

## 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 <sup>6</sup>]**

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

<sup>6</sup> 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.

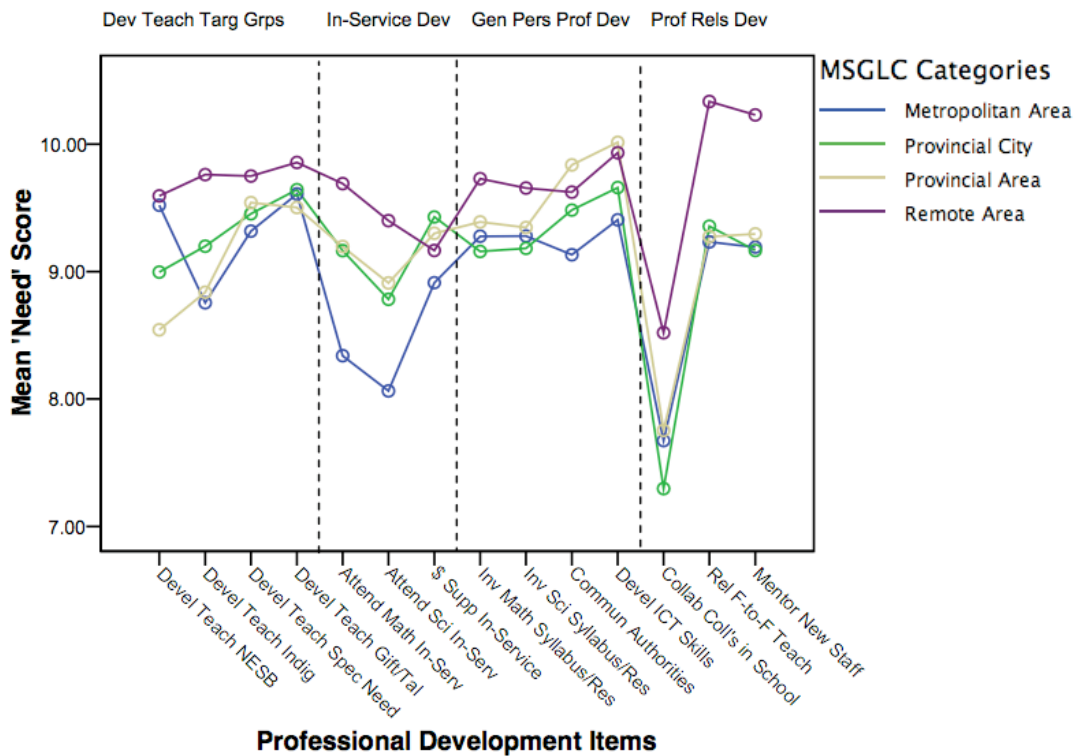


Figure 5.1. Profile plot of mean 'need' scores of primary respondents for the Professional Interaction and Development components<sup>7</sup>, compared by MSGLC categories (see Table 5.1 for item names in full)

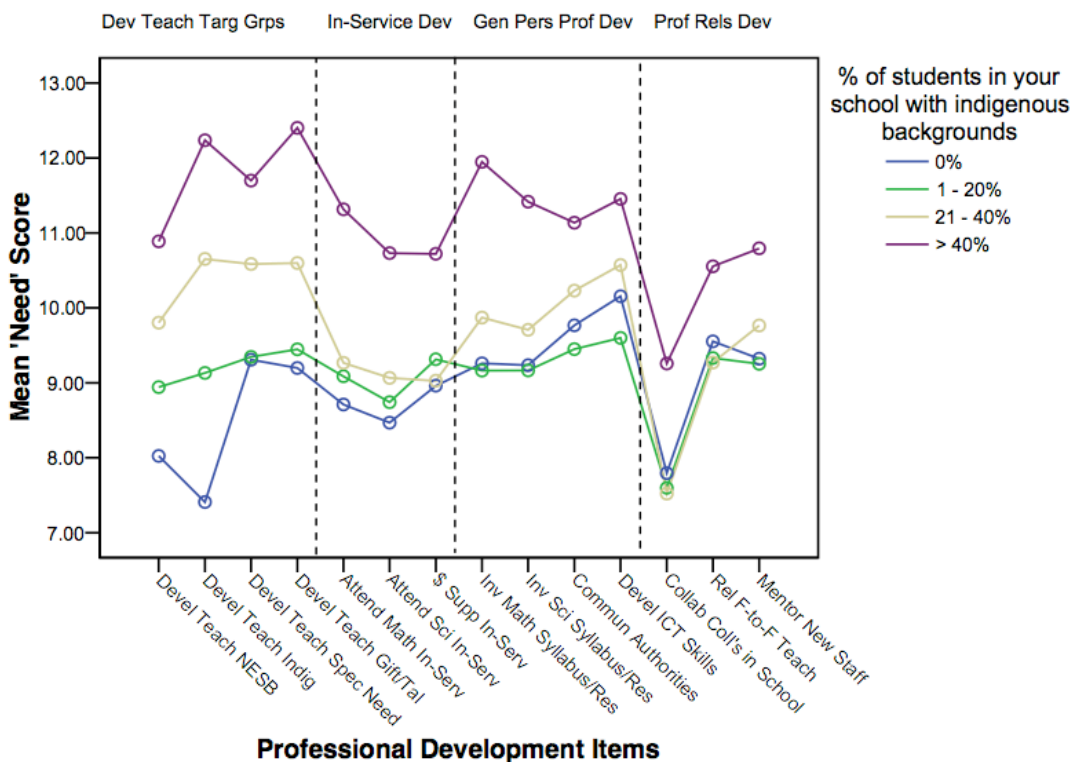


Figure 5.2. Profile plot of mean 'need' scores of primary respondents for the Professional Interaction and Development components, compared by percentage of students from Indigenous backgrounds (Table 5.1 for item names in full)

<sup>7</sup> 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)	<b>11.33</b>	4.28	539
Effective communication between education authorities and teachers	<b>10.16</b>	3.87	539
Professional development opportunities to help you teach science to gifted & talented students	<b>10.12</b>	3.88	531
Collaboration with science teachers in other schools	<b>9.98</b>	3.66	544
Professional development opportunities to help you teach science to special needs students	<b>9.97</b>	4.05	525
Workshops to develop your ICT skills	<b>9.80</b>	4.04	542
Involvement in region or state-wide syllabus development, or research projects (e.g., assessment)	<b>9.69</b>	3.89	539
Financial support for attendance at external in-services or conferences	<b>9.46</b>	3.96	542
Opportunities to attend external in-services or conferences related to teaching & learning science	<b>9.44</b>	3.74	543
Opportunities for mentoring new staff	<b>9.14</b>	3.74	539
Opportunity to mark/moderate external science assessments	<b>9.07</b>	4.12	535
Professional development opportunities to help you teach science to Indigenous students	<b>9.04</b>	4.50	522
Professional development opportunities to help you teach science to NESB students	<b>8.73</b>	4.22	501
Collaboration between science teachers in your school (e.g., sharing resources, ideas, knowledge)	<b>8.06</b>	3.48	542

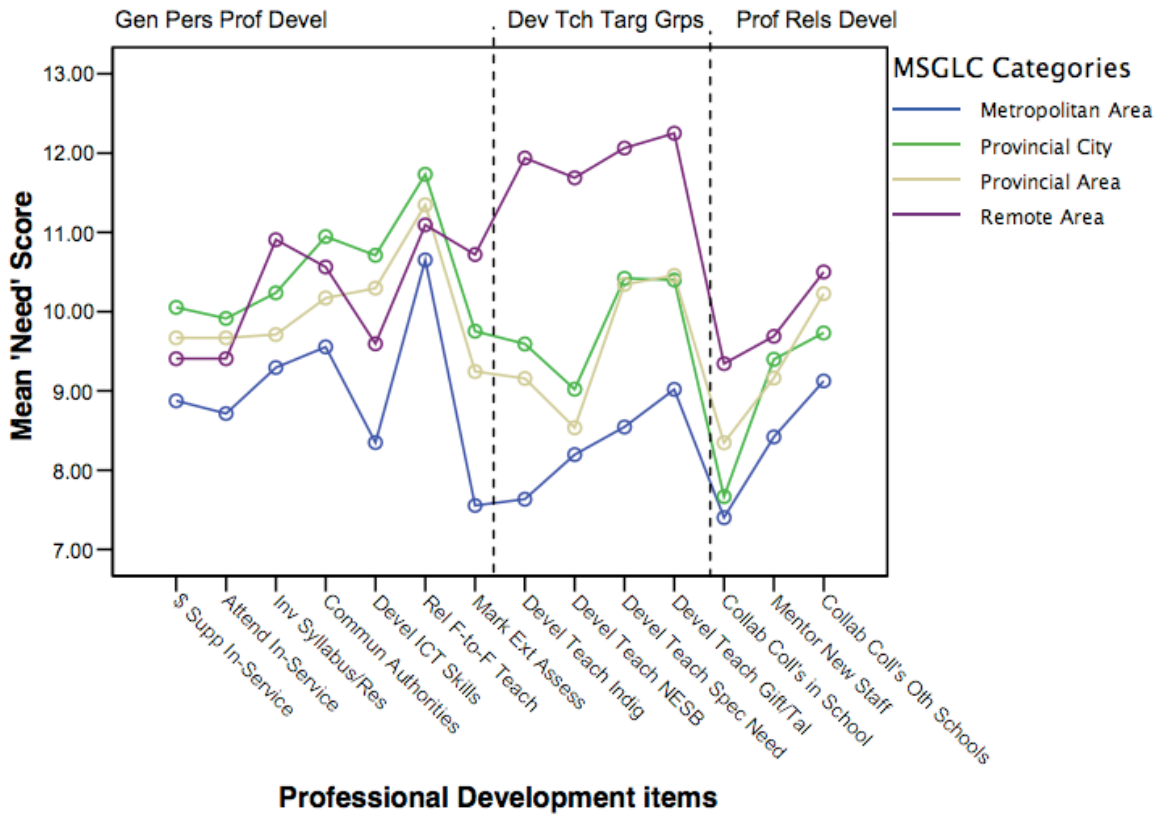


Figure 5.3. Profile plot of mean 'need' scores of science respondents for the Professional Interaction and Development components, compared by MSGLC categories (Table 5.2 for item names in full)

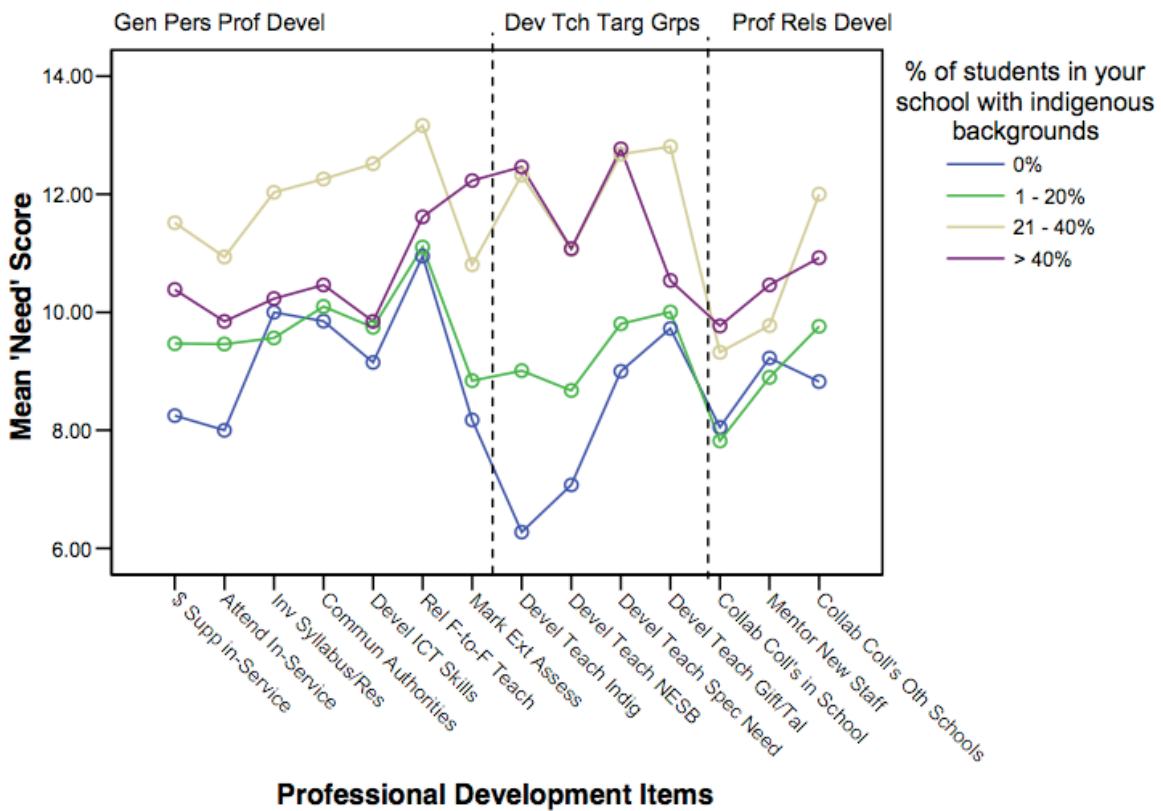


Figure 5.4. Profile plot of mean 'need' scores of science respondents for the Professional Interaction and Development components, compared by percentage of students from Indigenous backgrounds (Table 5.2 for item names in full)

### 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]**

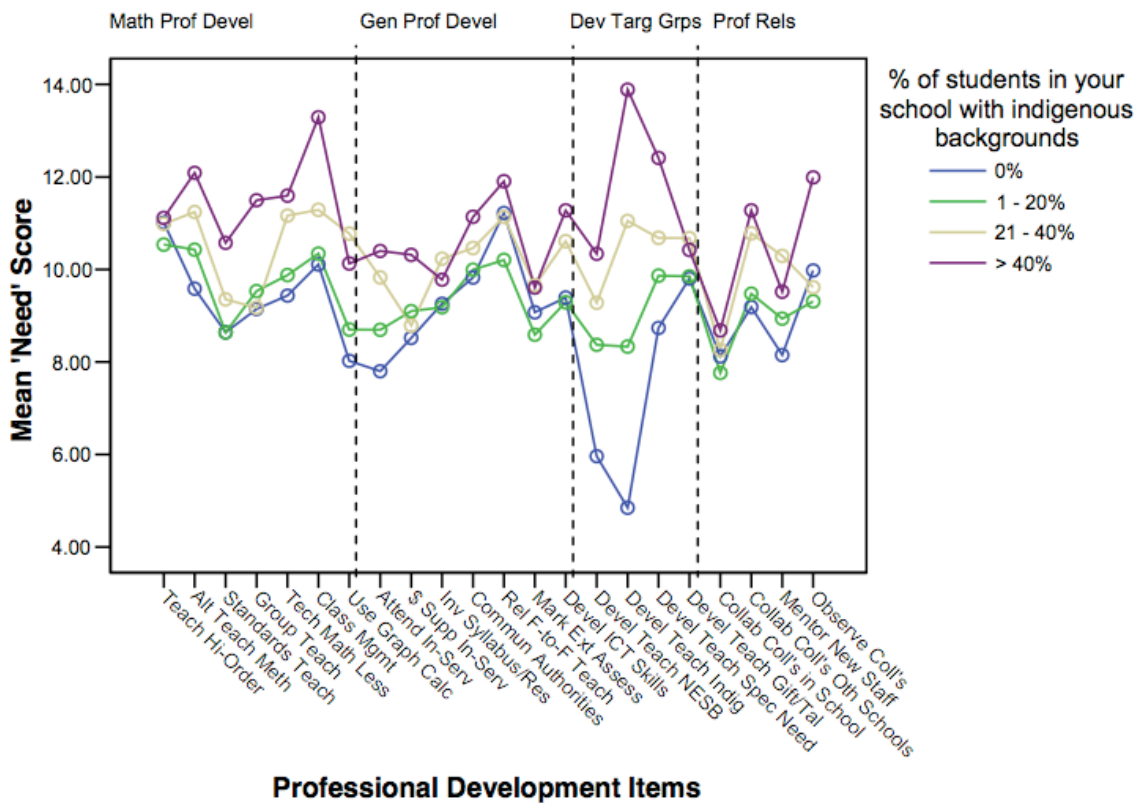
PROFESSIONAL DEVELOPMENT ITEMS	Mean	s.d.	Valid N
Release from face-to-face teaching for collaborative activities	10.79	4.00	225
Professional development opportunities: teach ICT to gift/talented students	10.38	4.34	214
Collaboration with ICT teachers in other schools	10.34	3.88	223
Opportunities for 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.