Chapter 5

School Resources

While it is probably true to say that the teacher is the primary provider of instruction in every country, countries vary in the extent to which they provide the resources necessary to support effective teaching and instruction. Although a detailed examination of school resource issues was outside the scope of TIMSS, the study did seek to probe differences by focusing on one important resource in the modern classroom, i.e., the computer, and by asking school principals about resource shortages or inadequacies that inhibit their school's capacity to provide instruction.

What Is the Availability of Computers for Teachers and Students?

In the modern world, computer literacy is fast becoming an essential attribute of a well-educated person. In response to this reality and in order to ensure that their students are equipped to face the challenges of tomorrow's world, schools and school systems around the globe have been investing heavily in information technology in recent years. To gauge the extent of this development, TIMSS asked school principals about the availability of computers for use by teachers and students in their schools.

It is clear from principals' responses (Tables 5.1 and 5.2) that computer availability varies dramatically from country to country, and that economic considerations may not always be the determining factor. Among TIMSS participants at grade four, there was a complete range of availability, from countries such as Canada, England, the Netherlands, and the United States, where principals reported that every school had at least some computers, to countries such as Iran and Thailand, where no computers were reported in any schools. Countries where more than half of the schools reported no computers at all included Austria, Cyprus, Greece, Kuwait, Latvia (LSS), and Portugal. Relatively little provision of computers at fourth grade was also reported in the Czech Republic, Hong Kong, Ireland, Japan, Norway, Singapore, and Slovenia, where most schools reported either that no computers were available or that there were at least 50 students for each computer. While Canada and the United States reported the highest level of computer provision, with 60% and 63% of schools reporting a student-computer ratio of less than 15:1, several other countries reported a high level also. In Australia, England, Iceland, New Zealand, and Scotland more than half of the schools at fourth grade reported that the number of students per computer was no more than 30.

In general, provision of computers to students in schools having eighth graders was better than in schools with fourth graders. Although more countries participated in TIMSS at eighth grade, relatively fewer countries (about one-third) had low provision of computers, with more than half of the schools reporting either no computers or a student-computer ratio of more than 50:1. Colombia, Cyprus, the Czech Republic, Iran, Latvia (LSS), Lithuania, Norway, Portugal, Romania, the Russian Federation, the Slovak Republic, Slovenia, Spain, and Thailand fell into this category. At the other end of the spectrum, Canada and the United States were clearly the leaders in terms of number of computers for student and teacher use at fourth grade. At eighth grade, however, England and Scotland have more generous provision, Australia is comparable, and many other countries are not far behind. In addition to these very well-resourced countries, comparatively more countries at eighth grade (about one-third) reported a student-computer ratio of no more than 30:1 in the majority of schools. These countries include Austria, Belgium (French), Denmark, France, Iceland, Ireland, Japan, the Netherlands, New Zealand, Singapore, and Sweden.

Table 5.1

Availability of Computers in Schools for Use by Teachers and Students
Fourth Grade*

Country	Percent of Schools Without Any Computers	Percent of Schools by Number of Students per Computer[1]			
		More than 50 Students per Computer	31-50 Students per Computer	15 to 30 Students per Computer	Less than 15 Students per Computer
Australia	r 1 (1.0)	3 (1.5)	7 (2.3)	50 (5.6)	39 (6.2)
Austria	72 (5.1)	27 (5.1)	0 (0.2)	0 (0.0)	0 (0.5)
Canada	0 (0.3)	3 (1.9)	6 (2.2)	32 (3.4)	60 (4.1)
Cyprus	r 84 (2.7)	15 (2.7)	1 (0.0)	0 (0.0)	1 (0.0)
Czech Republic	46 (5.3)	31 (4.2)	13 (2.4)	7 (2.0)	3 (1.6)
England	r 0 (0.0)	0 (0.4)	10 (3.7)	72 (4.9)	18 (4.9)
Greece	93 (2.2)	3 (1.2)	3 (1.7)	2 (0.8)	0 (0.2)
Hong Kong	38 (5.8)	52 (5.9)	7 (3.5)	4 (2.7)	0 (0.0)
Hungary	7 (2.5)	27 (4.1)	36 (4.8)	24 (4.7)	5 (2.5)
Iceland	5 (0.0)	16 (0.1)	21 (0.2)	31 (0.5)	27 (0.2)
Iran, Islamic Rep.	100 (0.4)	0 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
Ireland	40 (4.5)	44 (3.8)	10 (2.6)	5 (2.0)	1 (1.2)
Israel	x x	x x	x x	x x	x x
Japan	38 (4.6)	41 (4.6)	4 (1.9)	12 (3.1)	6 (2.6)
Korea	19 (7.4)	22 (2.4)	13 (2.5)	17 (6.1)	28 (7.5)
Kuwait	s 77 (1.5)	19 (0.3)	4 (1.3)	1 (0.0)	0 (0.0)
Latvia (LSS)	71 (4.1)	13 (2.5)	5 (2.0)	9 (2.1)	1 (1.3)
Netherlands	r 0 (0.0)	28 (5.0)	36 (5.2)	25 (4.5)	11 (4.0)
New Zealand	1 (0.8)	7 (1.9)	14 (2.7)	45 (4.3)	33 (4.3)
Norway	r 25 (5.3)	28 (4.8)	7 (2.3)	19 (5.2)	20 (6.6)
Portugal	85 (3.4)	8 (2.3)	5 (2.3)	2 (1.1)	0 (0.0)
Scotland	r 1 (0.7)	6 (2.4)	15 (3.0)	56 (5.7)	23 (4.4)
Singapore	2 (0.0)	64 (0.3)	22 (0.2)	10 (0.1)	3 (0.0)
Slovenia	r 14 (4.4)	51 (6.1)	31 (6.4)	2 (1.3)	2 (1.4)
Thailand	s 100 (0.0)	0 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
United States	s 0 (0.0)	2 (1.2)	3 (1.4)	32 (4.7)	63 (5.1)
International Average	37 (0.7)	20 (0.6)	11 (0.5)	18 (0.7)	14 (0.7)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Ratio of total enrollment to total computers for use by teachers and students.

* See Table 1.2 for more information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Appendix A).

Because population coverage falls below 65%, Latvia is annotated LSS for Latvian Speaking Schools only.

An "r" indicates school data available for 70-84% of schools. An "s" indicates school data available for 50-69% of schools.

An "x" indicates school data available for <50% of schools.

Table 5.2

Availability of Computers in Schools for Use by Teachers and Students
Eighth Grade*

Country		Percent of Schools Without Any Computers	Percent of Schools by Number of Students per Computer[1]			
			More than 50 Students per Computer	31-50 Students per Computer	15 to 30 Students per Computer	Less than 15 Students per Computer
Australia		0 (0.0)	4 (2.6)	3 (1.4)	31 (4.8)	63 (4.8)
Austria		0 (0.0)	2 (1.3)	12 (3.5)	57 (5.6)	29 (6.5)
Belgium (Fl)	r	5 (1.7)	24 (8.0)	22 (7.0)	27 (7.3)	22 (6.3)
Belgium (Fr)	s	3 (1.9)	25 (5.1)	18 (4.8)	32 (5.9)	22 (6.6)
Canada		0 (0.0)	4 (1.7)	3 (0.7)	31 (3.9)	63 (4.3)
Colombia	r	68 (4.5)	17 (3.3)	11 (3.1)	3 (1.8)	1 (1.0)
Cyprus	r	67 (0.0)	28 (0.0)	3 (0.0)	0 (0.0)	3 (0.0)
Czech Republic		22 (4.4)	40 (4.6)	19 (3.8)	19 (4.8)	0 (0.0)
Denmark	s	0 (0.0)	0 (0.0)	3 (1.6)	59 (4.9)	38 (4.7)
England	r	0 (0.0)	1 (0.7)	1 (1.0)	16 (4.1)	82 (4.4)
France	r	0 (0.0)	18 (3.6)	17 (3.5)	33 (7.0)	32 (5.0)
Germany	s	20 (6.0)	22 (5.3)	27 (4.9)	28 (6.5)	3 (1.2)
Greece		37 (5.5)	12 (2.3)	23 (3.9)	16 (3.7)	13 (4.8)
Hong Kong		9 (3.8)	24 (4.8)	39 (5.9)	24 (4.8)	4 (4.2)
Hungary		7 (2.5)	27 (4.1)	36 (4.8)	25 (4.8)	5 (2.5)
Iceland		6 (0.0)	10 (0.0)	16 (0.0)	35 (0.0)	32 (0.0)
Iran, Islamic Rep.		100 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Ireland	s	3 (2.1)	14 (3.8)	30 (5.2)	36 (6.6)	17 (7.1)
Israel		x x	x x	x x	x x	x x
Japan		6 (2.7)	8 (2.8)	13 (2.0)	42 (4.0)	31 (4.1)
Korea		17 (4.5)	24 (3.0)	13 (2.8)	21 (5.5)	25 (5.4)
Kuwait		x x	x x	x x	x x	x x
Latvia (LSS)		62 (4.4)	17 (2.9)	10 (2.7)	11 (2.9)	1 (1.1)
Lithuania		70 (4.2)	22 (3.6)	4 (1.7)	3 (1.5)	1 (1.0)
Netherlands	s	3 (2.6)	9 (3.1)	15 (4.7)	50 (7.6)	23 (6.0)
New Zealand		0 (0.0)	3 (1.3)	4 (1.3)	38 (5.5)	55 (5.8)
Norway	r	21 (7.6)	33 (5.2)	9 (2.4)	32 (8.5)	5 (3.6)
Portugal		14 (4.2)	71 (5.0)	10 (5.1)	5 (3.1)	0 (0.0)
Romania		91 (1.3)	9 (1.2)	0 (0.2)	0 (0.0)	0 (0.0)
Russian Federation		39 (4.1)	34 (3.8)	13 (3.5)	14 (3.4)	1 (1.0)
Scotland	r	4 (4.2)	3 (1.5)	1 (0.7)	8 (2.1)	83 (4.8)
Singapore		0 (0.0)	17 (0.0)	9 (0.0)	39 (0.0)	35 (0.0)
Slovak Republic		28 (4.7)	47 (4.0)	11 (3.2)	12 (4.7)	2 (1.6)
Slovenia	r	14 (4.5)	50 (5.6)	31 (6.5)	3 (2.1)	2 (1.4)
Spain		41 (4.4)	43 (4.9)	10 (2.8)	6 (2.0)	0 (0.0)
Sweden	r	0 (0.0)	2 (1.2)	8 (3.1)	49 (5.2)	41 (5.5)
[2] **Switzerland**		– –	– –	– –	– –	– –
Thailand		71 (3.8)	24 (3.5)	4 (1.7)	1 (0.8)	0 (0.0)
United States	r	1 (0.9)	2 (1.3)	4 (1.6)	23 (5.9)	70 (6.3)
International Average		23 (0.6)	19 (0.6)	12 (0.6)	23 (0.8)	22 (0.7)

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

1 Ratio of total enrollment to total computers for use by teachers and students.

2 Percentages based on total school weights cannot be computed for Switzerland; sampling based on tracks within schools at grade 8.

* See Table 1.2 for more information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Appendix A).

Because population coverage falls below 65%, Latvia is annotated LSS for Latvian Speaking Schools only.

School background data for Bulgaria and South Africa are unavailable.

A dash (–) indicates data are not available.

An "r" indicates school data available for 70-84% of schools. An "s" indicates school data available for 50-69% of schools.

An "x" indicates school data available for <50% of schools.

In Which Countries Is Capacity to Provide Instruction Affected by School-Wide Shortages or Inadequacies?

In an effort to inquire into the school resource issues that might inhibit instructional effectiveness, TIMSS asked school principals about shortages or inadequacies in three areas: general capacity to provide instruction; capacity to provide instruction in mathematics; and capacity to provide instruction in science. In the area of general capacity, principals were asked about instructional materials, budget for supplies, school buildings and grounds, heating/cooling and lighting, and instructional space. With reference to capacity to provide mathematics instruction, principals were asked about computers, computer software, calculators, library materials, and audio-visual resources for mathematics instruction. The list for capacity to provide science instruction included analogous items in the science instruction sphere as well as science laboratory experiments and materials. At the final year of secondary school, shortages or inadequacies in mathematics and science instruction also included a question about the availability of qualified mathematics or physics teachers. Figures 5.1 through 5.3 summarize the results, showing the percentage of students in schools reporting on the three areas of school-wide shortages or inadequacies for fourth grade, eighth grade, and the final year of secondary school, respectively.[1]

At fourth grade (Figure 5.1), about one-third of the schools, on average across all countries, reported that their general capacity to provide instruction was affected "some" or "a lot" by shortages or inadequacies in the items listed. In Iran, Latvia (LSS), Slovenia, and Thailand, more than half of the fourth-grade students were in such schools. Countries where relatively few problems were reported included Australia, Austria, Canada, Cyprus, the Czech Republic, the Netherlands, Norway, Singapore, and the United States. In these countries fewer than 20% of the fourth grade students were in schools reporting that their general capacity was affected. School buildings or grounds and instructional space were the factors most often mentioned as affecting general capacity at grade four (Table B.1).

When asked specifically about mathematics, more schools at grade four reported that shortages or inadequacies affected their capacity to provide mathematics instruction, with 40% of students on average in such schools. Countries where a majority of fourth-grade students were in such schools included Greece, Iran, Ireland, Israel, Korea, Latvia (LSS), Portugal, and Thailand. Only Austria, the Czech Republic, Hungary, and Singapore had relatively few schools reporting problems, with less than 20% of students in

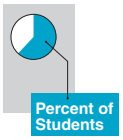
[1] The percent of schools reporting shortages or inadequacies is presented for each of the factors individually in Tables B.1-B.9 of Appendix B.

Figure 5.1

Percent of Students in Schools Reporting School-Wide Shortages or Inadequacies that Affect Capacity to Provide Instruction[1] - Fourth Grade*

Country	Facilities and Materials that Affect General Capacity to Provide Instruction[2]		Resources that Affect Capacity to Provide Instruction in Mathematics[3]		Resources that Affect Capacity to Provide Instruction in Science[4]	
Australia		18		33		45
Austria		5		8		11
Canada		17		36		52
Cyprus	r	14	r	30	r	44
Czech Republic		12		19		22
England		25		38		40
Greece		38		55		63
Hong Kong		33		25		36
Hungary		35		16		22
Iceland		28		29	r	42
Iran, Islamic Rep.		63		64		68
Ireland		26		61		78
Israel	s	20	s	57	s	64
Japan		30		32		45
Korea		41		70		79
Kuwait		x		x	s	11
Latvia (LSS)		89	r	79	r	81
Netherlands		13	r	23	r	33
New Zealand		26		37		49
Norway	r	17	r	22	r	38
Portugal		41		74		80
Scotland		–		–		–
Singapore		10		16		25
Slovenia	r	64	r	40	r	72
Thailand		96		69		78
United States	r	12	r	24	r	42
International Average		32		40		49

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.



1 Reported as percent of students in schools reporting school-wide shortages or inadequacies that affect capacity to provide instruction 'some' or 'a lot' based on the average response to several questions in each category (see Tables B.1, B.2, B.3).

2 Instructional materials; budget for supplies; school buildings/grounds; heating/cooling and lighting; instructional space.

3 Computers for mathematics instruction, computer software for mathematics instruction; calculators for mathematics instruction; library materials relevant to mathematics instruction; audio-visual resources for mathematics instruction.

4 Computers for science instruction, computer software for science instruction; calculators for science instruction; library materials relevant to science instruction; audio-visual resources for science instruction; science laboratory equipment and materials.

* See Table 1.2 for more information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Appendix A).

Because population coverage falls below 65%, Latvia is annotated LSS for Latvian Speaking Schools only.

A dash (–) indicates data are not available. A tilde (~) indicates insufficent data to report achievement.

An "r" indicates school data available for 70-84% of students. An "s" indicates school data available for 50-69% of students.

An "x" indicates school data available for <50% of students.

such schools. On average, shortages of computers and computer software and of audio-visual resources were most often reported as adversely affecting mathematics instruction (Table B.2). At grade four, the situation for science instruction was even worse, with almost half the students on average in schools where instruction was reportedly affected by resource shortages. In general, the countries where shortages affected instruction were the same for science and mathematics. Science laboratory equipment and materials were the items most often reported as adversely affecting capacity to provide science instruction (Table B.3).

The situation for schools with eighth-grade students was similar to that for fourth-grade. As seen in Figure 5.2, the countries where most eighth-grade students were in schools whose general capacity to provide instruction was affected by resource shortages included Belgium (French), Denmark, Iran, Latvia (LSS), Lithuania, Portugal, the Russian Federation, Slovenia, and Thailand. With the exception of Belgium (French) and Slovenia, these countries also had a majority of students in schools that reported that mathematics and science instruction was affected. Countries with a majority of students in schools that reported that mathematics and science instruction were affected but that their general capacity was not affected were Colombia, Korea, and Romania. In Greece, Ireland, the Slovak Republic, and the United States, the majority of students were in schools that reported shortages affecting science instruction only. As in fourth grade, general capacity to provide instruction at eighth grade was affected mostly by inadequate school buildings or shortage of instructional space (Table B.4). Lack of computers and computer software was the most common problem for mathematics instruction (Table B.5) and for science instruction (Table B.6), although science laboratory equipment and materials were also a common problem for the latter.

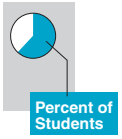
By comparison with fourth- and eighth-grade schools, resource shortages or inadequacies appear less of a problem in schools with students in the final year of secondary school (Figure 5.3). Among countries participating in TIMSS at this level, only the Russian Federation had a majority of students in schools where the general capacity to provide instruction was impaired (budget for supplies was the most frequently reported problem – Table B.7), and only this country and Lithuania had a majority in schools where mathematics or science instruction was affected. Again, shortage of computers and computer software was the most commonly reported problem for both mathematics and science instruction (Tables B.8 and B.9).

Figure 5.2

Percent of Students in Schools Reporting School-Wide Shortages or Inadequacies that Affect Capacity to Provide Instruction[1] - Eighth Grade*

Country	Facilities and Materials that Affect General Capacity to Provide Instruction[2]		Resources that Affect Capacity to Provide Instruction in Mathematics[3]		Resources that Affect Capacity to Provide Instruction in Science[4]	
Australia	r	18	r	24	r	33
Austria		12		8		26
Belgium (Fl)		4		16		9
Belgium (Fr)	r	54	r	30	r	46
Canada		13		36	r	45
Colombia		40	r	79	r	74
Cyprus	r	29	r	19	s	26
Czech Republic		10		13		20
Denmark	r	73	r	57	r	72
England	r	31	r	29	r	39
France		38		28		46
Germany	s	27	s	20	s	30
Greece		35		47		65
Hong Kong		25		22		31
Hungary		35		15		21
Iceland		23		27		30
Iran, Islamic Rep.		73		68		78
Ireland		22		49		51
Israel	s	34	s	45	s	49
Japan		27		22		31

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.



1 Reported as percent of students in schools reporting school-wide shortages or inadequacies that affect capacity to provide instruction 'some' or 'a lot' based on the average response to several questions in each category (see Tables B.4, B.5, B.6).

2 Instructional materials; budget for supplies; school buildings/grounds; heating/cooling and lighting; instructional space.

3 Computers for mathematics instruction, computer software for mathematics instruction; calculators for mathematics instruction; library materials relevant to mathematics instruction; audio-visual resources for mathematics instruction.

4 Computers for science instruction, computer software for science instruction; calculators for science instruction; library materials relevant to science instruction; audio-visual resources for science instruction; science laboratory equipment and materials.

* See Table 1.2 for more information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Appendix A).

School background data for Bulgaria and South Africa are unavailable.

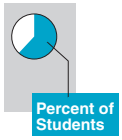
An "r" indicates school data available for 70-84% of students. An "s" indicates school data available for 50-69% of students.

Figure 5.2 (Continued)

Percent of Students in Schools Reporting School-Wide Shortages or Inadequacies that Affect Capacity to Provide Instruction[1] - Eighth Grade*

Country	Facilities and Materials that Affect General Capacity to Provide Instruction[2]	Resources that Affect Capacity to Provide Instruction in Mathematics[3]	Resources that Affect Capacity to Provide Instruction in Science[4]
Korea	44	67	78
Kuwait	x	x	x
Latvia (LSS)	r 82	r 77	r 86
Lithuania	51	71	83
Netherlands	r 8	r 13	r 8
New Zealand	27	35	47
Norway	r 16	r 19	r 27
Portugal	57	57	55
Romania	45	75	84
Russian Federation	85	82	85
Scotland	–	–	–
Singapore	10	10	12
Slovak Republic	17	49	58
Slovenia	r 62	r 38	r 68
Spain	25	28	34
Sweden	18	17	32
Switzerland	r 13	r 9	r 10
Thailand	r 83	69	77
United States	27	44	62
International Average	35	38	47

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.



1 Reported as percent of students in schools reporting school-wide shortages or inadequacies that affect capacity to provide instruction 'some' or 'a lot' based on the average response to several questions in each category (see Tables B.4, B.5, B.6).

2 Instructional materials; budget for supplies; school buildings/grounds; heating/cooling and lighting; instructional space.

3 Computers for mathematics instruction, computer software for mathematics instruction; calculators for mathematics instruction; library materials relevant to mathematics instruction; audio-visual resources for mathematics instruction.

4 Computers for science instruction, computer software for science instruction; calculators for science instruction; library materials relevant to science instruction; audio-visual resources for science instruction; science laboratory equipment and materials.

* See Table 1.2 for more information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Appendix A).

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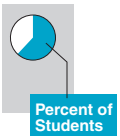
An "x" indicates school data available for <50% of students.

Figure 5.3

Percent of Students in Schools Reporting School-Wide Shortages or Inadequacies that Affect Capacity to Provide Instruction[1] - Final Year of Secondary School*

Country	Facilities and Materials that Affect General Capacity to Provide Instruction[2]		Resources that Affect Capacity to Provide Instruction in Mathematics[3]		Resources that Affect Capacity to Provide Instruction in Science[4]	
Australia		3		28		15
Austria		3		1	r	6
Canada	r	16	r	40	r	40
Cyprus	r	33	r	4	r	18
Czech Republic		15		15		12
Denmark	r	31	r	31	s	27
France	r	32		31		42
Germany	s	28	s	4	s	16
Hungary	r	33	r	35	r	26
Iceland	s	15	–		r	14
Italy		39		29		28
Lithuania	r	43	r	58	r	56
New Zealand		20		32		31
Norway		1		7	r	5
Russian Federation		65		81		74
Slovenia		x		x		–
South Africa		x		x		x
Sweden	r	7	r	8	r	13
Switzerland	r	10	r	2	r	9
United States	r	21	r	34	r	39
International Average		23		26		26

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.



1 Reported as percent of students in schools reporting school-wide shortages or inadequacies that affect capacity to provide instruction 'some' or 'a lot' based on the average response to several questions in each category (see Tables B.7, B.8, B.9).

2 Instructional materials; budget for supplies; school buildings/grounds; heating/cooling and lighting; instructional space.

3 Computers for mathematics instruction, computer software for mathematics instruction; calculators for mathematics instruction; library materials relevant to mathematics instruction; audio-visual resources for mathematics instruction; availability of suitably qualified mathematics teachers.

4 Computers for science instruction, computer software for science instruction; calculators for science instruction; library materials relevant to science instruction; audio-visual resources for science instruction; science laboratory equipment and materials; availability of suitably qualified physics teachers.

* See Table 1.2 for more information about the grades tested in each country.

( ) Standard errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Countries shown in italics did not satisfy one or more guidelines for sample participation rates, age/grade specifications, or classroom sampling procedures (see Appendix A).

The Netherlands did not administer the school questionnaire at the final year of secondary school.

A dash (–) indicates data are not available.

An "r" indicates school data available for 70-84% of students. An "s" indicates school data available for 50-69% of students.

An "x" indicates school data available for <50% of students.