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The SiMERR National Survey

Abridged Report of Findings

Prepared for the
Department of Education, Science and Training

Terry Lyons, Ray Cooksey, Debra Panizzon, Anne Parnell, John Pegg

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The views expressed in this report do not necessarily represent the views of the Australian Government Department of Education, Science and Training (DEST) or the Australian Government. The authors accept responsibility for the views expressed and all errors and omissions in this report.

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EXECUTIVE SUMMARY

PRINCIPAL FINDINGS

The SiMERR National Survey generated over 100 findings relating to the circumstances and needs of Australian teachers involved in science, ICT and mathematics education. The following are the most significant of these findings.

Supply and demand of teachers

Teachers in Provincial Areas[1] 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.

[1] See Chapter 3 for details of the MCEETYA Schools Geographical Location Classification (MSGLC) categories.

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 with 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:

- To map a coordinated approach across all government and non-government education jurisdictions to addressing geographic disparities in school education.
- To foster the development of strategic partnerships between stakeholders involved in rural and regional education.
- 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 the final chapter of this report. 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 action 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:
    a. the establishment of strategic partnerships with other ICT users in the local area
    b. 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.

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1. OVERVIEW OF THE SIMERR NATIONAL SURVEY

1.1 INTRODUCTION

This book is an abridged version of the full technical report submitted to the Department of Education, Science and Training in May 2006. It provides a summary of the SiMERR National Survey, including a synopsis of the findings, discussion and recommendations.

The National Survey was one of the first priorities of the National Centre of Science, ICT and Mathematics for Rural and Regional Australia (SiMERR Australia), established at the University of New England in July 2004 through a federal government grant. SiMERR Australia aims to support country teachers, students and communities in improving educational outcomes in these subject areas. In particular, SiMERR Australia aims to address concerns about the lower levels of achievement of rural and regional students in these subjects relative to their metropolitan peers.

The purpose of the National Survey was to identify the key issues that rural teachers, parents/caregivers and students see as affecting these outcomes at the primary and secondary levels. It collected base-line data on the characteristics, motivations and needs of teachers, along with perspectives from the three stakeholder groups on the strengths and obstacles associated with science, ICT and mathematics education in their schools.

1.2 ABOUT THE SURVEY

There were two phases of the National Survey. In Phase One, questionnaires were distributed to primary teachers, secondary science, ICT and mathematics teachers, and parent/caregivers in metropolitan, regional and rural schools and communities across Australia. 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 were 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*.

2. CONCERNS ABOUT RURAL EDUCATION

2.1 WHY WAS A NATIONAL SURVEY NEEDED?

For some time now, there have been concerns that schools in rural and regional Australia struggle to maintain equivalent educational standards, and to achieve comparable educational outcomes in science and mathematics, to those in metropolitan areas. For example, there is evidence of a significant geographical disparity in student achievement in science and mathematics. Figure 2.1 compares the scientific literacy, mathematical literacy and problem solving skills of Australian students from metropolitan, provincial and remote schools participating in the 2003 Programme for International Student Assessment (PISA). It is clear that students in metropolitan schools outperformed those in provincial schools, who in turn had a higher mean achievement than students in remote areas. According to Thomson, Cresswell & De Bortoli (2004), the international mean score was 500 and all of the differences between regions were statistically significant.

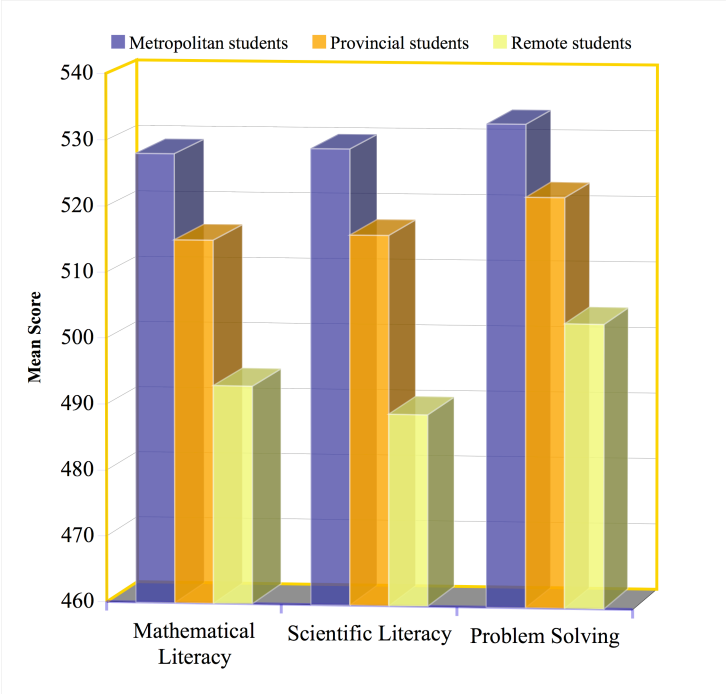

Figure 2.1. Mean scores of Australian students from different locations in the PISA 2003 tests of mathematical literacy, scientific literacy and problem solving (adapted from Thomson, Cresswell & De Bortoli, 2004)

The reasons behind this geographical divide in achievement levels have not been explored to any great extent. However, a number of studies (e.g., Alloway, Gilbert, Gilbert & Muspratt, 2004; Human Rights and Equal Opportunity Commission (HREOC), 2000; MCEETYA, 2006; Roberts, 2005; Vinson, 2002) have revealed similar divides in other aspects of school education that may be associated with the gap in outcomes.

For example, reports on the demand and supply of teachers (MCEETYA, 2003; 2005) identified difficulties in filling two types of teacher vacancies, those in rural and remote areas and those requiring specialists in mathematics, science and ICT. Undoubtedly, rural vacancies in these subject areas are therefore particularly hard to fill, leaving many schools to develop

other less ideal staffing strategies. Two recent reports (Harris, Jensz & Baldwin, 2005; Skilbeck & Connell, 2003) indicate that it is not uncommon for students to be taught science and mathematics by non-specialist teachers, and suggest that the likelihood of this situation increases with distance from a major centre. The studies also report that staffing difficulties are likely to increase with the retirement of many science and mathematics teachers over the next five years.

Teachers in rural and remote areas also face greater difficulties in maintaining high standards of professional practice than do their urban colleagues. Squires (2003) and Herrington and Herrington (2001) reported that many rural teachers feel professionally isolated and unable to access opportunities to update skills, familiarise themselves with new syllabus or assessment requirements, or participate in professional discourse that benefits their students.

Some studies (e.g., Cresswell & Underwood, 2004; HREOC, 2000; Vinson, 2002) have reported that rural and remote schools lack the level of resourcing available to city schools, particularly in the area of ICT connectivity. The literature is less specific about resourcing disparities in science and mathematics, and the National Survey aimed to provide some clarification in this area.

Parents in rural and remote areas face particular dilemmas in relation to their children's schooling. They worry about the breadth of educational opportunities and subject options available to their children at local schools, and are concerned about the additional expense of excursions to cities. Alternatives are also problematic, with research indicating that the appropriateness of distance education decreases with the age of the child (HREOC, 1999). Boarding in city schools is expensive, and neither family nor community friendly. Preston (1999) argued that 'middle class flight' (e.g., sending rural students to boarding schools) lessens the attractiveness of rural and remote schools.

While studies such as those above have identified the main areas of concern about rural education, there are gaps and inconsistencies in the literature which, in many cases, relates to school education in general, rather than science, ICT and mathematics education specifically. The need for up-to-date, nationwide data on these themes provided both the motivation and framework for the SiMERR National Survey.

2.2 WHAT IS THE CONTRIBUTION OF THE SIMERR NATIONAL SURVEY?

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 in general. Second, it compares the different circumstances and needs of teachers in four regions of a nationally accepted geographic framework, and quantifies these differences. Third, it compares the circumstances and needs reported by 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. This distinction has not been made in previous studies. Finally, the major reports on rural Australia mentioned above were generally based upon focus interviews, public submissions or secondary analyses of available data. The National Survey, on the other hand, generated a sizable body of original quantitative and qualitative data.

3. DESIGN AND IMPLEMENTATION OF THE SURVEY

3.1 WHAT IS MEANT BY 'RURAL' AND 'REGIONAL'?

In general discussions, terms such as regional, rural and remote are often used in a vague and overlapping way. However, when measuring and comparing geographical differences there is a need to use a defined and standardised framework that adequately distinguishes between the levels of accessibility and remoteness of different locations. There are many such frameworks, and the one used in the National Survey was the MCEETYA Schools Geographic Location Classification (MSGLC). This model was adopted in 2001 by the Ministerial Committee on Employment, Education, Training and Youth Affairs (MCEETYA) for reporting nationally comparable schooling outcomes.

The MSGLC divides Australia into three main zones: Metropolitan, Provincial and Remote. For the National Survey, the Provincial Zone was further subdivided to distinguish between Provincial Cities and Provincial Areas. Table 3.1 shows these categories, along with the sub-categories and criteria used in the MSGLC. The first four sub-categories are differentiated by population, while the accessibility/remoteness of locations with populations below 25000 is determined with reference to the Accessibility and Remoteness Index of Australia (ARIA) developed by the Australian Bureau of Statistics.[2] In ARIA, locations are given an accessibility/remoteness value between 0 and 15, based on the physical road distance to the nearest town or service centre. The higher the value, the more remote and inaccessible the location.

Table 3.1. Categories of the MCEETYA Schools Geographic Location Classification (MSGLC) used in the report

MSGLC Category	Code	Sub-category	Criteria	Examples
Metropolitan Area	1.1	State Capital City regions (except Darwin)	All cities pop. ≥ 100 000	Sydney, Melbourne, Brisbane, Adelaide, Perth, Canberra-Queanbeyan, Cairns, Gold Coast-Tweed, Geelong, Hobart, Newcastle, Townsville, Wollongong
	1.2	Major urban Statistical Districts		
Provincial City	2.1.1	Provincial City Statistical Districts + Darwin	Pop. 25 000 – 99 999	Ballarat, Bathurst-Orange, Burnie-Devonport, Bundaberg, Darwin, Launceston, Portland, Bunbury,
	2.1.2	Provincial City Statistical Districts		
Provincial Area	2.2.1	Inner provincial areas	Pop. < 25 000 and CD ARIA Plus score ≤ 5.92	Armidale, Busselton, Mt. Gambier, Gympie Dimboola, Huonville
	2.2.2	Outer provincial areas		
Remote Area	3.1	Remote areas	CD ARIA Plus score > 5.92	Port Headland, Cowell, Lightning Ridge, Mataranka, Cloncurry, Cape Barren Island
	3.2	Very Remote areas		

[2] A number of slightly different ARIA classifications have been developed by the ABS. The one used by the MSGLC is the Collection District (CD) ARIA Plus index.

3.2 HOW WAS PHASE ONE OF THE NATIONAL SURVEY CONDUCTED?

Survey questionnaires were sent to 5445 primary and secondary departments in 4880 schools[3], including a sample of 750 metropolitan schools. Principals were asked to distribute the questionnaires to all teachers involved in science, ICT or mathematics education, and to invite parents/caregiver through their newsletters or parent organisations. Teachers and parents/caregivers could complete the paper questionnaires, or access the online survey. Completed questionnaires were returned from 1408 schools.

3.3 WHO PARTICIPATED IN THE NATIONAL SURVEY?

Teachers

Useable responses were received from 2940 teachers. Considering the length of the questionnaires (10 pages), this was a satisfactory response. Table 3.2 shows that 1576 respondents were primary teachers and 1364 were secondary teachers. Of the latter, 580 were science teachers, 237 were ICT teachers and 547 were mathematics teachers. Overall, about 58% of respondents were from Provincial and Remote Areas, and about 69% taught in Government schools. Breakdowns of schools, teachers and parents/caregivers by state/territory can be found in the full report.

Table 3.2. Breakdown of teacher survey respondents by School System and MSGLC Categories of School

			Survey Respondent Type				
			Secondary Science	Secondary Mathematics	Secondary ICT	Primary	*Overall*
School System	Government	**Count**	**365**	**367**	**149**	**1138**	**2019**
		% of Row	18.1%	18.2%	7.4%	56.4%	100.0%
		% of Column	62.9%	67.1%	62.9%	72.2%	68.7%
	Catholic Systemic	**Count**	**107**	**87**	**45**	**319**	**558**
		% of Row	19.2%	15.6%	8.1%	57.2%	100.0%
		% of Column	18.4%	15.9%	19.0%	20.2%	19.0%
	Independent	**Count**	**108**	**93**	**43**	**119**	**363**
		% of Row	29.8%	25.6%	11.8%	32.8%	100.0%
		% of Column	18.6%	17.0%	18.1%	7.6%	12.3%
MSGLC Category of School	Metropolitan Area	**Count**	**148**	**142**	**60**	**230**	**580**
		% of Row	25.5%	24.5%	10.3%	39.7%	100.0%
		% of Column	25.5%	26.0%	25.3%	14.6%	19.7%
	Provincial City	**Count**	**120**	**132**	**47**	**362**	**661**
		% of Row	18.2%	20.0%	7.1%	54.8%	100.0%
		% of Column	20.7%	24.1%	19.8%	23.0%	22.5%
	Provincial Area	**Count**	**266**	**240**	**110**	**809**	**1425**
		% of Row	18.7%	16.8%	7.7%	56.8%	100.0%
		% of Column	45.9%	43.9%	46.4%	51.3%	48.5%
	Remote Area	**Count**	**46**	**33**	**20**	**175**	**274**
		% of Row	16.8%	12.0%	7.3%	63.9%	100.0%
		% of Column	7.9%	6.0%	8.4%	11.1%	9.3%
Overall	**Count**		**580**	**547**	**237**	**1576**	**2940**
	% of Row		19.7%	18.6%	8.1%	53.6%	100.0%
	% of Column		100.0%	100.0%	100.0%	100.0%	100.0%

About 60% of respondents were female, reflecting the high proportion of female teachers in primary schools. The majority of respondents were 41 years of age or older; only about 18% were less than 30 years of age. Approximately 64% of respondents were classroom teachers, 18% were Subject Coordinators or Heads of Department (these were secondary respondents

[3] There were 565 'combined schools' with both primary and secondary departments

only) and about 19% were Senior School Management (Principals or Deputy/Assistant Principals). In the Teacher and Senior School Management categories, the greater percentages of respondents were female and vice-versa for Subject Coordinators/Heads of Department.

Parents/caregivers

Of the 928 respondents to the Parent/Caregiver survey, about 75% were female, with 66% reporting with relation to primary-age children and 72% reporting on Government schools. Table 3.3 shows the characteristics of parent/caregiver respondents.

Table 3.3. Parent/caregiver respondent characteristics

		Respondents	%
Sex	Female	690	74%
	Male	238	26%
School type	Primary	511	55%
	Combined	169	18%
	Secondary	248	27%
MSGLC category	Metropolitan Area	159	17%
	Provincial City	186	20%
	Provincial Area	487	53%
	Remote Area	96	10%
School System	Government	667	72%
	Catholic Systemic	129	14%
	Independent	132	14%
Total		**928**	**100%**

3.4 HOW WERE THE DATA ANALYSED?

The questionnaires generated a huge body of numerical and qualitative data. The numerical data were analysed a number of ways, depending on the research questions and the characteristics of data sets. Categorical data were explored through frequency analyses, cross-tabulations and chi-squared significance tests. In order to minimise false claims of significance, the conventionally accepted *.05* level of significance was reset to the much stricter level of *.001*. Statistical tests achieving a level of significance of *.01* are identified as suggestive and worthy of further exploration. Unless otherwise stated, the findings presented in this abridged report are supported by significant associations between relevant variables. The detailed tables and significance tests which accompany many of the figures in this summary can be found in the full technical report.

Rating importance and availability of need items

The teacher questionnaires asked respondents to rate the importance and availability of a range of professional development opportunities, resources and learning experiences in their location. The 'Importance' scales ranged from 1 (Not at all Important) to 5 (Extremely Important) and

the 'Availability' scales ranged from 1 (Never Available) to 4 (Always Available). Rather than analysing importance ratings and availability ratings separately (leading to a huge number of comparisons), the importance and availability ratings were combined in such a way as to produce 'need' scores, where higher values indicated a greater unmet 'need' for the resource or opportunity.[4]

Principal components analysis

The National Survey sought to identify both general categories of need, and specific needs within each category. To achieve these two levels of magnification, two strategies were used. First, principal components analyses were conducted on each set of items. This strategy identified subsets of items that measured a common sub-theme. Each component was labelled in a way that summarised the general theme running through the items comprising it. Once the appropriate number of components was identified in each analysis, respondents were given a score on each component, and subsequent statistical tests then focused on the component scores. Details of the analyses, and the results of all principal components analyses for each survey instrument appear in the Appendices of the full technical report.

Multivariate analysis of covariance (MANCOVA)

Once the principal components had been identified for a particular set of rating items, multivariate analyses of covariance (MANCOVAs) were conducted to compare the component scores across various respondent categories, for example, sex, MSGLC of school, Indigenous population, etc. The reason for using MANCOVA was to control for the effects of school size and socio-economic background of the school location[5].

MANCOVAs, in conjunction with the stricter level of significance criterion of *.001* and the use of principal component scores as dependent variables, were employed in an attempt to maintain some control over the increased risk of making false claims of significance when simultaneous tests on many variables were conducted.

Qualitative analysis

Many sections of the surveys invited comments or reflections and teachers and parents made good use of these opportunities, generating thousands of items of qualitative data. Constant comparative analysis (Maykut & Morehouse, 1994) was used to develop numerical codes for the responses to each question. This process involved the interpretation of meaning, inductive development of response categories and allocation of subsequent responses to categories through comparisons. Frequency analysis of response codes identified the most commonly expressed opinions, and the characteristics of schools and teachers allowed comparisons across these variables. Where appropriate, representative comments are used in the report to complement or illustrate findings.

[4] Unmet 'Need' scores were calculated using the transformation 'Need' = I x (5 – A), where 'I' was the Importance rating and 'A' the Availability rating. An item considered extremely important (5) but unavailable (1) would therefore generate the highest unmet need score (20). Items which were unimportant and always available would attract the lowest score (1). It should be recognised that since the two component scales were ordinal rather than interval, the 'Need' scale is also ordinal. More detail about this approach is found in the full technical report.

[5] The justification for this is that these variables may in some cases have a confounding effect on the results of analyses using MSGLC categories, given that socioeconomic factors and school size may be covariates with geographic location. In order to ensure that any significant differences found in such analyses were a function of location rather than socioeconomic background or school size, these variables were controlled.

3.5 HOW TO INTERPRET THE PROFILE PLOT FIGURES IN THIS REPORT

Throughout the report there are a number of profile plot figures used to illustrate the findings. These figures attempt to provide detail about the original 'need' rating items, the principal components, and the significant differences across categorical variables revealed by the MANCOVAs. The full report should be consulted for further explanations of the methodology.

In order to identify which rating items within the components contributed most to significant or suggestive differences, colour coded profile plots accompany each table. These figures have a number of dimensions, worth introducing here. The example below, Figure 3.1 shows the profile plot for the professional development needs of science respondents in different locations.

Shortened names for the individual items are found on the 'x' axis, and the 'mean need' rating scale on the 'y' axis. The higher the rating, the greater the unmet need for that professional development opportunity (the scale is ordinal). It is clear from Figure 3.1 that the highest unmet need for science respondents in Remote Areas (purple) was for professional development (PD) opportunities to help them teach gifted and talented students. The highest unmet need among Provincial City science respondents (green) was for relief from face-to-face teaching for programming. The coloured lines do not suggest a trend, as these are discrete items. The lines are simply a visual aid to minimise confusion when differentiating between variables.

The items in Figure 3.1 are divided into three sets, separated by dotted lines. The sets contain items identified by the principal components analysis as relating to a common sub-theme. It is possible, therefore, to see from the profile plots which components were associated with particular variables, which items within these components contributed most to this association, and how mean ratings on these items differed across a variable.

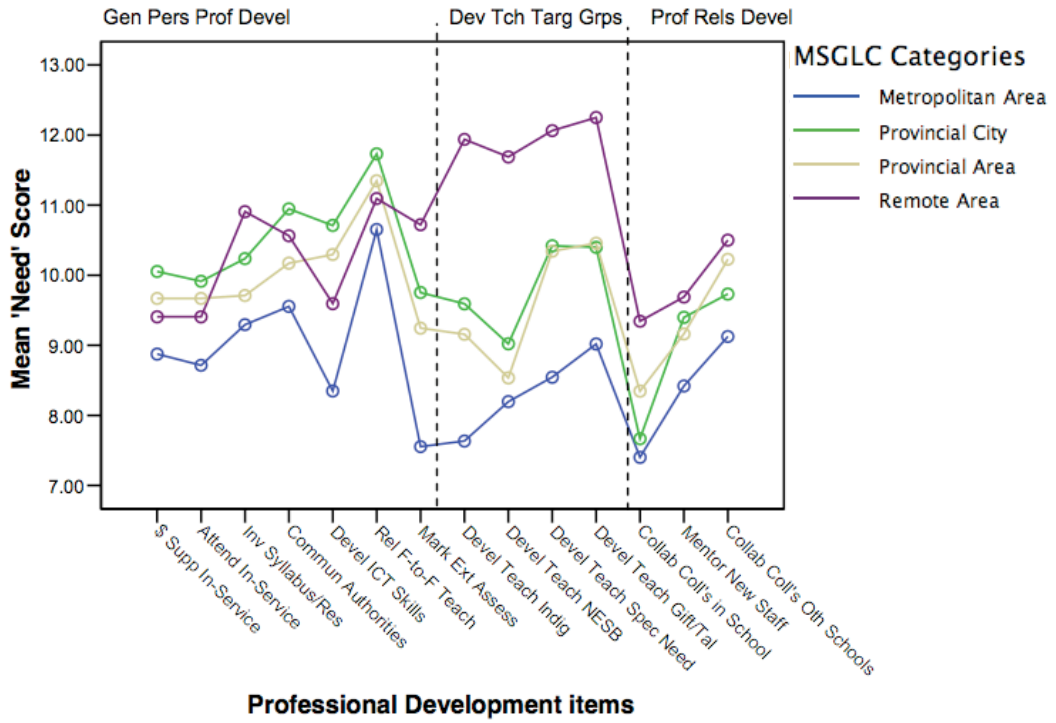

Figure 3.1. Profile plot of mean 'need' scores of science respondents for the professional interaction and development components, compared by MSGLC categories

4. STAFFING ISSUES IN SCIENCE, ICT AND MATHEMATICS

Respondents provided ground-level perspectives on a range of issues concerned with staffing, including their perceptions of staffing profiles in their schools, their motivations for teaching in rural or regional schools, their reflections on pre-service teacher education and preparation and, finally, their teaching qualifications. This section summarises the main findings from the survey.

4.1 DEMAND AND SUPPLY OF TEACHERS IN RURAL AND REGIONAL SCHOOLS

Teachers were asked for their perceptions of annual staff turnover rates in their schools and the difficulty of filling vacant positions. Primary teachers were asked to rate the difficulty of filling general teaching vacancies, while secondary teachers were asked to rate the difficulty of filling vacancies in their subject areas.

1. Overall, about 13% of respondents reported a high annual teacher turnover (>20% p.a.) in their schools. Those in combined and secondary schools reported higher turnover rates than did those in primary schools.
2. Reported rates varied significantly with location. Figure 4.1 shows that almost twice as many respondents from Provincial Area schools, and about six times as many from Remote Area schools, reported a high staff turnover rate (>20% p.a.) compared with their colleagues in Metropolitan and Provincial City schools.

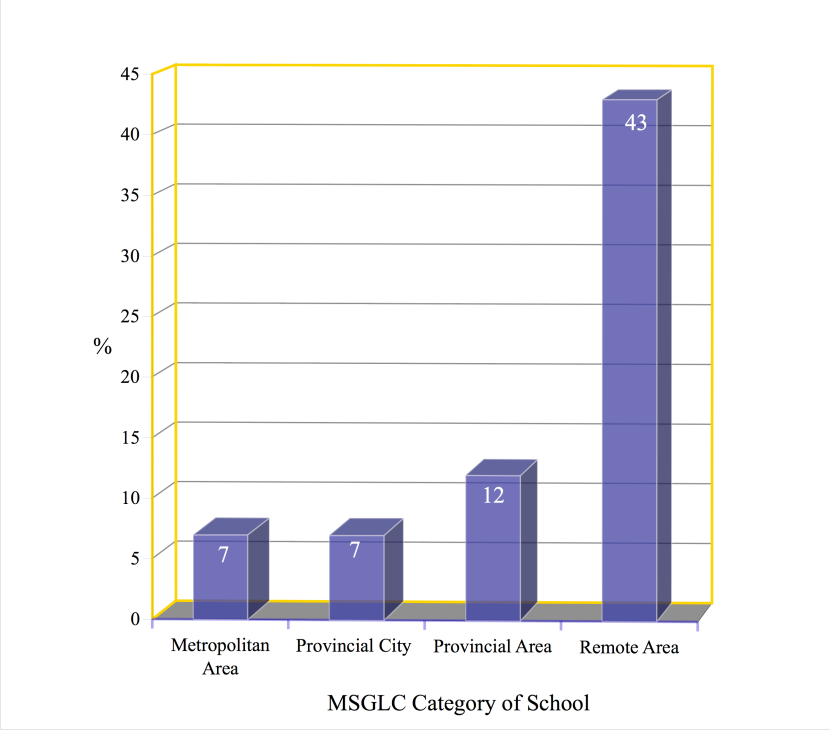

Figure 4.1. Percentage of primary and secondary respondents in different locations reporting an annual staff turnover greater than 20% (*N*=2702*)*

3. Figure 4.2 shows that twice as many primary respondents in Provincial Areas, and up to six times more respondents in Remote Areas reported that it was 'very difficult' to fill vacant teaching positions in their schools, compared with respondents in Metropolitan Areas.

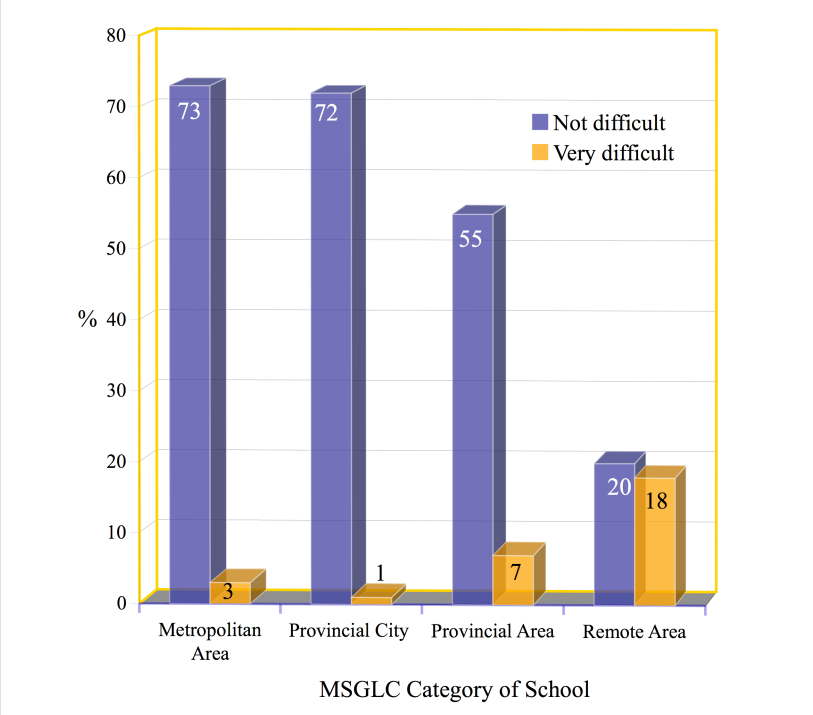

Figure 4.2. Reported difficulty of filling vacant primary teaching positions in different locations [only respondents reporting the situation as 'not difficult' and 'very difficult' are shown here] ***(N=1480)***

4. Secondary science, ICT and mathematics respondents in Provincial Areas were collectively 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 (see Figure 4.3). Respondents in Provincial City schools were also considerably more likely than their metropolitan colleagues to regard it as very difficult to fill teacher vacancies in these subjects.

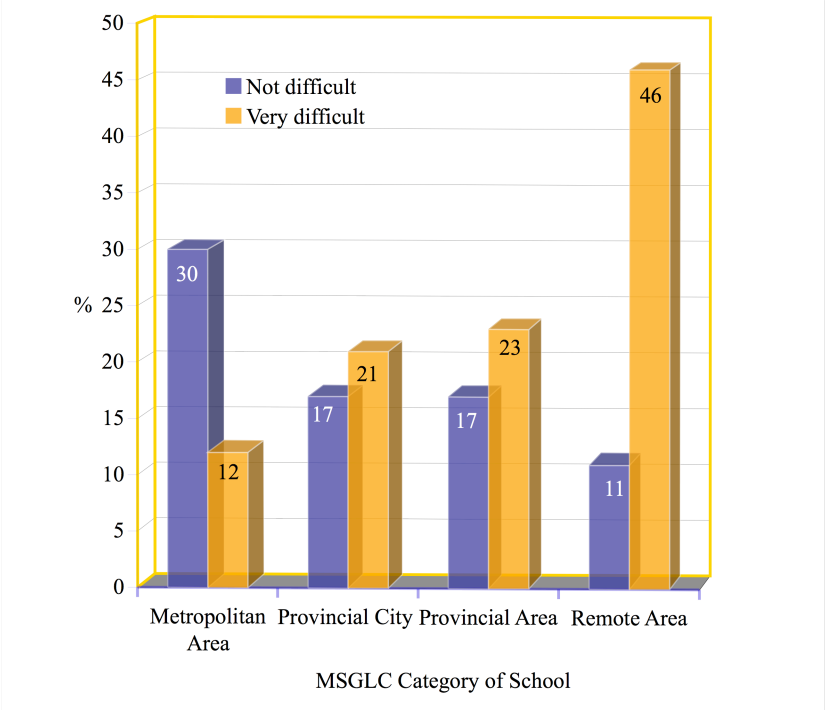

Figure 4.3. Reported difficulty of filling vacant secondary teaching positions in different locations [only respondents reporting the situation as 'not difficult' and 'very difficult' are shown here] ***(N (science, ICT and mathematics combined)=1261)***

5. Figure 4.4 compares the proportions of secondary science, ICT and mathematics respondents in different locations reporting that it is 'very difficult' to fill vacancies in their subject areas. The evidence suggests that it is relatively more difficult to fill vacant mathematics positions in Provincial and Remote Areas, than to fill science and ICT vacancies in these locations.
6. The difficulty in filling vacant ICT positions appears to vary less with geographical location. However, ICT teachers seem to be in shorter supply in Metropolitan Areas than are science or mathematics teachers.

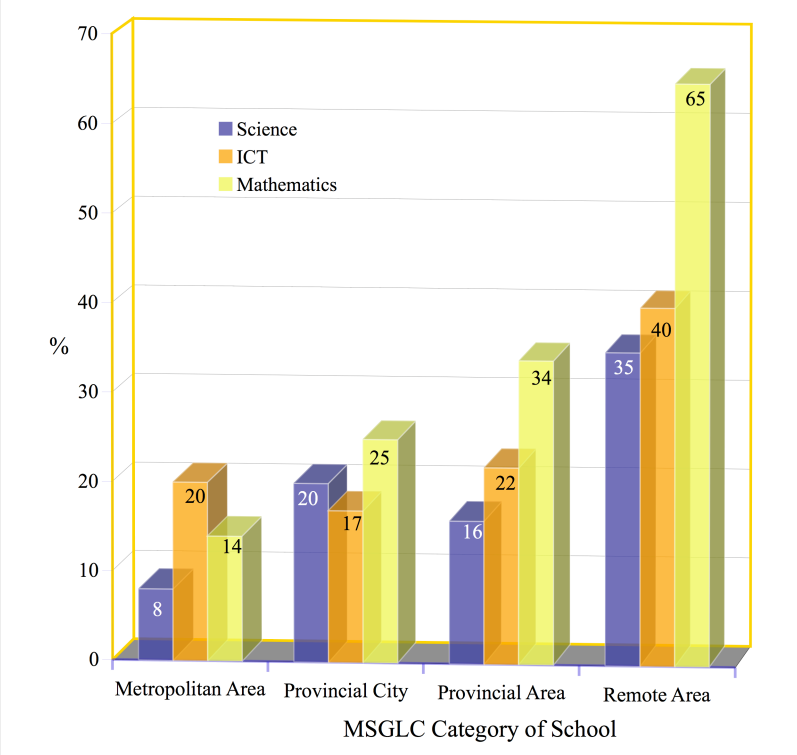

Figure 4.4. Percentages of science, ICT and mathematics respondents in different locations reporting that it is 'very difficult' to fill teaching vacancies in their subject areas (*N*=1261)

Discussion

The findings provide a 'teacher perspective' on the rural school staffing problems revealed elsewhere in the literature (e.g., Harris, Jensz & Baldwin, 2005; MCEETYA, 2003; Skilbeck & Connell, 2003). This is an important perspective, confirming inequities in the supply of qualified primary and secondary science, ICT and mathematics teachers to schools in different locations. These inequities have an obvious effect on the quality of education available to students in these locations. It is unlikely that students in a school that has a high turnover of staff, great difficulty in replacing these staff with qualified teachers, and where staff are required to teach outside their area of expertise, are receiving the same quality of education, and are as supported in their learning, as are those in schools adequately staffed with established, well qualified and experienced teachers. In view of this situation, it is difficult to avoid the conclusion of Alloway et al. (2004) and others that students in these schools are educationally disadvantaged by comparison with their city peers. The findings indicate that this disadvantage is most acute for secondary students, due to the higher turnover rates in combined and secondary schools and greater difficulty filling science and mathematics vacancies.

4.3 DESTINATION SCHOOLS OF CITY AND COUNTRY EDUCATED TEACHERS

Primary and secondary teachers were asked to indicate where they had lived while undertaking their high school education. Responses to this item served as a rough indicator of where they spent their formative years. Teachers were also asked where they had lived while completing their initial teacher education. Responses to these items were compared to the locations of their current schools. About 46% of respondents completed their high school studies in Regional (defined as having a population between 25000 - 50000[6]) or Rural Centres (defined as having a population fewer than 25000) and 43% in Metropolitan Areas (population >100000). However, the majority (about 62%) of respondents undertook their initial teacher education while in a Metropolitan Area. Female respondents tended to be somewhat more likely to have completed their initial teacher education outside a Metropolitan Area. Analysis of the teacher surveys revealed a number of associations between the destinations of teachers, and their locations while undertaking pre-service teacher education.

1. The findings revealed a tendency for teachers who attended high school in a rural or regional centre to move to a larger centre when undertaking their teacher training. This is not surprising, as nearly all universities and teachers' colleges are, or were, located in large centres, with most in the capital cities.
2. The findings exposed a tendency for teachers to gain employment in locations similar to those in which they lived while undertaking pre-service education. Figure 4.5 shows that 73% of respondents who lived in Rural Centres while completing their teacher education are currently working in Provincial Area or Remote Area schools. Only 5% of respondents who lived in Rural Centres during their teacher education were currently working in metropolitan schools.

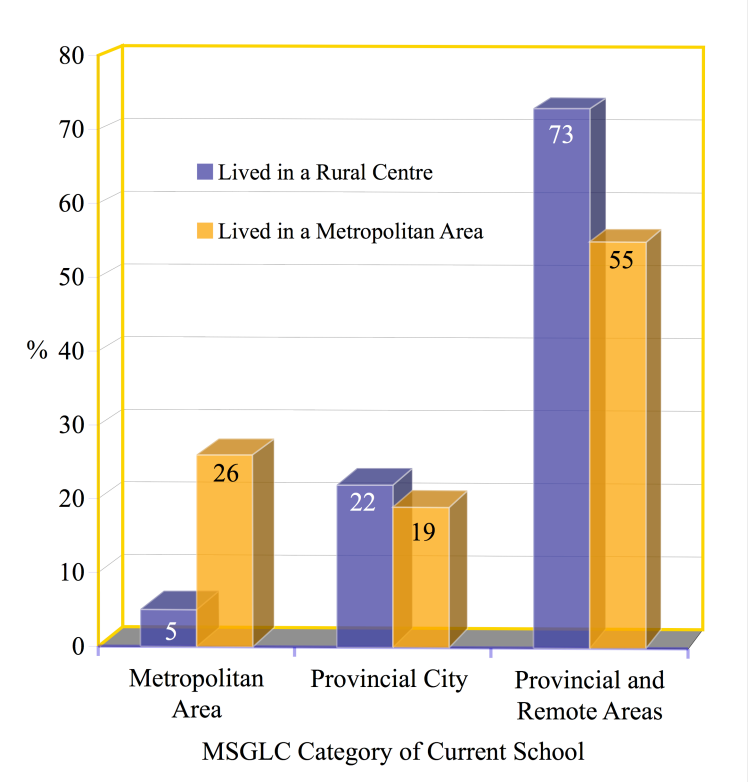

Figure 4.5. Current teaching locations of respondents who lived in either a Metropolitan Area or a Rural Centre when undertaking their initial teacher education *(N*=2895*)*

[6] This population based classification was necessary as teachers were asked to identify their locations during these periods without reference to the MSGLC. The classification 'Regional Centre' corresponds to the MSGLC sub-category Provincial City 2.1.2, while 'Rural Centre' corresponds to Provincial Areas and Remote Areas.

3. On the other hand, the findings did not provide any evidence that teachers who lived in Rural Centres while attending high school or completing teacher education gain employment in Remote Areas. Rather, there appears to be a pattern of drift to larger centres.
4. The findings revealed that a greater-than-expected proportion (over 70%) of science, ICT and mathematics teachers lived in Metropolitan Areas during their teacher education. In view of finding 2, above, it is likely, therefore, that beginning teachers in these subject areas will tend to seek employment in Metropolitan rather than Provincial Area or Remote Area schools.

Discussion

The two most important findings in this section are the strong relationship between where teachers lived while undertaking their pre-service teacher education and where they subsequently teach, and the finding that over 70% of secondary science, ICT and mathematics teachers lived in metropolitan areas while completing their teacher education. These findings point to a greater supply of science, ICT and mathematics teachers in Metropolitan Areas, which is the current situation. In an environment of overall declining teacher numbers in these subjects (MCEETYA, 2003; 2005), it is clear that demand for these teachers in rural areas will increasingly outweigh supply.

4.4 MOTIVATIONS FOR TEACHING IN RURAL AND REGIONAL SCHOOLS

In order to understand the influences on staffing patterns and teacher motivations to work in rural and regional schools, the survey investigated the influences on teachers' decisions to work in, or to leave, these schools. The findings provide a solid basis for understanding these motivations, and for suggesting what steps can be taken to address the staffing problems identified above.

Motivations for moving to rural or regional schools

1. Table 4.1 shows that, overall, teachers initially taking up positions in these schools were motivated mostly by job availability, educational authority placement, and having previously lived in the same or a similar location.
2. The influence of motivational factors seems to vary with the sex of the teacher. Figure 4.6 shows that males were generally more motivated by financial and advancement considerations whereas females placed greater priority on family factors, such as spouse employment or location of other family members.

Table 4.1. Overall average ratings, standard deviations and valid N for the initial decision items (items are listed in descending order of mean rating) [Ratings on a 1 (Not influential) to 5 (Extremely influential) scale]

How influential were the following on your initial decision to teach in a rural or regional school?	Mean	s.d.	Valid N
Job availability	**2.41**	1.23	2388
Education authority placement	**2.26**	1.30	2416
Previously lived in the same or similar location	**1.99**	1.17	2408
Lifestyle change	**1.84**	1.07	2395
Family connections in the location	**1.78**	1.15	2410
Spouse's/Partner's employment situation	**1.70**	1.15	2402
Bond/contract with educational provider	**1.61**	1.10	2381
Promotion	**1.43**	.89	2372
Affordable housing	**1.38**	.75	2390
Rent subsidy	**1.21**	.59	2392
Rural or remote area allowance	**1.14**	.48	2389

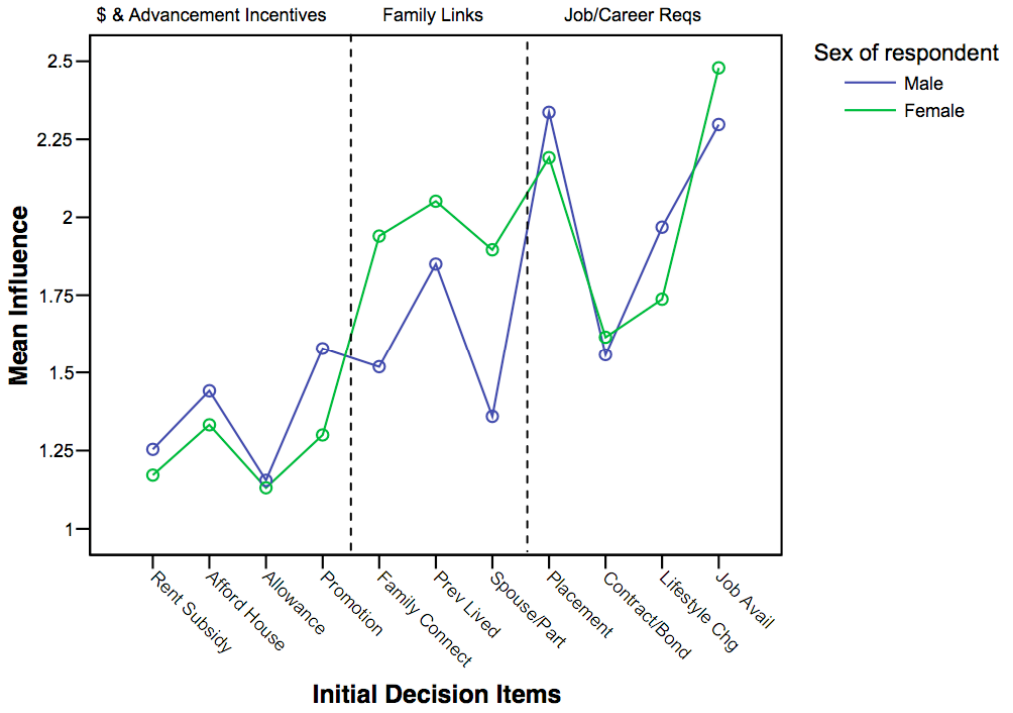

Figure 4.6. Profile plot of means for the eleven initial decision items, compared by Sex of Respondent (see Table 4.1 for item names in full)

3. There is evidence that the influence of motivational factors has changed over time. Figure 4.7 indicates that those who started their teaching careers 30 or so years ago were often allocated to rural or regional schools by education authorities, either through placement or

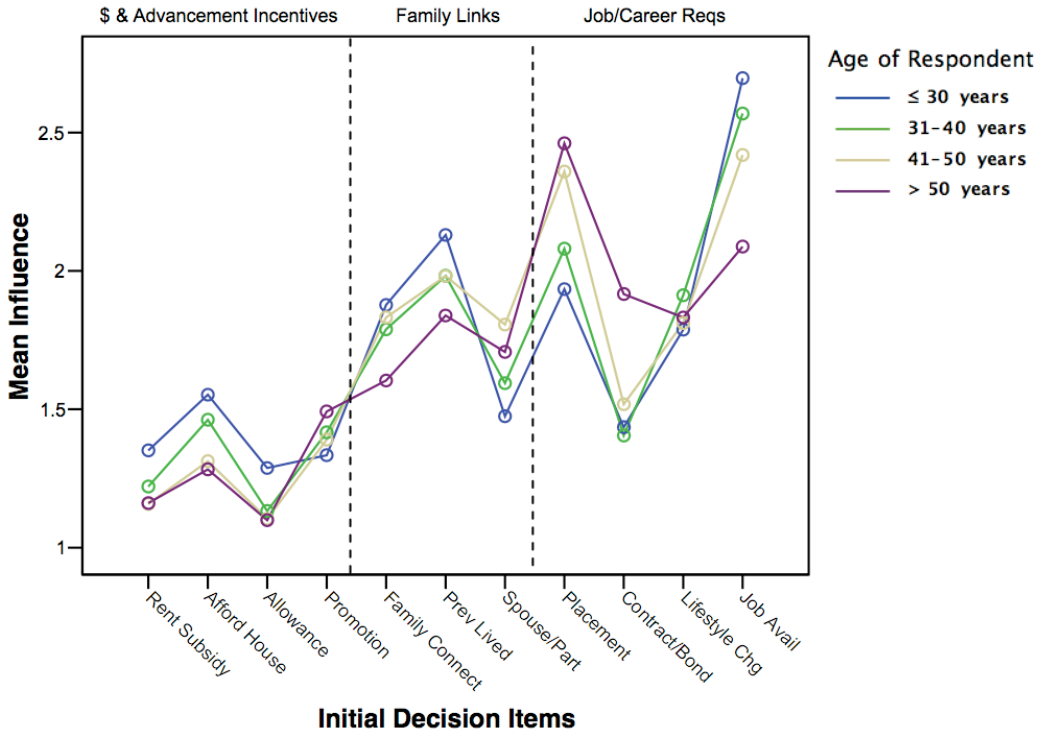

Figure 4.7. Profile plot of means for the eleven initial decision items, compared by Age of Respondent (Table 4.7 for item names in full)

scholarship bonds. However, these systems were not so influential (or extant) among younger teachers who were more motivated by job availability and whether they had previously lived in the same or a similar location. Younger teachers were also more motivated by financial inducements such as rent subsidies, affordable housing and allowances, while older teachers were more influenced by the situation of their partners.

4. Respondents from Government schools were more likely to have taken up a position at a rural or regional school due to education authority placement than were teachers in other systems.
5. The low mean ratings for subsidies and allowances possibly reflect the relatively small number of respondents who qualified for these incentives.

Motivations for remaining at a rural or regional school

1. The greatest influences on teachers' decisions to stay in rural and regional schools were their enjoyment of the lifestyle and community spirit. Table 4.2 shows that family links and partner's employment were also very influential.
2. The highest motivating school characteristic was small class size.
3. Female teachers considered their family situation to be more influential than did males, who rated the cost of living and quality of the lifestyle higher than did females.
4. Consistent with the findings on initial motivations, younger teachers were more inclined to remain in a rural or regional school because of financial considerations than were their older colleagues.
5. Promotion or advancement opportunities were also a greater incentive among younger teachers.

Table 4.2. Overall average ratings, standard deviations and valid N for the continuance decision items (items are listed in descending order of mean rating) [Ratings on a 1 (Not influential) to 5 (Extremely influential) scale]

How influential were the following on your decision to continue teaching in a rural or regional school?	Mean	s.d.	Valid N
Enjoyment of lifestyle	**2.87**	1.04	2253
Community spirit	**2.43**	1.00	2234
Spouse's/partner's employment situation	**2.16**	1.25	2245
Family connections in the location	**2.11**	1.24	2239
Smaller class sizes	**1.84**	.97	2232
Opportunity for promotion	**1.71**	.93	2239
Expense of moving to the city	**1.66**	.99	2225
Affordable housing	**1.61**	.91	2232
Opportunity to work with Indigenous students	**1.29**	.65	2232
Rent subsidy	**1.26**	.67	2222
Rural or remote area allowance	**1.24**	.63	2222

Motivations for leaving a rural or regional school

1. Respondents had a wide variety of mainly personal reasons for leaving rural and regional schools.
2. Table 4.3 shows that, for the most part, these reasons were family-related, such as changes in a partner's employment situation, or to improve educational opportunities for their own children.
3. Other teachers left due to a sense of social or professional isolation.
4. While problems with the school or community were the least influential factors, younger teachers tended to rate these as more influential than did older teachers.

5. Figure 4.8 shows that primary respondents rated these problems as less influential on their decisions than did those at secondary or combined schools. Professional isolation was a greater motivation among secondary and combined school respondents.

Table 4.3. Overall average ratings, standard deviations and valid N for the 'decision to leave' items (items are listed in descending order of mean rating) [Ratings on a 1 (Not influential) to 5 (Extremely influential) scale]

If you left a rural or regional school for a metropolitan school, how influential were the following?	Mean	s.d.	Valid N
Spouse's/partner's employment situation	**2.16**	1.27	678
Educational opportunities for your own children	**1.97**	1.18	682
Sense of social isolation	**1.88**	1.05	669
Sense of professional isolation	**1.75**	.94	679
Limited essential services	**1.72**	.96	655
Education authority placement	**1.71**	1.06	670
Reduced cost of travelling	**1.67**	.93	670
Opportunity for promotion	**1.65**	.95	687
Problems within the school	**1.51**	.90	668
Problems in the community	**1.43**	.83	666

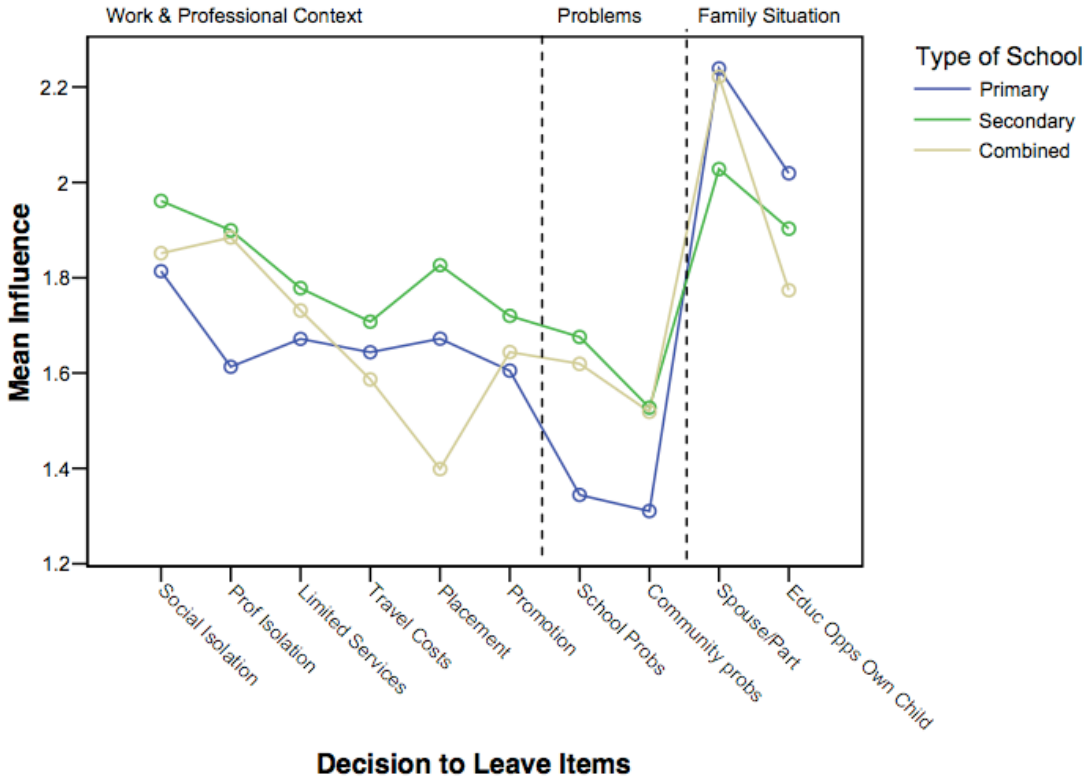

Figure 4.8. Profile plot of means for the ten decisions to move to a metropolitan school items, compared by Type of School (Table 4.3 for item names in full)

Motivations for moving from a metropolitan to a rural or regional school

Respondents who had only ever taught in metropolitan schools were asked to rate a range of items on their motivational value for taking up a position in a rural or regional school.

1. Table 4.4 shows that metropolitan teachers consider smaller class sizes and preference for future transfers to have the highest motivational value in terms of moving to a rural or regional school.
2. Financial incentives such as cheaper housing, rent and travel subsidies and allowances were also potentially influential.
3. Opportunities to work with a smaller staff, or with Indigenous students were the least influential items.
4. Figure 4.9 shows that the youngest group of teachers considered financial and advancement incentives to be substantially more influential than did their older colleagues.

Table 4.4. Overall average ratings, standard deviations and valid N for the motivation to take up a rural or regional teaching position items (items are listed in descending order of mean rating) [Ratings on a 1 (Not influential) to 5 (Extremely influential) scale]

How influential would the following be in motivating you to take up a position in a rural or regional school?	Mean	s.d.	Valid N
Smaller class sizes	**2.10**	1.00	603
Preference for future transfers	**2.09**	1.11	590
Affordable housing	**2.05**	1.02	598
Rent subsidy	**2.05**	1.03	597
Travel subsidy	**2.01**	1.03	593
Rural or remote area allowance	**1.98**	.98	596
More holidays	**1.93**	.98	595
Improved opportunities for promotion	**1.89**	.95	600
Smaller school staff	**1.63**	.83	595
Opportunity to work with Indigenous students	**1.42**	.71	596

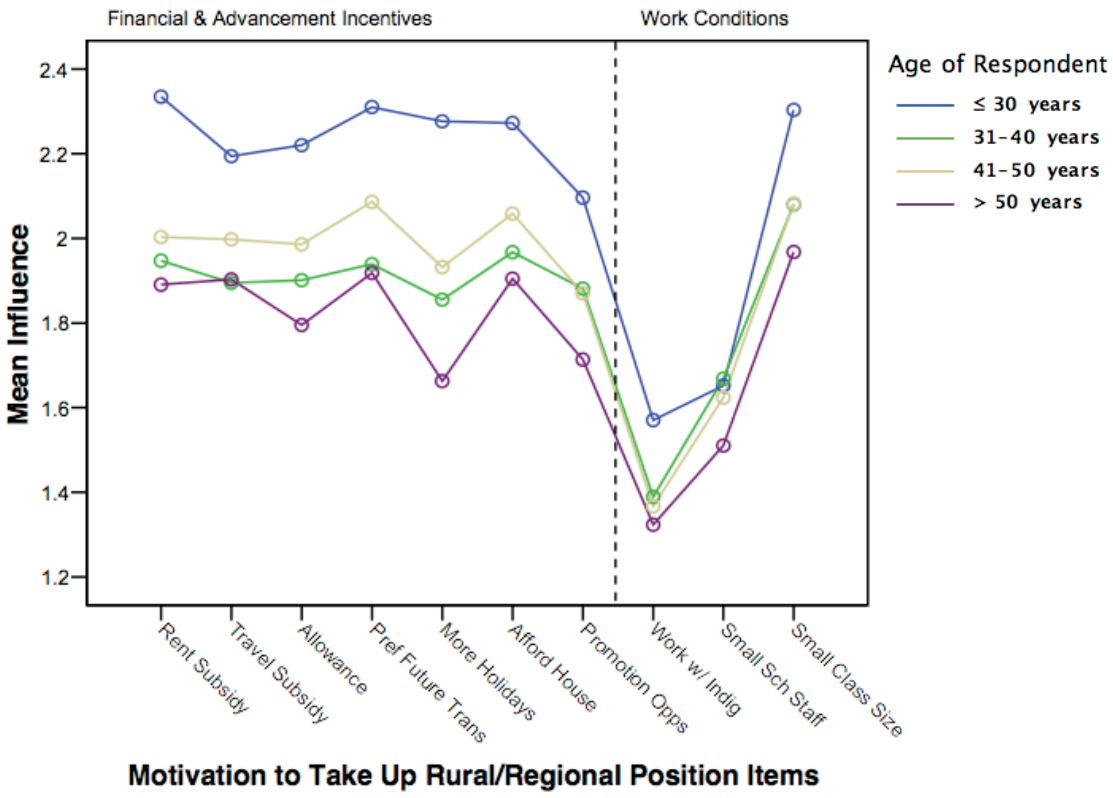

Figure 4.9. Profile plot of means for the ten motivation to take up a rural or regional position items, compared by Age of Respondent (Table 4.4 for item names in full)

Discussion

The finding that education authority bonds or placement were the reasons most teachers initially took up positions in rural and regional schools has a number of implications. First, since most teachers, particularly secondary teachers, were educated in metropolitan centres, it is questionable whether these teachers would have taken up rural teaching positions without such a strategy. Second, it is noteworthy that, once placed, many teachers remained because of satisfaction with the lifestyle and community, or through establishing family ties. However, without the initial placement, it is unlikely these factors alone would have attracted many city-bred teachers.

The analysis of destinations of teachers educated in different areas revealed a pattern of drift from smaller to larger centres. Furthermore, it provided evidence that young teachers are influenced principally by their familiarity with an area and whether they have contacts there. Because of these trends, and the aforementioned fact that most teachers are educated in metropolitan areas, it is difficult to see how rural and regional schools can be properly staffed in the future without either a system of obligatory placement or the development of more effective incentive schemes.

The findings indicate that younger teachers are more motivated than older colleagues by financial inducements such as rent subsidies, affordable housing and allowances. Opportunities for future promotion or preferential transfer were also deemed to be influential, even among experienced teachers. Nevertheless, the present high turnover rates and difficulties filling vacancies indicate that current incentive schemes are not effective, although this would probably vary across states/territories.

Finally, it is significant that a relatively high proportion of teachers who left rural schools did so in order to improve the educational opportunities for their own children. While it is understandable that a teacher would want to maximise these opportunities, such decisions may also suggest to the community that the standard of education in rural schools is inadequate. Thus, the decision has a compounding and self-perpetuating effect, particularly as it removes at least one more professional person from the community.

4.5 PERCEPTIONS OF TEACHER EDUCATION AND PREPARATION

Primary and secondary teachers were asked to reflect on how well their pre-service teacher education had prepared them for various aspects of their careers. The findings in this section refer to the suitability and effectiveness of respondents' pre-service education, not to their current skill levels.

Primary teacher preparation

1. The findings in Table 4.5 suggest that primary teachers in general feel they were well prepared by their teacher education for teaching mathematics, though considerably less so for teaching science. Figure 4.10 shows that this was the case for teachers of all ages.
2. Most primary teachers also seem to feel that they were reasonably well prepared for teaching in rural and regional schools, and for managing student behaviour. Figure 4.10 shows that, while there was little variation with age in the former, the youngest teachers tended to feel they were better prepared for dealing with student behaviour than were their older colleagues. This may be due to changes in the way teacher education institutions approach the issue of student management, or to younger teachers having less experience of a range of student behaviours.

Table 4.5. Overall average ratings, standard deviations and valid N for the primary teacher education preparation items (items are listed in descending order of mean rating) [Ratings on a 1 (Not at all prepared) to 5 (Extremely well prepared) scale]

How well do you think your teacher education prepared you for:	Mean	s.d.	Valid N
teaching mathematics?	**3.09**	.96	1546
teaching science?	**2.60**	.96	1545
teaching in rural and regional schools?	**2.57**	1.17	1543
managing student behaviour?	**2.55**	1.03	1548
teaching gifted and talented students?	**1.98**	.97	1549
teaching special needs students?	**1.94**	1.02	1550
using ICT across the curriculum?	**1.77**	1.03	1537
teaching Indigenous students?	**1.72**	.94	1550
teaching NESB students?	**1.52**	.84	1551

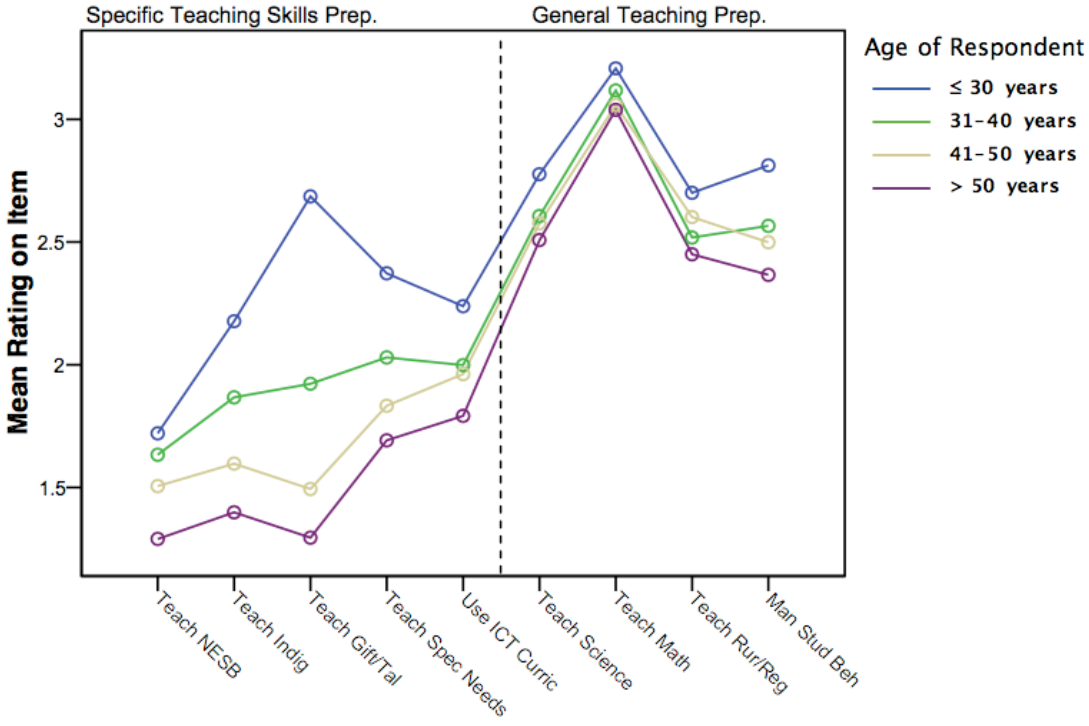

Figure 4.10. Profile plot of teacher preparation items, compared by Age of Respondent [ratings on 1 (Not Prepared) to 5 (Extremely Well Prepared) scale] (Table 4.5 for item names in full)

3. The evidence suggests that primary teachers were considerably less well prepared for teaching Indigenous and NESB students, and for using ICT across the curriculum. It is reasonable to argue that the significant variation with age across a range of specific teaching skills is indicative of the changes in emphasis in teacher preparation over time, particularly with regard to using ICT, and catering for student diversity in the classroom. Acknowledgement by older teachers that their initial teacher education did not prepare them well for aspects of their current teaching environments underscores the importance of providing ongoing professional development.
4. Figure 4.11 shows that primary teachers who lived in metropolitan centres during their teacher education felt less prepared in a number of areas, especially teaching in rural or regional schools and teaching Indigenous students. One reasonable interpretation is that

pre-service teachers in metropolitan centres were less likely to take their practical teaching experiences outside these centres.

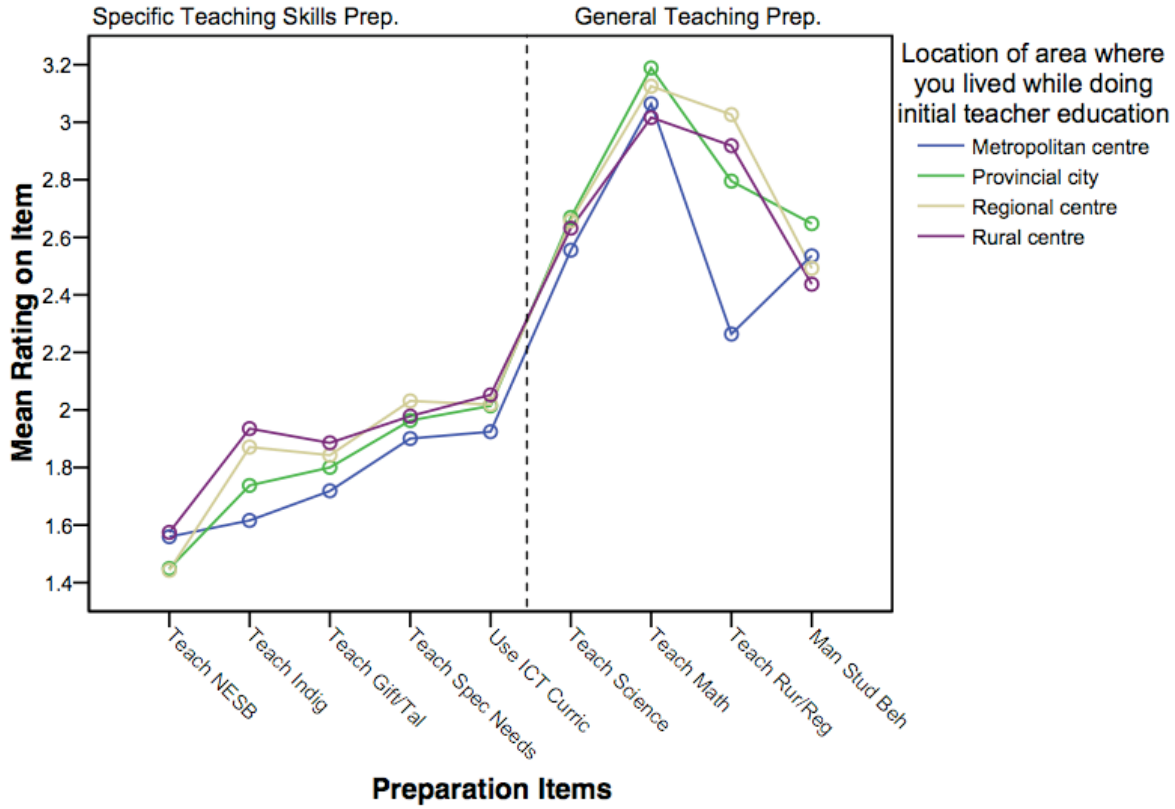

Figure 4.11. Profile plot of primary teacher preparation items, compared by Location During Initial Teacher Education (Table 4.5 for item names in full)

Secondary teacher preparation

1. The findings in Table 4.6 indicate that secondary science and mathematics teachers feel their teacher education prepared them relatively well for teaching their subjects. This was generally the case for teachers of all ages. However, Figure 4.12 shows that many ICT teachers felt their initial teacher education did not prepare them well for teaching their subjects. This is understandable given the relative novelty of ICT as a school subject and the dynamic nature of ICT in general.

Table 4.6. Overall average ratings, standard deviations and valid N for the teacher education preparation items for secondary respondents (items are listed in descending order of mean rating) [Ratings on a 1 (Not at all prepared) to 5 (Extremely well prepared) scale]

How well do you think your teacher education prepared you for:	Mean	s.d.	Valid N
teaching [science/mathematics/ICT]?	**2.89**	1.12	1348
teaching in rural and regional schools?	**2.47**	1.09	1331
managing student behaviour?	**2.41**	1.01	1342
teaching gifted and talented students?	**2.10**	1.00	1342
using ICT across the curriculum?	**1.84**	1.07	1332
teaching special needs students?	**1.77**	.95	1338
teaching Indigenous students?	**1.59**	.84	1339
teaching NESB students?	**1.47**	.83	1344

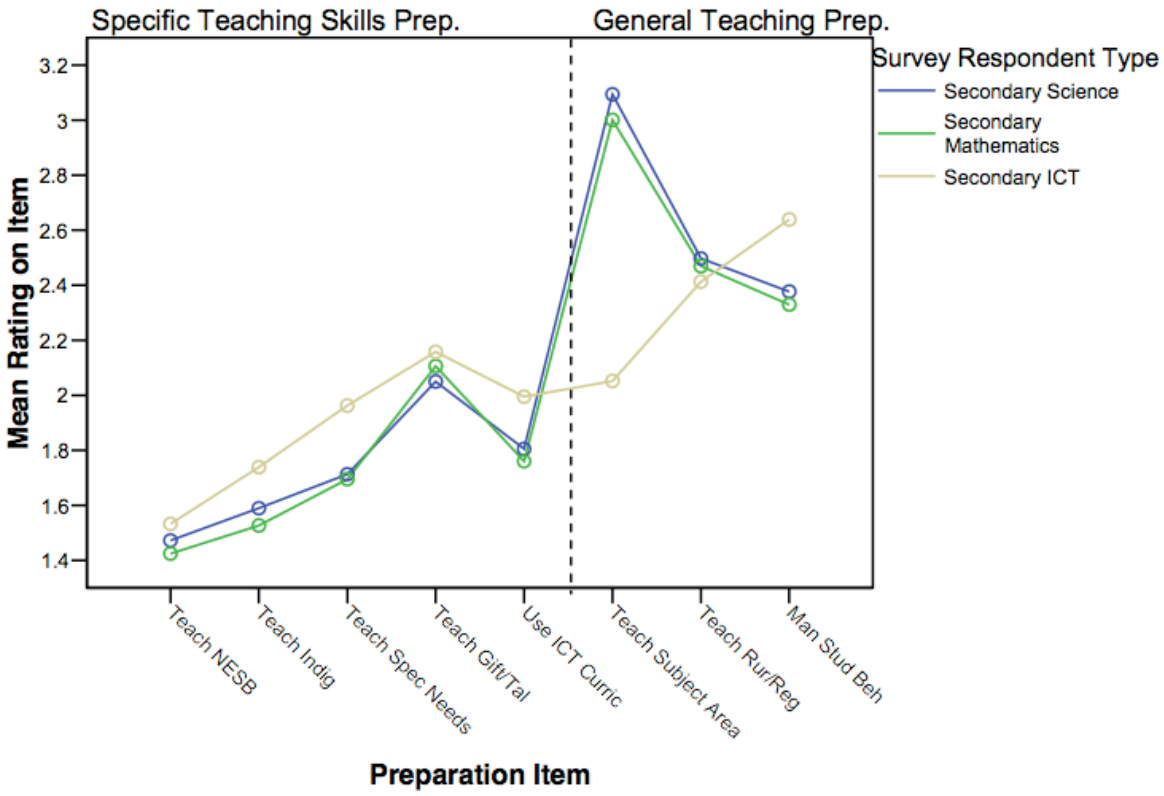

Figure 4.12. Profile plot of secondary teacher preparation items, compared by Survey Respondent Type (Science, ICT and Mathematics) [ratings on 1 (Not Prepared) to 5 (Extremely Well Prepared) scale] (Table 4.6 for item names in full)

2. Secondary teachers appear to have been reasonably well prepared for teaching in rural and regional schools, and for managing student behaviour. Figure 4.13 suggests that younger teachers felt better prepared by their pre-service education for incorporating ICT and catering for student diversity than did their older colleagues. As with primary teachers, this is probably indicative of changes in the educational landscape over time, and demonstrates the need for ongoing professional development.

3. Figure 4.14 indicates that secondary science, ICT and mathematics teachers who lived in provincial cities or regional centres during their initial teacher education felt better prepared in some respects by this experience than did those who were located in metropolitan or remote centres. This was particularly the case for preparation for teaching in rural and regional schools.

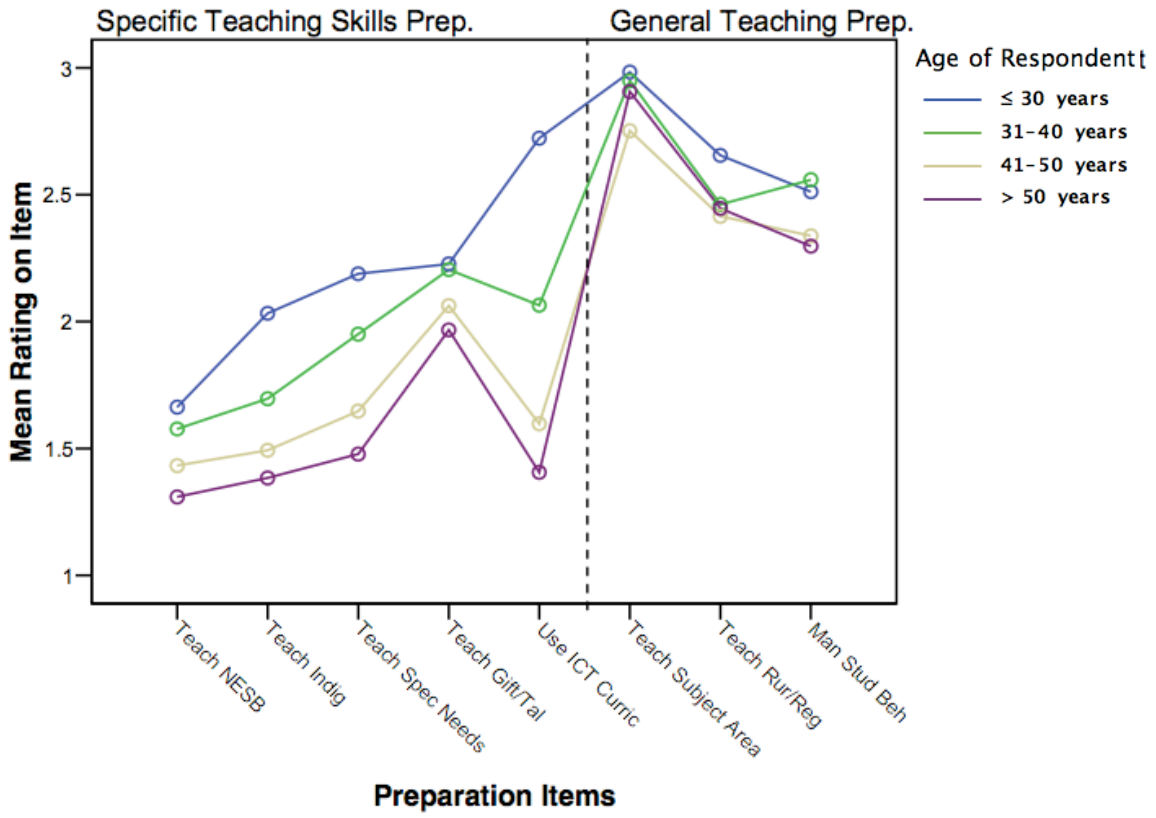

Figure 4.13. Profile plot of secondary teacher preparation items, compared by Age of Respondent [ratings on 1 (Not Prepared) to 5 (Extremely Well Prepared) scale] (Table 4.6 for item names in full)

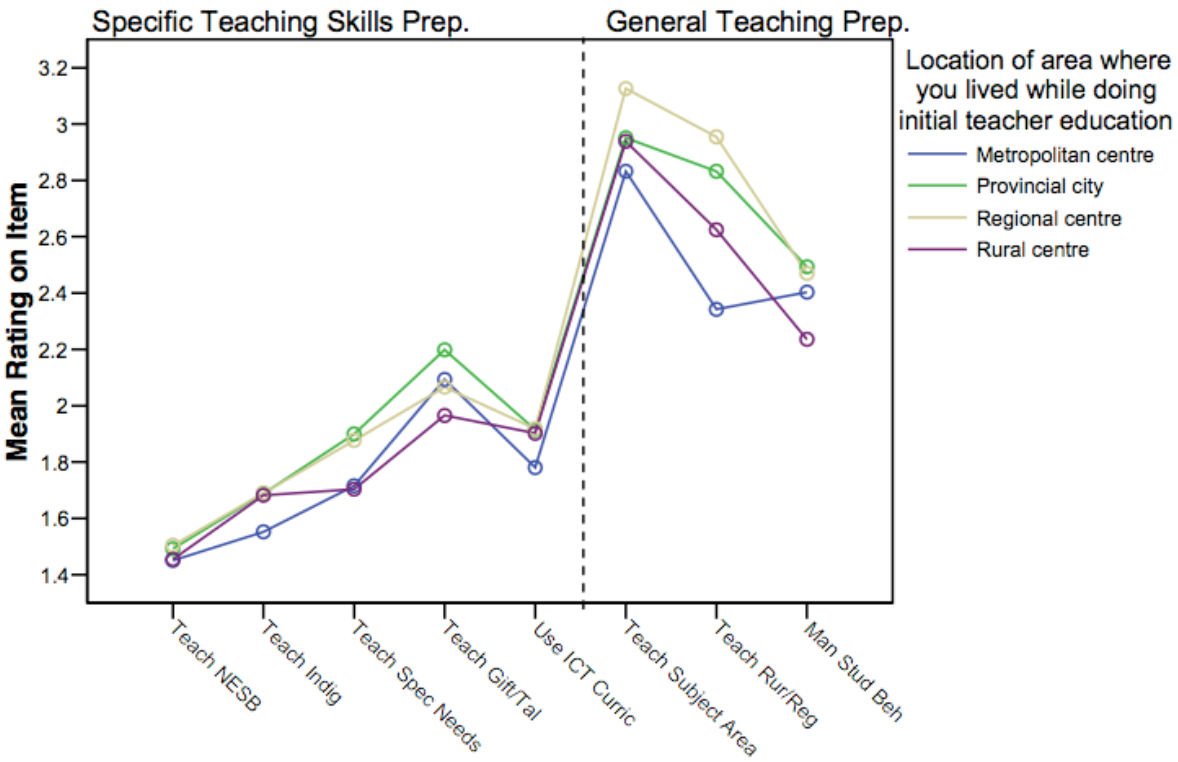

Figure 4.14. Profile plot of secondary teacher preparation items, compared by Location During Initial Teacher Education [ratings on 1 (Not Prepared) to 5 (Extremely Well Prepared) scale] (Table 4.6 for item names in full)

Discussion

The finding that primary teachers generally felt less well prepared by their pre-service education for teaching science than for teaching mathematics is consistent with the conclusions of Goodrum, Hackling & Rennie (2001) and Harris et al. (2005), who found that primary teachers are not as confident in teaching science as they are in other subjects. Secondary science and mathematics teachers felt they were relatively well prepared for teaching in their subject area. Nevertheless, the findings suggest that few ICT teachers feel their pre-service education prepared them adequately for teaching ICT subjects. In view of the relative novelty and dynamic nature of the subject matter, equipment and pedagogical models, this comes as no surprise. ICT teachers, more than any other group, are required to learn on the job, a situation that has implications for their professional development.

All teacher groups felt generally well prepared to teach in rural and regional schools, although those who had lived in rural or regional centres during their teacher education tended to feel considerably better prepared. While this is understandable since no city universities insist on their students having teaching experiences in a rural area (Boylan, 2003; Halsey, 2005), the finding may be a cause for some concern because of the high proportion of teaching students enrolled in metropolitan universities. In Western Australia, Tasmania and South Australia, for example, all universities are located in metropolitan areas.

4.6 TEACHER QUALIFICATIONS

Primary and secondary teachers were asked to describe their levels of qualification and experience (see Table 4.7). They were also asked whether they had been required to teach courses for which they are not formally qualified (see Figure 4.15).

1. Overall, more than 85% of respondents held either a Bachelor's degree (plus an undergraduate or postgraduate diploma) or some type of postgraduate teaching qualification.

Table 4.7. Level of teaching qualifications of primary teachers and secondary science, ICT and mathematics teachers

	Primary teachers	Science teachers	ICT teachers	Mathematics teachers
<B.Ed	21%	4%	13%	6%
B.Ed	45%	13%	30%	22%
Bach + UG or PG Dip.	19%	58%	32%	52%
PG degree + other	15%	24%	26%	21%
	100%	**100%**	**100%**	**100%**

2. The qualifications of primary and secondary science, ICT and mathematics respondents did not vary significantly with age, sex or geographic location.
3. There was strong evidence that many science, ICT and mathematics teachers are being required to teach subjects for which they are not qualified, and that this requirement is considerably more common in Provincial and Remote Area schools. Figure 4.15 suggests

that teachers in Provincial Areas are 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 are not qualified.

4. The findings also suggest that ICT teachers are more likely to be required to take classes in another subject area than are science teachers. Mathematics teachers are least likely to be asked to take such classes.

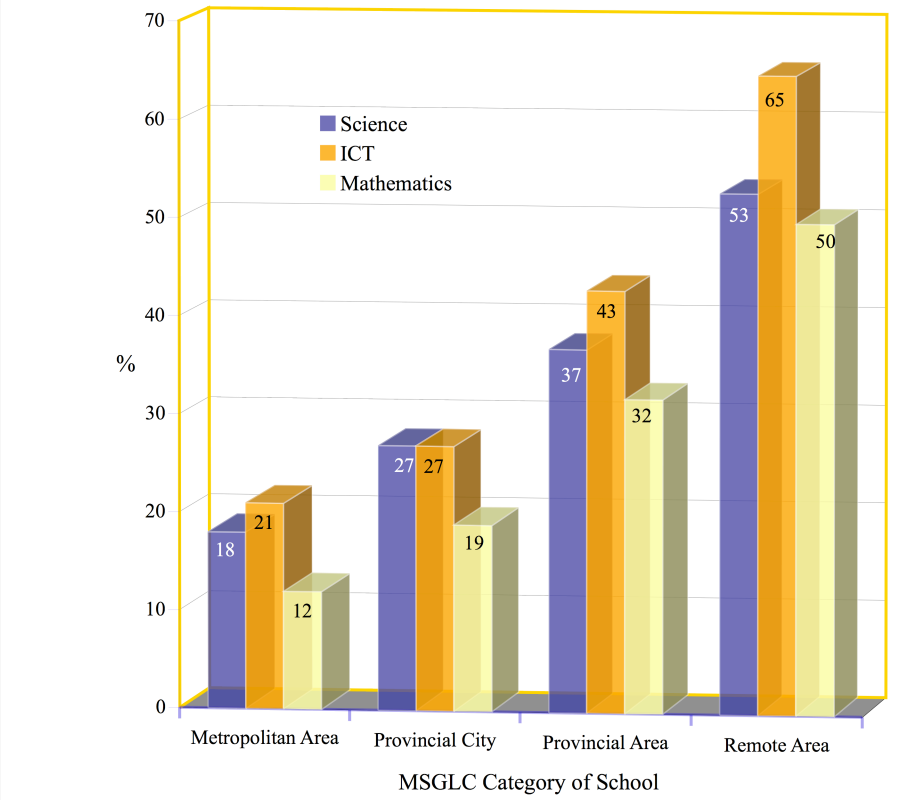

Figure 4.15. Percentages of science, ICT and mathematics respondents indicating they are required to teach subjects for which they are not formally qualified

Discussion

The study found that the qualifications of teachers do not vary significantly with age, sex or geographic location. While this might be taken as indicating that students in different areas have equal access to qualified teachers, the study also found that secondary teachers in Provincial and Remote Areas are, respectively, two to three times more likely to be required to teach outside their subject areas than are those in Metropolitan Area schools. The implication is that students in metropolitan schools are more certain of having a specialist teacher for each of their subjects than are students in Provincial and Remote Area schools. This has obvious implications for the understanding and achievement levels of senior students in different locations.

5. PROFESSIONAL CONNECTEDNESS AND ISOLATION

The surveys presented teachers with a set of items relating to potential opportunities and support mechanisms for undertaking professional development related to science, ICT or mathematics teaching, as well as more general opportunities such as staff mentoring, ICT skill development and programs to help address student diversity in their classrooms. Teachers were asked to rate each item on two scales: the importance of the opportunity for their current teaching situation, and the availability of the opportunity at their school. The two ratings for each item were combined to produce a single 'need' rating

5.1 PROFESSIONAL DEVELOPMENT NEEDS OF PRIMARY TEACHERS

1. Table 5.1 shows the mean need ratings of primary respondents for a variety of professional development opportunities. The findings indicate a strong need for opportunities to develop their ICT skills, and to help them cater for special needs and gifted and talented students.
2. Figure 5.1 shows that primary teachers in Remote Areas are significantly disadvantaged in terms of accessing professional development opportunities such as mentoring, release time for PD and collaboration with colleagues. Teachers in Metropolitan schools have a considerably lower unmet need for in-services in mathematics and science than teachers in other areas, particularly those in Remote Areas.
3. There appears to be a need to develop or improve structures to support mentoring of teachers in remote schools.
4. The findings provide evidence that primary teachers in remote schools, and in schools with high proportions of Indigenous students, feel professionally isolated. In particular, there is a need for professional development to help these teachers cater for special needs and gifted and talented students, for more financial support to cover the costs of professional development, and for strategies to ensure that classes are covered in their absence (see Figure 5.2).

Table 5.1. Overall average 'need' scores, standard deviations and valid N for primary respondents' ratings of the Professional Interaction and Development items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20 [7]]

PROFESSIONAL DEVELOPMENT ITEMS	Mean	s.d.	Valid N
Workshops to develop your ICT skills	**9.92**	3.73	1460
Professional development opportunities to help you teach science & maths to gifted & talented students	**9.70**	3.74	1446
Professional development opportunities to help you teach science & maths to special needs students	**9.62**	3.79	1440
Effective communication between education authorities and teachers	**9.57**	3.59	1454
Release from face-to-face teaching for in-school collaborative activities	**9.40**	3.80	1477
Involvement in region or state-wide syllabus development, or research projects in science	**9.35**	3.76	1442
Involvement in region or state-wide syllabus development, or research projects in mathematics	**9.26**	3.73	1427
Opportunities for mentoring new staff	**9.24**	3.77	1468
Financial support for attendance at external in-services or conferences	**9.15**	3.91	1461
Opportunities to attend external in-services or conferences related to teaching & learning science	**9.11**	3.53	1469
Professional development opportunities to help you teach science & maths to Indigenous students	**9.07**	4.25	1396
Professional development opportunities to help you teach science & maths to NESB students	**8.95**	4.25	1355
Opportunities to attend external in-services or conferences related to teaching & learning mathematics	**8.71**	3.27	1454
Collaboration with teachers in your school	**7.62**	2.85	1487

[7] The 'needs' scores constitute ordinal rather than interval measures, since they were transformed from ordinal rating scales. While the possible scores range from 1 to 20, an average 'need' score on an item (that is, an item rated midway on both the importance and availability scales) would be about 7.5, rather than 10.

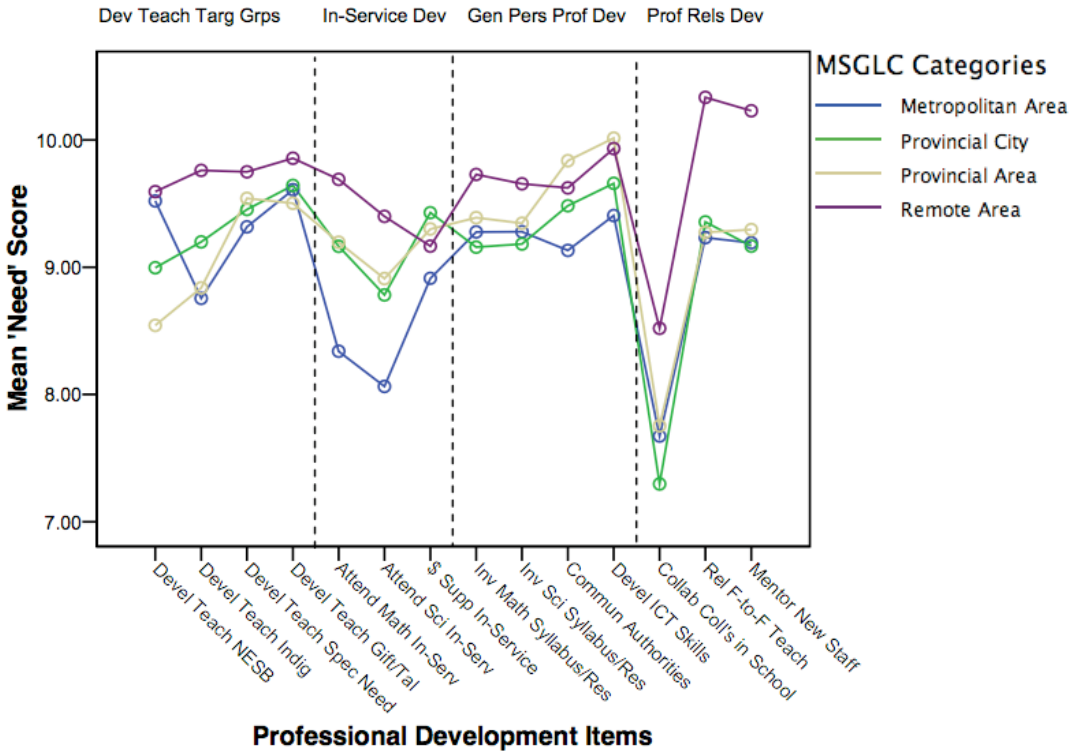

Figure 5.1. Profile plot of mean 'need' scores of primary respondents for the Professional Interaction and Development components[8], compared by MSGLC categories (see Table 5.1 for item names in full)

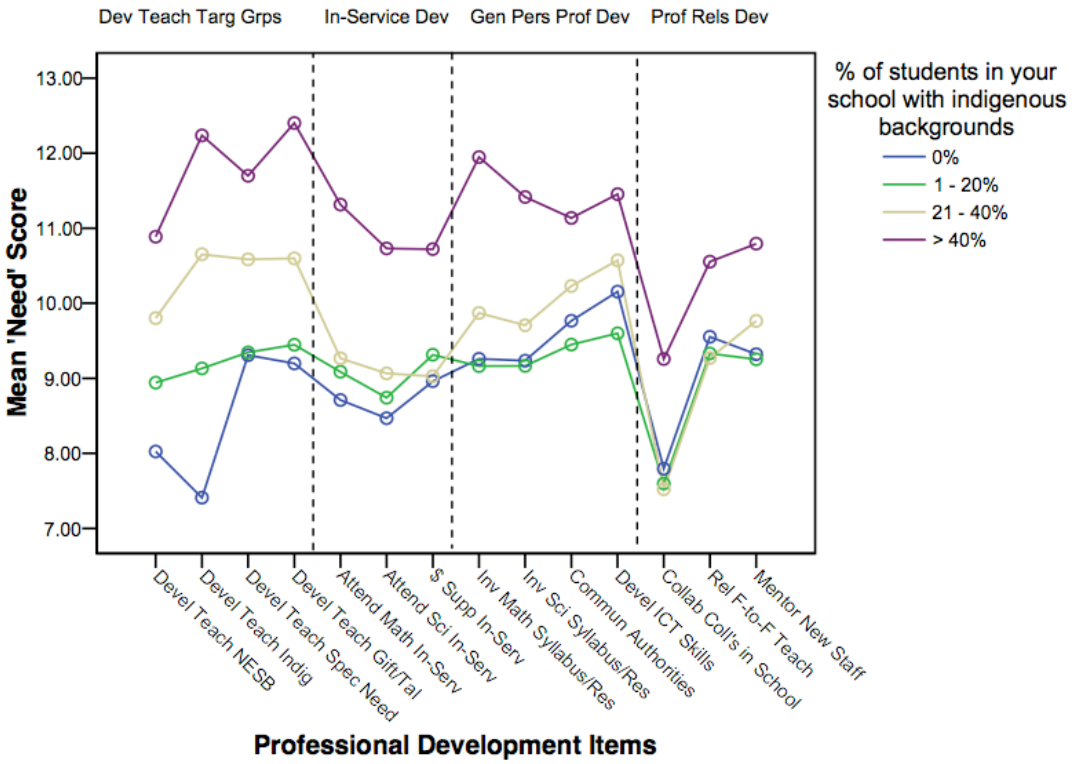

Figure 5.2. Profile plot of mean 'need' scores of primary respondents for the Professional Interaction and Development components, compared by percentage of students from Indigenous backgrounds (Table 5.1 for item names in full)

[8] The principal components analysis of the 'need' items produced four substantive components: Development for Teaching to Targeted Groups, In-Service Development, General Personal Professional Development, and Professional Relationships Development

5.2 PROFESSIONAL DEVELOPMENT NEEDS OF SECONDARY SCIENCE TEACHERS

1. Table 5.2 shows the mean 'need' ratings by science respondents for a range of professional development opportunities. The findings strongly suggest that science teachers in general see the priority areas for professional development as being release from face-to-face teaching for programming and other collaborative activities, and more effective communication with educational authorities. The high level of need may be related to developments in secondary science curriculum that have been, and still are, in progress in a number of Australian states and territories.
2. There was a clear indication that science teachers need professional development opportunities to help them cater for the diversity of students in their classes
3. Figure 5.3 shows that the need for professional development opportunities increased substantially with distance from Metropolitan and Provincial Cities. Indeed, teachers in Metropolitan schools reported a lower mean 'need' score on *every* professional development item.
4. The evidence suggests that science teachers in remote schools feel professionally isolated when it comes to opportunities to contribute to syllabus development. It is also apparent that teachers in Metropolitan Areas have far more opportunity to mark/moderate external science examinations. Such opportunities for teachers in remote schools would clearly benefit their students.
5. Figure 5.4 suggests that science teachers in schools which have a relatively large proportion of Indigenous students have a substantially greater need for a range of professional development opportunities, particularly those which would help them cater for student diversity. However, the findings imply that science teachers in schools where Indigenous students make up 20 to 40% of the student population have a greater need for general in-service opportunities and support than do those in other schools.

Table 5.2. Overall average 'need' scores, standard deviations and valid N for science respondents' ratings of the Professional Interaction and Development items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

PROFESSIONAL DEVELOPMENT ITEMS	Mean	s.d.	Valid N
Release from face-to-face teaching for in-school collaborative activities (e.g., programming)	**11.33**	4.28	539
Effective communication between education authorities and teachers	**10.16**	3.87	539
Professional development opportunities to help you teach science to gifted & talented students	**10.12**	3.88	531
Collaboration with science teachers in other schools	**9.98**	3.66	544
Professional development opportunities to help you teach science to special needs students	**9.97**	4.05	525
Workshops to develop your ICT skills	**9.80**	4.04	542
Involvement in region or state-wide syllabus development, or research projects (e.g., assessment)	**9.69**	3.89	539
Financial support for attendance at external in-services or conferences	**9.46**	3.96	542
Opportunities to attend external in-services or conferences related to teaching & learning science	**9.44**	3.74	543
Opportunities for mentoring new staff	**9.14**	3.74	539
Opportunity to mark/moderate external science assessments	**9.07**	4.12	535
Professional development opportunities to help you teach science to Indigenous students	**9.04**	4.50	522
Professional development opportunities to help you teach science to NESB students	**8.73**	4.22	501
Collaboration between science teachers in your school (e.g., sharing resources, ideas, knowledge)	**8.06**	3.48	542

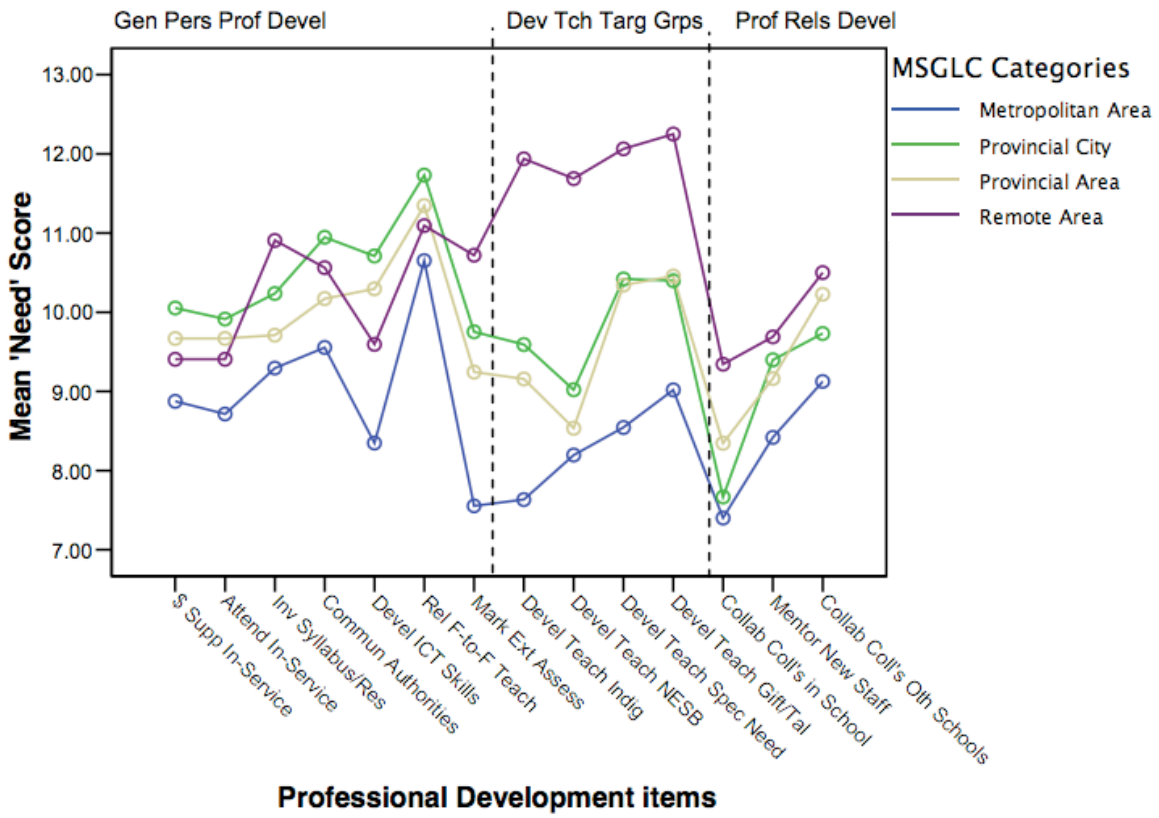

Figure 5.3. Profile plot of mean 'need' scores of science respondents for the Professional Interaction and Development components, compared by MSGLC categories (Table 5.2 for item names in full)

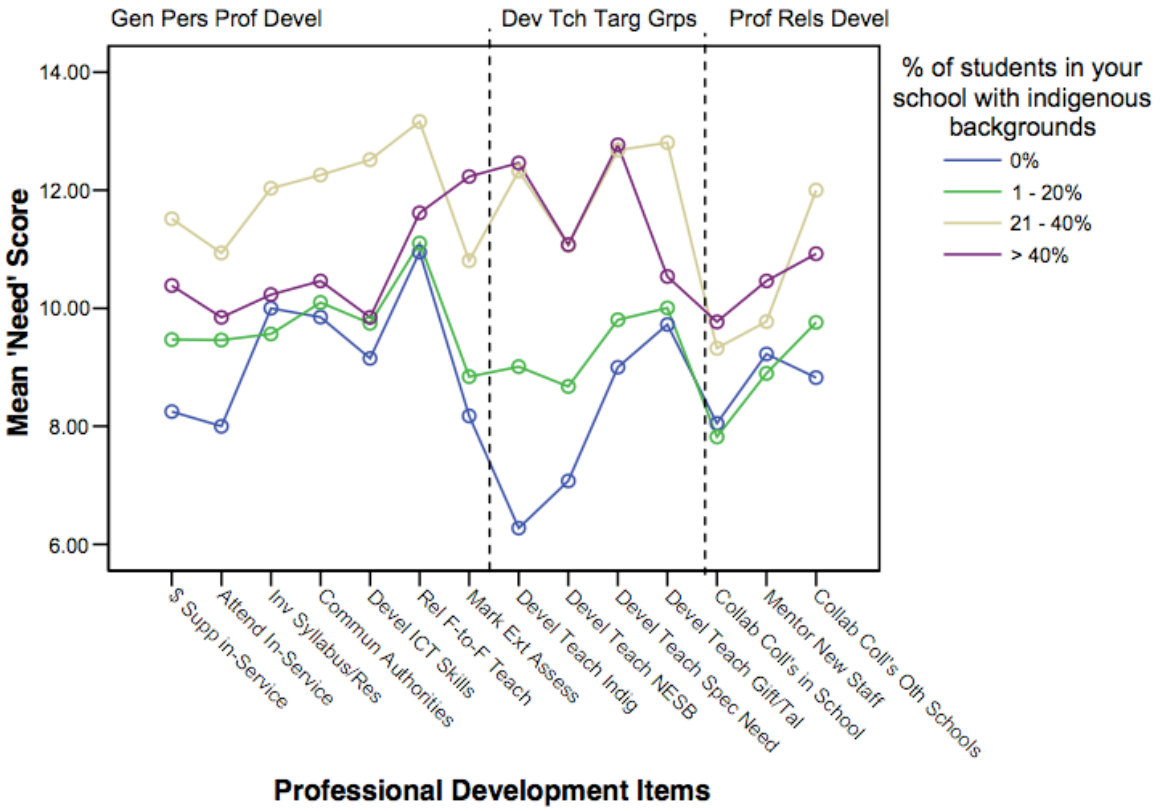

Figure 5.4. Profile plot of mean 'need' scores of science respondents for the Professional Interaction and Development components, compared by percentage of students from Indigenous backgrounds (Table 5.2 for item names in full)

5.3 PROFESSIONAL DEVELOPMENT NEEDS OF SECONDARY ICT TEACHERS

1. Overall ratings (see Table 5.3) strongly suggest that ICT teachers see the need for release from face-to-face teaching for collaborative activities as the highest professional development priority.
2. This finding is indicative of what appears to be a need for intensive on-the-job training. This conclusion is supported by ICT respondents' emphasis on the need for collaboration with ICT teachers in other schools, and for mentoring new staff. These priority areas are also consistent with what many respondents regarded as a relative lack of pre-service training in ICT.
3. The tendency for professional development needs to increase with distance from a metropolitan city was not significant for ICT teachers, indicating that distance may be less of an issue for these teachers than is the case with primary and science teachers.

Table 5.3. Overall average 'need' scores, standard deviations and valid N for ICT teachers' ratings of the Professional Interaction and Development items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

PROFESSIONAL DEVELOPMENT ITEMS	Mean	s.d.	Valid N
Release from face-to-face teaching for collaborative activities	**10.79**	4.00	225
Professional development opportunities: teach ICT to gift/talented students	**10.38**	4.34	214
Collaboration with ICT teachers in other schools	**10.34**	3.88	223
Opportunities for mentoring new staff	**10.22**	4.03	223
Professional development opportunities: teaching ICT to special needs students	**10.21**	4.40	214
Effective communication between education authorities & teachers	**10.17**	3.85	218
Involvement in region/state-wide syllabus development/research projects	**9.93**	3.88	218
Financial support to attend external in-services/conferences	**9.59**	4.01	221
Professional development opportunities teaching ICT to NESB students	**9.46**	4.38	205
Opportunities to attend external in-services/conferences related to teaching ICT	**9.43**	3.49	221
Professional development opportunities: teaching ICT to Indigenous students	**9.33**	4.58	211
Collaboration between ICT teachers in your school	**9.23**	3.79	222
Opportunities to mark/mod external ICT assessments	**9.17**	4.27	214

5.4 PROFESSIONAL DEVELOPMENT NEEDS OF SECONDARY MATHEMATICS TEACHERS

1. The findings presented in Table 5.4 strongly suggest that secondary mathematics teachers throughout Australia see a high need for professional development to help teach higher-order thinking skills, to improve classroom management and to develop alternative teaching methods.
2. There also appears to be a strong need for release from face-to-face teaching for unit programming, and for more effective communication with education authorities.
3. The evidence suggests that mathematics teachers see a substantial need for professional development opportunities to help them cater for student diversity in their classrooms.
4. While there was a pattern in 'need' ratings across MSGLC categories, the differences were not significant, suggesting that the professional development needs of mathematics teachers do not vary as much with location as do those of science and primary teachers.
5. The findings illustrated in Figure 5.5 strongly suggest that mathematics teachers in schools with substantial proportions of Indigenous students require more professional development in student management, alternative teaching methods and strategies to cater for student diversity than do those in schools with fewer Indigenous students.

Table 5.4. Overall average 'need' scores, standard deviations and valid N for mathematics respondents' ratings of the Professional Interaction and Development items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

PROFESSIONAL DEVELOPMENT ITEMS	Mean	s.d.	Valid N
Professional development opportunities: teaching of higher-order skills	**10.70**	3.91	492
Professional development opportunities: classroom management & organisation	**10.47**	4.04	496
Professional development opportunities: alternative teaching methods	**10.34**	3.98	494
Release from face-to-face teaching for collaborative activities	**10.33**	4.25	499
Effective communication between education authorities & teachers	**9.92**	3.72	492
Professional development opportunities: teach mathematics to gift/talented students	**9.89**	3.72	490
Professional development opportunities: integrating technology into math lessons	**9.89**	3.85	497
Professional development opportunities: teaching math to special needs students	**9.77**	3.96	493
Collaboration with mathematics teachers in other schools	**9.65**	3.61	501
Professional development opportunities: methods for using group teaching strategies	**9.60**	3.80	489
Opportunities for observing teaching techniques of colleagues	**9.49**	3.97	499
Workshops to develop your ICT skills	**9.47**	3.82	492
Involvement in region/state-wide syllabus development/research projects	**9.29**	3.90	493
Financial support to attend external in-services/conferences	**9.04**	4.00	498
Opportunities for mentoring new staff	**8.90**	3.68	501
Opportunities to attend external in-services/conferences related to T&L math	**8.76**	3.57	502
Professional development opportunities: use of graphics calculators	**8.75**	3.82	495
Professional development opportunities: outcomes/standards-based teaching	**8.72**	3.87	495
Opportunities to mark/mod external mathematics assessments	**8.62**	3.99	488
Professional development opportunities: teaching mathematics to Indigenous students	**8.40**	4.31	480
Professional development opportunities teaching mathematics to NESB students	**8.29**	3.99	459
Collaboration between mathematics teachers in your school	**7.86**	3.44	500

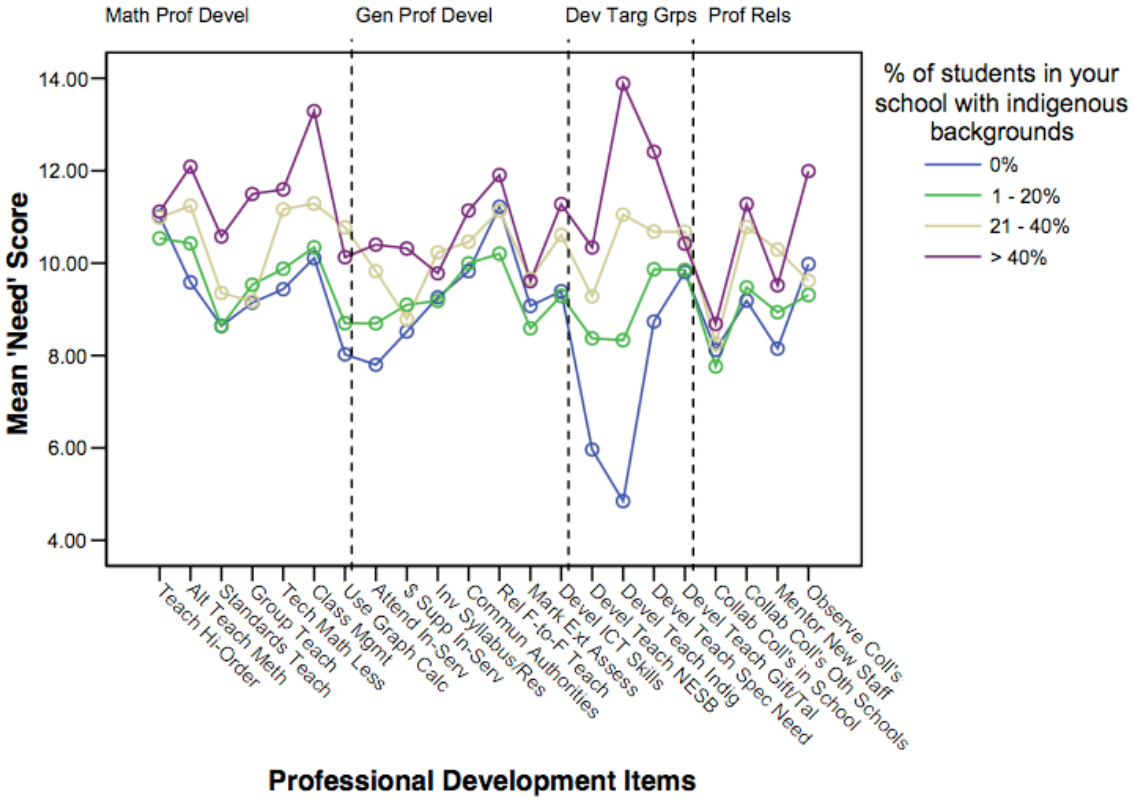

Figure 5.5. Profile plot of mean 'need' scores of mathematics respondents for the Professional Interaction and Development components, compared by percentage of students from Indigenous backgrounds (Table 5.4 for full item names)

5.5 DISCUSSION

Teachers' responses to the questions about their professional development needs were consistent with much of the literature in this area (Roberts, 2005; Vinson, 2002), but provided a greater level of detail on the specific professional development priorities of different types of teachers in different locations. All of the teacher groups indicated a substantial need for release from face-to-face teaching to attend in-services, and better lines of communication between themselves and education authorities. Professional development to help teachers cope with both special needs and gifted and talented students was also a common priority area.

There were a number of important differences in the professional development needs of different types of teachers. The most striking of these include the higher need for primary teachers to develop their ICT skills compared with secondary teachers, and the greater need among ICT teachers for collaboration and ongoing training. Mathematics teachers expressed a high need for professional development to help them teach higher-order thinking skills, and for classroom management strategies.

A general tendency for professional development needs to increase with geographic isolation was noticed among all four respondent groups, although this pattern was significant only among primary and science respondents. Primary teachers in Metropolitan Areas appear to have greater access to in-services to help them with science and mathematics teaching, while the greatest needs of primary teachers in Remote Areas appear to be for the mentoring of new staff, and for relief from face-to-face teaching to access professional development opportunities. The ability of the survey to distinguish between the professional development priorities of these teacher groups highlights its value in providing guidance to education authorities in formulating relevant policies.

There is evidence that the professional development needs of science teachers in metropolitan schools are better catered for than are those of science teachers in all other locations. This is particularly the case for access to in-services and opportunities to mark examinations or contribute to syllabus development. It is clear that such opportunities for teachers would have substantial benefits for their students. Moreover, non-metropolitan science teachers, and those in Remote Areas in particular, appear to be far less satisfied with the availability of professional development opportunities to help them cater for special needs and gifted and talented students. Judging by their comments, many teachers working outside cities find the centralisation of most professional development, with the attendant problems of cost, distance, time and teaching relief, to be the biggest obstacle to making the most of such opportunities.

Finally, the findings provide strong evidence that primary teachers and secondary science and mathematics teachers in schools with higher proportions of Indigenous students have a greater need for a range of professional development opportunities. This is most likely a function of low levels of pre-service preparation in teaching Indigenous students, the greater diversity of student backgrounds, and the aforementioned difficulties involved in accessing professional development in larger centres.

6. MATERIAL RESOURCE AND SUPPORT NEEDS OF TEACHERS

The surveys presented teachers with a set of items relating to material resources, such as textbooks, computers and laboratory equipment, along with support personnel for technical support or to help cater for student diversity. Teachers were asked to rate each item on two scales: the importance of this resource for their current teaching situation, and the availability of this resource at their school. The two ratings for each item were combined to produce a single 'need' rating.

6.1 MATERIAL RESOURCE AND SUPPORT NEEDS OF PRIMARY TEACHERS

1. The overall findings summarised in Table 6.1 highlight the priority primary teachers give to adequate ICT resourcing and support. In particular, there appears to be a clear need for additional skilled personnel not only to maintain ICT equipment, but also to help primary teachers incorporate ICT into their teaching.
2. Table 6.1 indicates that the highest non-ICT need among primary teachers is for learning support assistants. In general, the needs of primary teachers appear to be for support personnel rather than material resources such as books, worksheets or AV equipment.
3. The evidence illustrated in Figure 6.1 indicates that primary teachers' needs in many areas increase with the proportion of Indigenous students in their schools. For the most part, these needs relate to resources and support to cater for student diversity in their classrooms – not only for Indigeneity, but also for special needs and gifted and talented students. This is an important finding, as teachers' 'need' ratings did not vary significantly with MSGLC category of school.

Table 6.1. Overall average 'need' scores, standard deviations and valid N for primary respondents' for Material Resources and Support Personnel items (in descending order of mean 'need' score) [Scores can range from 1 to 20]

RESOURCE ITEMS	Mean	s.d.	Valid N
Suitably skilled personnel to assist in integrating ICT in your classroom	**10.23**	4.12	1506
Suitably skilled ICT support staff	**10.07**	4.04	1498
Appropriate numbers of computers for student use	**9.39**	4.01	1505
Suitable software for teaching & learning science & mathematics	**9.17**	3.65	1499
Suitable learning support assistant(s)	**9.08**	3.72	1500
Effective maintenance & repair of teaching equipment	**8.99**	3.42	1486
Computer hardware for your teaching & learning situation	**8.95**	3.76	1513
Adequate consumables for teaching science	**8.72**	3.34	1469
A fast, reliable internet connection	**8.61**	3.55	1517
Suitable equipment for teaching science	**8.55**	3.23	1493
Science & mathematics resources that address the needs of special needs students	**8.51**	3.58	1456
Suitable Indigenous Education Assistants	**8.44**	4.26	1387
Science & mathematics resources that address the needs of gifted & talented students	**8.43**	3.41	1459
Suitable computer resources for teachers use	**8.33**	3.34	1504
Access to a wide range of internet resources	**8.17**	3.22	1515
Adequate consumables for teaching mathematics	**8.00**	2.87	1442
Suitable library resources for teaching & learning science	**7.93**	2.79	1492
Science & mathematics resources that address the needs of Indigenous students	**7.91**	4.01	1389
Science & mathematics resources that address the needs of NESB students	**7.86**	4.04	1340
Suitable equipment for teaching mathematics	**7.76**	2.67	1486
Suitable library resources for teaching & learning mathematics	**7.50**	2.68	1476
Suitable AV equipment	**7.39**	3.03	1467
Worksheets for teaching science	**6.04**	2.81	1471
Worksheets for teaching mathematics	**5.66**	2.58	1461

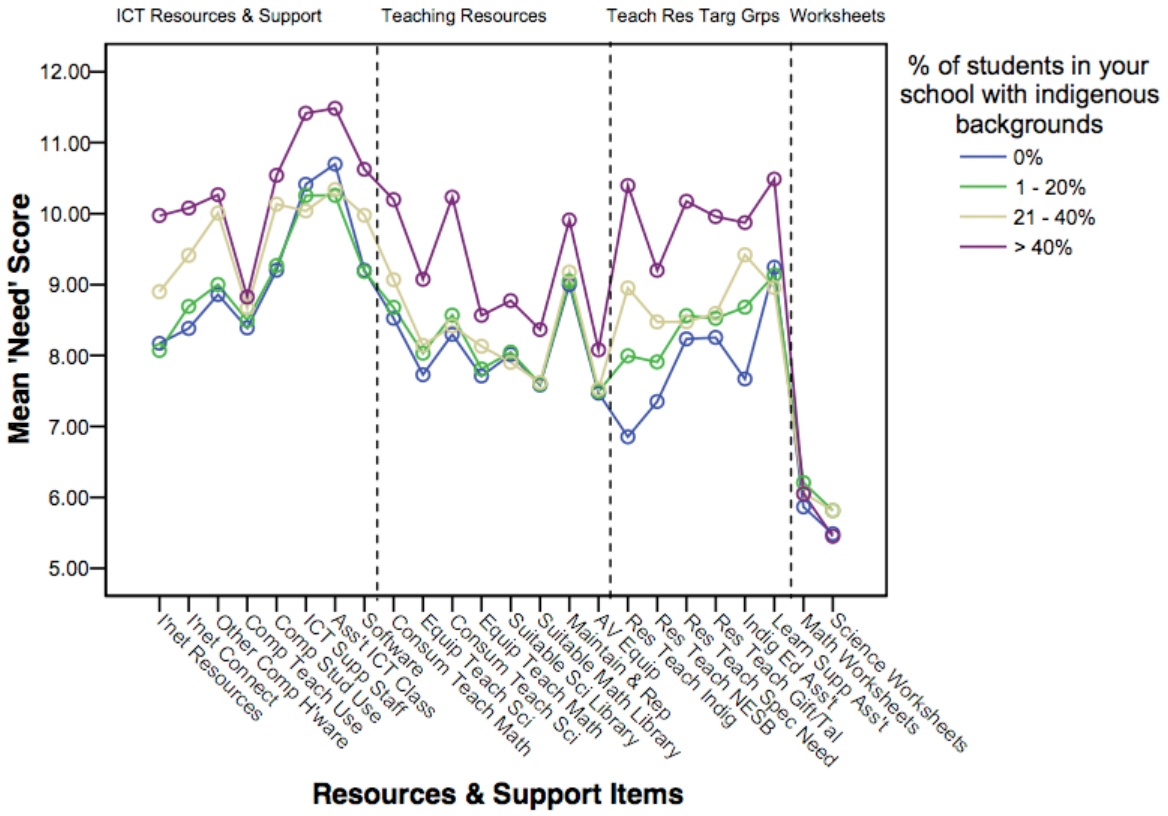

Figure 6.1. Profile plot of mean 'need' scores of primary respondents for the Material Resources and Support Personnel components[9], compared by percentage of students from Indigenous backgrounds (Table 6.1 for item names in full)

6.2 MATERIAL RESOURCE AND SUPPORT NEEDS OF SECONDARY SCIENCE TEACHERS

1. The overall mean ratings shown in Table 6.2 indicate that science teachers generally see ICT infrastructure and support as the highest priority areas for resourcing.
2. On the basis of results illustrated in Figure 6.2, it appears that science teachers in non-metropolitan schools have a higher need for a range of resources and assistance than their metropolitan colleagues. This is particularly the case for ICT support and maintenance, learning support, and resources to cater for student diversity.
3. Figure 6.2 shows an interesting contrast in the ICT needs of Remote Area science teachers. While their expressed need for computers for student use was lower than that of teachers in other areas, their need for ICT support staff was considerably higher. The comments of Remote Area science teachers suggest that this may be because remote schools have adequate hardware, but lack access to technical support to properly maintain and utilise it.
4. Science teachers in schools with relatively high proportions of Indigenous students appear to have a substantially higher level of need for most resources and support. However, Figure 6.3 suggests this need is not always highest among teachers in schools with the highest proportions of Indigenous students. For many items, teachers in schools with 21-40% Indigenous students indicated a higher need than did those with >40% Indigenous students. One possible explanation is that schools with the highest populations of such students qualify for extra support and/or funding. Further research is needed to investigate this finding.

[9] The principal components analysis of 'need' items produced four substantial components: ICT Resources, Teaching Resources for Targeted Groups, General Teaching Resources, and General Teaching Support.

Table 6.2. Overall average 'need' scores, standard deviations and valid N for science respondents' ratings of the Material Resources and Support Personnel items (items listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

SCIENCE RESOURCE AND SUPPORT PERSONNEL ITEMS	Mean	s.d.	Valid N
Appropriate numbers of computers for student use	**10.11**	3.83	552
Suitably skilled personnel to assist in integrating ICT in your classroom	**9.80**	4.07	549
Suitable software for teaching & learning science	**9.73**	3.77	542
Suitable learning support assistant(s)	**9.65**	3.60	538
Other computer hardware for teaching & learning science	**9.56**	3.63	542
Suitably skilled ICT support staff	**8.99**	3.76	542
Effective maintenance & repair of teaching equipment	**8.88**	3.60	544
Classroom resources suitable for teaching science to gifted & talented students	**8.85**	3.54	531
Classroom resources suitable for teaching science to special needs students	**8.85**	3.76	520
A fast, reliable internet connection	**8.81**	3.70	551
Suitable computer resources for teachers use	**8.62**	3.71	554
Suitable Indigenous Education Assistants	**8.54**	4.38	518
Access to a wide range of internet science resources	**8.42**	3.49	546
Well-equipped science laboratories	**8.24**	3.10	552
Classroom resources suitable for teaching science to Indigenous students	**8.15**	4.05	519
Classroom resources suitable for teaching science to NESB students	**7.87**	3.89	489
Suitable laboratory assistant(s)	**7.74**	3.70	545
Suitable library resources (e.g., magazines, books) for teaching & learning science	**7.73**	3.24	547
Sufficient laboratory consumables	**7.70**	2.87	548
Suitable AV equipment	**7.33**	2.91	546
Class sets of suitable texts	**6.69**	3.32	543
Worksheets for classroom teaching	**6.01**	2.90	544

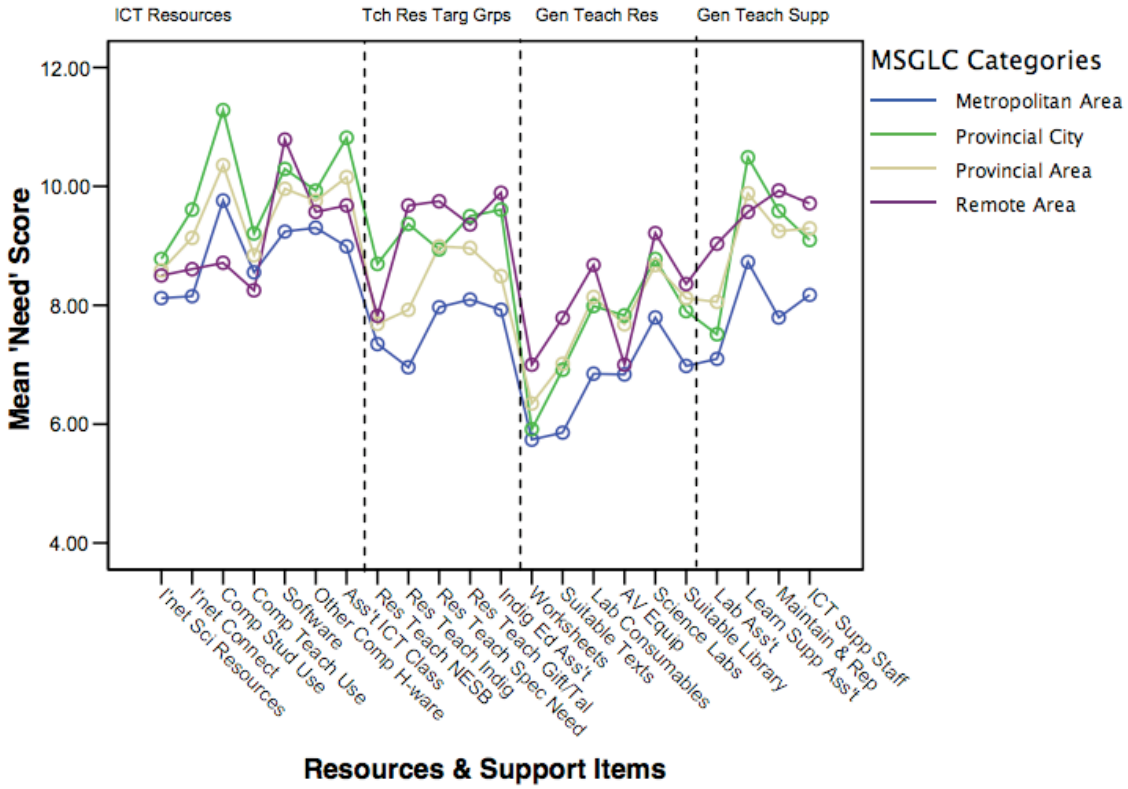

Figure 6.2. Profile plot of mean 'need' scores of science respondents for the Material Resources and Support Personnel components, compared by MSGLC categories (see Table 6.2 for item names in full)

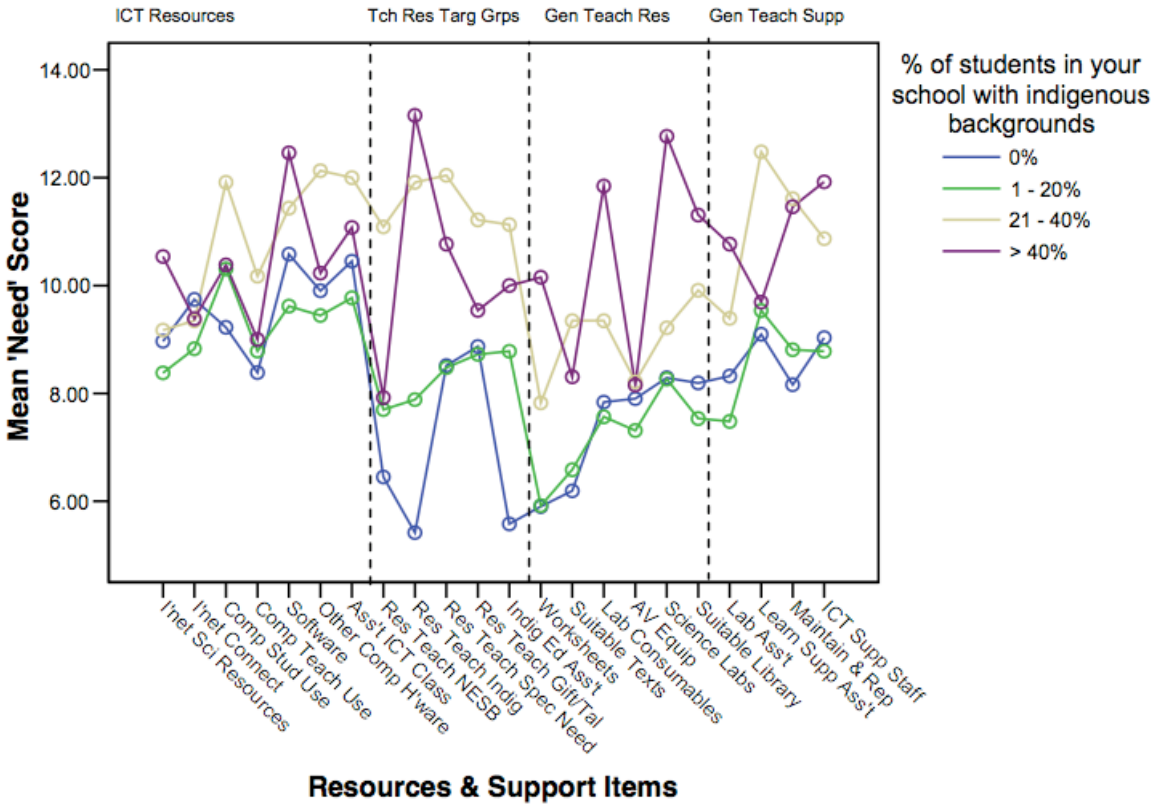

Figure 6.3. Profile plot of mean 'need' scores of science respondents for the Material Resources and Support Personnel components, compared by percentage of students from Indigenous backgrounds (see Table 6.2 for item names in full)

6.3 MATERIAL RESOURCE AND SUPPORT NEEDS OF SECONDARY ICT TEACHERS

1. The mean ratings shown in Table 6.3 suggest strongly that ICT teachers in general are most in need of support personnel to help them manage ICT resources and assist teachers and other staff to use these resources effectively. This finding supports the priorities given to greater ICT support by other teacher groups.
2. ICT teachers also expressed a high need for learning support assistants.
3. The geographic variation shown in Figure 6.4 suggests that ICT teachers in non-metropolitan schools have a higher need for a range of resources and support, particularly for addressing student diversity and managing ICT resources. ICT teachers in Remote Area schools have a considerably higher need for basic teaching resources, such as worksheets, texts and library books.
4. ICT respondents were asked about the time allocated and required for supportive non-teaching tasks. Figure 6.5 indicates that they spent considerably more time managing and maintaining ICT resources, and assisting other staff to use ICT than they were allocated. This increasing demand on their time appears to be the greatest area of concern for many ICT teachers.

Table 6.3. Overall average 'need' scores, standard deviations and valid N for ICT respondents' ratings of the Material Resources and Support Personnel items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

ICT RESOURCES AND SUPPORT ITEMS	Mean	s.d.	Valid N
Suitably skilled personnel to assist in integrating ICT in your classroom	**10.14**	4.00	223
Skilled ICT resource management personnel	**9.71**	4.16	217
Suitable learning support assistant(s)	**9.65**	3.77	220
Up-to-date ICT resources for teacher use	**9.43**	3.49	224
Effective maintenance & repair of teaching equipment	**9.32**	3.16	223
ICT resources that address the needs of gifted/talented students	**9.18**	3.95	211
Appropriate number of computers for student use	**9.08**	3.390	225
Suitable Indigenous Education assistant(s)	**8.90**	4.30	210
ICT resources that address the needs of special needs students	**8.87**	3.89	213
Well-equipped learning spaces for teaching ICT	**8.78**	3.31	223
ICT resources that address the needs of NESB students	**8.59**	3.90	198
Suitable AV equipment	**8.55**	3.34	224
Other computer hardware for teaching & learning ICT	**8.48**	3.13	224
Suitable software for teaching & learning ICT	**8.44**	3.03	224
Fast, reliable internet connection	**8.23**	3.65	224
ICT resources that address the needs of Indigenous students	**8.08**	3.91	209
Class sets of suitable texts	**7.60**	3.62	216
Suitable library resources for teaching & learning ICT	**7.58**	3.26	217
Worksheets for classroom teaching	**7.03**	3.01	214

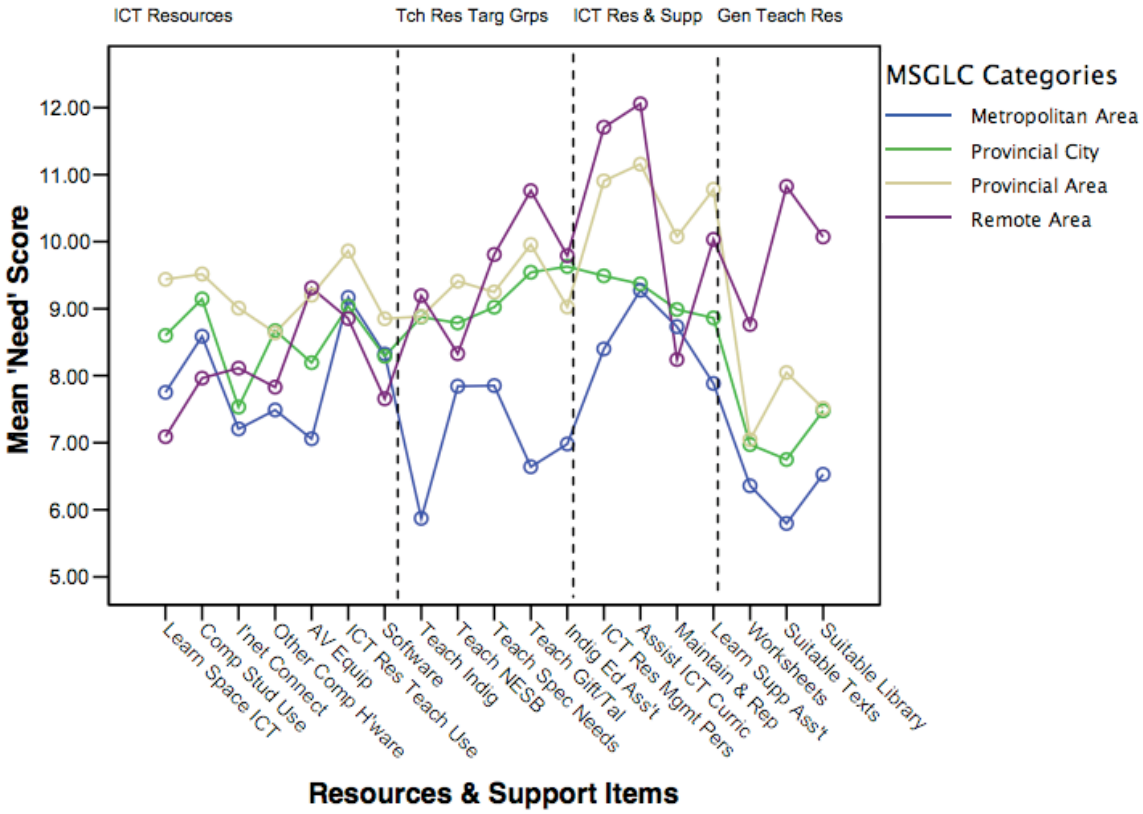

Figure 6.4. Profile plot of mean 'need' scores of ICT respondents for the Material Resources and Support Personnel components, compared by MSGLC categories (see Table 6.3 for item names in full)

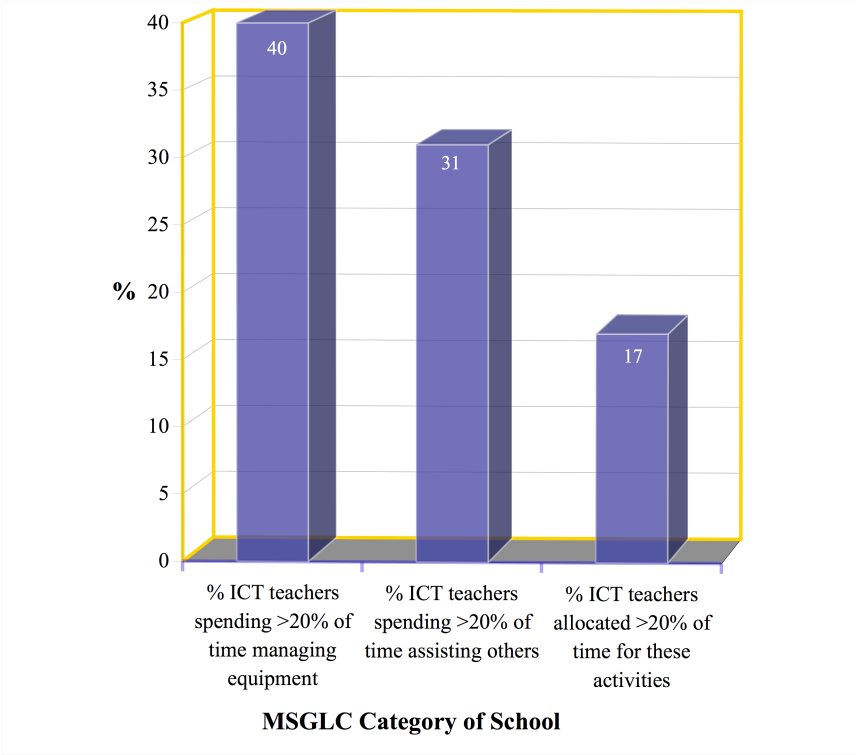

Figure 6.5. Percentages of ICT respondents reporting that >20% of their time is spent managing equipment and assisting others

6.4 MATERIAL RESOURCE AND SUPPORT NEEDS OF SECONDARY MATHEMATICS TEACHERS

1. The mean ratings shown in Table 6.4 indicate that mathematics respondents overall considered ICT equipment and technical support to be their greatest area of resourcing need. Like primary and science teachers, mathematics teachers felt that sufficient computers for student use should be a priority area.
2. Mathematics teachers also see a substantial need for learning support assistants. Table 6.4 shows a substantial need for resources to cater for the diversity of student abilities in mathematics.
3. In general, schools with moderate to high proportions of Indigenous students appear to be in greater need of most resources. However, Figure 6.6 indicates that the variation in needs across schools with different proportions of Indigenous students illustrates that the greatest needs are not always with schools with the highest Indigenous populations. For many material and personnel resources, teachers in schools with between 21% and 40% Indigenous students expressed a higher need than did those with higher populations.

Table 6.4. Overall average 'need' scores, standard deviations and valid N for mathematics respondents' ratings of the Material Resources and Support Personnel items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

MATHEMATICS RESOURCE AND SUPPORT ITEMS	Mean	s.d.	Valid N
Suitably skilled personnel to assist in integrating ICT in your classroom	**9.72**	4.34	517
Appropriate number of computers for student use	**9.44**	3.69	520
Suitable learning support assistant(s)	**9.24**	3.61	523
Other computer hardware for teaching & learning mathematics	**9.06**	3.76	512
Suitable software for teaching & learning mathematics	**8.91**	3.69	520
Suitably skilled ICT support staff	**8.87**	3.75	518
Mathematical resources that address the needs of gifted/talented students	**8.59**	3.48	511
Suitable computer resources for teacher use	**8.58**	3.63	523
Mathematical resources that address the needs of special needs students	**8.57**	3.72	514
Suitable Indigenous Education assistant(s)	**8.21**	4.05	501
Effective maintenance & repair of teaching equipment	**8.07**	3.21	515
Sufficient mathematics equipment & materials	**8.02**	3.03	525
Fast, reliable internet connection	**7.98**	3.68	523
Mathematical resources that address the needs of Indigenous students	**7.91**	4.24	488
Concrete materials for mathematics teaching	**7.85**	3.11	524
Mathematical resources that address the needs of NESB students	**7.80**	4.05	462
Access range of internet mathematics resources	**7.78**	3.45	517
Student access to scientific calculators	**7.55**	3.30	520
Student access to graphics calculators for in class	**6.84**	3.41	519
Class sets of suitable texts	**6.50**	3.22	518
Suitable library resources for teaching & learning mathematics	**6.46**	2.97	515
Suitable AV equipment	**6.39**	3.24	520
Worksheets for classroom teaching	**6.14**	2.77	526

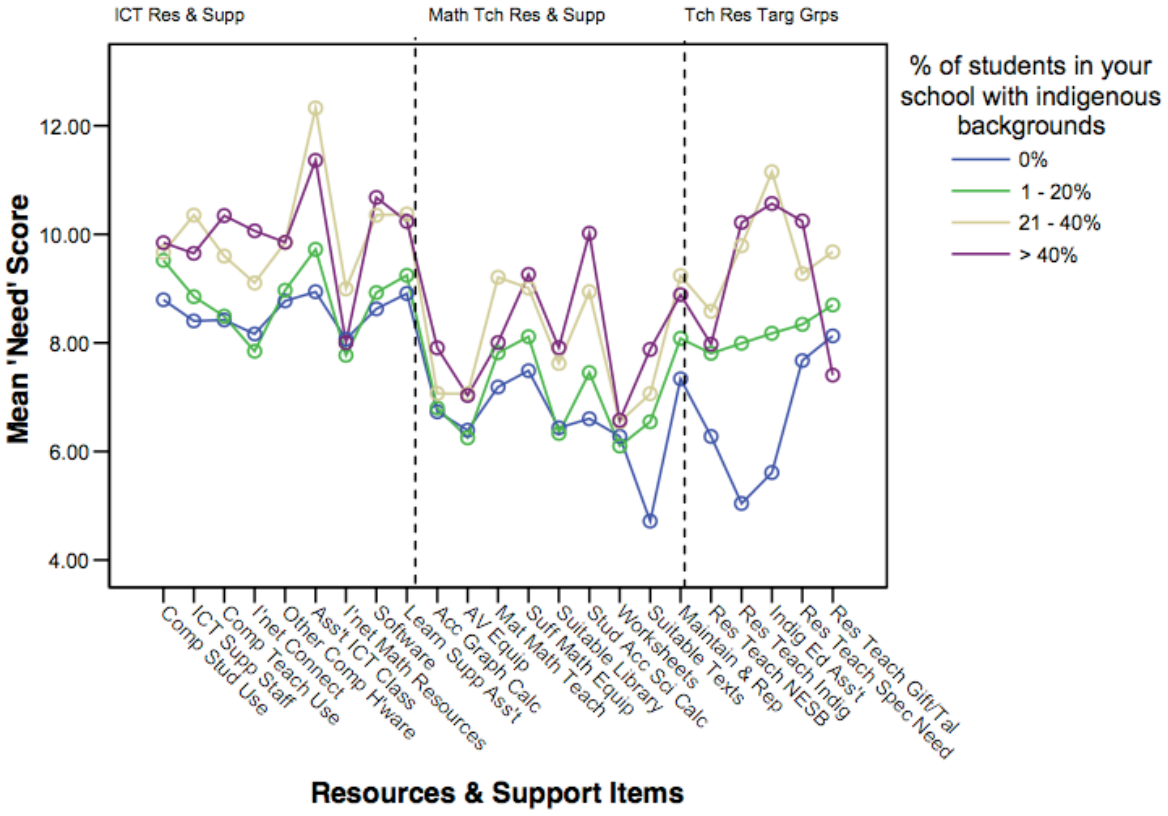

Figure 6.6. Profile plot of mean 'need' scores of mathematics teachers for the Material Resources and Support Personnel components[10], compared by percentage of students from Indigenous backgrounds (see Table 6.4 for item names in full)

[10] A principal components analysis of the 'need' items showed three substantive components: Alternative and Extension Activities for Targeted Groups, External Competitions and Activities for Students, and Time Allocated to Teach Syllabus Requirements.

6.5 DISCUSSION

Teachers' responses to the questions about material resource and support needs revealed many commonalities and several interesting differences. The most obvious commonality was the high priority teachers placed on ICT resources and assistance. It is significant that the first or second priority of every teacher group was for more ICT support personnel to help integrate ICT into their teaching. The need for additional assistance in maintaining and managing ICT resources also appears to be very high. These findings were consistent with the high demand on ICT teachers to fill these roles additional to their teaching loads.

The results indicate that a third priority of primary, science and mathematics teachers is for sufficient computers for student use. It was noted that all teacher groups indicated a substantially higher need for computers for their students than for themselves. This suggests that most schools are catering reasonably well for their staff in terms of hardware and software for lesson preparation and administration, but are challenged by the evolution of computers into an increasingly mainstream learning medium.

The high need for learning support personnel was also apparent among all teacher groups. In addition, the relatively high priority teachers gave to resources for special needs, gifted and talented, and in some schools, Indigenous students, indicates that teachers require more support in catering for the diversity of needs among their students.

Conventional resources such as textbooks, worksheets and science equipment (for secondary science teachers) generally rated lower than most other nominated items. However, this should not necessarily be construed as indicating that teachers no longer see these resources as important. Need scores were generated from teachers' ratings of both the importance and availability of resources for their teaching situation. A lower rating may therefore indicate that a resource is relatively important, but readily available.

The findings indicate that science and ICT teachers in non-metropolitan areas have a greater unmet need for resources and support personnel in comparison to their metropolitan peers. The geographical trend is most apparent among science teachers, with those in non-metropolitan schools reporting a greater unmet need for a broad range of resources. Considering the importance of equipment and practical work in science, it is reasonable to argue that students in Metropolitan schools have an advantage over those in Provincial and Remote schools.

The geographical trend in resourcing for ICT teachers is less extensive, but indicative of inequities in the area of resources and support to cater for student diversity and general teaching resources. Hardware and connectivity needs in general appear to vary little with geographic location but the necessary support to manage these resources varies considerably, with the needs of Provincial and Remote schools for this support often unmet.

There is strong evidence that teachers in schools with relatively high proportions of Indigenous students feel less well resourced than those in other schools. Primary school teachers in schools where Indigenous students make up more than 40% of the student population appear in greatest need. While relatively well resourced in terms of worksheets, computers and audio visual equipment, teachers in these schools have a greater need for resources to address student diversity, equipment to help them teach science and mathematics, and support personnel to help them get the most out of the ICT equipment they have. Science and mathematics teachers in schools with relatively high Indigenous populations also appear in need of better support and resourcing. The higher needs for resources to cater for special needs and gifted and talented students is perhaps indicative of the range of student abilities in these schools.

7. STUDENT LEARNING OPPORTUNITIES AND EXPERIENCES

The surveys presented teachers with a set of items relating to educational experiences and opportunities such as extension activities, excursions, alternate activities for targeted groups, and a broad range of academic courses. Teachers were asked to rate each item on two scales: the importance of this experience/opportunity for their students' learning, and the availability of this experience/opportunity at their school. The two ratings for each item were combined to produce a single 'need' rating.

7.1 PRIMARY TEACHERS' VIEWS ON STUDENT LEARNING NEEDS

1. The mean ratings in Table 7.1 indicate that primary respondents overall saw a significant need for their students to have more opportunities to visit science or mathematics-related educational sites. The teachers felt they needed more time to fulfil mathematics and science syllabus requirements, and required a wider range of activities to better cater for the diversity of students in their classes.
2. Figure 7.1 shows that Primary respondents in non-metropolitan schools, and Remote schools in particular, saw a substantially greater unmet need for their students to have access to such learning opportunities than did those in Metropolitan schools.
3. The findings suggest that primary teachers generally consider students to have sufficient opportunities to participate in externally organised competitions and activities. However, it seems that primary teachers in Remote Areas see a greater need for more such opportunities than do those in other locations.
4. The results shown in Figure 7.2 suggest that teachers in schools with relatively high proportions of Indigenous students saw a substantially greater need for a range of learning experiences for their students than did those in schools with fewer Indigenous students. These experiences include alternative and extension activities to cater for the diversity of students and ability levels in their classes, and for opportunities to visit science and mathematics-related educational sites.

Table 7.1. Overall average 'need' scores, standard deviations and valid N for primary respondents' ratings of the Student Learning Experience items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

PRIMARY STUDENT LEARNING NEEDS ITEMS	Mean	s.d.	Valid N
Opportunities for students to visit science or mathematics related educational sites	**9.84**	3.62	1485
Adequate time allocation for teaching to fulfil the syllabus requirements for science	**9.28**	3.89	1475
Alternative or extension activities in science or mathematics teaching programs for gifted & talented students	**8.93**	3.43	1425
Alternative or extension activities in science or mathematics teaching programs for special needs students	**8.89**	3.53	1413
Adequate time allocation for teaching to fulfil the syllabus requirements for mathematics	**8.76**	3.88	1470
Alternative or extension activities in science or mathematics teaching programs for Indigenous students	**8.48**	3.83	1351
Alternative or extension activities in science or mathematics teaching programs for NESB students	**8.39**	3.87	1316
Student participation in external ICT competitions and activities	**7.07**	3.16	1439
Student participation in external science competitions and activities	**6.67**	2.89	1467
Student participation in external mathematics competitions and activities	**6.60**	2.86	1454

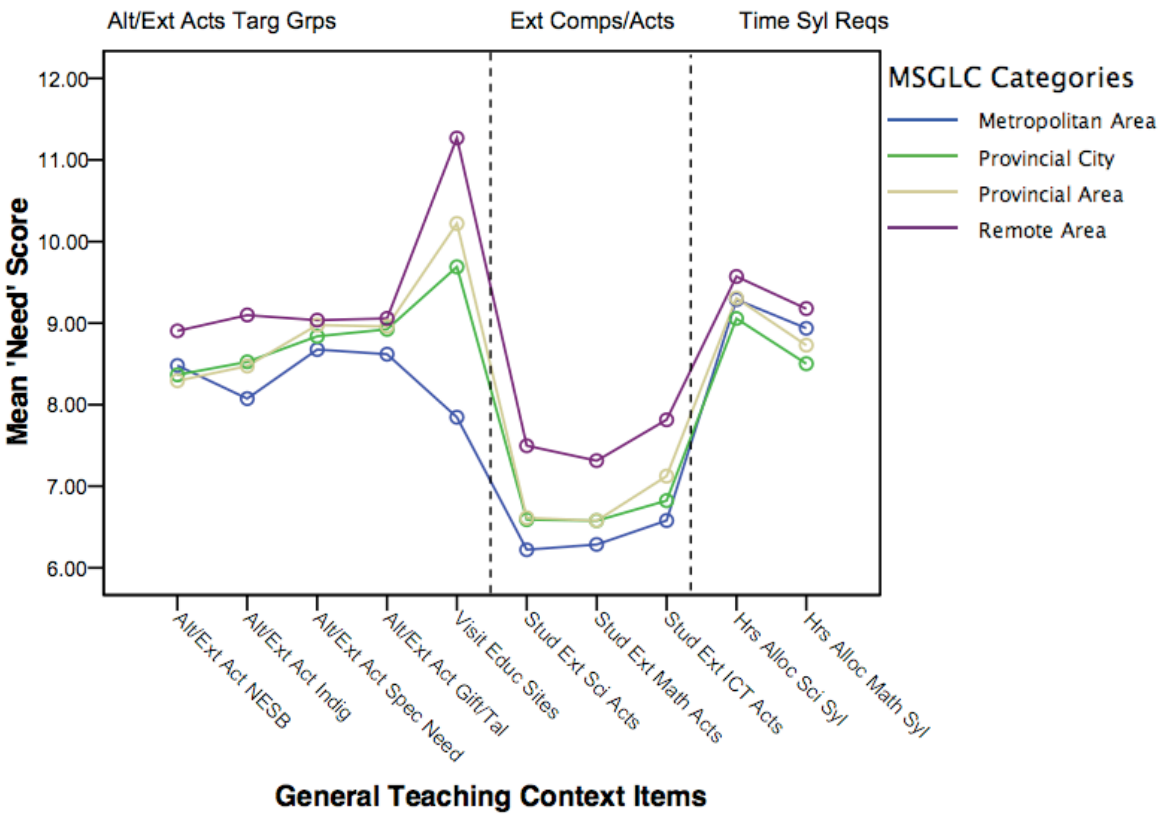

Figure 7.1. Profile plot of mean 'need' scores of primary respondents for the Student Learning Experience components, compared by MSGLC categories (Table 7.1 for item names in full)

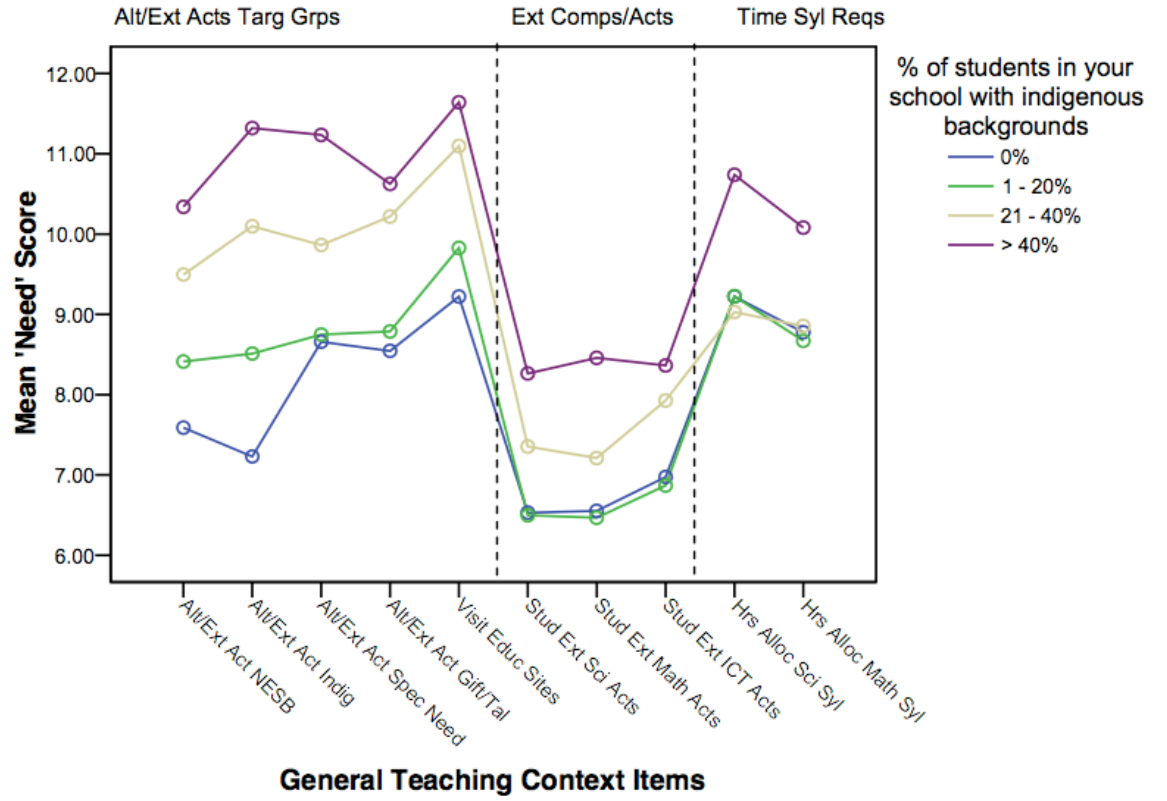

Figure 7.2. Profile plot of mean 'need' scores of primary respondents for the Student Learning Experience components, compared by percentage of students from Indigenous backgrounds (Table 7.1 for item names in full)

7.2 SECONDARY SCIENCE TEACHERS' VIEWS ON STUDENT LEARNING NEEDS

1. The mean ratings in Table 7.2 indicate that science respondents saw visits by their students to science related sites as the highest priority in this area, followed by a greater range of activities catering for individual differences.
2. Figure 7.3 suggests that science teachers in non-metropolitan schools saw a significantly greater need than did Metropolitan teachers for their students to visit science-related educational sites. The level of unmet need increased with degree of isolation.
3. The findings suggest that science teachers in general, and those in Metropolitan Areas in particular, consider students to have sufficient opportunities to participate in externally organised competitions and activities.

Table 7.2. Overall average 'need' scores, standard deviations and valid N for science respondents' ratings of the Student Learning Experience items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

STUDENT LEARNING NEEDS ITEMS - SCIENCE	Mean	s.d.	Valid N
Opportunities for students to visit science related educational sites	**10.14**	3.62	545
Alternative or extension activities in science teaching programs for gifted & talented students	**9.69**	3.88	523
Alternative or extension activities in science teaching programs for special needs students	**9.38**	3.98	511
Alternative or extension activities in science teaching programs for NESB students	**8.79**	4.30	496
Alternative or extension activities in science teaching programs for Indigenous students	**8.78**	4.32	513
Having the total indicative hours allocated to face-to-face teaching	**8.48**	3.65	513
Having the full range of senior science courses available in your school	**8.08**	3.53	535
Teachers qualified to teach the science courses offered in your school	**8.03**	2.78	544
Student participation in external science competitions and activities	**6.77**	2.73	543

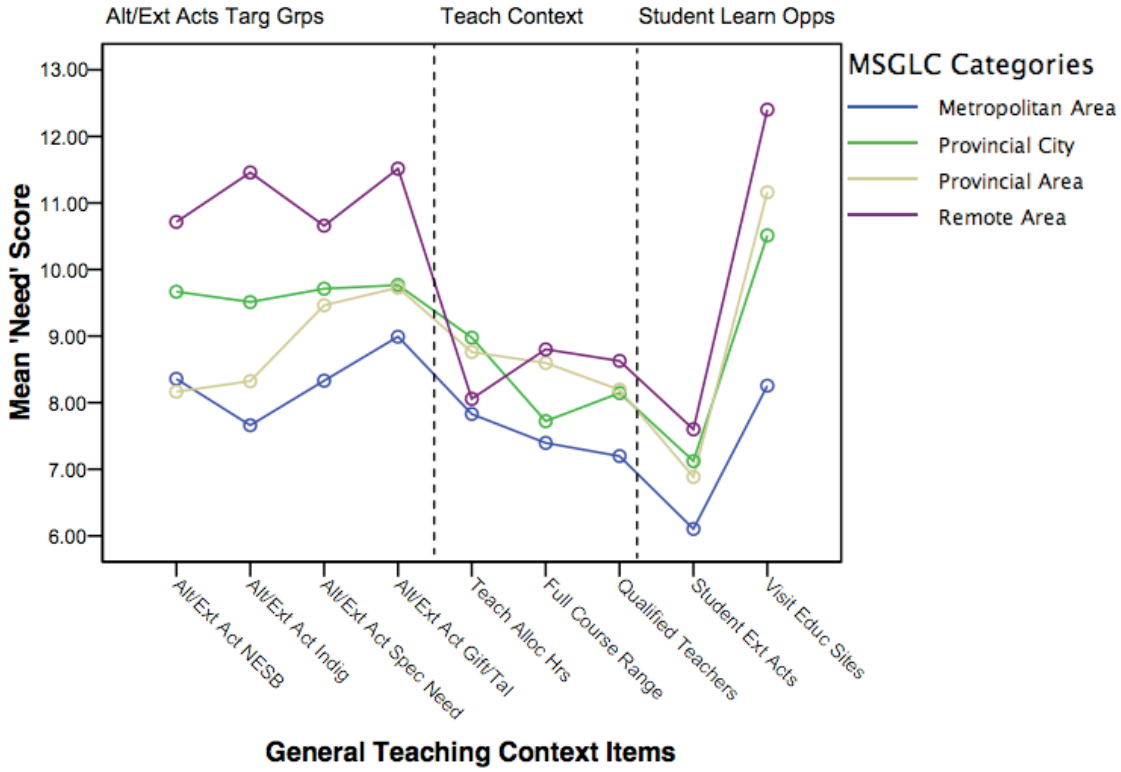

Figure 7.3. Profile plot of mean 'need' scores of science respondents for the Student Learning Experiences components, compared by MSGLC categories (Table 7.2 for item names in full)

4. There appears to be a considerable disparity across locations in teachers' perceptions of the need for alternative or extension science activities to cater for student diversity. The evidence indicates that teachers in remote areas see a greater need for such activities than do teachers elsewhere, though in terms of experiences of benefit to NESB and Indigenous students, science teachers in Provincial Cities also see a greater need than do those in Provincial or Metropolitan Areas.
5. Figure 7.4 shows that science respondents in schools with relatively high proportions of Indigenous students saw a substantially greater need for a range of learning experiences for their students than did those in schools with fewer Indigenous students. These experiences include alternative and extension activities to cater for the diversity of students and ability levels in their classes and for opportunities to visit science and mathematics-related educational sites.
6. Figure 7.4 also suggests that the greatest need for these experiences is found in schools where Indigenous students make up between 21 and 40% of the student population. Science teachers at these schools seem to feel there is a greater need for qualified teachers, a broader range of science courses, and learning experiences for gifted and talented and special needs students, than do those in schools with higher or lower proportions of Indigenous students.

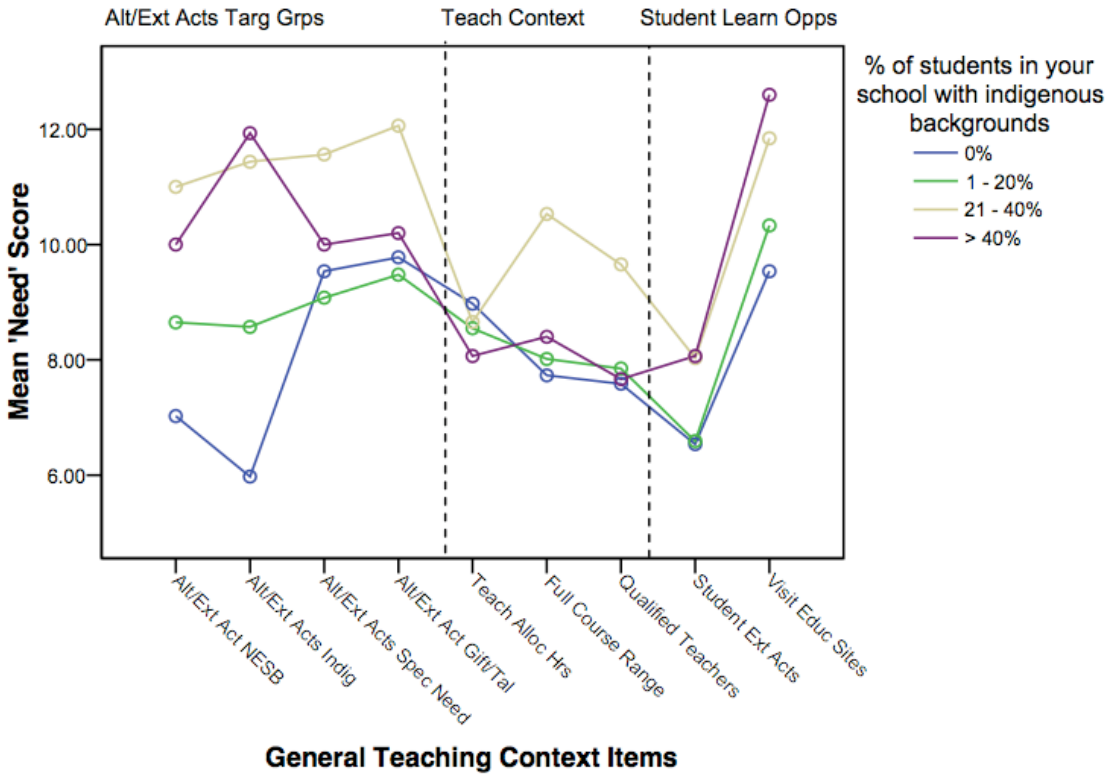

Figure 7.4. Profile plot of mean 'need' scores of science respondents for the Student Learning Experiences components, compared by percentage of students from Indigenous backgrounds (Table 7.2 for item names in full)

7.3 SECONDARY ICT TEACHERS' VIEWS ON STUDENT LEARNING NEEDS

1. The mean ratings in Table 7.3 indicate that ICT respondents saw a substantial need for their students to have the more opportunities to visit ICT-related sites. This need was very high in Remote schools, though ICT teachers in Provincial schools also perceived a relatively high need for these experiences compared to those in Metropolitan schools.

Table 7.3. Overall average 'need' scores, standard deviations and valid N for ICT respondents' ratings of the Student Learning Experience items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

STUDENT LEARNING NEEDS ITEMS - ICT	Mean	s.d.	Valid N
Opportunities for students to visit ICT related educational sites	**9.81**	3.53	219
Teachers qualified to teach the ICT courses offered in your school	**9.47**	3.52	223
Alternative/extension activities in ICT teaching programs for gifted & talented students	**9.21**	3.91	213
Having the full range of senior ICT courses available in your school	**9.04**	3.58	218
Alternative/extension activities in ICT teaching programs for special needs students	**8.99**	3.72	209
Alternative/extension activities in ICT teaching programs for NESB students	**8.92**	3.85	206
Alternative/extension activities in ICT teaching programs for Indigenous students	**8.67**	4.07	206
Having the total indicative hours allocated to face-to-face teaching	**8.19**	3.24	203
Student participation in external ICT competitions and activities	**7.29**	2.72	222

2. Table 7.3 also indicates that ICT teachers saw a substantially higher need than science and mathematics teachers for qualified teachers in their subject area. The level of this need varied little with MSGLC category of school, as shown in Figure 7.5. This is consistent with the earlier findings that ICT teachers are less formally qualified in their areas than are other subject teachers, and feel a greater need for ongoing professional development and collaboration.
3. ICT teachers also appear to require more alternative or extension activities for gifted and talented students. Respondents felt there was a moderate to low need for their students to participate in more external competitions and activities.
4. While the geographic differences in general were suggestive rather than significant, the findings clearly show that Metropolitan ICT respondents perceived a markedly lower need for a range of student experiences than did teachers in other locations.

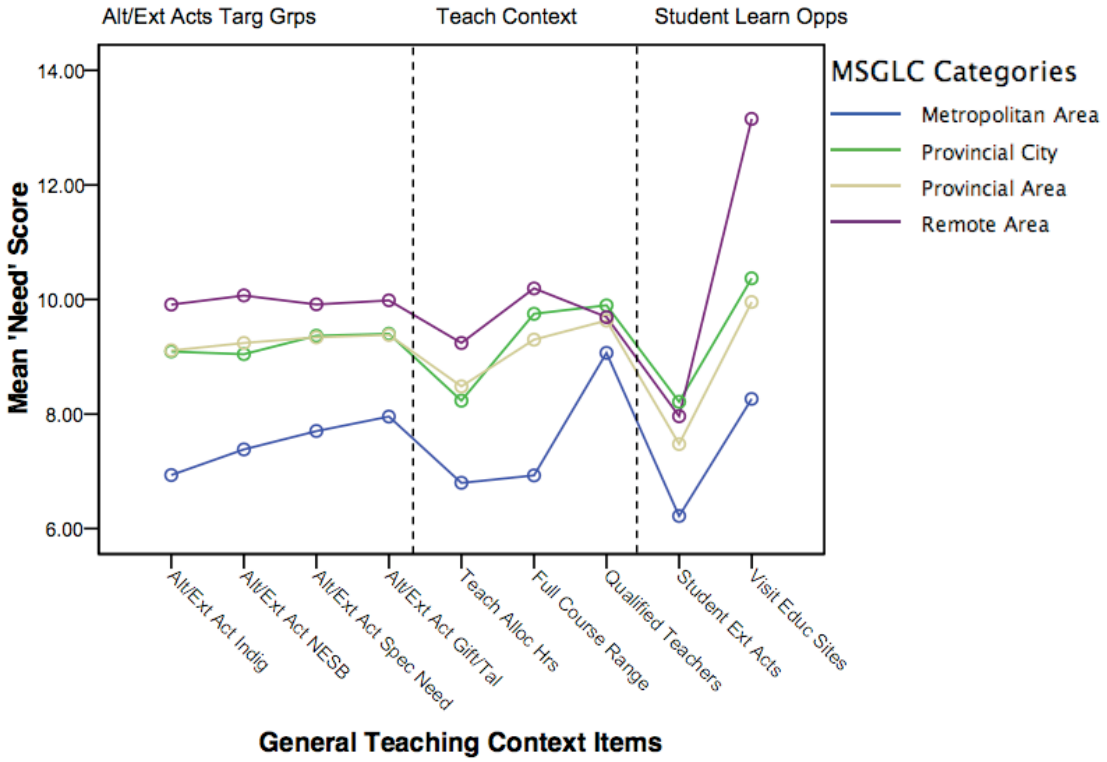

Figure 7.5. Profile plot of mean 'need' scores of ICT respondents for the Student Learning Experience components, compared by MSGLC categories (Table 7.3 for item names in full)

7.4 SECONDARY MATHEMATICS TEACHERS' VIEWS ON LEARNING NEEDS

1. The mean ratings in Table 7.4 indicate that mathematics teachers saw a need for their students to have more opportunities to visit mathematics-related educational sites, though the overall need rating was not as high as for science respondents. Respondents also saw a need for alternative/extension activities for gifted and talented and special needs students. They felt there was a moderate-to-low need for their students to participate in more external mathematics competitions and activities
2. Figure 7.6 shows that the greatest level of 'need' in the Teaching Context component was expressed by respondents from schools having a percentage of Indigenous students between 21% and 40% and the lowest level of 'need' in each case was expressed by respondents from schools with no Indigenous students.

Table 7.4. Overall average 'need' scores, standard deviations and valid N for mathematics respondents' ratings of the Student Learning Experience items (items are listed in descending order of mean 'need' score) [Scores can range from 1 to 20]

STUDENT LEARNING NEED ITEMS	Mean	s.d.	Valid N
Opportunities for students to visit mathematics related educational sites	**9.36**	3.70	505
Alternative/extension activities in mathematics teaching programs for gifted & talented students	**9.22**	3.58	500
Alternative/extension activities in mathematics teaching programs for special needs students	**8.86**	3.64	496
Alternative/extension activities in mathematics teaching programs for Indigenous students	**8.47**	4.16	474
Alternative/extension activities in mathematics teaching programs for NESB students	**8.43**	4.05	455
Teachers qualified to teach the mathematics courses offered in your school	**8.15**	3.06	505
Having the total indicative hours allocated to face-to-face teaching	**8.12**	3.48	492
Having the full range of senior mathematics courses available in your school	**7.14**	3.24	506
Student participation in external mathematics competitions and activities	**5.92**	2.49	510

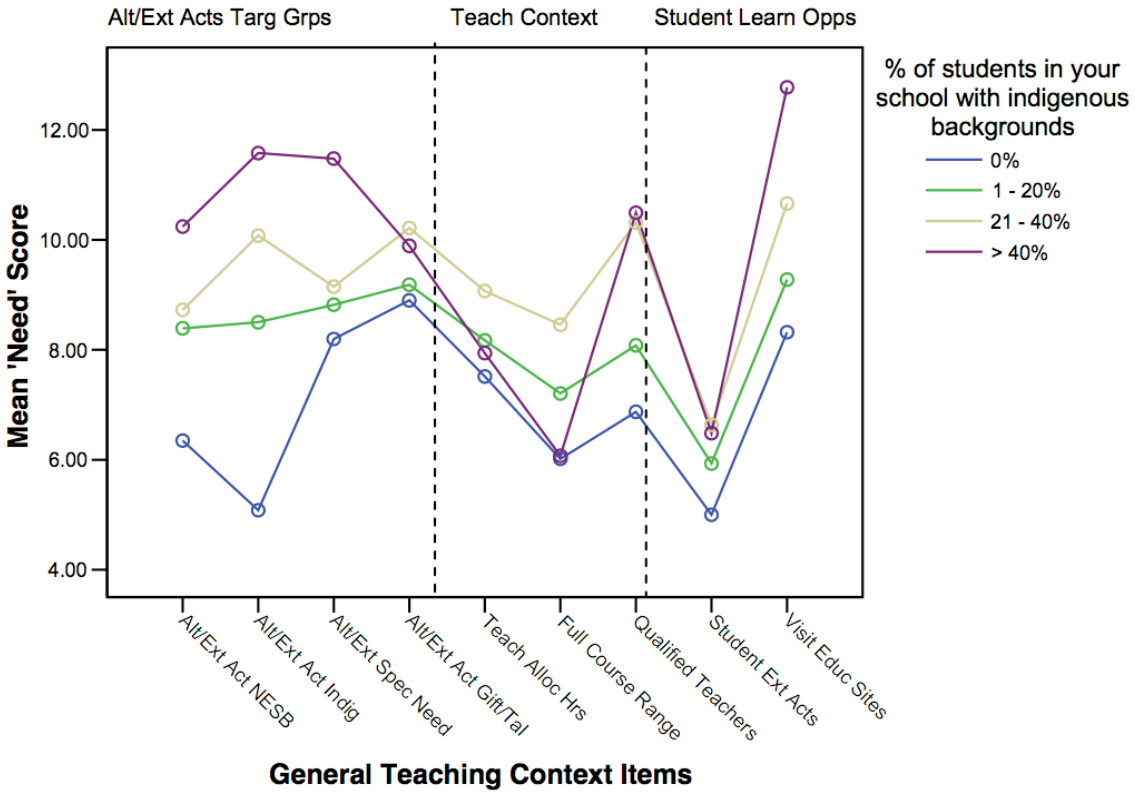

Figure 7.6. Profile plot of mean 'need' scores of mathematics respondents for the Student Learning Experience components, compared by percentage of students from Indigenous backgrounds (Table 7.7 for item names in full)

3. Figure 7.6 also indicates that mathematics teachers in schools with high proportions of Indigenous students perceived a higher need for activities catering for students with special needs, and for opportunities to visit educational sites. Mathematics teachers in schools where more than 20% of students are Indigenous tended to feel there was a need for more qualified teachers.

7.5 STUDENT LEARNING IN COMPOSITE CLASSES

1. Overall, more than 27% of secondary respondents indicated that at least some senior science, ICT or mathematics courses were taught in composite classes in their schools. Figure 7.7 shows that 40% of ICT respondents were required to combine their senior classes, compared with 23% of science respondents and 25% of mathematics respondents.
2. The practice of combining classes was significantly more common in rural schools. Figure 7.8 indicates that only 11% of Metropolitan Area respondents and 17% of Provincial City respondents reported composite senior science, ICT or mathematics classes in their schools. By contrast, 36% of those in Provincial Areas and 58% of those in Remote Areas reported this arrangement.

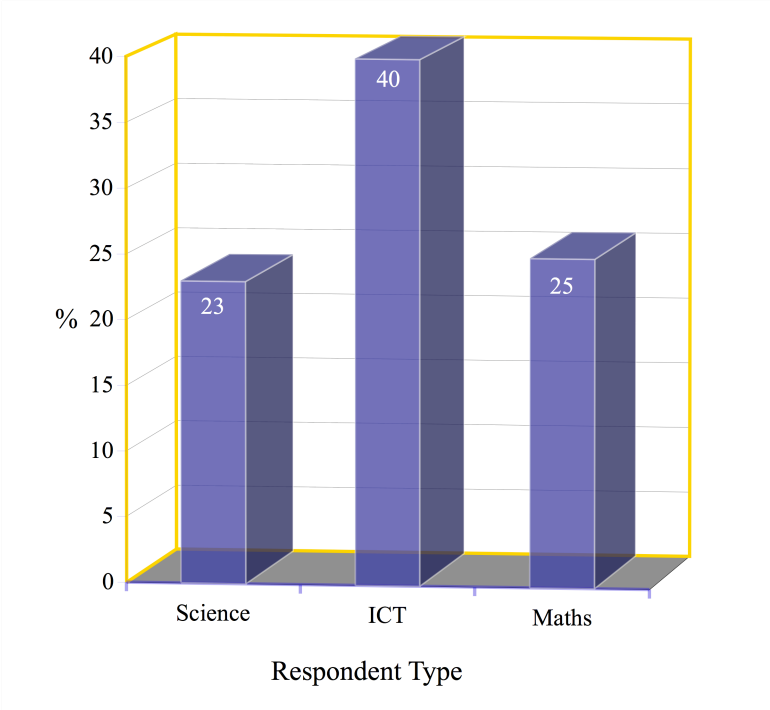

Figure 7.7. Percentages of secondary respondents in different subject areas indicating that composite senior courses in these subjects were taught in their schools

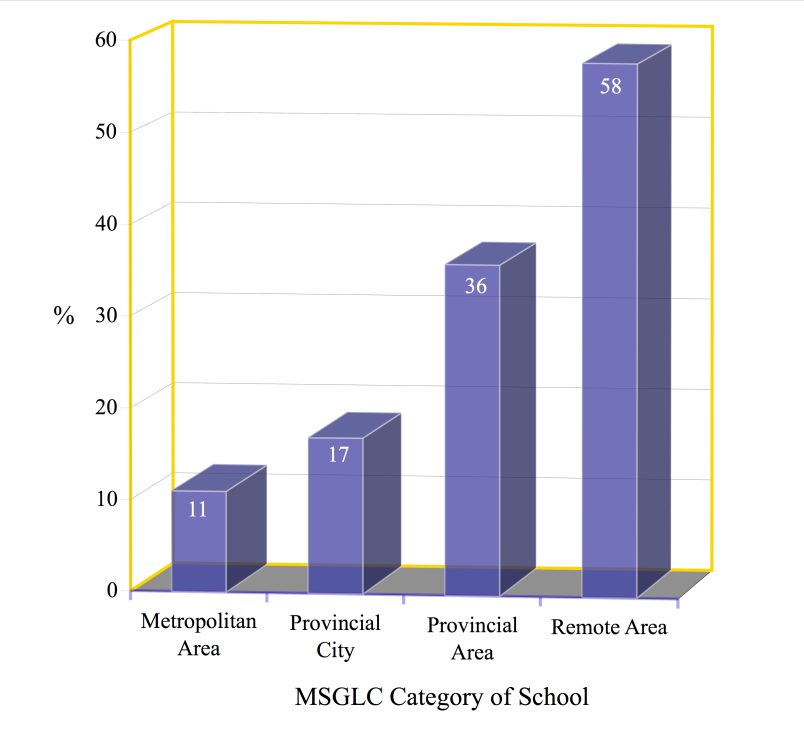

Figure 7.8. Percentages of secondary teachers in different MSGLC categories indicating that science, ICT or mathematics courses were taught in composite classes

7.6 DISCUSSION

Overall, the findings clearly indicate that primary and secondary teachers see a substantial need for their students to visit educational sites related to science, ICT and mathematics. Nevertheless, there appears to be considerable geographical variation in the level of need, with primary, science and mathematics teachers in Metropolitan Areas feeling that their students' needs for such excursions are reasonably well served. The level of need increases with distance from a metropolitan centre, with teachers in Remote Areas expressing the highest level of need. It is reasonable to expect that the range of educational experiences available to students in different areas would differ. For example, while students in Metropolitan Areas might have more access to museums, businesses and factories, those in Provincial or Remote Areas may have easier access to agricultural and mining sites or national parks. However, the trend in the findings suggests that students in Metropolitan Areas have access to richer educational experience in science, ICT and mathematics than do those in less populated areas. Distance to sites, cost, and the lack of public transport are factors that inhibit student access to a variety of relevant sites, and sites outside their normal experience.

The finding that primary teachers across Australia appear to have insufficient time to complete the requirements of science syllabuses is concerning, but consistent with literature showing that science often has a lower priority in primary schools than assumed by syllabuses. Goodrum et al. (2001) suggested that this was partly due to some teachers' reluctance to teach science, due to their lack of confidence in the subject. Another possibility is that the focus on numeracy and literacy as priority areas leaves less time for other subjects. Either way, the finding implies that many classes are not completing the science syllabus requirements for one stage/grade before progressing to the next.

Teachers' responses provide convincing evidence that primary and secondary schools with relatively high proportions of Indigenous students are in need of a greater variety of learning

opportunities to cater for the diversity of students. While this obviously includes suitable learning opportunities for Indigenous students, teachers indicated that learning experiences suitable for special needs and gifted and talented students are also a priority. However, it does not appear to be a matter of simply distributing extra resources in proportion to the numbers of Indigenous students, as the findings showed that in many cases it was schools with between 21 and 40% Indigenous populations that have the greatest need. One explanation could be that such schools have a greater diversity than those in which Indigenous students make up the majority. Another might be that schools with relatively fewer Indigenous students attract less targeted funding, and therefore have fewer resources. Further investigation is warranted.

Results from the ICT teachers survey indicated that there is a substantial need for qualified teachers in this subject area. The level of this need varied little with MSGLC category of school. This finding is consistent with findings that ICT teachers are less formally qualified in their areas than are other subject teachers, and feel a greater need for ongoing professional development and collaboration.

Finally, the study shows that about 27% of science, ICT and mathematics teachers are required to teach courses in composite classes in order for those courses to run. Many composite classes are made up of Year 11 and 12 students, or of Year 12 students taking different courses. This appears to be a more common situation for ICT courses.

The findings clearly show that students in Provincial and Remote Areas, and senior students in particular, are required far more often to take science, ICT and mathematics courses in composite classes than their peers in Metropolitan and Provincial Cities. This finding highlights another educational inequity detrimental to students in rural schools.

8. PARENTS/CAREGIVERS' PERSPECTIVES ON THEIR CHILDREN'S SCIENCE, ICT AND MATHEMATICS EDUCATION

Parents/caregivers were asked for their perceptions on a range of issues concerning their eldest school-age child's education in science, ICT and mathematics. The most significant findings related to perceptions of the capacity of their children's schools to attract and retain qualified teachers, and the qualities of their children's teachers.

8.1 PERCEPTIONS OF CAPACITIES OF SCHOOLS TO ATTRACT AND RETAIN TEACHERS OF SCIENCE, ICT AND MATHEMATICS

1. The study found that parents/caregivers' confidence in the capacity of their children's primary schools to attract and retain qualified teachers decreased significantly with the size and remoteness of school location (see Figure 8.1). There was also a clear indication that parents/caregivers in rural and remote areas are aware of staffing difficulties in those locations. Overall, parent/caregiver perceptions were generally in agreement with those of teachers, who considered vacant positions in metropolitan schools easiest to fill.

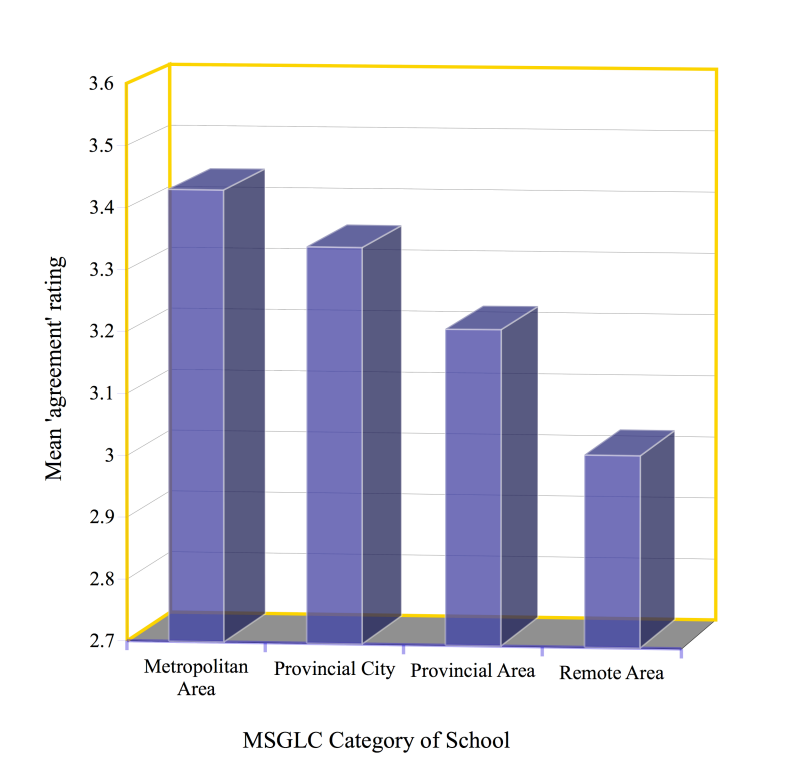

Figure 8.1. Mean 'agreement' by respondents that their child's school is able to attract and keep qualified primary teachers, compared by MSGLC categories [ratings on a scale of 1 (Strongly Disagree) to 4 (Strongly Agree)]

2. Analysis of the responses of parents/caregivers reporting about secondary schools did not reveal the same significant geographical pattern in staffing difficulties reported by science and mathematics teacher respondents. However, it may be that many parents/caregivers are unfamiliar with the subject-specific qualifications of secondary teachers, generally assuming that those teaching mathematics or science to their children are qualified to teach those subjects.
3. While parents/caregivers in Remote Areas are generally appreciative of their children's teachers, there appears to be concern about the inexperience and capabilities of the teachers

commonly recruited to these schools, and the long-term effects on the education of children.

8.2 PERCEPTIONS OF ACHIEVEMENT AND TEACHER ATTITUDES IN SCIENCE, ICT AND MATHEMATICS EDUCATION

1. The findings indicate firstly that parents/caregivers consider the commitment and enthusiasm of teachers to be one of the greatest strengths of schools. Perceptions of the levels of enthusiasm teachers bring to class do not appear to vary significantly with geographical location or type of school.
2. With regard to parents/caregivers' views on whether teachers care that students work to their potential, there was little evidence of substantial variation with type or location of school. Nevertheless, the weak but consistent (and in the case of mathematics, significant) pattern suggesting that parents/caregivers with children attending Provincial Area schools were less inclined than others to consider that teachers care whether students work to their potential is perhaps cause for further investigation.
3. The evidence suggests that the perceptions of parents/caregivers across Australia about achievement levels in science, ICT and mathematics vary substantially with geographic location. As shown in Figures 8.2, 8.3 and 8.4 respondents with children attending Metropolitan schools were significantly more inclined to agree that children in these schools achieved to a high standard in science, ICT and mathematics than were respondents with children in non-metropolitan schools. Those with children attending schools in Remote Areas were least inclined to agree. The geographical pattern in perceptions is consistent with patterns of achievement levels in science and mathematics revealed in international studies (Thomson et al., 2004).
4. There also seems to be a perception that teachers in primary and secondary schools in larger population centres provide greater encouragement for students to achieve to their potential in these subjects.

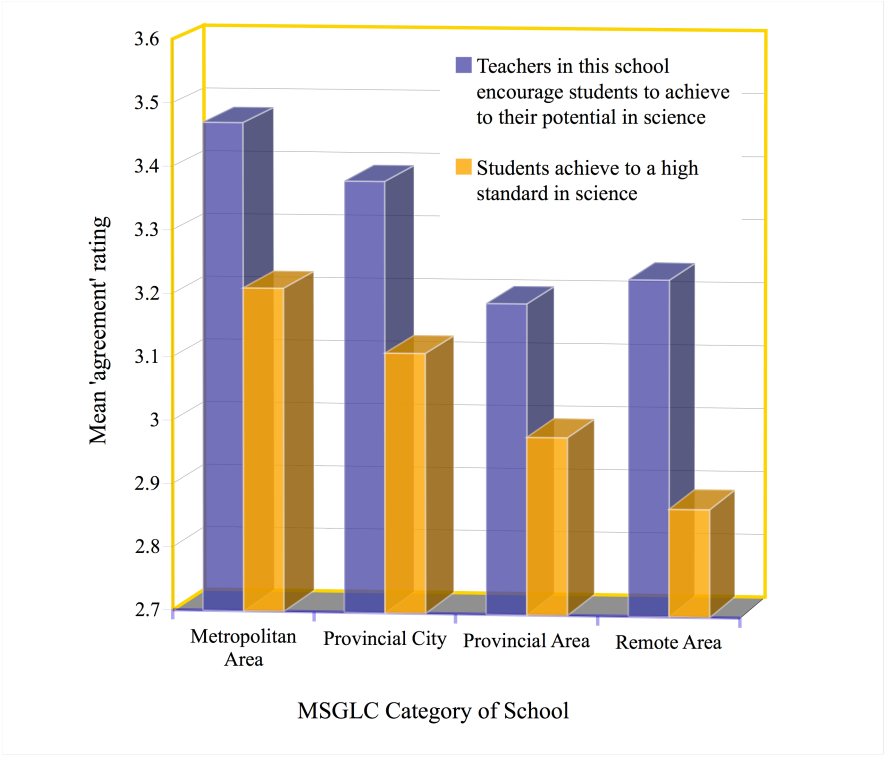

Figure 8.2. Mean 'agreement' of parent/caregiver respondents with statements about science achievement in their children's schools, compared by MSGLC categories [ratings on a scale of 1 (Strongly Disagree) to 4 (Strongly Agree)]

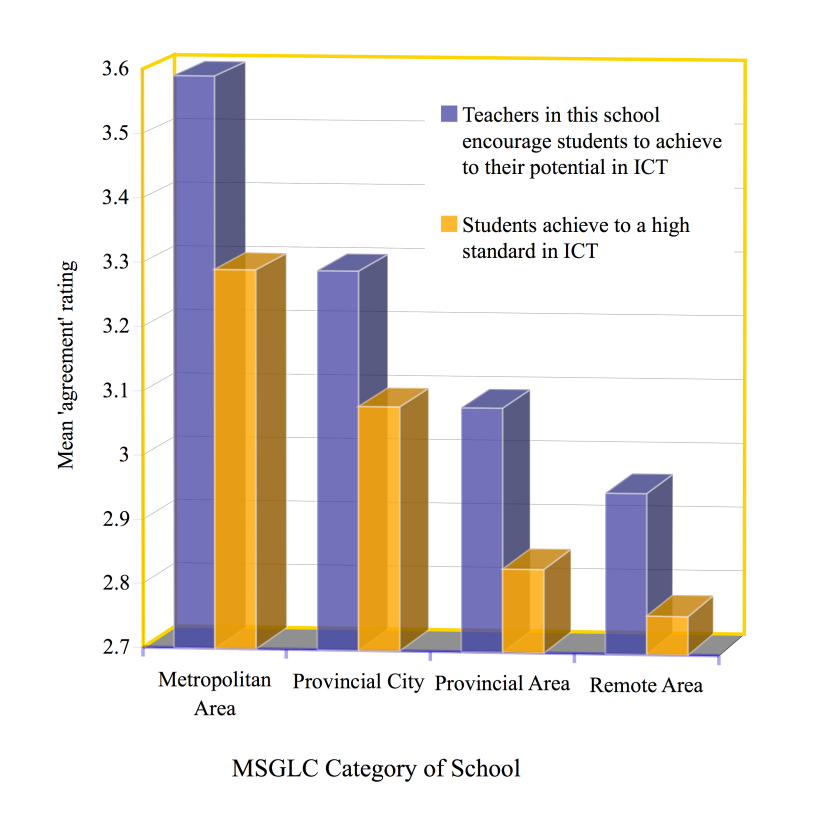

Figure 8.3. Mean ratings by parent/caregiver respondents on perceptions of ICT achievement levels in their child's school, compared by MSGLC categories [ratings on a scale of 1 (Strongly Disagree) to 4 (Strongly Agree)]

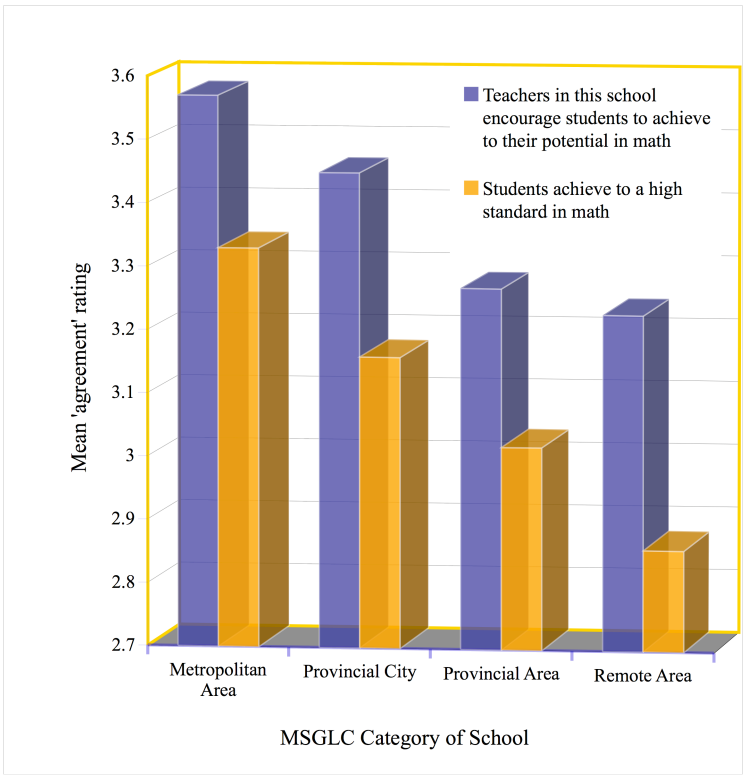

Figure 8.4. Mean ratings by parent/caregiver respondents on perceptions of mathematics achievement levels in their child's school, compared by MSGLC categories [ratings on a scale of 1 (Strongly Disagree) to 4 (Strongly Agree)]

8.3 PERCEPTIONS OF STRENGTHS AND OBSTACLES IN SCIENCE, ICT AND MATHEMATICS EDUCATION

1. The findings suggest that, overall, parent/caregivers are appreciative of the commitment, efforts and enthusiasm of teachers involved in science, ICT and mathematics education.
2. Understandably, their greatest concern appears to be that their children have access to an adequate range of learning experiences and opportunities. These include excursions, visits by experts, and a good variety of senior courses from which to choose. Parents/caregivers seem to be aware that student access to these experiences and opportunities is considerably greater in larger population centres. There is also evidence that those outside these centres are concerned that their children are at an educational disadvantage.
3. Parents/caregivers with children having special needs or talent are appreciative where schools are able to provide relevant support. However, there appears to be concern from parents/caregivers in Provincial and Remote Areas that their schools are unable to provide this support adequately.
4. Finally, ICT education emerged as a key area of interest among parent/caregivers. There seems to be a general concern that children are not incorporating ICT into their learning as effectively as parents/caregivers would like, and a specific concern among those with children in rural schools that there is insufficient expertise and technical support for ICT.

8.4 DISCUSSION

The responses of parents/caregivers provided an illuminating insight into their educational values and attitudes, as well as their perceptions of the schools attended by their children. In some cases these perceptions reflected the views and concerns of teachers.

Parents/caregivers' perceptions of the difficulty of attracting and retaining qualified primary teachers displayed a geographical pattern similar to that of primary teachers themselves, indicating their awareness that it is considerably more difficult to staff rural primary schools with qualified teachers than is the case in larger population centres. It was not clear whether parents/caregivers with children at the secondary level were aware of the staffing difficulties reported by science, ICT and mathematics teachers. However, it is doubtful that parents/caregivers would be aware of the subject-specific qualifications of secondary teachers, and therefore of whether their children's teachers were suitably qualified to teach those courses.

With regard to reflections on the qualities of their children's teachers, it was heartening to find that parents/caregivers are in general appreciative of the commitment, efforts and enthusiasm of teachers involved in these subject areas. There was no evidence that the enthusiasm teachers bring to the classroom varied with type or geographic location of school. Nevertheless, comments from parents/caregivers with children in Remote Area schools suggest that there is greater concern about the inexperience of teachers in these schools, and the long term effects of this on children's learning, than is the case in other locations.

One area in which geographical differences were clear was in perceptions of the achievement levels of students in science, ICT and mathematics. The findings indicate that parents/ caregivers with children attending schools in Metropolitan Areas are more inclined to think that students in these schools exhibit high achievement, and are encouraged to do so by their teachers, than are parents/with children in non-metropolitan schools. This geographic pattern in perceptions reflects the achievement patterns in national science and mathematics results from PISA, indicating awareness on the part of parents/caregivers of the achievement levels of their schools relative to those in other locations. In a few cases, the belief that students in

Metropolitan schools achieved higher results, and are more achievement-oriented, influenced parents/caregivers to consider sending their child to a metropolitan school.

The influence of this belief is important in the context of educational orientations, in that parents/caregivers who value university admission results highly may be influenced to move their children from rural schools to metropolitan schools in order to maximise academic success.

9. RURAL EDUCATION: A FRAMEWORK FOR ACTION

9.1 WHERE TO FROM HERE FOR RURAL EDUCATION?

The review of the literature identified some of the endemic problems facing rural and regional education and highlighted significant studies we believe provided guidance on directions but which have not received due recognition from those formulating policy. These reports have presented a fairly consistent picture of rural education: lower schooling outcomes, problematic teacher retention and a lack of access to professional development and resources. While differing in focus and offering fresh insights, the recommendations of the SiMERR National Survey are clearly in the spirit of these reports. The findings above add significantly to the evidence from other reports that we are still falling a long way short of the principle of equity of educational access established by the *Adelaide Declaration* (MCEETYA, 1999).

Through the process of conducting the National Survey and, in particular, the focus group interviews, the various research teams became keenly aware that principals, teachers and parents expect remedial action to be taken in response to the findings. We therefore feel obligated to do our best to ensure that this report leads to significant and effective action.

In all such endeavours there comes a point at which research must give way to action, and we believe that the time is now. The pertinent question is 'Where to from here for rural education?' The following sections discuss the catalysts for our principal recommendation that a National Rural School Education Strategy be established, and outline the proposed scope and aims of the 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:

- To map a coordinated approach across all government and non-government education jurisdictions to addressing the disparities in rural and regional school education.
- To foster the development of strategic partnerships between stakeholders involved in rural and regional education.
- 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.

9.2 CATALYSTS FOR A NATIONAL RURAL SCHOOL EDUCATION STRATEGY

The National Survey is one of a number of recent catalysts for the idea of a coordinated national approach. The most significant of these include a national summit on rural education convened by SiMERR Australia in 2005 and a framework for rural education initiated by MCEETYA in 2001. The outcomes of these initiatives present a unique opportunity to achieve something significant for rural and regional education in general, and science, ICT and mathematics education in particular.

The SiMERR National Summit

In November 2005, the first SiMERR National Summit was held at the Australian Science and Mathematics School in Adelaide. It was attended by key academics, including many associated with SiMERR Australia, executives from Australia's leading education bodies (and in particular those concerned with science, ICT and mathematics) and senior representatives of federal, state and territory education jurisdictions. The purpose of the summit was to discuss the initial findings of the SiMERR National Survey, the underperformance of students in rural and regional Australia, and an agenda for further action.

The keynote presentations and workshop sessions focused on inequities in the educational provision for, and outcomes of, rural students compared with their metropolitan peers. Emerging from the summit were several themes, some of which went beyond science, ICT and mathematics education:

- Education authorities across Australia should be deeply concerned about the disparities in achievement between rural and metropolitan students in science, ICT and mathematics.
- Rural schools face barriers to providing quality education, such as distances to major centres, problematic staffing and difficulties establishing and maintaining infrastructure.
- Rural education is interlinked with other aspects of rural communities, such as fluctuating populations, economic influences, seasonal conditions and climate.
- The need for students in rural and remote areas to have access to quality education services within a reasonable distance from the family home.

Summit participants were in general agreement that potential solutions which considered these concerns in isolation from one another would not be successful. In addition, it was recognised that attempts to address inequities in the provision of quality education would not be effective unless broader economic and social issues are also considered. Broader issues of rural and regional development, infrastructure, health and social services are all related to, and affect, rural education. A coherent and coordinated approach across all of these areas is needed to address rural and regional education concerns in a sustainable way.

MCEETYA Framework for Rural and Remote Education

In 2001, the MCEETYA Taskforce on Rural and Remote Education, Training, Employment and Children's Services produced a *National Framework for Rural and Remote Education* (MCEETYA Task Force, 2001). The Framework was the product of collaborative work undertaken in response to Recommendation 4.5 of the Human Rights and Equal Opportunity Commission (HREOC, 1999) National Inquiry into Rural and Remote Education, and was designed to:

- provide a framework for the development of nationally agreed policies and support services
- promote consistency in the delivery of high quality education services to rural and remote students and their families
- provide reference points and guidance for non-government providers of services and support for education in rural and remote areas
- facilitate partnership building between government and non-government providers of services and support related to the provision of education in regional, rural and remote locations.

These aims are clearly consistent with the resolve emerging from the National Summit and encompass many of the recommendations of the National Survey. The framework offers the vision for rural education 'that, by age 18, each young person residing in rural and remote Australia will receive the education required to develop their full potential in the social, economic, political and cultural life of the nation' (MCEETYA, 2001).

The framework provided an underlying philosophical position, drawn from extensive research findings and arguing for the type of inter-governmental and inter-agency collaboration identified above. Despite an agreement that practical action follow to ensure 'improvement for children and students in rural and remote Australia in the quality of provision of education available to them and to which they are inherently entitled', little seems to have resulted from this initiative.

One reason for this may be that the National Framework for Rural and Remote Education was positioned as a supplementary framework rather than a priority area. According to MCEETYA (2001), the framework:

> … nests within the broader work of MCEETYA through its various taskforces and working groups. It will inform the work of taskforces that have a specific link to rural and remote issues. Used in conjunction with existing policies and practices, it will ensure that children and students in rural and remote Australia receive the quality of education provision to which they are inherently entitled.

The framework was not positioned to generate action, but to inform other MCEETYA Taskforces. As a consequence, rural and regional school education became a peripheral area for policy. The MCEETYA Taskforce on Rural and Remote Education, Training, Employment and Children's Services has since been disbanded, as has its successor, the Taskforce on Targeted Initiatives of National Significance, which also had responsibility for rural and remote education issues.

It is our belief that the proposed National Rural School Education Strategy should fulfill the mandate initiated by this Taskforce and mapped by the Framework, while avoiding the same fate. The National Strategy would be the most effective mechanism whereby consensus views could be turned into coordinated and focused actions.

9.4 DEVELOPING A NATIONAL RURAL SCHOOL EDUCATION STRATEGY

While the *National Framework for Rural and Remote Education* established a sound blueprint, the National Rural Health Strategy provides a working model with greater potential for effective action. In many ways the rural education situation is similar to that faced by rural communities in terms of health services. Both need to deal with small population sizes, low population densities, and difficulties in achieving economies of scale in both infrastructure support and human resourcing. Furthermore, there is a similar relationship in terms of federal, state and territory responsibilities.

The National Survey findings of inequity of access in this study have marked similarities to those facing the health sector. One could even replace students with patients, teachers with medical practitioners, and schools with hospitals. While the comparison should not be pushed too far, it does mean that successful initiatives arising from the health sector might provide valuable insights into how to address rural and regional education issues. For example, rural health investigations have noted that approaches that work for health improvement for

Metropolitan Areas, do not necessarily work in rural and regional areas. The implication is that problems in rural education might not be best served by a metro-centric mind-set.

To address health concerns in rural Australia, the Federal, State and Territory governments agreed that the best way forward was to develop an integrated national approach to rural health. In 2000 they established the Rural Health Strategy to improve access to health and aged-care services for rural and regional communities. Like the proposed National Rural School Education Strategy, the Rural Health Strategy emerged after many reports highlighting concerns about health in rural and regional areas.

There are many similarities between the actions taken under the auspices of the Rural Health Strategy and the recommendations of the SiMERR National Survey. Both advocate:

- a flexible approach which considers the wider rural and regional context
- measures to 'address the gap in outcomes between rural and urban Australians' (Department of Health and Aging (DoHA), 2004)
- 'programs to support the recruitment and retention of … professionals in rural areas' including bonded scholarships (DoHA, 2004)
- 'rural-based and rural-focused training for … professionals' (DoHA, 2004)
- 'programs to support existing service providers' (DoHA, 2004)
- increased access to 'services in hundreds of smaller rural communities' (DoHA, 2004).

Modeling the National Rural School Education Strategy along the lines of the Rural Health Strategy would be consistent with current government policy. Furthermore, the process of implementing elements of the education strategy would be informed by the experiences of those involved in the Rural Health Strategy, avoiding many of the obstacles and pitfalls faced by new programs. Significantly for rural communities, gains have already been made through actions flowing from the Rural Health Strategy. At the same time, the needs in health and education are not identical and care must be taken to develop a unique strategy relevant to, and designed for, education initiatives. Hence, it would be important to identify the contextual differences between health and education circumstances.

The National Rural School Education Strategy would be expected to address service delivery to rural and regional communities in a cost effective way, recognising that such communities have many differences and that this will require solutions tailored to the community and the context. It will also be important that the National Rural School Education Strategy builds on existing programs and services and ensures appropriate linkages between stakeholders.

We consider the following to be initial steps in formulating the National Rural School Education Strategy:

1. Establishing a coordination mechanism, possibly an inter-governmental Taskforce under the Council of Australian Governments (COAG) or the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA).
2. Developing the details of the strategy with reference to the *National Framework for Rural and Remote Education* developed by MCEETYA, the findings and recommendations from the SiMERR National Survey, and other relevant studies.
3. Identifying roles, responsibilities and accountabilities associated with various aspects of the strategy.
4. Facilitating communication and strengthening collaboration between governments, agencies and communities.

5. Establishing an integrated research agenda to monitor the outcomes of the National Rural School Education Strategy with regard to students, teachers, schools and communities, and to guide its development using evidence-based research in rural and regional areas.

Recommendation 21, restated below is aimed at facilitating steps 1 to 4:

21. It is recommended that a National Rural School Education Taskforce be established by MCEETYA or COAG 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, 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 COAG or 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.

Research support for the activities of the National Strategy

Step 5 above is considered crucial for providing evidence-based support for the initiatives of the National Strategy and accountability in terms of monitoring outcomes. Recommendation 22, restated below, suggests some guidelines for a research network to support the National Rural School Education Strategy:

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, 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.

Possible domains of a National Rural School Education Strategy

Several recommendations of the National Survey, such as the establishment of an Association of Rural Educators and the Rural School Leadership Program, could be incorporated under the National Rural School Education Strategy. However, the scope of the Strategy could extend beyond these to consider broader domains relating to rural school education. The suggestions below show how different ideas that move beyond, but are inclusive of, our recommendations might cluster under a National Rural School Education Strategy. Actions for consideration might include the development of programs that:

- seek ways to integrate current initiatives within the National Strategy so that they are more complementary, and identify how recommendations from the SiMERR National Survey might be incorporated within the Strategy
- help revitalise rural and regional schools. For example, schools may be given the option of restructuring their facilities to make them more viable and relevant to community needs, such as becoming multi-purpose centres
- encourage flexibility so that a wide range of services can be subsumed and supported under the Strategy. Frequently schools in a rural area are the largest employer in the community and play an integral role in sustaining the local economy
- allow or encourage flexibility of rules and regulations at a local level to enable local responses to emerge. Linking recommendations with regional development may assist the development of customised strategic plans to improve the viability of each school
- develop a communication strategy that informs rural and regional communities of current and future rural education initiatives. Encourage work with key rural and regional groups/communities to identify and structure local priorities
- review regional access and undertake an audit to determine broad areas of need for different education facilities. It may be that adjustment grants for rural schools could create a more balanced system across institutions with additional flexible funding in more remote areas. Viability funding should recognise the higher day-to-day operating costs of education services in rural areas
- support the recruitment of more teachers to rural and regional centres, as recommended by this and other reports. Considerations could be given to scholarships or employer arrangements with regard to Higher Education Contribution Scheme (HECS) payments for students willing to teach in rural and regional areas
- develop positive long-term incentives to increase and strengthen the rural education workforce and especially to encourage teachers to remain in rural areas. At the same time, programs are needed to enhance the skills of rural teaching professionals, reduce professional isolation and encourage teachers into small communities
- create a senior teacher outreach program to enhance education and training for rural education professionals and to provide for rural leadership support and development
- address rural and regional issues concerning preschool and tertiary education
- link through Teaching Australia to various state/territory Teacher Institutes.

We recognise that there are tensions here in providing elaboration of our ideas with various degrees of detail. We have tried to highlight ideas and actions to explicate possibilities that a

National Rural School Education Strategy would open up. However, in doing so we caution against getting caught up in details at this stage, and losing sight of the overall picture.

9.5 CONCLUSION

We believe that a National Rural School Education Strategy is the only viable and sustainable way for Australia to address rural and urban inequities in education. We are convinced that this initiative will help 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 the National Rural School Education Strategy 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.

In this concluding chapter we have tried to highlight an important tension that has plagued past attempts to address educational inequities. It concerns the tendency to maintain ownership of the issues within education without establishing a broader role for rural and regional communities and other areas of government responsibility. Too often education is seen as the panacea for social ills. Australian society as a whole has a responsibility for, and a stake in, the education of students in rural and regional areas. While we believe that those responsible for coordinating and implementing the proposed National Rural School Education Strategy should be drawn primarily from education, it needs to be a truly national agenda.

Importantly, the ideas in this final chapter are not about working from a deficit model of teaching and learning in rural and regional Australia. Rather, the ideas and illustrative actions are offered as positive steps towards harnessing the strengths of rural and regional communities in meeting the challenges facing their schools, and ensuring equity of access for their students. The recommendations in this report, and in particular the proposal for a National Rural School Education Strategy, are aimed squarely at reducing the educational divide between rural and urban Australia, and therefore at creating a fairer and healthier Australia.

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[11] See the full technical report for a comprehensive review of the relevant literature

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