residential colleges where RRR students reside do provide some opportunities to students to develop social networks there are risks involved with relying on residential colleges⁸.

Recommendation: Ensure more of the Student Services and Amenities Fee is provided to student organisations for use in developing student run equity support groups.

How can we better support Indigenous people from RRR areas to access and succeed in tertiary education?

Indigenous students continue to be one of the most underrepresented groups in tertiary education. There are multiple barriers to indigenous participation and while they have been recognized overcoming these barriers is continuing to be a challenge. The cultural and racial gaps that still exist in universities can often deter participation and needs to be addressed if participation in higher education is going to improve for this cohort.

One of the key initiatives to help Aboriginal and Torres Strait Islanders Students to succeed at universities has been the indigenous education centres. These centres are imperative as they provide students with both educational and cultural support specific to the issues faced by Indigenous students. Despite the importance of these centres one of the key funding pathways, the Indigenous Student Success Program (ISSP) has faced cuts and efficiency dividends since the 2015-16 Federal Budget where \$23.2m was removed⁹. While a small amount has recently been reintroduced to the program this has not replaced the effect of these cuts.

As a result of these cuts remote Aboriginal and Torres Strait Islander students are unable to receive hard copy material and have no access to the internet, while those students attending on campus are experiencing reduced tutorial assistance that was once available.

Recommendation: Return funding to the Indigenous Student Success Program and ensure the continuation of Indigenous Education Centres

⁸ [“The red zone report: An investigation into sexual violence and hazing in Australian university residential colleges”](#) End Rape on Campus Australia, 2018

⁹ [“Budget Analysis 2017-18 Indigenous Student Success Program”](#) National Tertiary Education Union, 2017

Challenge E: Attracting people and jobs to RRR areas

Regional universities are a key source of both local investment and local employment for RRR communities. Regional hubs themselves are important, but without ongoing stable investment in these institutions, potential flow on benefits for local communities are limited.

One example of this is investment in research infrastructure. Through the now defunct Education Investment Fund, regional universities and universities with regional campuses were able to fund infrastructure projects that attracted ongoing investment in the region as well as providing jobs in construction, manufacture and specialist operations.

Universities are more likely to invest in large infrastructure projects with government support. With sound, strategic and long-term co-investment, not only will regional campuses attract local RRR students, they will also be better placed to attract students from metropolitan areas and internationally, which will achieve valuable economic flow on effects for the broader community in which they reside.

It's also important to note that, according to the 2010 Australian Regional Higher Education Report:

Those who study at regional Higher Education Institutions (HEIs) feel that their studies prepare them for employment better than those who study at metropolitan HEIs and are more likely to feel that their employability and skills are excellent.

Within six months of completing their courses, those who study at regional HEIs are somewhat more likely than those from metropolitan HEIs to have obtained a permanent or open-ended contract and to be in full-time employment.

Five years after completing their courses, the majority of those who were enrolled at regional HEIs and are working are still living in regional areas, with just over one-third having moved to metropolitan areas.¹⁰

This provides an insight into the value of strong Higher Education Institutions, and their role in bolstering RRR communities and in achieving better retention of RRR graduates in the local workforce. With more STEM graduates in local communities, the more adaptive and better future-proofed our regional, rural and remote communities will be.

Recommendation: Provide mechanisms for government co-investment in regional research infrastructure

¹⁰ ["Australian Regional Higher Education Report"](#) Australian Council of Education Research 2010