EXECUTIVE SUMMARY

INTRODUCTION

The SiMERR National Survey was one of the first priorities of the National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia (SiMERR Australia), established at the University of New England in July 2004 through a federal government grant. With university based 'hubs' in each state and territory, SiMERR Australia aims to support rural and regional teachers, students and communities in improving educational outcomes in these subject areas. The purpose of the survey was to identify the key issues affecting these outcomes.

The National Survey makes six substantial contributions to our understanding of issues in rural education. First, it focuses specifically on school science, ICT and mathematics education, rather than on education more generally. Second, it compares the different circumstances and needs of teachers across a nationally agreed geographical framework, and quantifies these differences. Third, it compares the circumstances and needs of teachers in schools with different proportions of Indigenous students. Fourth, it provides greater detail than previous studies on the specific needs of schools and teachers in these subject areas. Fifth, the analyses of teacher 'needs' have been controlled for the socio-economic background of school locations, resulting in findings that are more tightly associated with geographic location than with economic circumstances. Finally, most previous reports on rural education in Australia were based upon focus interviews, public submissions or secondary analyses of available data. In contrast, the National Survey has generated a sizable body of original quantitative and qualitative data.

DESIGN AND IMPLEMENTATION

The National Survey proceeded in two phases. In Phase One, questionnaires were distributed to primary teachers, secondary science, ICT and mathematics teachers, and parent/caregivers in four geographical regions across Australia: Metropolitan Areas, Provincial Cities, Provincial Areas and Remote Areas[1]. The teachers were asked about the staffing situations at their schools, and the importance and availability of a range of professional development opportunities, resources, and student learning opportunities in their locations. Parents/caregivers were asked for their views on the science, ICT and mathematics education experienced by their children, and the strengths and challenges facing their communities and their children's schools. Survey questionnaires were sent to schools in May 2005, and responses received from 2940 teachers and 928 parents/caregivers.

In the second phase, research groups in the eight state and territory 'hubs' of SiMERR Australia interviewed over 550 teachers, students and parent/caregivers in 38 Provincial and Remote schools. The interviews provided rich, in-depth perspectives to complement the quantitative data. The hub reports are presented in the companion volume, *Science, ICT and Mathematics Education in Rural and Regional Australia: State and Territory Case Studies*.

[1] See Chapter One for details of the MCEETYA Schools Geographical Location Classification.

PRINCIPAL FINDINGS

The SiMERR National Survey generated over 100 findings, of which the following are the most significant.

Supply and demand of teachers

Teachers in Provincial Areas were twice as likely, and those in Remote Areas about six times as likely as their Metropolitan and Provincial City colleagues to report high annual staff turnover rates (>20% p.a.) in their schools.

Primary teachers in Provincial Areas were more than twice as likely, and those in Remote Areas up to six times as likely as those in Metropolitan Areas to report that it was 'very difficult' to fill vacant teaching positions in their schools.

Secondary science, ICT and mathematics teachers in Provincial Areas were about twice as likely, and those in Remote Areas about four times as likely as those in Metropolitan Areas to report that it was 'very difficult' to fill vacant teaching positions in those subjects in their schools.

Attracting and retaining teachers for rural and regional schools

The study found that the teachers tended to gain employment in locations similar to those in which they lived while undertaking pre-service education. In particular, about 73% of respondents who lived in rural centres while completing their initial teacher education are currently teaching in Provincial Area or Remote Area schools. Only 5% of respondents who lived in rural centres during their teacher education are teaching in Metropolitan schools.

The teachers' motivations for initially going to rural and regional schools were very different from their reasons for staying. While the most common motivations for going were job availability and education authority placement, once in the locality they tended to stay because of the quality of lifestyle, community spirit, and the relationships they established.

The influence of different factors on initial decisions to work in rural and regional schools has changed over time. Teachers older than 40 years were more influenced by education authority placement, scholarships and bonds than were younger teachers.

The most common reasons teachers gave for moving from a rural or regional school to a metropolitan school were their partners' employment situations and wanting to increase educational opportunities for their own children. For many teachers, social and professional isolation were also influential in decisions to leave.

In terms of attracting metropolitan teachers to rural and regional schools, smaller class sizes and preference for future transfers had the highest motivational value. Financial incentives such as cheaper housing, rent and travel subsidies and allowances were also influential among younger teachers.

Teacher qualifications and preparedness for teaching in rural and regional schools

The qualifications of primary and secondary science, ICT and mathematics respondents did not vary significantly with age, sex or geographic location.

Science, ICT and mathematics teachers in Provincial Areas indicated they were about twice as likely, and those in Remote Areas more than three times as likely as those in Metropolitan Areas to be required to teach a subject for which they were not qualified.

Teachers who lived in provincial cities or regional centres during their initial teacher education felt better prepared for teaching in rural and regional schools and teaching Indigenous students than did those who were in metropolitan centres.

Professional Connectedness and Isolation

The study compared the professional development needs of teachers in different locations and the degree to which they felt these needs were being met. The findings highlight the inequities in access to professional development opportunities across Australia.

Primary teachers in Remote Areas indicated a significantly higher unmet need for professional development opportunities such as mentoring, release time for professional development (PD) and collaboration with colleagues than did teachers elsewhere. Primary teachers outside Metropolitan Areas indicated a substantially greater unmet need for in-services in science and mathematics than did their metropolitan counterparts.

Science teachers in Provincial and Remote Areas indicated a significantly higher unmet need for a broad range of professional development opportunities than did those in Provincial Cities or Metropolitan Areas. Science teachers in metropolitan schools reported a lower level of unmet need for *every* professional development item.

The professional development needs of primary teachers and secondary science and mathematics teachers in schools with substantial proportions of Indigenous students are not being satisfactorily met. In particular, all three groups indicated a high need for professional development to help them cater for Indigenous, special needs, and gifted and talented students in their classrooms.

Material Resources and Support Personnel

The study compared the resourcing and support needs of teachers in different locations and the degree to which they felt these needs were being met.

Science teachers outside Metropolitan Areas indicated a significantly higher unmet need for a range of resources and assistance including ICT support and maintenance, learning support, and resources to cater for student diversity, than did their metropolitan colleagues.

Primary teachers and secondary science and mathematics teachers in schools with moderate to high proportions of Indigenous students indicated higher levels of unmet need for resources and support, including resources suited to special needs, gifted and talented and Indigenous students than did those in schools with fewer Indigenous students.

The highest need indicated by ICT teachers was for support personnel to help them manage ICT resources and assist teachers and other staff to use these resources effectively. ICT teachers in non-metropolitan schools had a higher unmet need for a range of resources and support, particularly for addressing student diversity and managing ICT resources.

Student Learning Experiences

The surveys asked teachers in different locations about the learning needs of their students and the degree to which they felt these needs were being met.

Primary teachers and secondary science and ICT teachers in non-metropolitan schools indicated a significantly higher unmet need for their students to have access to a broad range of

learning experiences including opportunities to visit educational sites, than did their metropolitan colleagues.

Science teachers in non-metropolitan schools indicated a significantly higher level of unmet need for alternative activities to suit gifted and talented, special needs and Indigenous students than did their metropolitan colleagues.

Primary teachers and secondary science and mathematics teachers in schools with higher proportions of Indigenous students indicated that their needs for alternative and extension activities to cater for the diversity of student backgrounds and ability levels in their classes were not being met.

The practice of combining secondary classes (e.g., Year 11 and Year 12 physics) was significantly more common in rural schools. Only 11% of Metropolitan Area respondents, and 17% of Provincial City respondents, reported that composite science, ICT or mathematics classes were held in their schools. By contrast, 36% of those in Provincial Areas and 58% of those in Remote Areas reported this arrangement.

Parent/Caregiver Perspectives

Parents/caregivers considered the commitment and enthusiasm of teachers to be one of the greatest strengths of their children's schools. Perceptions of the levels of enthusiasm teachers brought to class did not vary significantly with geographical location or type of school.

The confidence of parents/caregivers in the capacity of their children's primary schools to attract and retain qualified teachers declined substantially with the size and remoteness of school location. However, this was not perceived in secondary school staffing.

Although parents/caregivers in Remote Areas were generally appreciative of their children's teachers, there were concerns about the inexperience and capabilities of the teachers commonly recruited to these schools, and the long-term effects on the education of children.

The perceptions of parents/caregivers about levels of achievement in science, ICT and mathematics in their children's schools varied substantially with geographic location. Those with children in metropolitan schools were more inclined to agree that children in these schools achieved to a high standard in these subjects than were parents/caregivers with children in non-metropolitan schools. Those with children attending schools in Remote Areas were least inclined to agree.

The greatest concern of parents/caregivers was about whether their children had adequate access to a good range of learning experiences and opportunities, including excursions, visits by experts, and a variety of senior courses from which to choose. Parents/caregivers believed that student access to these experiences and opportunities is considerably greater in larger population centres, and those outside larger centres were concerned that their children were at an educational disadvantage.

RECOMMENDATIONS

It is recognised that efforts have been, and are being made by individual state/territory education authorities and other organisations to address various aspects of the problems identified above, and those of rural and regional education in Australia more generally (MCEETYA, 2005). Nevertheless, the authors 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 this and similar reports be implemented under the auspices of a National Rural School Education Strategy.

Principal Recommendation

It is recommended that a whole-of-government approach to addressing the issues of rural and regional school education be developed and implemented in the form of a National Rural School Education Strategy. The aim of the strategy would be:

g. To map a coordinated approach across all government and non-government education jurisdictions to addressing geographic disparities in school education.
h. To foster the development of strategic partnerships between stakeholders involved in rural and regional education.
i. To deliver a coordinated, collaboratively-designed and research-supported package of programs to address the needs of rural teachers and students, rather than a collection of separate initiatives.

The concept of the National Rural School Education Strategy is developed in greater detail in Recommendations 21 and 22, and in Chapter 10. The following twenty recommendations relate specifically to the findings of the National Survey, and were also informed by the state and territory case studies.

Recommendations to address staffing concerns

Attraction and retention of teachers for rural schools

1. It is recommended that education authorities review their rural and remote recruitment incentive schemes in the light of motivational factors identified by the National Survey, with a view to:
   a. extending the eligibility of schemes to apply to a broader range of locations
   b. providing a system of progressive incentives that reward retention
   c. including incentives which would appeal to experienced science, ICT and mathematics teachers and school leaders
   d. ensuring greater awareness of such schemes among pre-service and existing teachers.

Components of a progressive incentive scheme could include:

- ongoing career development tied to retention (e.g. targeted leadership training)
- professional development (e.g. qualification for sabbatical after a period of service)
- improved leave entitlements (maturing at intervals of service)
- a progressive rather than flat system of financial incentives
- inbuilt relief in staffing formulae for locations where there is difficulty employing relieving and short term contract teachers.

2. It is recommended that government and non-government education authorities develop or extend scholarship schemes targeting pre-service or beginning science, ICT and mathematics teachers willing to take up appointments in rural and regional schools. Federal and state/territory governments and relevant non-government bodies should examine current scholarship schemes to determine how they might be made more economically efficient, and be monitored for effectiveness.

Most states/territories already have scholarship schemes in place, and in some cases these have recently been reviewed (MCEETYA, 2005). Evidence from the National Survey supports the expansion of such schemes specifically to target pre-service secondary science, ICT and mathematics teachers willing to work in rural or remote schools.

Potential obstacles to the uptake of such scholarships among pre-service teachers include the personal economic difficulties (employment obligations, accommodation, etc.) they may experience in undertaking practical experiences in rural schools. Scholarship schemes would need to take account of these difficulties, especially among students in metropolitan universities. An alternative approach might be to expand the number of places for pre-service teaching programs in science, ICT and mathematics at rural and regional universities (where they exist). Education authorities should also explore scholarship schemes whereby they pay some or all of a teacher's Higher Education Contribution Scheme (HECS) debt. Research by Roberts (2005) suggests that beginning teachers would be strongly motivated by a significant reduction in their HECS debt.

3. It is recommended that education authorities, in partnership with universities, local councils, industries and businesses develop or improve strategies to promote the advantages of living and teaching in rural communities.

Strategies could include publicity campaigns promoting rural teaching, aimed at both pre-service and experienced teachers. Education authorities could also collaborate with university education faculties to engage experienced rural teachers to address pre-service teachers about the benefits and challenges of rural schools. Another strategy could be the development of programs whereby groups of pre-service students visit rural and remote schools (e.g. *Beyond the Line* in New South Wales) if something similar is not already in place.

Support for rural teachers

4. It is recommended that state/territory education systems sponsor the establishment of a professional Association of Rural Educators, with a central office in a regional area of each state/territory and branches in rural areas. The charter of the association would include:
   a. supporting the orientation of new teachers
   b. supplementary peer support
   c. advocating for rural teachers
   d. enhancing the status of rural service
   e. promoting a sense of collegiality between rural teachers
   f. maintaining the institutional memory of the profession in rural areas.

5. It is recommended that education authorities, in collaboration with universities and professional organisations, establish a Rural School Leadership Program. This program would have both an incentive and a developmental dimension, be highly selective and competitive, and target experienced teachers with significant leadership potential. Components of the program may include:
   a. further university education, such as accredited action research (towards a masters or doctoral degree)
   b. links to international rural teacher networks, with the possibility of an exchange program
   c. fast-tracked entry into regional and state Succession Planning programs
   d. provision of personal online coaches/mentors to assist with professional learning pathways and skill acquisition.

Details of the support mechanisms and financial arrangements underpinning aspects of the program, such as further education, would need to be negotiated by the program partners. Nevertheless, such a program would enhance the attractiveness of rural service among experienced teachers and the status of rural teaching in general.

Pre-service preparation for rural teaching

6. It is recommended that Centres of Excellence in rural and regional pre-service teacher education be established at universities in each state and territory. The National Survey findings clearly support the establishment of such centres in regional universities, where these exist. In states/territories without rural universities, the centres could be established in one or more metropolitan universities committed to rural education.

7. It is recommended that the federal government, in partnership with universities, allocate additional student places in primary teaching and secondary science, ICT and mathematics teaching programs in the aforementioned Centres of Excellence in rural and regional pre-service teacher education.

8. It is recommended that parties involved in the emerging national and state/territory standards frameworks for pre-service education include standards requiring that:
   a. primary teachers are adequately prepared for teaching mathematics, science and ICT
   b. all teachers are able to address the learning needs of students in rural and regional areas, especially Indigenous students.

Recommendations to address professional isolation

Induction/orientation of teachers new to a rural area

9. It is recommended that education authorities, in collaboration with professional organisations (including the Association of Rural Educators), develop and monitor induction and orientation strategies to support the particular needs of teachers new to rural and regional schools including, as appropriate:
   a. teaching Indigenous students, including an awareness of Indigenous cultural issues within local contexts
   b. teaching multi-grade and multi-subject classes
   c. teaching out of curriculum area
   d. working with limited resources including support staff
   e. teaching students with special needs
   f. living in rural communities.

The recommendation that rural teachers be better prepared and supported for teaching outside their curriculum areas is a response to the present realities of rural placement revealed by this and other studies. In the longer term, however, this is not an acceptable compromise and it is hoped that actions taken to improve the science, ICT and mathematics staffing situations in these schools will have mitigated the necessity for this practice.

Continuing professional development

10. It is recommended that education authorities, in partnership with schools and school communities, universities, and professional organisations meet the continuing professional development needs of teachers in rural and regional areas through a range of strategies that ensure equitable access to ongoing quality professional learning. Approaches could include:
    a. the development of flexible staffing and school timetabling arrangements to allow scheduling of professional development
    b. the development of improved systems and strategies for collaborative face-to-face and online modes of professional development for teachers in rural and regional locations
    c. promoting cross-sectoral collaboration in meeting the professional development needs of teachers on a local basis
    d. funding research, development and dissemination of strategies to teach science, ICT and mathematics to the diverse range of students found in rural and regional classrooms
    e. implementing strategies for mentoring rural and regional mathematics, science and ICT teachers at various career stages, e.g., establishment of local networks such as the Association of Rural Educators, and initiatives such as the Rural School Leadership Program, suggested above.

Professional Engagement

11. It is recommended that education authorities and curriculum bodies address the professional isolation of rural and regional science, ICT and mathematics teachers by developing and monitoring strategies to ensure equitable access to and involvement in a range of core activities, enabling them to be engaged and contributing members of their professional community. Core professional activities include:
    a. curriculum development
    b. state/territory and system-wide student assessment programs
    c. consultations on pedagogical practice.

Recommendations to address access to resources and support personnel

Provision of compensatory ICT resources

12. It is recommended that education authorities, in collaboration with school communities, industry and business partners, provide improved access for rural and regional students and teachers to ICT hardware and network capacity. The level of access should allow increased use of online learning modes to compensate for reduced resources in other areas.

Access to ICT support personnel

13. It is recommended that education authorities, in collaboration with school communities, industry and business partners, develop and monitor strategies to improve the provision of technical support to rural and regional schools to maximise efficiency of hardware and networks, and to reduce the time spent by teachers in maintaining ICT systems. Initiatives could include:
    c. the establishment of strategic partnerships with other ICT users in the local area
    d. the employment of additional human resources for ICT system support.

Access to curriculum resources

14. It is recommended that education authorities, in collaboration with schools and other government and non-government agencies, develop and disseminate strategies and resources applicable to rural and regional contexts that support primary teachers in catering for students with diverse backgrounds, learning needs and aspirations, including Indigenous students, gifted and talented students, students from non-English speaking backgrounds and students with special learning needs.

15. It is recommended that education authorities, in collaboration with schools and other government and non-government agencies, develop and disseminate strategies and resources applicable to rural and regional contexts that support secondary science, ICT and mathematics teachers in:
    a. integrating ICT into their teaching
    b. catering for students with diverse backgrounds, learning needs and aspirations, including Indigenous students, gifted and talented students, students from non-English speaking backgrounds and students with special learning needs
    c. teaching subjects out of their curriculum areas, including consideration of alternative flexible staffing strategies and online learning to maximise the quality of teaching and learning where the availability of teachers in specialised areas is restricted.

Access to Learning Support personnel

16. It is recommended that education authorities increase the numbers of teacher assistants, Aboriginal and Islander Education Workers (AIEW) and other para-professionals in rural and remote schools to support teachers in catering for the diverse learning needs of students.

The National Survey findings show that the unmet need for support personnel is higher in rural and remote areas, indicating that present funding formulae do not seem to be addressing needs equitably. Calculations should recognise that the need for para-professional support does not relate simply to student numbers, but to the diversity of students, community characteristics and accessibility to services.

Resource funding formulae

17. It is recommended that education authorities review strategies and funding formulae to recognize that there is a greater unmet need for some resources in schools with 21-40% Indigenous students than in schools with higher Indigenous populations. The variation in resource needs among schools with different proportions of Indigenous students suggests a need for education authorities to allow schools greater flexibility in determining their own resourcing priorities.

Recommendations to improve student learning opportunities

18. It is recommended that education authorities, in partnership with schools, rural communities and other agencies, develop strategies, allocate funding, and provide resources to enable rural and regional students to access locally and online a broader range of educational experiences in science, ICT and mathematics comparable to those available to metropolitan locations, such as:
    a. on-site visits
    b. summer schools
    c. opportunities to interact with students from other schools nationally and internationally
    d. mentoring by experts and practitioners in the field
    e. high quality learning materials, including interactive simulations and problem-solving activities
    f. activities that address the learning needs of the range of students in composite classes.

To be effective, the strategies would need to include:

- proportionate funding formulae that reflect difficulty of travelling to major centres
- improved broadband access to facilitate use of web-based simulations, communication with mentors and interaction with other schools.

19. It is recommended that government and non-government schools in rural areas form clusters within which staff are shared to maximise the subjects available to students, particularly in the senior years. These clusters could also coordinate (in collaboration with the Association of Rural Educators) visits by educational outreach programs to minimise costs.

Recommendation to address parent/caregiver concerns

20. It is recommended that the federal government publicly acknowledge the concerns of parents/caregivers in rural and regional areas outlined in this report. Furthermore, in addressing recommendations 1-19, education authorities should ensure that parent organizations are kept informed, and consulted about initiatives and strategies employed in response to the findings. It is clear from the findings that parents/caregivers in rural and regional areas are concerned about student outcomes in science, ICT and mathematics in rural schools, and it is critical that governments be seen to be addressing these concerns in a systematic and effective way.

Recommendations 21 and 22 relate to the principal recommendation of this report, and in particular, to the establishment of two important components of the National Rural School Education Strategy – the initiating Taskforce and a national rural education research network.

21. It is recommended that a National Rural School Education Taskforce be established to coordinate the development of the National Rural School Education Strategy. The Taskforce would facilitate ongoing cooperation between federal and state/territory governments and other stakeholders, and encourage active commitment to coordinate and jointly plan activities and initiatives aimed at achieving equitable access to education by teachers and students.

It is envisaged that the Taskforce be a dedicated national body, having an operational arm in DEST and given high level direction through the Council of Australian Governments (COAG) or the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA). This would give the National Strategy unequivocal support from peak political bodies reporting to federal, state and territory governments and their instrumentalities. There should also be input from other relevant government departments, such as the Department of Transport and Regional Services, the Department of Employment and Workplace Relations, and the Department of Health and Ageing.

22. It is recommended that a National Rural Education Research Network be established and funded over the life of the National Strategy. Consistent with the National Strategy, the research would need to be conducted though a body or bodies having a coordinated national focus, a presence at universities in each state and territory with strong links to local education agencies and organizations, and expertise in rural and regional education, particularly, though not exclusively, in science, ICT and mathematics education.

The Rural Education Research Network would have a strategic focus as well as a coordinating and initiating role. Members of the Network would undertake high-quality research, synthesise research findings so they are made available through the Network, add to our knowledge of how to teach in rural and regional areas, provide guidance to governments and other education authorities on policy, and disseminate research and good practice through conferences, publications, media releases and network websites. The Research Network would also constitute a national forum for addressing issues in rural and regional education, including those relating to science, ICT and mathematics, and student diversity.

Participant universities should be located in regional areas, or where this is not possible, have a demonstrated commitment to rural education. Preferably, the universities should also be Centres of Excellence in rural and regional pre-service education. The Centres would build upon the significant infrastructure already in place in regional universities.