



The National Centre of Science,  
ICT, and Mathematics Education  
for Rural and Regional Australia (SiMERR)



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# Report to the Senate Inquiry into Rural and Regional Access to Secondary and Tertiary Education Opportunities



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# **The National Centre of Science, Information and Communication Technology, and Mathematics Education for Rural and Regional (SiMERR) Australia: *Overview and Way Forward***

## **Why SiMERR?**

The rationale for the SiMERR National Centre was based on compelling evidence from many sources that the performance of students in rural and regional Australia, about a third of the Australian student population, is not performing at the same level as their peers in metropolitan areas. Data have been drawn from the Programme for International Assessment (PISA) (Thomson, Cresswell, & De Bortoli, 2004), the Trends in International Mathematics and Science Study (TIMSS) (Zammit, Routitsky, & Greenwood, 2002), student achievement results from states and territories, and national (MCEETYA Benchmarks) basic skills test information (MCEETYA, 2007). These data quantified the extent of inequities for rural students (as compared to their metropolitan peers) in learning outcomes in science and mathematics education. Further, these findings underscore the most significant challenge currently facing education in Australia – equity of educational opportunity for all school students regardless of location (e.g., Lyons, Cooksey, Panizzon, Parnell, & Pegg, 2006; Roberts, 2005; Vinson, 2002).

The graph below illustrates one example of the data currently available. Here the columns illustrate PISA summary data for Australia in 2003 considered in terms of location. There are significant differences in achievement between students in these location groups.

As a consequence of these types of data, SiMERR Australia was established to work with rural and regional communities to achieve improved educational outcomes for all students in the areas of science, ICT and mathematics. This vision of our work can be stated so that:

- Parents can send their children to rural or regional schools knowing they will experience equal opportunities for a quality education;
- Students can attend rural or regional schools realising their academic potential in Science, ICT and Mathematics; and
- Teachers can work in rural or regional schools and be professionally connected and supported.

Our mission is to

support student achievement and enhance teacher growth in rural and regional areas through research, pre-service, in-service, community and overseas programs by working collaboratively with communities, educational authorities, professional associations and industry groups to develop solutions to problems faced by teachers, particularly those who are professionally isolated.

## Creating SiMERR Australia

In 2004 the SiMERR National Centre received a \$4.95 million establishment grant from the Federal Government through its Regional Partnerships Program overseen by the Federal Department of Transport and Regional Services (DOTARS). This represents one of the largest education grants ever awarded in Australia and provides some indication of the Federal importance attached to issues concerning rural and regional education.

### *Establishment*

It is our contention that in order to achieve improved learning outcomes for rural students, a united, collaborative research organisation was needed so educational research and teacher professional development would be more complementary and directed towards common goals. The work to be undertaken was not to replace current efforts by education authorities or researchers in universities but would offer a tighter more evidenced-based focus and solutions than previously was the case. Our belief was that the issues surrounding rural education and the teaching and learning of science, ICT, and mathematics were so complex, and so much needed to be achieved, that it required the professional expertise of many organisations and individuals throughout Australia working collaborately.

To facilitate such an approach across Australia, Hubs were created in every state and territory with activities carried out by small groups of key academics. However, the establishment of collaborative partnerships meant addressing many institutional issues.

To begin with we identified four main areas of focus. These were the three discipline areas Science Education, ICT Education, Mathematics Education and a fourth area that was considered to cross these three foundation areas that we refer to as Student Diversity. For convenience, we restricted the Student Diversity focus to three aspects of diversity, namely, Indigenous education, Gifted and Talented education and education directed to support students at or below national benchmarks. These three aspects have been identified as those having the highest priority of need for research and professional support among teachers.

Following the appointment of academic and support staff at UNE in these four areas, an *Expression of Interest* document was developed and sent to all universities in Australia. The criteria included:

- Specification that each Hub consist of a minimum of four academics per institution to cover the areas of science, ICT, mathematics, and student diversity education;
- Commitment from each university that there would be in-kind support provided by the institution along with funds to meet the contribution provided by the SiMERR National Centre; and
- Contracts with universities that met all legal requirements and specifications for the Hub university and UNE over the period of the establishment grant.

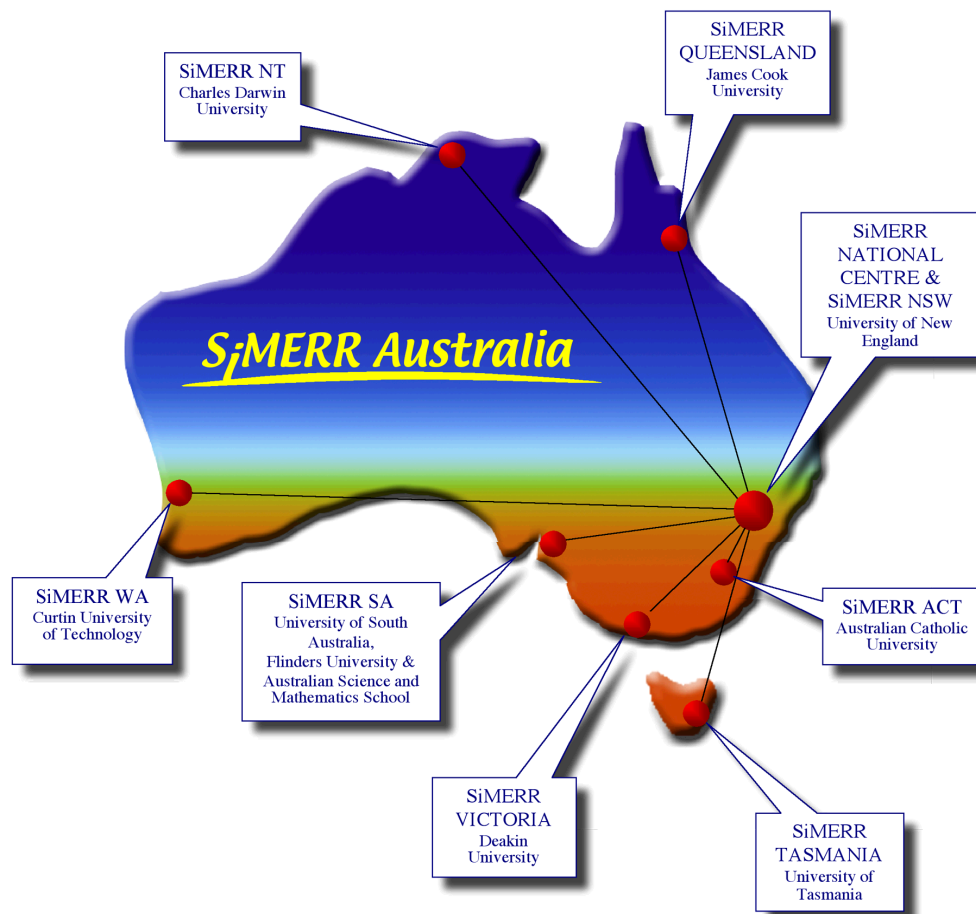
At the same time an objective selection process was developed. This consisted of clear criteria for selecting the most appropriate state and territory groups (Hubs), along with a comprehensive selection panel including academics with high national credibility independent of UNE.

Once the process was completed nine universities were identified. These were the University of New England, Australian Catholic University (ACT), Deakin University, University of Tasmania, Flinders University and the University of South Australia, Curtin University, Charles Darwin University, and James Cook University.

The Hubs together with the SiMERR National Centre are referred to collectively as SiMERR Australia. They provide a national platform to address rural school-education issues. In particular, SiMERR carries out research and professional development activities with a focus on improving the learning outcomes of Australian students, especially those studying in rural and regional Australia.

As a consequence, SiMERR targets two specific areas of research and teacher professional learning. SiMERR programs identify and address important educational issues of (i) specific concern to education in rural and regional Australia, and (ii) national concern to education across Australia but ensuring rural and regional voices are strongly represented. This dual focus complements two major Federal policy areas in Australia, namely, the underperformance of rural students compared to those studying in metropolitan areas, and the importance to Australia to maximise high levels of teaching competence and student learning outcomes in the critical subject areas of mathematics, science and ICT.

## Hubs of SiMERR Australia



On its part, the SiMERR National Centre provided each Hub with funds on a six-monthly basis to support research and professional development activities in the relevant state/territory. Also, each Hub was given the first right of refusal concerning involvement in any future federal, or relevant state or territory grant applications.

### Communication

To facilitate communication among university teams, a program was developed to ensure that Hub members 'met' to share ideas in moving the rural research and professional development agenda forward. Initiatives introduced to enhance communication within SiMERR Australia included:

1. Development of a central SiMERR National Centre website with each Hub devising their own website within their own university. Links were then incorporated on each site to allow users to navigate across the various Hubs.
2. A video conferencing link was established via the Internet using the Tandberg system. Regular video meetings of Hub coordinators, disciplinary groups (i.e., science, mathematics, ICT, and student diversity), and project teams were developed with dates advertised.
3. A senior administrative assistant was dedicated to communicating with the members of the Hubs, particularly the coordinators, in a regular manner.
4. National Summits were held in 2005 and 2007 to bring together all Hub members

and relevant stakeholder organizations from across Australia. A meeting of Hub coordinators was held in Canberra in June 2009.

5. Meetings of members across Hubs were instigated to coincide with disciplinary-based conferences or workshops within Australia.

### **Evaluating Successes of SiMERR**

Since its establishment in July 2004 members of SiMERR Australia have been, or are currently, involved in 140 projects throughout Australia. While some of these projects involve small numbers of schools (often in very remote areas), teachers, and students, other projects span across regions or state/territory jurisdictions. Many projects have national relevance, not only for rural areas but also more broadly for all students in Australia regardless of location. It has become clear that in working to address the needs of rural students, the findings and solutions that are emerging offer ways of enhancing student-learning outcomes in metropolitan areas as well. The reader is directed to the SiMERR web site [www.une.edu.au/simerr/pages/index.php](http://www.une.edu.au/simerr/pages/index.php) for more complete information.

The progress of the SiMERR National Centre and the SiMERR Hubs was monitored carefully by the federal authority (DOTARS) with detailed reports filed every six months. These reports summarised activities relating to projects, finances, key performance indicators, and the completion of specified milestones. A major report was submitted to the Federal Government in 2008.

While tying down ‘impact’ in such a diverse area is fraught with problems, there is evidence that some projects are having a major influence. As a result of SiMERR activities there is now:

- State Government legislation in NSW related to validating teacher professional teaching standards across four career stages;
- Recommendations to advise Federal policy as it relates to addressing inequity in rural students learning outcomes as a result of the SiMERR National Survey;
- A new state-based diagnostic test of Year 8 students for science in NSW;
- Recommendations on ways to encourage more senior secondary students to undertake high-level mathematics courses awaiting Federal policy initiatives;
- Identification of the characteristics of Faculty Departments achieving outstanding educational student learning outcomes across the student ability spectrum;
- A large number of research activities (\$14.9 million) that have been awarded to Hubs to support rural schools, teachers and students;
- Rural concerns in education have a stronger National Profile with higher media visibility especially via radio and press;
- Impressive evidence that students at or below national benchmarks in literacy and numeracy can be supported and show considerable improvement;
- Support for national professional teaching associations to provide more targeted professional support for teachers in rural locations;
- Recommendations concerning the use of stakeholder partnerships in

- embedding ICT in education awaiting Federal policy initiatives; and
- A National Summer School program designed for Australia's most experienced mathematics and science teachers that encompasses rural and regional needs.

### **Challenges and Further Steps**

SiMERR has embarked on a challenging journey. It has sought to influence positively the educational outcomes of rural students whose educational opportunities do not match those of their metropolitan counterparts, and to reduce the professional isolation of teachers. This has been pursued through targeted research programs to inform education policy, teaching practice and pedagogy, professional development programs, and teaching and learning interventions for teachers and students.

Engendering and maintaining a climate of collaboration and trust among universities and their staff, education jurisdictions and their schools, teachers and communities around the country is critical to the success of the SiMERR operation. The capacity to engage schools to participate in activities is built on networking with teachers, education authorities and professional education organizations. These fruitful connections are important in building trust and rapport between schools and researchers, and they also facilitate discussion and collegiality. They are also critical players in attempts to move the findings of research to scale.

The model of collaboration developed by SiMERR is in contrast to the highly competitive practices of universities in other fields of endeavour within Australia. It is recognised as important for the long-term that individual universities are supported to maintain and celebrate their own integrity, identity and successes as well as those achievements of the collective.

The needs of schools, teachers and students in rural Australia require national action and commitment. The track record of SiMERR over its short period of existence has already shown that universities across Australia working in partnerships with communities and education jurisdictions can make a difference. Nevertheless, sustaining and further developing such collaborations is not easy and will require an investment of federal funds over a sustained period.

### **Conclusion to Overview**

The extent of the inequities in access to fundamental elements of science, ICT and mathematics education revealed by the National Survey, in concert with the geographical divide in student achievement levels, underscore the most significant challenge currently facing education in Australia – equity of educational opportunity for all school students regardless of location.

The principle of equity, established by the *Adelaide Declaration on National Goals for Schooling*, emphasises our obligation as a nation towards socially just education, in which student outcomes are independent of geographic location. Clearly this is not the current situation.

It is recognised that efforts are being made by the federal government, individual

state/territory education authorities and other organisations to address various aspects of the problem (MCEETYA, 2005). Nevertheless, the SiMERR National Survey findings assert that a nationally coordinated approach, involving these and other relevant stakeholders is required to address these issues in a holistic way. We therefore propose that the recommendations from the reports be considered under the auspices of a National Rural School Education Strategy.

Recommendations in the SiMERR National Survey have been developed through a rigorous data collection process followed by a consultation process involving representatives from DEST, teacher professional associations, teacher institutes, school principals, teachers, parent groups, education administrators, and academics. The recommendations focus on several key areas including:

- student disadvantage and underachievement;
- staffing issues such as attraction and retention of teachers;
- teacher training and qualifications;
- professional development needs of teachers;
- resource material needs of teachers;
- learning opportunities and experiences of students;
- student and parent aspirations;
- perceptions of the quality of rural education.

It is worth reflecting on a statement made by the chair of the Committee for the Review of Teaching and Teacher Education (in the areas of science, technology and mathematics), Kwong Lee Dow (2003, p. 8):

Australia's future lies in its potential as a knowledge-based economy and society—one built on the knowledge, intellectual capabilities and creativity of its people. To achieve this potential, it will be necessary to: raise the scientific, mathematical and technological literacy and the innovative capacity of students; strengthen the education system that provides the platform from which world class scientists and innovators emerge; support the development of a new generation of excellent teachers of science, technology and mathematics teaching.

As the federal, state, and territory governments move to take up these challenges, it is critical that the particular needs of rural and regional areas are addressed, and that the principle of equality of opportunity for students and teachers remains central as a stated tenet of Australian education.

### **A Way Forward**

Australia faces education challenges on two fronts. First, there is a need to improve the education outcomes of students in science, ICT and mathematics, and second to address the inequities evident in education provision and results in rural and regional Australia. We believe there is a way forward that presents a pathway to address both of these challenges.



Needed is a *National Rural School Education Strategy*. At the heart of the *National Strategy* are two key initiatives that are closely linked but contain two separate components. Both components require federal government commitment and financial support. One is to continue federal funding (and possible expansion of) the SiMERR National Centre at UNE (in collaboration with State and Territory universities) to include programs involving professional development improvement for rural teachers, revamping pre-service education, linking and supporting more closely regional communities as they face education challenges for their youth, and taking on a monitoring and accountability role associated with rural issues.

The second component requires a coordinating body to be established within DEEWR. This group will develop a close working relationship with SiMERR as well as initiate programs derived from other input such as MCEETYA and COAG.

### **What needs to be done?**

Needed is continuation of the investment in the SiMERR National Centre in order to build upon the significant gains made. Australia needs to capitalise on the investment and to maintain a critical mass of people that see the improvement in learning outcomes for all Australian students as an important focus, and in particular those activities which will help narrow the gap between the achievements of city and rural schools.

Much more can be achieved. The SiMERR National Centre needs financial support to help make a difference. Examples include:

- expanding activities that enable a new way forward for low-achieving students,
- enhancing the learning outcomes of average- and high-achieving students,
- new research projects into improving rural education, e.g., in areas of mathematics, science or ICT; Gifted and Talented Education, Indigenous Education, advancing teacher strategies, etc,
- encouraging senior rural leaders to update skills and to remain in rural areas,
- developing rural teacher networks,
- seconding teachers to update skills in the National Centre for periods,
- scholarships for Masters' or PhD degree into rural issues by teachers in rural areas,
- upgrading rural teacher qualifications.

This proposal represents a comprehensive and sustained research approach to providing equity of education provision for rural and regional communities. It is based around five programs.

#### **1. Rural Teacher Professional Development**

**Program 1 Aim:** To reduce professional isolation and improve retention rates among rural teachers involved in science, ICT and mathematics education by providing support mechanisms, professional development resources and networking opportunities.

#### **2. Rural Pre-service Teacher Education**

**Program 2 Aim:** To increase the number and improve the preparation of beginning

primary teachers and secondary science, ICT, mathematics teachers in rural and regional schools

3. Rural Promotion, Advocacy and Community Outreach

**Program 3 Aim:** To increase awareness of the strengths and concerns of rural schools and communities among policy-makers, professional associations, parent groups, education authorities and the general public.

4. Research to Improve Rural Learning Outcomes

**Program 4 Aim:** To produce and disseminate quality, high impact research identifying ways of improving the learning outcomes of rural students in science, ICT and mathematics.

5. Monitoring and Accountability of National Strategy Programs

**Program 5 Aim:** To monitor rural and Indigenous student outcomes, and support, evaluate and account for programs of SiMERR Australia

### Measurable Outcomes

- Improve learning outcomes of rural students based on school, State/Territory, and Federal learning measures;
- Improve application of policies to attract teachers to rural areas;
- Improve retention of teachers in rural areas;
- Evidence of decrease in teacher professional isolation in rural areas;
- Improve training programs for pre-service primary and secondary teachers in rural areas; and
- Increase rural community awareness and involvement in local education

### *Final comments*

We believe that this proposal is an efficient, viable and sustainable way for Australia to address rural and urban inequities in education. We are convinced that this initiative will position all stakeholders to work together effectively to introduce local solutions that meet the needs of rural and regional communities in the provision of quality education across Australia.

Clearly, the long-term mission of this proposal is to improve the performance of students in rural and regional Australia. The driving forces for addressing this mission are government and non-government education authorities in the main, but also rural communities that will become involved because they recognise the needs of their students and teachers, and because they will have some ownership of actions and will see the positive results of these actions.

Importantly, the ideas in this proposal are not about working from a deficit model of teaching and learning in rural and regional Australia. Rather, the proposal is offered as a positive step towards harnessing the strengths of rural and regional communities in meeting the challenges facing their schools, and ensuring equity of access for their students.

We are happy to provide more detail.

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