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.[1] 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		

[1] 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[2], 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

[2] 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.[3]

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[4].

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.

[3] 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.

[4] 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.

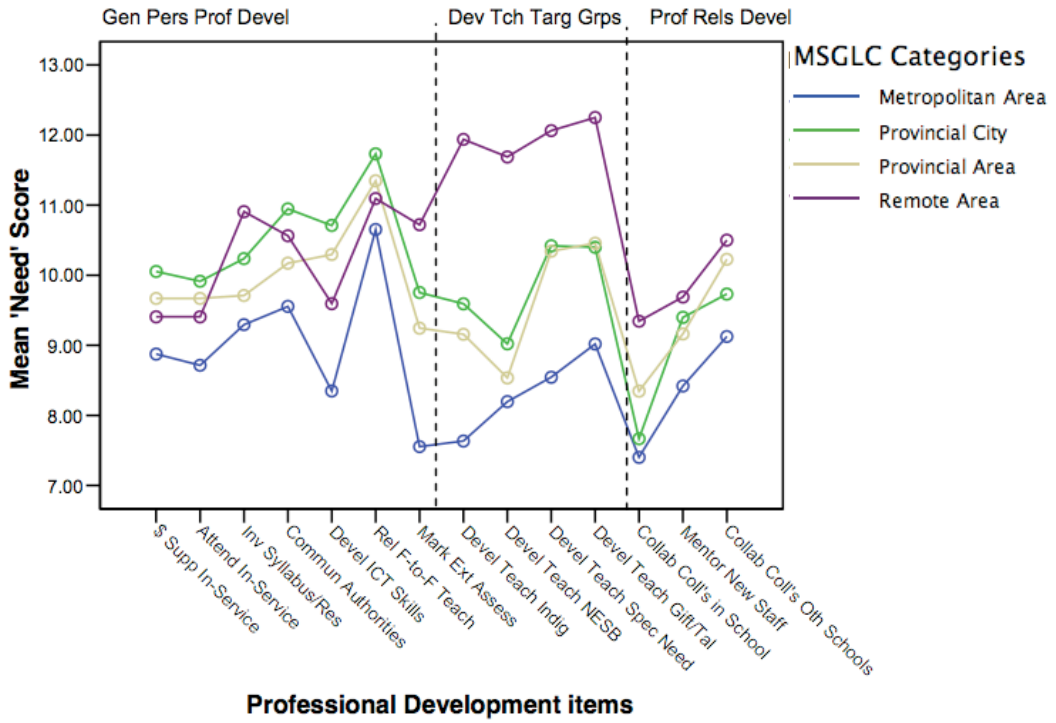

Figure 3.1. Profile plot of mean 'need' scores of science respondents for the professional interaction and development components, compared by MSGLC categories