

**Isolated Children's Parents' Association of Australia Inc.**

**"Access to Education"**



**Submission**

to the

**STEM Partnerships Forum**

into the

**Optimising STEM Industry-School Partnerships: Inspiring Australia's Next Generation**

from the

**Federal Council**

of the

**Isolated Children's Parents' Association of Australia Inc.  
ICPA (Aust)**

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The Isolated Children's Parents' Association of Australia, ICPA (Aust), welcomes the opportunity to contribute to the *Optimising STEM Industry-School Partnerships: Inspiring Australia's Next Generation Issues Paper*, identifying issues relating specifically to rural and remote students.

Since 1971, ICPA (Aust) has represented families living in rural and remote regions of Australia, who are passionate about the sustainability and prosperity of the industries they work in. Research indicates that the ability to access affordable and appropriate educational services plays a major factor in determining if a family will remain in rural and remote locations. The goal for our 2700 member families is to achieve equity of educational opportunity for all children living in rural and remote areas, thus ensuring they have access to a continuing and appropriate education determined by their aspirations and abilities rather than the location of their home.

Remote and isolated locations in Australia provide the greatest challenges for improving provision of education options and pathways for children and families. Improving the educational outcomes for rural and remote students requires a national approach that ensures educational delivery of a consistent high standard no matter where the education is provided.

While all Australian governments recognise the social and economic benefits of a high quality and equitable school education system, ICPA (Aust) continues to devote an enormous amount of volunteer hours holding relevant governments to account to address inequities. Much of this can be attributed to many programs not reaching locations where the programs are costly to administer and jurisdictions not providing additional funding to ensure program objectives are met. Governments must ensure rural and remote students are identified in the *National STEM Education Strategy 2016-2026*, with its aim to improve STEM skills by focusing on foundation skills, developing mathematical, scientific and digital literacy and promoting problem solving, critical analysis and creative thinking skills. Poor communication services also impact greatly on what is available to rural and remote students and while internet services continue to improve, access for these students lags well behind that available in metropolitan areas.

It is in the national interest to ensure geographically isolated children are not disadvantaged in terms of educational and social development and to make sure their educational outcomes are not compromised. These students need the opportunity to an education that is commensurate to their needs allowing them to realise their educational potential and presenting a pathway which provides educational parity with their urban peers.

Education is a much broader issue than just basic academic subjects. It encompasses life skills, cultural experiences, sporting opportunities and exposure to experiences and opportunities in order to develop a sense of self-worth and confidence in choosing a career pathway; vital elements for young people in an ever-changing and challenging world and particularly in rural and remote Australia.

ICPA (Aust), in this submission will identify issues pertaining to rural and remote students in relation to STEM.

### **Barriers in Rural and Remote Settings for STEM Studies and Industry-School Partnerships**

In a future workforce requiring specific knowledge and skills of STEM-related disciplines, it is imperative that all students across Australia are exposed to and given the opportunity to participate in ongoing quality STEM education which provides the necessary skills for the future. Furthermore, any objective to optimise and strengthen STEM in future industry and workforce needs to take into consideration how this is to be addressed in rural and remote settings, where issues such as access to appropriate STEM related curriculum, teachers and programs may be limited and at times non-existent due to the very nature of these contexts.

### **Access to STEM in Rural and Remote Contexts**

Across Australia, one of the most significant issues for rural and remote students is the opportunity to access an equitable education to that of their urban counterparts. ICPA (Aust) believes this is a key factor when considering optimising STEM education for students in rural and remote communities. In order for rural and remote students to attain knowledge and understanding, acquire skills and aspire to engage in STEM, they must be given every opportunity to access the same quality STEM curriculum, teachers, career advisers, resources, support, initiatives, industry partnerships and career/work experience programs that is afforded to their urban counterparts.

With many rural and remote students accessing their compulsory education in a small rural school setting or via a state approved Distance Education (DE) program due to geographic isolation, there is limited opportunity for STEM to be substantially incorporated in the curriculum they are delivered. This can be due to resources being finite, limited access to appropriate STEM instruction and experiences in the small rural school or DE classroom including teachers who are untrained in STEM-specific curricula as well as home tutors with no training, who are unable to effectively implement STEM studies. Furthermore, the opportunity to participate in STEM-related programs and initiatives can be limited by distance, expense or simply being unable to dedicate time to exploring, creating and implementing STEM lessons due to the complexities of the rural context including multi-age classrooms.

It is very difficult for students who study rurally and remotely to have an affinity with STEM and wish to pursue STEM pathways if they have limited or no exposure to STEM subjects.

In a small rural high school setting, many schools do not or cannot offer the higher sciences or maths due to lack of specific STEM teachers and low student numbers wishing to engage in these courses, resulting in limited knowledge, opportunity, motivation and aspiration to pursue STEM-related courses and careers or interact substantially with STEM activities. In rural high schools where STEM subjects are accessed through distance education, there are limited resources available to these students and they lack the opportunity to engage with other students studying the same subject for interaction, expansion and discussion of ideas. While ICPA members are grateful that this exists, it is not as encompassing as participation in a full classroom setting. As such the challenges for rural and remote students to access quality STEM-related programs and resources, need to be fully recognised when making decisions around optimising STEM engagement in the future.

### **STEM Motivation and Aspirations for Rural and Remote Students**

Without quality curriculum and engagement with appropriate STEM related activities, it is difficult to motivate rural and remote students to aspire to participate in and attain knowledge and skills in STEM disciplines. Students bring individual motivational characteristics to the classroom including self-perceptions that influence their school success, multiple goal orientations and different types and degrees of motivation. These characteristics are influenced by past and present achievement and experiences, along with feedback from teachers, family and peers. The motivations that students develop at home and in school, influence their future goals, expectations and intentions. With this in mind, if rural and remote students are not afforded an opportunity to access and participate in STEM-related programs and activities, then it can be assumed they will not be motivated to pursue such disciplines.

Furthermore, students from small rural schools and Distance Education have limited understanding of the importance of STEM studies and the application in their future endeavours. As an example, a student who completed distance education in their primary years did not know what coding or information technology was when she attended boarding school at the beginning of Year Seven. She had previously had no experience with coding and although she had used digital curricula and

technology for her everyday distance education schooling, she was not aware that this is a discipline on its own nor that it encompasses a much wider variety of interesting topics. With that in mind she avoided undertaking these disciplines simply due to her lack of knowledge of what they involved. In order to prevent similar situations, quality, engaging and relevant STEM education, skills and practical application needs to be available for all students, including rural and remote, early in their education in order to achieve improved engagement, aspiration, motivation, outcomes and attainment in STEM studies.

Rural and remote students should be offered tailored support as they approach decisions regarding further study or career paths. The close and essential relationship between community and schools could be enhanced and utilised more effectively to enrich students' learning experiences. Previously, under the Country Area Program (CAP), which was targeted federal funding directed towards assisting rural and remote schools and their communities to enhance the learning outcomes and educational opportunities for students in geographically-isolated areas; community and schools worked closely together on projects which supported curriculum enhancement, information and communications technology, professional development and school support. These projects enabled students to participate in many learning experiences that they otherwise would not have been able to access. This program process would be effective in STEM partnerships.

From 2000 to at least 2007, the original 'flying scientist' Phil Higgins (a retired university science lecturer) flew to remote stations in the outback to give gatherings of remote students some hands-on science lessons.

<http://www.abc.net.au/site-archive/rural/sa/content/2006/s1981808.htm>.

Recently in Queensland, the program 'Flying Scientists: Engaging Rural Queenslanders in Science' has worked in collaboration with the 'Wonder of Science' to send out early-mid career researchers 'flying scientists' that accompany Young Science Ambassadors into regional Queensland centres for community Science, Technology, Engineering and Maths (STEM) awareness events.

<http://www.chiefscientist.qld.gov.au/science-comms/programs-events/flying-scientists> .

These programs were very well received, however, students from rural and remote areas needed to travel many kms to attend them.

Motivation of students to succeed and reach their aspirations within a distance education setting is largely underpinned by the home tutor. Without distance education tutors to implement distance education materials in an effective, positive and competent manner, distance education students cannot reach their potential. The families who fill the role of distance education tutor in the home are often not qualified teachers also need to be prepared, considered and better supported in the delivery of distance education.

Capricornia School of Distance Education in Queensland was fortunate to be one of fifty schools which received grant funding through the Digital Literacies School Grants Round One, which was provided by the Australian Government under its National Innovation and Science Agenda. This is a very exciting project in which twelve Year 6 students will complete the build of the '*CSDE Bush-Bot*', a robotic vehicle designed to show students how technology can be used in modern agriculture.

<http://aades.edu.au/news/qld-capricornia-stem-pilot-project-building-agriculture-bush-bots>

### **Teacher education**

Teacher quality matters. It could be considered the most important school-related factor influencing student achievement. ICPA (Aust) implores governments to ensure their student teachers are trained appropriately. Neglecting to equip teachers, in already challenging circumstances of the rural and remote classroom, with knowledge of discipline specific education, is to set them up for failure and will contribute to poor teacher recruitment and retention rates particularly in the STEM discipline.

ICPA (Aust) believes education providers who offer teacher education courses, should implement a major in Rural and Remote Education which incorporates the range of unique challenges requiring specific knowledge, understanding and skills relevant to rural and remote areas. Topics included are those that are unique to teaching positions in an isolated area, including multi-age classrooms, multi-age curriculum tools, web conferencing, online learning tools, and strategies for coping with the unique dynamics that exist in small rural and remote communities and schools. As an adjunct to this major, it is envisaged that students would need to complete rural and remote practicums ensuring graduate teachers would start their career job-ready and have invaluable insight into the structure, practice and delivery methods of rural and remote education so that they can succeed in this field.

### **Teachers**

Often, due to staff shortages in rural and remote locations, secondary teachers are teaching disciplines that they have little knowledge in. Additional support needs to be available for these teachers teaching out of their field.

Most states offer some form of incentives to encourage teachers to teach in rural and remote locations. The most effective initiatives in attracting and retaining top teachers seem to be those which prepare teachers for living and working in rural areas and/or offer mentoring support. Incentives, specifically for teachers to teach STEM disciplines would assist in the recruitment and retention of discipline specific teachers. Teachers in the rural and remote context teaching STEM disciplines need to be effectively supported to be able to deliver a quality STEM curriculum and support opportunities to ensure students engage in STEM education and develop STEM-related skills and knowledge required to succeed post-school.

### **Connectivity**

The delivery of compulsory education for many rural and remote students attending small rural and remote schools or through distance education schools, is reliant on reliable telecommunications services including internet, landlines and mobile services. Rural and remote education is dependent on internet and telephony for curriculum opportunities, research, teacher support/mentoring, specific needs sessions, extra-curricular endeavours, school-industry partnerships, teacher and peer interaction and general administration tasks of a school. Some of our members experience internet problems including dropouts, poor speeds, slowed services, insufficient data amounts and connection difficulties.

Many STEM learning and enhancement opportunities are available online such as World Maths Day and various STEM challenges and participation websites. These can offer the chance for rural and remote students to access experiences they normally could not, however, they do need the data and adequate internet speed in order to do so. Students on the **nbn** Sky Muster satellite internet who attend small schools or are studying at a tertiary level have no access to the Education Port, which would greatly assist them to participate in these types of opportunities.

Connectivity is key to STEM partnerships with industry and students in the rural and remote context. Access to reliable and adequate internet, with regard to speed, quality, capabilities and cost of the service must be a priority for state and federal governments so that we can ensure the gap between urban and rural STEM education does not continue to widen and keep our rural communities and schools alive.

### **Professional Development (PD)**

It is imperative that professional development for rural and remote teachers is of high quality, accessible, contextual, timely and discipline-specific to improve and increase engagement in STEM studies, student outcomes and skills. Students in the Distance Education classroom are reliant on a

distance education tutor, usually the mother, who should be afforded professional development to support their role. To overcome barriers of isolation, rural and remote teachers require access and support to attend professional development including financial, incentives, online/face-to-face options and quality back fill/relief teachers.

### **Philanthropic sector/Industry**

Community groups and the philanthropic sector play an important role in improving outcomes for rural and remote students. Without these groups students who live in rural and remote areas would not be able to access career pathway information or experiences or further their education in an informed manner.

### **Enhancing STEM outcomes for rural and remote students**

The available opportunities for students within rural and remote communities need to be considered. A recognition within the STEM framework of the rural and agricultural opportunities these communities provide, would ensure rural and remote students are given access to appropriate and relevant industry-school STEM relationships and provide both engaging and relevant experiences. By using local expertise to bring expanded educational opportunities to rural students, could be encouraged to offer them additional exposure to STEM. People such as local health care professionals, engineers, geologists (mining), palaeontologists, (who often are out digging near where rural students live) agronomists, veterinarians and the local agricultural department could all help bolster a knowledge and interest in STEM subjects.

Rural and remote students that continue onto further education in STEM-related courses including Agricultural, Rural and Veterinary Science need assurance that these courses will continue to be eligible for programs that attract STEM students, for example, Rural and Remote Enterprise Scholarships (RRES) and be considered for future programs similar to HECS-HELP benefit.

The STEM educational outcomes of rural and remote students would benefit from a federal approach that ensures national consistency no matter where education is provided. STEM educational success in rural and remote communities would see students engaged in their education, and the promotion of positive role models/mentors within these communities. Teachers would choose to be there. Students would be reaching their potential and pursuing their aspirations. Students from remote areas would have choices and not be limited by their geographic location. They would be encouraged to pursue their educational aspirations and provided with adequate resources and financial and emotional support to do so. Students, families, teachers and whole communities would work together, with the support of government and policy makers, to ensure successful STEM educational outcomes for all students.