

# Chapter 6



## *Teachers of Mathematics*

To help place students' mathematics achievement in the context of their school and classroom situations, the mathematics teachers of the students tested were asked to complete questionnaires about their experience and education. This chapter presents teachers' reports about their background characteristics, education and training in teaching mathematics, and about how well prepared they feel to teach mathematics. It is important to note that the data shown are the percentages of students whose teachers reported on various characteristics. That is, the student is the unit of analysis so that TIMSS can describe the classroom contexts of the students. The exhibits have special notations when relatively large percentages of students did not have teacher questionnaire information. For a country where teacher responses were available for 70 to 84 percent of the students, an "r" is included next to its data.<sup>1</sup> Where teacher responses were available for 50 to 69 percent of students, an "s" is included. Where teacher responses were available for less than 50 percent, an "x" replaces the data.

### **What Are the Background Characteristics of Mathematics Teachers?**

This section presents information about the background characteristics of the teachers of mathematics, including gender, age, and years teaching experience. As shown in Exhibit 6.1, in many countries, most fourth-grade students were taught mathematics by females (international average of 79%). This was less so at the eighth grade (international average of 57%), although the majority of students had female teachers in more than half of the countries.

<sup>1</sup> Although countries worked hard to maximize participation by teachers, sometimes this was affected by external factors. For example, a teacher strike led to somewhat reduced teacher participation in Israel.

Exhibit 6.1 **Mathematics Teachers' Gender, Age, and Number of Years Teaching with Trends**

**TIMSS2007**  
Mathematics **4<sup>th</sup>**  
Grade

Country	Percentage of Students by Teacher Characteristics						Trends in Average Number of Years Teaching	
	Gender		Age				2007	Difference from 2003
	Female	Male	29 Years or Under	30–39 Years	40–49 Years	50 Years or Older		
Algeria	58 (4.5)	42 (4.5)	6 (1.9)	45 (4.6)	44 (4.4)	5 (1.8)	17 (0.6)	0 (0)
Armenia	85 (3.3)	15 (3.3)	15 (3.0)	20 (3.2)	26 (3.2)	39 (4.4)	22 (0.8)	2 (1.2)
Australia	80 (3.4)	20 (3.4)	21 (3.9)	18 (3.4)	29 (4.1)	32 (3.4)	17 (1.0)	0 (1.3)
Austria	89 (2.0)	11 (2.0)	8 (2.1)	21 (2.7)	36 (2.8)	34 (2.8)	22 (0.7)	0 (0)
Chinese Taipei	75 (3.7)	25 (3.7)	21 (3.6)	46 (3.9)	25 (3.2)	8 (2.3)	12 (0.7)	1 (1.0)
Colombia	76 (4.3)	24 (4.3)	13 (3.6)	28 (4.9)	30 (4.0)	29 (4.5)	19 (1.1)	0 (0)
Czech Republic	91 (2.5)	9 (2.5)	11 (2.5)	24 (3.1)	40 (3.4)	25 (3.2)	17 (1.0)	0 (0)
Denmark	49 (4.0)	51 (4.0)	9 (1.9)	30 (4.2)	24 (3.9)	37 (4.3)	16 (1.1)	0 (0)
El Salvador	70 (4.2)	30 (4.2)	14 (2.7)	38 (3.9)	40 (4.0)	8 (2.6)	14 (0.7)	0 (0)
England	69 (3.5)	31 (3.5)	31 (3.8)	29 (3.4)	23 (3.4)	16 (3.0)	r 11 (0.8)	-2 (1.2)
Georgia	99 (0.8)	1 (0.8)	4 (1.5)	17 (2.6)	29 (3.9)	50 (3.8)	25 (0.9)	0 (0)
Germany	85 (2.1)	15 (2.1)	9 (1.8)	20 (2.7)	16 (2.5)	56 (3.1)	22 (0.8)	0 (0)
Hong Kong SAR	59 (4.1)	41 (4.1)	38 (3.8)	37 (4.1)	11 (2.9)	13 (2.7)	12 (0.8)	-1 (1.3)
Hungary	95 (1.7)	5 (1.7)	5 (1.9)	20 (2.7)	45 (3.3)	30 (3.5)	23 (0.7)	3 (1.1) (▲)
Iran, Islamic Rep. of	53 (2.7)	47 (2.7)	14 (2.4)	40 (4.1)	40 (3.9)	7 (1.6)	16 (0.6)	0 (0.9)
Italy	97 (0.9)	3 (0.9)	4 (1.4)	20 (2.3)	37 (3.0)	39 (3.1)	21 (0.6)	0 (0.9)
Japan	65 (3.1)	35 (3.1)	13 (2.5)	20 (3.1)	39 (3.5)	28 (3.5)	19 (0.8)	0 (1.1)
Kazakhstan	94 (1.7)	6 (1.7)	11 (3.0)	34 (3.7)	34 (5.2)	22 (4.6)	18 (0.9)	0 (0)
Kuwait	r 88 (2.7)	12 (2.7)	r 37 (4.3)	56 (4.5)	7 (2.1)	0 (0.0)	r 8 (0.5)	0 (0)
Latvia	100 (0.3)	0 (0.0)	5 (1.6)	27 (3.1)	39 (3.2)	29 (3.1)	22 (0.7)	2 (1.2) (▲)
Lithuania	98 (0.8)	2 (0.8)	1 (0.6)	34 (3.0)	39 (3.5)	26 (3.3)	21 (0.6)	2 (0.9) (▲)
Morocco	50 (4.3)	50 (4.3)	21 (3.0)	29 (3.7)	35 (3.6)	15 (2.9)	s 16 (0.6)	1 (1.0)
Netherlands	58 (4.1)	42 (4.1)	24 (3.5)	19 (3.1)	15 (3.0)	42 (3.9)	18 (1.0)	2 (1.5)
New Zealand	75 (2.4)	25 (2.4)	27 (2.6)	29 (2.1)	23 (2.0)	21 (2.2)	11 (0.6)	0 (0.8)
Norway	82 (2.4)	18 (2.4)	10 (2.0)	28 (2.8)	20 (2.6)	42 (2.9)	17 (0.8)	1 (1.3)
Qatar	92 (0.1)	8 (0.1)	39 (0.2)	42 (0.1)	18 (0.1)	1 (0.0)	9 (0.0)	0 (0)
Russian Federation	99 (0.9)	1 (0.9)	7 (2.3)	34 (3.3)	37 (3.6)	22 (2.4)	21 (0.5)	1 (0.9)
Scotland	92 (1.8)	8 (1.8)	23 (3.6)	21 (3.1)	23 (2.8)	33 (3.4)	r 15 (0.9)	-1 (1.3)
Singapore	67 (2.6)	33 (2.6)	37 (2.8)	36 (3.1)	18 (2.2)	8 (1.7)	10 (0.6)	-1 (1.1)
Slovak Republic	94 (1.7)	6 (1.7)	12 (2.4)	32 (3.5)	28 (3.3)	28 (2.7)	20 (0.7)	0 (0)
Slovenia	98 (0.7)	2 (0.7)	14 (1.9)	21 (2.4)	48 (3.0)	17 (2.5)	19 (0.6)	1 (1.0)
Sweden	82 (2.9)	18 (2.9)	7 (1.8)	26 (3.1)	26 (2.5)	41 (3.3)	18 (0.9)	0 (0)
Tunisia	66 (3.4)	34 (3.4)	8 (2.0)	47 (4.2)	35 (3.4)	10 (1.8)	r 17 (0.5)	-1 (0.9)
Ukraine	100 (0.0)	0 (0.0)	8 (1.8)	32 (3.7)	38 (3.9)	22 (2.8)	22 (0.6)	0 (0)
United States	88 (1.7)	12 (1.7)	18 (2.0)	28 (2.3)	22 (2.1)	31 (2.1)	14 (0.4)	0 (0.7)
Yemen	26 (3.9)	74 (3.9)	29 (4.0)	61 (4.7)	8 (2.3)	2 (1.6)	13 (0.6)	0 (0)
International Avg.	79 (0.5)	21 (0.5)	16 (0.4)	31 (0.6)	29 (0.5)	24 (0.5)	17 (0.1)	0 (0)
<b>Benchmarking Participants</b>								
Alberta, Canada	80 (3.1)	20 (3.1)	16 (3.1)	28 (4.0)	29 (4.1)	27 (3.3)	14 (0.8)	0 (0)
British Columbia, Canada	82 (2.9)	18 (2.9)	r 10 (2.7)	32 (4.0)	23 (3.1)	35 (3.8)	r 15 (0.8)	0 (0)
Dubai, UAE	r 80 (5.2)	20 (5.2)	r 21 (3.8)	44 (5.1)	24 (4.3)	11 (3.9)	r 13 (0.9)	0 (0)
Massachusetts, US	93 (2.9)	7 (2.9)	23 (4.2)	28 (5.5)	23 (5.6)	26 (5.7)	13 (0.9)	0 (0)
Minnesota, US	75 (5.6)	25 (5.6)	8 (3.4)	29 (5.3)	22 (5.4)	41 (7.2)	18 (1.2)	0 (0)
Ontario, Canada	84 (3.2)	16 (3.2)	12 (2.7)	29 (4.5)	38 (4.9)	21 (3.9)	13 (0.8)	0 (1.2)
Quebec, Canada	87 (3.0)	13 (3.0)	12 (2.5)	30 (3.6)	33 (4.2)	25 (3.8)	16 (0.8)	-2 (1.2)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

2007 significantly higher (▲)  
2007 significantly lower (▼)

Background data provided by teachers.

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

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students. A diamond (◊) indicates the country did not participate in the assessment.



**TIMSS & PIRLS**  
International Study Center  
Lynch School of Education, Boston College

Exhibit 6.1 Mathematics Teachers' Gender, Age, and Number of Years Teaching with Trends (Continued)

TIMSS2007  
Mathematics 8<sup>th</sup> Grade

Country	Percentage of Students by Teacher Characteristics						Trends in Average Number of Years Teaching	
	Gender		Age				2007	Difference from 2003
	Female	Male	29 Years or Under	30–39 Years	40–49 Years	50 Years or Older		
Algeria	40 (4.2)	60 (4.2)	6 (1.9)	25 (3.8)	63 (4.0)	7 (2.0)	19 (0.8)	∅ ∅
Armenia	82 (2.7)	18 (2.7)	9 (2.6)	26 (3.3)	29 (3.4)	36 (3.6)	r 20 (0.7)	1 (1.0)
Australia	49 (4.3)	51 (4.3)	20 (3.2)	29 (3.7)	22 (3.2)	30 (3.2)	15 (0.8)	0 (1.2)
Bahrain	48 (1.1)	52 (1.1)	18 (1.9)	51 (2.7)	27 (2.6)	4 (1.4)	12 (0.5)	1 (0.9)
Bosnia and Herzegovina	57 (4.1)	43 (4.1)	6 (2.1)	22 (3.3)	22 (3.7)	50 (3.5)	23 (0.8)	∅ ∅
Botswana	43 (4.5)	57 (4.5)	32 (4.4)	60 (4.5)	8 (2.3)	0 (0.1)	r 8 (0.4)	1 (0.7)
Bulgaria	86 (2.7)	14 (2.7)	1 (0.7)	12 (2.6)	37 (4.1)	50 (4.2)	23 (0.9)	3 (1.1) ▲
Chinese Taipei	57 (4.4)	43 (4.4)	16 (3.2)	45 (4.1)	29 (3.7)	10 (2.4)	12 (0.7)	-2 (1.1)
Colombia	41 (5.8)	59 (5.8)	23 (4.0)	25 (3.8)	22 (4.1)	31 (5.3)	18 (1.4)	∅ ∅
Cyprus	69 (2.4)	31 (2.4)	6 (1.5)	32 (2.4)	36 (2.6)	26 (2.5)	13 (0.5)	1 (0.8)
Czech Republic	79 (3.3)	21 (3.3)	13 (2.4)	19 (3.0)	34 (3.6)	35 (3.9)	20 (0.9)	∅ ∅
Egypt	22 (3.5)	78 (3.5)	10 (2.5)	52 (3.8)	34 (3.6)	4 (1.4)	14 (0.6)	1 (0.7)
El Salvador	55 (4.6)	45 (4.6)	21 (3.7)	45 (4.9)	27 (3.3)	7 (2.3)	12 (0.6)	∅ ∅
England	52 (4.2)	48 (4.2)	18 (3.4)	25 (3.3)	26 (3.3)	31 (2.8)	r 14 (0.9)	-2 (1.7)
Georgia	89 (3.2)	11 (3.2)	3 (1.3)	21 (3.7)	30 (4.1)	46 (4.2)	23 (1.0)	∅ ∅
Ghana	8 (2.2)	92 (2.2)	52 (3.9)	28 (4.2)	16 (3.1)	4 (1.1)	7 (0.4)	0 (0.7)
Hong Kong SAR	40 (3.8)	60 (3.8)	26 (4.0)	35 (4.4)	27 (4.3)	12 (2.7)	13 (0.9)	1 (1.2)
Hungary	80 (3.3)	20 (3.3)	9 (2.7)	19 (3.3)	35 (2.9)	37 (3.2)	21 (0.8)	-1 (1.1)
Indonesia	44 (4.3)	56 (4.3)	15 (3.2)	41 (3.9)	37 (4.3)	7 (2.3)	14 (0.7)	0 (0.9)
Iran, Islamic Rep. of	42 (2.0)	58 (2.0)	26 (3.2)	49 (3.5)	20 (3.1)	5 (1.3)	14 (0.5)	0 (0.7)
Israel	76 (3.3)	24 (3.3)	15 (2.7)	33 (3.2)	32 (3.0)	20 (2.4)	r 17 (0.7)	1 (1.0)
Italy	81 (2.8)	19 (2.8)	2 (1.1)	10 (1.9)	22 (2.3)	67 (2.9)	23 (0.7)	0 (0.9)
Japan	43 (3.7)	57 (3.7)	20 (3.1)	28 (3.3)	39 (3.7)	13 (2.7)	16 (0.8)	-1 (1.0)
Jordan	52 (2.6)	48 (2.6)	36 (3.9)	39 (3.8)	18 (3.0)	7 (2.0)	10 (0.6)	-1 (0.9)
Korea, Rep. of	64 (3.2)	36 (3.2)	25 (2.8)	29 (2.9)	34 (3.2)	12 (2.5)	s 14 (0.6)	1 (0.8)
Kuwait	r 51 (2.5)	49 (2.5)	r 19 (3.7)	49 (4.9)	22 (3.6)	10 (2.9)	r 12 (0.7)	∅ ∅
Lebanon	42 (4.4)	58 (4.4)	33 (4.0)	27 (3.6)	22 (3.7)	19 (3.8)	r 14 (0.9)	-1 (1.2)
Lithuania	93 (1.7)	7 (1.7)	7 (1.8)	12 (2.7)	47 (4.0)	34 (3.4)	22 (0.7)	2 (1.1) ▲
Malaysia	71 (3.7)	29 (3.7)	22 (3.7)	39 (4.1)	28 (3.8)	10 (2.5)	12 (0.7)	2 (0.9)
Malta	59 (0.2)	41 (0.2)	47 (0.2)	30 (0.2)	13 (0.2)	10 (0.1)	11 (0.0)	∅ ∅
Norway	41 (3.6)	59 (3.6)	10 (2.2)	34 (3.0)	17 (2.3)	39 (2.5)	17 (0.7)	-1 (1.2)
Oman	52 (2.4)	48 (2.4)	83 (3.0)	14 (2.9)	3 (1.0)	0 (0.4)	5 (0.4)	∅ ∅
Palestinian Nat'l Auth.	49 (3.1)	51 (3.1)	37 (4.4)	29 (3.7)	24 (3.4)	11 (2.4)	12 (0.9)	1 (1.1)
Qatar	51 (0.2)	49 (0.2)	25 (0.1)	40 (0.1)	22 (0.1)	13 (0.1)	14 (0.0)	∅ ∅
Romania	60 (3.4)	40 (3.4)	6 (1.8)	21 (3.0)	23 (3.1)	50 (3.2)	23 (1.0)	0 (1.5)
Russian Federation	94 (1.8)	6 (1.8)	5 (1.0)	21 (2.8)	33 (2.9)	41 (3.4)	24 (0.7)	0 (1.1)
Saudi Arabia	47 (1.7)	53 (1.7)	35 (4.3)	46 (4.2)	13 (2.6)	7 (2.6)	11 (0.8)	--
Scotland	58 (3.1)	42 (3.1)	16 (2.1)	25 (3.0)	25 (2.9)	33 (3.6)	r 15 (0.8)	-1 (1.3)
Serbia	61 (4.4)	39 (4.4)	9 (2.4)	20 (3.0)	20 (3.5)	51 (4.0)	20 (1.0)	-2 (1.4)
Singapore	64 (2.7)	36 (2.7)	45 (2.5)	31 (2.3)	12 (1.8)	12 (1.3)	8 (0.4)	-4 (0.8) ▼
Slovenia	82 (2.0)	18 (2.0)	17 (2.1)	23 (2.4)	39 (3.0)	21 (2.5)	18 (0.6)	-2 (1.0)
Sweden	55 (2.9)	45 (2.9)	11 (2.0)	30 (2.7)	22 (2.7)	37 (3.2)	15 (0.8)	1 (1.1)
Syrian Arab Republic	55 (3.8)	45 (3.8)	34 (3.8)	39 (4.0)	17 (3.0)	10 (2.8)	11 (0.7)	∅ ∅
Thailand	64 (4.1)	36 (4.1)	19 (3.5)	29 (3.9)	26 (3.9)	25 (3.8)	15 (0.9)	∅ ∅
Tunisia	33 (3.8)	67 (3.8)	15 (2.9)	47 (4.1)	25 (3.6)	13 (2.7)	s 13 (0.6)	0 (1.1)
Turkey	45 (4.2)	55 (4.2)	49 (4.0)	16 (2.8)	19 (3.3)	16 (3.4)	11 (0.8)	∅ ∅
Ukraine	91 (2.4)	9 (2.4)	8 (2.3)	21 (3.1)	31 (4.1)	40 (4.2)	23 (0.9)	∅ ∅
United States	69 (2.6)	31 (2.6)	20 (2.3)	29 (2.8)	26 (2.8)	25 (2.2)	14 (0.6)	-1 (0.9)
‡ Morocco	25 (3.5)	75 (3.5)	9 (2.9)	13 (3.0)	47 (5.4)	31 (5.2)	r 20 (1.3)	--
International Avg.	57 (0.5)	43 (0.5)	21 (0.4)	30 (0.5)	26 (0.5)	23 (0.4)	15 (0.1)	
<b>Benchmarking Participants</b>								
Basque Country, Spain	51 (5.2)	49 (5.2)	2 (1.4)	23 (4.0)	34 (4.3)	41 (4.8)	22 (1.1)	1 (1.4)
British Columbia, Canada	45 (4.3)	55 (4.3)	16 (3.4)	39 (4.7)	24 (3.9)	21 (3.8)	13 (0.8)	∅ ∅
Dubai, UAE	s 57 (6.2)	43 (6.2)	s 13 (1.5)	46 (5.6)	24 (4.3)	17 (4.3)	s 15 (0.6)	∅ ∅
Massachusetts, US	56 (6.1)	44 (6.1)	23 (5.6)	29 (6.5)	23 (5.3)	25 (5.3)	12 (1.2)	∅ ∅
Minnesota, US	50 (8.2)	50 (8.2)	33 (8.6)	32 (7.7)	19 (7.0)	16 (4.6)	12 (1.5)	∅ ∅
Ontario, Canada	49 (3.6)	51 (3.6)	20 (3.8)	50 (5.0)	16 (3.6)	14 (3.5)	10 (0.9)	-1 (1.2)
Quebec, Canada	53 (4.3)	47 (4.3)	22 (3.7)	46 (4.6)	19 (3.6)	13 (2.7)	11 (0.8)	-5 (1.3) ▼

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

2007 significantly higher ▲  
2007 significantly lower ▼

Background data provided by teachers.

‡ Did not satisfy guidelines for sample participation rates (see Appendix A).

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

A dash (-) indicates comparable data are not available.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

A diamond (∅) indicates the country did not participate in the assessment.

Exhibit 6.1 also presents teachers' reports about their age and teaching experience. At both the fourth and eighth grades, the majority of students were taught mathematics by teachers in their 30s and 40s. Relatively few students, 16 to 21 percent on average internationally, were taught by younger teachers. Several countries participating at the eighth grade did have the majority of their students taught by younger teachers (for example, Ghana and Oman). Although about one-fourth of the students internationally (23–24%) were taught by teachers age 50 or older, the teaching force was older in a number of countries. For example, half or more of the students had teachers 50 years or older in Georgia and Germany at the fourth grade, and at the eighth grade in Bosnia and Herzegovina, Bulgaria, Italy, Romania, and Serbia. Older teachers can have more experience and as would be expected from their ages, on average internationally, mathematics teachers at both the fourth and eighth grades were relatively experienced, with 15 to 17 years of teaching. Increases in years teaching experience were noted at the fourth grade in Hungary, Latvia, and Lithuania, and at the eighth grade in Bulgaria and Lithuania. The only decreases were at the eighth grade in Singapore and the benchmarking province of Quebec.

### **What Education and Training Do Teachers Have for Teaching Mathematics?**

Exhibit 6.2 presents teachers' highest level of education. On average internationally, 70 percent of the fourth grade students and 78 percent of the eighth grade students had teachers with a university degree. However, at the fourth grade, there was some variation and the majority of students in Algeria, Italy, Morocco, and Tunisia had teachers that had completed only secondary school.

Exhibit 6.3 contains information about teachers' educational emphasis in mathematics. Most countries have a national or regional mathematics curriculum, and most countries reported that teachers received specific preparation in how to teach the mathematics curriculum as part of pre-service education. However, the teachers of the fourth grade students in a number of countries reported little specific training or specialized education in mathematics. Countries where 80 percent or more of the fourth grade students had teachers who studied primary/elementary education without a major or specialization in mathematics or science, included Australia, Austria, the Czech Republic, Hungary, Lithuania, and the Slovak Republic as well as the benchmarking province of Quebec. At the other end of the continuum, 80 percent or more had teachers with primary/elementary education and a major or specialization in mathematics or science in Germany and Kazakhstan. In Armenia and Kuwait almost all teachers had a mathematics major or specialization (94 to 98%), but few had studied primary/elementary education. At the eighth grade, on average internationally, most students had teachers who had studied mathematics (70%) or mathematics education (54%) or both (since teachers often reported that their study was focused in more than one area).

Exhibit 6.4 contains teachers' reports about their participation in professional development related to teaching mathematics. At the fourth grade, two-fifths or more of the students, on average internationally, had teachers that had participated in some type of professional development during the past two years in the various mathematics areas asked about by TIMSS, including mathematics content (42%), mathematics pedagogy (47%), mathematics curriculum (40%), and/or improving students' critical thinking or problem-solving skills (40%). Somewhat fewer students had teachers

## Exhibit 6.2 Highest Educational Level of Mathematics Teachers\*

TIMSS2007  
Mathematics 4<sup>th</sup> Grade

Country	Percentage of Students by Their Teachers' Educational Level				
	Completed Postgraduate University Degree**	Completed University but Not a Postgraduate Degree	Completed Post-secondary Education but Not University	Completed Upper-secondary School	Did Not Complete Upper-secondary School
Algeria	0 (0.5)	19 (3.3)	5 (2.1)	69 (3.8)	7 (1.9)
Armenia	0 (0.0)	98 (1.2)	2 (1.2)	0 (0.0)	0 (0.0)
Australia	42 (4.0)	51 (4.1)	7 (1.6)	0 (0.0)	0 (0.0)
Austria	3 (1.0)	1 (0.5)	93 (1.7)	3 (1.0)	0 (0.0)
Chinese Taipei	16 (3.0)	69 (3.6)	2 (1.0)	12 (2.7)	1 (0.0)
Colombia	10 (2.6)	75 (4.4)	4 (1.8)	11 (3.1)	1 (0.0)
Czech Republic	84 (2.8)	3 (1.2)	2 (0.8)	11 (2.6)	0 (0.0)
Denmark	2 (1.0)	86 (3.2)	9 (2.7)	3 (1.4)	1 (0.6)
El Salvador	0 (0.0)	20 (3.1)	65 (4.1)	14 (3.2)	2 (1.2)
England	35 (4.1)	56 (4.5)	10 (2.2)	0 (0.0)	0 (0.0)
Georgia	90 (1.9)	9 (1.7)	0 (0.0)	1 (0.8)	0 (0.0)
Germany	0 (0.0)	100 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
Hong Kong SAR	12 (3.0)	71 (3.8)	16 (3.0)	1 (0.7)	0 (0.0)
Hungary	--	--	--	--	--
Iran, Islamic Rep. of	1 (0.6)	27 (4.1)	44 (4.2)	28 (3.9)	0 (0.0)
Italy	2 (0.7)	19 (2.5)	6 (1.5)	73 (3.0)	0 (0.0)
Japan	3 (1.2)	90 (2.2)	8 (1.8)	0 (0.0)	0 (0.0)
Kazakhstan	24 (3.4)	40 (5.3)	35 (5.3)	0 (0.0)	0 (0.0)
Kuwait	1 (0.9)	95 (1.9)	4 (1.6)	0 (0.0)	0 (0.0)
Latvia	0 (0.0)	98 (0.8)	0 (0.0)	2 (0.8)	0 (0.0)
Lithuania	18 (2.5)	60 (3.1)	22 (2.9)	0 (0.0)	0 (0.0)
Morocco	1 (0.5)	22 (3.7)	4 (1.7)	58 (4.0)	14 (2.6)
Netherlands	2 (1.4)	96 (1.7)	0 (0.0)	1 (1.0)	0 (0.0)
New Zealand	9 (1.3)	66 (2.7)	25 (2.2)	0 (0.0)	0 (0.0)
Norway	1 (0.5)	71 (3.3)	27 (3.2)	1 (0.7)	1 (0.4)
Qatar	7 (0.1)	86 (0.1)	7 (0.1)	0 (0.0)	0 (0.0)
Russian Federation	36 (3.4)	35 (3.5)	29 (3.1)	0 (0.0)	0 (0.0)
Scotland	30 (4.0)	70 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)
Singapore	4 (1.1)	55 (2.5)	38 (2.2)	3 (1.1)	0 (0.4)
Slovak Republic	98 (1.1)	0 (0.0)	0 (0.0)	2 (1.0)	0 (0.0)
Slovenia	0 (0.0)	50 (2.6)	49 (2.6)	0 (0.4)	0 (0.0)
Sweden	11 (2.1)	58 (3.8)	31 (3.2)	0 (0.0)	0 (0.0)
Tunisia	0 (0.0)	9 (2.3)	32 (4.0)	58 (3.5)	0 (0.0)
Ukraine	1 (0.6)	81 (3.1)	18 (3.1)	0 (0.0)	0 (0.0)
United States	52 (2.7)	47 (2.7)	0 (0.2)	0 (0.0)	0 (0.0)
Yemen	0 (0.0)	15 (2.9)	41 (4.4)	39 (4.7)	4 (2.3)
<b>International Avg.</b>	<b>17 (0.3)</b>	<b>53 (0.5)</b>	<b>18 (0.4)</b>	<b>11 (0.3)</b>	<b>1 (0.1)</b>
<b>Benchmarking Participants</b>					
Alberta, Canada	12 (2.4)	86 (2.7)	1 (1.0)	0 (0.0)	0 (0.0)
British Columbia, Canada	19 (2.4)	81 (2.4)	0 (0.0)	0 (0.0)	0 (0.0)
Dubai, UAE	1 (0.8)	91 (2.5)	7 (2.5)	1 (0.7)	0 (0.0)
Massachusetts, US	82 (4.2)	18 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)
Minnesota, US	70 (5.6)	30 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)
Ontario, Canada	21 (3.7)	77 (3.8)	2 (0.9)	1 (0.6)	0 (0.0)
Quebec, Canada	9 (2.4)	90 (2.6)	2 (1.2)	0 (0.0)	0 (0.0)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

Background data provided by teachers.

\* Based on countries' categorizations to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-1997).

\*\* For example, doctorate, master's, other postgraduate degree or diploma.

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

A dash (-) indicates comparable data are not available.

An "r" indicates data are available for at least 70 but less than 85% of the students.

Exhibit 6.2 Highest Educational Level of Mathematics Teachers\* (Continued)

TIMSS2007  
Mathematics 8<sup>th</sup> Grade

Country	Percentage of Students by Their Teachers' Educational Level				
	Completed Postgraduate University Degree**	Completed University but Not a Postgraduate Degree	Completed Post-secondary Education but Not University	Completed Upper-secondary School	Did Not Complete Upper-secondary School
Algeria	1 (0.0)	14 (3.0)	63 (3.7)	20 (3.4)	3 (1.5)
Armenia	94 (1.6)	4 (1.0)	2 (1.3)	0 (0.0)	0 (0.0)
Australia	60 (4.1)	38 (3.9)	2 (1.1)	0 (0.0)	0 (0.0)
Bahrain	10 (1.9)	86 (2.3)	4 (1.4)	0 (0.0)	0 (0.0)
Bosnia and Herzegovina	1 (0.6)	8 (2.1)	91 (2.3)	1 (0.8)	0 (0.0)
Botswana	1 (1.0)	9 (2.6)	89 (2.8)	0 (0.0)	0 (0.0)
Bulgaria	77 (3.4)	12 (2.5)	11 (2.5)	0 (0.0)	0 (0.0)
Chinese Taipei	22 (3.5)	72 (3.7)	1 (1.0)	5 (1.8)	0 (0.0)
Colombia	13 (5.7)	84 (5.8)	1 (1.1)	1 (0.1)	1 (0.8)
Cyprus	24 (2.8)	76 (2.8)	0 (0.0)	0 (0.0)	0 (0.0)
Czech Republic	97 (1.2)	1 (0.0)	1 (0.0)	2 (0.8)	0 (0.0)
Egypt	6 (1.7)	91 (2.2)	0 (0.5)	0 (0.0)	2 (1.4)
El Salvador	0 (0.0)	27 (4.5)	67 (4.6)	6 (2.0)	0 (0.0)
England	30 (3.3)	64 (3.4)	6 (1.6)	0 (0.0)	0 (0.0)
Georgia	96 (1.5)	4 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)
Ghana	0 (0.0)	6 (1.8)	75 (3.6)	19 (3.3)	0 (0.0)
Hong Kong SAR	26 (3.7)	62 (3.8)	12 (3.1)	1 (0.9)	0 (0.0)
Hungary	--	--	--	--	--
Indonesia	0 (0.0)	76 (3.6)	20 (3.3)	4 (1.4)	0 (0.0)
Iran, Islamic Rep. of	1 (0.0)	49 (4.0)	51 (4.0)	0 (0.0)	0 (0.0)
Israel	29 (2.6)	67 (3.1)	4 (2.0)	0 (0.0)	0 (0.0)
Italy	14 (2.4)	86 (2.4)	0 (0.0)	0 (0.0)	0 (0.0)
Japan	8 (2.1)	90 (2.5)	2 (1.2)	0 (0.0)	0 (0.0)
Jordan	13 (2.6)	76 (3.4)	11 (2.2)	0 (0.0)	0 (0.0)
Korea, Rep. of	32 (3.1)	68 (3.1)	0 (0.0)	0 (0.0)	0 (0.0)
Kuwait	r 3 (1.6)	96 (1.8)	1 (0.0)	0 (0.0)	0 (0.0)
Lebanon	9 (2.3)	63 (4.5)	0 (0.0)	28 (4.2)	0 (0.0)
Lithuania	42 (4.1)	39 (4.1)	18 (3.5)	1 (0.5)	0 (0.0)
Malaysia	6 (2.0)	76 (3.4)	15 (2.6)	3 (1.5)	0 (0.0)
Malta	5 (0.1)	83 (0.1)	6 (0.1)	6 (0.1)	0 (0.0)
Norway	9 (2.0)	76 (3.0)	13 (2.4)	0 (0.0)	1 (0.9)
Oman	1 (0.5)	99 (0.9)	1 (0.0)	0 (0.0)	0 (0.0)
Palestinian Nat'l Auth.	4 (1.6)	81 (3.1)	14 (2.9)	0 (0.0)	1 (0.9)
Qatar	16 (0.1)	81 (0.1)	2 (0.0)	0 (0.0)	1 (0.0)
Romania	9 (2.3)	71 (3.7)	19 (3.0)	0 (0.3)	1 (0.5)
Russian Federation	79 (2.7)	20 (2.8)	1 (0.4)	0 (0.0)	0 (0.0)
Saudi Arabia	1 (0.0)	96 (1.5)	3 (1.2)	0 (0.0)	0 (0.0)
Scotland	30 (3.3)	70 (3.3)	0 (0.0)	0 (0.0)	0 (0.0)
Serbia	1 (0.7)	38 (3.7)	59 (3.8)	2 (1.0)	0 (0.0)
Singapore	6 (1.5)	89 (1.8)	4 (1.0)	0 (0.0)	0 (0.0)
Slovenia	1 (0.6)	45 (3.3)	50 (3.1)	4 (1.1)	0 (0.0)
Sweden	50 (2.9)	41 (2.9)	8 (1.6)	1 (0.6)	0 (0.0)
Syrian Arab Republic	2 (1.3)	5 (1.9)	89 (2.6)	3 (1.2)	2 (1.0)
Thailand	11 (2.7)	88 (2.9)	0 (0.0)	1 (0.9)	0 (0.0)
Tunisia	0 (0.0)	71 (3.6)	27 (3.5)	2 (1.1)	0 (0.0)
Turkey	7 (2.4)	66 (4.0)	27 (3.5)	0 (0.0)	0 (0.0)
Ukraine	1 (0.7)	98 (1.1)	1 (0.0)	0 (0.0)	0 (0.0)
United States	56 (2.9)	43 (2.8)	0 (0.4)	0 (0.0)	0 (0.0)
‡ Morocco	r 2 (1.7)	9 (2.7)	14 (3.1)	58 (5.8)	17 (5.2)
<b>International Avg.</b>	<b>21 (0.3)</b>	<b>57 (0.4)</b>	<b>18 (0.3)</b>	<b>3 (0.2)</b>	<b>1 (0.1)</b>
<b>Benchmarking Participants</b>					
Basque Country, Spain	49 (4.5)	51 (4.5)	0 (0.0)	0 (0.0)	0 (0.0)
British Columbia, Canada	59 (4.3)	40 (4.4)	1 (0.9)	0 (0.0)	0 (0.0)
Dubai, UAE	s 3 (1.1)	92 (1.4)	6 (1.2)	0 (0.0)	0 (0.0)
Massachusetts, US	64 (6.4)	36 (6.4)	0 (0.0)	0 (0.0)	0 (0.0)
Minnesota, US	49 (7.2)	51 (7.2)	0 (0.0)	0 (0.0)	0 (0.0)
Ontario, Canada	76 (3.8)	22 (3.7)	2 (1.1)	0 (0.0)	0 (0.0)
Quebec, Canada	16 (3.4)	82 (3.6)	1 (1.0)	0 (0.0)	0 (0.0)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

Background data provided by teachers.

\* Based on countries' categorizations to UNESCO's International Standard Classification of Education (Operational Manual for ISCED-1997).

\*\* For example, doctorate, master's, other postgraduate degree or diploma.

‡ Did not satisfy guidelines for sample participation rates (see Appendix A).

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

A dash (–) indicates comparable data are not available.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

Exhibit 6.3 Teachers' Educational Emphasis on Mathematics and Teaching

TIMSS2007  
Mathematics 4<sup>th</sup> Grade

Country	Teachers Receive Specific Preparation in How to Teach the Mathematics Curriculum as Part of Pre-service Education	Percentage of Students by Their Teachers' Major Area of Study in Their Post-secondary Education				
		Primary / Elementary Education with a Major or Specialization in Mathematics	Primary / Elementary Education with a Major or Specialization in Science but Not in Mathematics	Mathematics or Science Major or Specialization Without a Major in Primary/Elementary Education	Primary / Elementary Education Without a Major or Specialization in Mathematics or Science	Other
Algeria	–	r 11 (2.9)	6 (2.1)	14 (3.4)	46 (4.9)	22 (3.8)
Armenia	○	8 (2.1)	1 (0.8)	90 (2.4)	1 (0.5)	1 (0.6)
Australia	●	7 (1.7)	5 (1.9)	1 (0.8)	84 (2.7)	2 (0.9)
Austria	●	5 (1.3)	0 (0.0)	0 (0.0)	94 (1.4)	0 (0.2)
Chinese Taipei	●	27 (3.7)	3 (1.5)	7 (1.9)	41 (4.1)	22 (3.5)
Colombia	○	16 (4.0)	6 (2.2)	17 (4.1)	43 (4.0)	19 (4.0)
Czech Republic	●	3 (1.3)	1 (0.9)	4 (1.7)	81 (3.2)	12 (2.3)
Denmark	●	18 (3.3)	2 (1.0)	40 (4.4)	14 (2.8)	27 (3.7)
El Salvador	●	11 (2.4)	3 (1.7)	13 (3.0)	35 (4.3)	38 (4.3)
England	●	11 (2.5)	9 (2.0)	11 (2.5)	50 (3.8)	20 (3.2)
Georgia	○	56 (4.3)	1 (0.0)	13 (3.2)	19 (3.1)	11 (2.4)
Germany	●	71 (2.8)	14 (2.3)	3 (0.9)	9 (1.8)	2 (1.0)
Hong Kong SAR	●	51 (4.2)	2 (1.2)	13 (2.8)	26 (3.4)	8 (2.3)
Hungary	●	4 (2.3)	3 (1.3)	0 (0.0)	93 (2.6)	0 (0.0)
Iran, Islamic Rep. of	●	43 (4.0)	6 (2.2)	10 (2.0)	28 (3.0)	13 (2.9)
Italy	○	0 (0.0)	0 (0.0)	2 (0.7)	4 (1.2)	94 (1.4)
Japan	●	19 (3.0)	6 (1.3)	2 (1.2)	54 (3.8)	19 (2.8)
Kazakhstan	●	89 (2.9)	1 (0.8)	3 (1.3)	6 (2.5)	1 (0.4)
Kuwait	●	r 32 (4.0)	1 (1.0)	62 (4.3)	3 (1.6)	1 (0.9)
Latvia	●	69 (3.4)	2 (0.9)	2 (1.1)	27 (3.2)	0 (0.1)
Lithuania	●	8 (2.1)	1 (0.4)	2 (0.7)	85 (2.3)	5 (1.7)
Morocco	○	14 (2.9)	3 (1.4)	26 (3.7)	30 (3.7)	28 (4.1)
Netherlands	●	22 (3.7)	15 (3.2)	0 (0.0)	61 (4.5)	2 (1.2)
New Zealand	●	12 (1.9)	7 (1.2)	2 (0.7)	73 (2.4)	6 (0.8)
Norway	●	–	–	–	–	–
Qatar	●	18 (0.1)	3 (0.1)	53 (0.2)	3 (0.1)	23 (0.2)
Russian Federation	●	55 (3.0)	3 (1.2)	6 (1.4)	35 (2.8)	2 (1.0)
Scotland	●	7 (2.0)	5 (1.6)	3 (1.2)	74 (3.4)	11 (2.2)
Singapore	●	51 (3.0)	6 (1.4)	13 (2.0)	15 (2.0)	15 (2.0)
Slovak Republic	●	3 (1.1)	0 (0.0)	4 (1.5)	91 (1.8)	3 (0.8)
Slovenia	●	44 (3.0)	14 (2.1)	0 (0.0)	42 (3.1)	0 (0.4)
Sweden	●	42 (3.6)	2 (0.9)	5 (1.6)	45 (3.4)	5 (1.6)
Tunisia	●	r 3 (1.4)	2 (1.0)	13 (2.9)	24 (4.3)	58 (5.0)
Ukraine	●	23 (3.5)	1 (1.0)	2 (1.3)	68 (3.6)	6 (1.7)
United States	●	8 (1.4)	4 (1.1)	2 (0.6)	70 (2.1)	15 (1.6)
Yemen	●	19 (4.1)	0 (0.0)	39 (4.7)	17 (3.7)	25 (4.0)
International Avg.		25 (0.5)	4 (0.2)	14 (0.4)	43 (0.5)	15 (0.4)
<b>Benchmarking Participants</b>						
Alberta, Canada	●	7 (1.9)	6 (1.8)	3 (1.1)	70 (3.5)	14 (3.1)
British Columbia, Canada	○	7 (2.2)	5 (1.8)	2 (0.7)	72 (4.1)	14 (3.1)
Dubai, UAE	●	r 15 (2.5)	5 (3.3)	59 (4.0)	10 (2.1)	10 (4.4)
Massachusetts, US	●	9 (3.1)	4 (2.0)	4 (2.1)	70 (4.2)	13 (3.2)
Minnesota, US	–	10 (3.8)	9 (4.9)	0 (0.0)	77 (6.5)	4 (2.8)
Ontario, Canada	●	7 (2.9)	6 (2.3)	2 (1.2)	64 (4.5)	21 (3.3)
Quebec, Canada	●	4 (1.6)	3 (1.4)	1 (0.3)	84 (3.1)	8 (2.6)

● Yes    ○ No

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

Background data provided by National Research Coordinators and by teachers.

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

A dash (–) indicates comparable data are not available.

An "r" indicates data are available for at least 70 but less than 85% of the students.



Exhibit 6.3 Teachers' Educational Emphasis on Mathematics and Teaching (Continued)

TIMSS2007  
Mathematics 8<sup>th</sup> Grade

Country	Teachers Receive Specific Preparation in How to Teach the Mathematics Curriculum as Part of Pre-service Education	Percentage of Students by Their Teachers' Major Area of Study in Their Post-secondary Education <sup>1</sup>					
		Education – Mathematics	Mathematics	Education – Science	Science	Education – General	Other
Algeria	○	r 26 (3.8)	r 85 (3.3)	r 2 (1.5)	r 2 (1.4)	r 8 (2.6)	r 16 (3.4)
Armenia	○	91 (2.3)	98 (1.1)	15 (2.7)	37 (3.8)	54 (4.5)	40 (3.7)
Australia	●	46 (4.0)	49 (3.6)	25 (3.6)	34 (3.4)	32 (3.2)	39 (3.6)
Bahrain	●	73 (2.5)	62 (2.4)	3 (0.1)	9 (1.8)	6 (1.4)	7 (1.2)
Bosnia and Herzegovina	●	36 (4.0)	96 (1.6)	16 (3.2)	19 (3.6)	30 (3.8)	14 (2.8)
Botswana	●	61 (4.7)	73 (4.2)	9 (2.5)	19 (3.2)	24 (3.8)	21 (3.4)
Bulgaria	○	74 (3.7)	96 (1.9)	33 (3.5)	40 (4.0)	68 (3.9)	38 (4.2)
Chinese Taipei	●	50 (4.5)	81 (3.7)	19 (3.5)	17 (3.2)	54 (4.2)	35 (3.9)
Colombia	○	58 (5.2)	79 (3.8)	10 (2.5)	15 (3.2)	32 (3.9)	29 (5.8)
Cyprus	●	27 (2.5)	96 (1.2)	4 (1.2)	8 (1.6)	11 (1.9)	11 (1.4)
Czech Republic	●	85 (2.8)	62 (3.6)	58 (4.2)	47 (4.1)	24 (3.5)	27 (3.1)
Egypt	●	71 (4.3)	63 (4.1)	6 (2.0)	4 (1.3)	25 (3.7)	12 (2.6)
El Salvador	●	46 (4.1)	66 (4.3)	20 (3.5)	29 (4.1)	52 (4.2)	41 (4.4)
England	●	39 (4.1)	72 (3.6)	8 (2.3)	20 (3.2)	27 (3.6)	33 (3.6)
Georgia	●	78 (3.5)	46 (5.2)	1 (0.7)	7 (2.8)	7 (3.0)	17 (3.7)
Ghana	●	57 (4.4)	69 (4.2)	32 (4.2)	42 (4.2)	54 (4.3)	43 (4.5)
Hong Kong SAR	●	58 (4.6)	62 (4.3)	19 (3.6)	30 (4.0)	36 (4.3)	40 (3.8)
Hungary	●	96 (1.7)	97 (1.6)	57 (3.9)	58 (3.9)	5 (2.1)	25 (3.1)
Indonesia	●	75 (3.6)	44 (4.0)	7 (2.2)	8 (2.3)	12 (2.4)	13 (2.8)
Iran, Islamic Rep. of	●	57 (3.7)	58 (3.8)	3 (1.3)	5 (1.9)	7 (2.1)	11 (2.5)
Israel	●	r 57 (3.6)	r 76 (2.8)	r 10 (2.1)	r 19 (2.8)	r 20 (2.6)	r 35 (3.6)
Italy	○	--	16 (2.4)	--	67 (3.1)	--	17 (2.6)
Japan	●	52 (3.8)	76 (3.3)	3 (1.3)	16 (2.7)	30 (3.4)	19 (2.9)
Jordan	●	44 (4.0)	86 (2.9)	3 (1.3)	36 (4.5)	21 (3.8)	18 (3.6)
Korea, Rep. of	●	70 (3.2)	28 (3.2)	1 (0.9)	0 (0.0)	4 (1.2)	4 (1.4)
Kuwait	●	r 61 (4.2)	r 62 (4.7)	r 6 (2.3)	r 7 (2.2)	r 9 (2.5)	r 2 (1.2)
Lebanon	●	40 (4.9)	77 (4.4)	14 (3.9)	26 (4.3)	13 (3.1)	20 (4.2)
Lithuania	●	33 (3.3)	93 (1.9)	1 (0.8)	6 (1.8)	17 (2.7)	11 (2.3)
Malaysia	●	45 (4.2)	46 (3.9)	11 (2.1)	19 (3.4)	31 (3.9)	41 (4.1)
Malta	●	76 (0.2)	71 (0.2)	10 (0.2)	7 (0.1)	44 (0.3)	26 (0.2)
Norway	●	r 8 (2.4)	r 41 (3.9)	r 8 (2.5)	r 38 (3.9)	r 43 (4.1)	r 61 (4.3)
Oman	●	73 (3.8)	71 (3.5)	3 (1.8)	2 (1.6)	6 (1.9)	12 (2.9)
Palestinian Nat'l Auth.	●	47 (3.9)	78 (3.5)	8 (2.5)	9 (2.3)	24 (3.5)	4 (1.4)
Qatar	○	65 (0.1)	70 (0.2)	3 (0.0)	10 (0.1)	10 (0.1)	6 (0.1)
Romania	●	65 (3.8)	97 (1.8)	11 (2.3)	26 (3.7)	68 (3.5)	16 (3.3)
Russian Federation	●	70 (3.2)	99 (0.8)	15 (2.4)	20 (2.6)	55 (3.3)	17 (2.1)
Saudi Arabia	●	43 (4.6)	r 70 (4.3)	r 1 (0.5)	r 0 (0.3)	r 1 (0.5)	r 1 (0.7)
Scotland	●	46 (3.8)	87 (2.3)	3 (1.1)	24 (2.2)	15 (2.4)	22 (2.4)
Serbia	●	41 (3.6)	95 (1.9)	2 (1.3)	11 (2.5)	28 (3.9)	12 (2.9)
Singapore	●	49 (2.9)	69 (2.4)	18 (2.1)	46 (2.5)	34 (3.0)	50 (2.9)
Slovenia	●	94 (1.3)	9 (1.6)	21 (2.2)	3 (0.8)	9 (1.7)	22 (2.4)
Sweden	●	63 (2.5)	50 (3.2)	62 (3.1)	44 (3.5)	30 (2.8)	28 (3.0)
Syrian Arab Republic	●	17 (3.2)	92 (2.1)	2 (1.2)	5 (1.7)	6 (1.3)	11 (2.9)
Thailand	●	4 (1.7)	72 (3.8)	1 (0.0)	4 (1.3)	4 (1.8)	23 (3.6)
Tunisia	●	13 (2.8)	92 (2.0)	4 (1.5)	15 (2.8)	3 (1.5)	13 (2.6)
Turkey	●	69 (3.9)	49 (4.0)	12 (3.0)	14 (2.6)	29 (4.2)	9 (2.5)
Ukraine	●	59 (4.0)	53 (4.2)	3 (1.4)	4 (1.4)	11 (2.7)	12 (2.8)
United States	●	49 (2.9)	42 (3.0)	7 (1.7)	9 (1.9)	56 (2.7)	34 (2.7)
‡ Morocco	●	r 27 (4.9)	r 87 (3.4)	r 6 (2.7)	r 17 (4.0)	r 7 (3.0)	r 11 (3.2)
International Avg.		54 (0.5)	70 (0.5)	12 (0.3)	19 (0.4)	25 (0.4)	22 (0.4)
<b>Benchmarking Participants</b>							
Basque Country, Spain	○	31 (4.9)	36 (5.0)	37 (4.6)	32 (5.1)	15 (3.1)	25 (4.1)
British Columbia, Canada	○	33 (4.0)	25 (3.9)	29 (3.5)	42 (3.9)	39 (4.0)	56 (4.8)
Dubai, UAE	●	s 50 (5.3)	s 88 (2.5)	s 7 (2.9)	s 20 (4.1)	s 22 (3.3)	s 10 (2.8)
Massachusetts, US	●	26 (5.0)	43 (7.2)	3 (1.6)	13 (3.8)	57 (6.7)	39 (7.0)
Minnesota, US	●	72 (5.9)	50 (7.3)	3 (2.3)	4 (2.5)	60 (6.3)	25 (6.5)
Ontario, Canada	●	12 (3.2)	11 (3.1)	18 (3.5)	20 (3.3)	62 (4.6)	72 (3.7)
Quebec, Canada	●	57 (4.1)	33 (4.0)	14 (3.4)	25 (4.0)	19 (3.4)	31 (3.8)

● Yes ○ No

Background data provided by National Research Coordinators and by teachers.

<sup>1</sup> Teachers who responded that they majored in more than one area are reflected in all categories that apply.

‡ Did not satisfy guidelines for sample participation rates (see Appendix A).

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

A dash (–) indicates comparable data are not available.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

## Exhibit 6.4 Teachers' Participation in Professional Development in Mathematics

TIMSS2007  
Mathematics 4<sup>th</sup> Grade

Country	Percentage of Students by Their Teachers' Participation in Professional Development in Mathematics in the Past 2 Years					
	Mathematics Content	Mathematics Pedagogy / Instruction	Mathematics Curriculum	Integrating Information Technology into Mathematics	Improving Students' Critical Thinking or Problem Solving Skills	Mathematics Assessment
Algeria	44 (4.8)	53 (4.4)	50 (4.8)	10 (2.6)	42 (4.3)	45 (4.4)
Armenia	64 (4.0)	77 (3.5)	75 (3.6)	39 (4.1)	51 (3.5)	62 (3.5)
Australia	71 (3.1)	63 (3.7)	73 (3.7)	35 (3.9)	53 (4.3)	52 (3.5)
Austria	56 (3.1)	32 (3.1)	11 (1.9)	6 (1.7)	22 (2.7)	20 (2.6)
Chinese Taipei	67 (3.8)	74 (3.5)	71 (3.9)	42 (4.0)	33 (3.7)	33 (4.0)
Colombia	42 (5.6)	37 (5.3)	46 (6.0)	28 (4.6)	52 (5.0)	37 (5.4)
Czech Republic	20 (3.0)	35 (3.8)	20 (3.3)	33 (3.5)	31 (3.6)	21 (3.5)
Denmark	23 (3.4)	23 (3.4)	9 (2.6)	21 (3.0)	9 (2.2)	5 (2.0)
El Salvador	26 (3.7)	28 (3.9)	12 (2.7)	13 (2.9)	34 (4.2)	26 (3.9)
England	60 (3.6)	70 (3.5)	65 (3.7)	44 (4.1)	59 (3.8)	43 (4.5)
Georgia	21 (3.5)	41 (3.6)	39 (4.3)	18 (3.4)	55 (4.6)	53 (5.1)
Germany	44 (3.3)	37 (3.1)	38 (3.3)	7 (1.5)	28 (3.2)	27 (3.1)
Hong Kong SAR	74 (3.5)	82 (3.5)	70 (3.6)	49 (4.5)	72 (3.7)	58 (4.3)
Hungary	43 (4.1)	47 (4.3)	19 (3.5)	11 (2.7)	26 (3.3)	23 (3.6)
Iran, Islamic Rep. of	30 (3.6)	37 (3.6)	25 (3.2)	18 (3.2)	29 (3.9)	27 (3.6)
Italy	22 (2.7)	25 (2.6)	14 (2.4)	33 (3.2)	22 (2.6)	14 (2.3)
Japan	48 (3.9)	55 (3.6)	16 (2.6)	19 (2.8)	27 (3.4)	21 (2.7)
Kazakhstan	63 (5.6)	72 (5.5)	76 (5.0)	56 (4.2)	72 (5.4)	70 (5.6)
Kuwait	r 27 (4.0)	r 34 (4.2)	r 20 (3.9)	r 25 (4.1)	r 30 (4.3)	r 28 (4.3)
Latvia	43 (3.9)	42 (3.7)	43 (3.8)	17 (3.0)	55 (3.9)	46 (3.5)
Lithuania	17 (2.7)	21 (3.1)	18 (3.1)	56 (3.6)	50 (4.1)	30 (2.8)
Morocco	11 (2.7)	11 (2.6)	10 (2.3)	3 (0.8)	9 (2.3)	13 (2.8)
Netherlands	11 (2.7)	15 (2.5)	6 (1.9)	18 (2.9)	19 (3.0)	10 (2.5)
New Zealand	83 (2.1)	76 (2.4)	78 (2.1)	26 (2.4)	54 (2.7)	64 (2.6)
Norway	26 (3.2)	30 (3.5)	24 (3.3)	12 (2.8)	18 (2.7)	5 (1.3)
Qatar	41 (0.2)	50 (0.2)	40 (0.2)	36 (0.2)	40 (0.2)	38 (0.2)
Russian Federation	66 (3.5)	67 (3.0)	68 (3.0)	51 (3.5)	58 (3.6)	55 (3.2)
Scotland	44 (4.1)	62 (4.0)	43 (4.1)	51 (4.7)	57 (4.8)	33 (4.2)
Singapore	59 (2.6)	70 (2.6)	50 (2.7)	51 (2.9)	66 (2.6)	52 (2.8)
Slovak Republic	13 (2.5)	41 (3.4)	46 (3.8)	55 (3.2)	30 (3.3)	24 (2.9)
Slovenia	43 (3.0)	35 (3.1)	38 (3.4)	25 (2.8)	17 (2.3)	62 (3.4)
Sweden	34 (3.4)	41 (3.3)	35 (3.8)	5 (0.9)	21 (3.1)	25 (3.4)
Tunisia	39 (4.0)	57 (3.9)	33 (3.9)	19 (3.1)	36 (3.9)	61 (4.0)
Ukraine	65 (3.3)	74 (2.8)	73 (3.3)	64 (3.5)	82 (3.0)	81 (2.7)
United States	60 (2.2)	50 (2.6)	63 (2.4)	39 (2.6)	51 (2.5)	47 (2.4)
Yemen	20 (4.4)	47 (5.0)	28 (4.3)	6 (2.6)	37 (4.9)	31 (4.8)
International Avg.	42 (0.6)	47 (0.6)	40 (0.6)	29 (0.5)	40 (0.6)	37 (0.6)
<b>Benchmarking Participants</b>						
Alberta, Canada	57 (4.1)	54 (4.2)	52 (3.9)	33 (3.4)	54 (4.2)	46 (4.1)
British Columbia, Canada	r 73 (3.8)	r 59 (4.5)	r 67 (3.8)	r 17 (3.3)	r 64 (4.2)	r 39 (4.3)
Dubai, UAE	r 55 (4.5)	s 51 (4.2)	s 54 (6.3)	s 36 (4.3)	s 64 (5.2)	r 48 (4.8)
Massachusetts, US	77 (6.4)	77 (5.7)	77 (5.6)	44 (5.6)	65 (6.1)	64 (6.8)
Minnesota, US	59 (5.2)	57 (4.7)	63 (6.7)	33 (4.9)	49 (8.5)	34 (7.6)
Ontario, Canada	68 (4.2)	67 (4.3)	75 (4.3)	30 (4.3)	53 (4.3)	51 (5.9)
Quebec, Canada	36 (4.8)	39 (4.6)	41 (4.2)	11 (2.5)	31 (3.8)	39 (4.2)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

Background data provided by teachers.

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

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

**Exhibit 6.4 Teachers' Participation in Professional Development in Mathematics (Continued)**
**TIMSS2007**  
**Mathematics 8<sup>th</sup> Grade**

Country	Percentage of Students by Their Teachers' Participation in Professional Development in Mathematics in the Past 2 Years					
	Mathematics Content	Mathematics Pedagogy / Instruction	Mathematics Curriculum	Integrating Information Technology into Mathematics	Improving Students' Critical Thinking or Problem Solving Skills	Mathematics Assessment
Algeria	51 (4.4)	66 (4.0)	51 (4.4)	27 (3.6)	60 (4.5)	51 (4.5)
Armenia	56 (3.9)	67 (3.7)	69 (4.1)	32 (3.9)	38 (4.2)	45 (3.9)
Australia	69 (3.8)	61 (3.4)	69 (3.3)	57 (3.2)	45 (3.7)	59 (3.6)
Bahrain	33 (2.4)	48 (2.4)	26 (2.2)	69 (2.4)	56 (2.7)	40 (2.5)
Bosnia and Herzegovina	67 (3.9)	60 (3.8)	56 (3.6)	39 (3.6)	43 (3.8)	46 (4.3)
Botswana	20 (3.5)	12 (2.5)	11 (2.7)	13 (3.2)	27 (4.1)	27 (4.0)
Bulgaria	59 (3.6)	42 (3.4)	60 (3.6)	69 (3.5)	25 (3.0)	44 (3.4)
Chinese Taipei	84 (2.9)	79 (3.3)	84 (3.1)	73 (3.6)	40 (4.1)	52 (4.5)
Colombia	70 (4.0)	64 (5.5)	67 (4.3)	51 (4.9)	60 (4.6)	53 (4.6)
Cyprus	69 (2.9)	70 (2.7)	56 (2.3)	59 (3.4)	46 (2.7)	48 (2.9)
Czech Republic	47 (4.2)	45 (4.1)	35 (3.8)	49 (4.6)	28 (3.3)	22 (3.3)
Egypt	46 (4.0)	66 (3.9)	34 (4.1)	54 (4.1)	77 (3.4)	51 (3.7)
El Salvador	49 (4.0)	42 (3.9)	26 (3.9)	26 (3.7)	45 (4.0)	38 (4.4)
England	66 (3.9)	79 (3.3)	61 (4.3)	62 (4.2)	40 (3.7)	58 (3.9)
Georgia	30 (4.3)	49 (4.6)	52 (5.5)	26 (4.3)	59 (5.3)	64 (5.0)
Ghana	60 (3.9)	38 (3.6)	44 (3.8)	13 (2.5)	44 (4.3)	46 (4.2)
Hong Kong SAR	78 (3.5)	71 (4.0)	72 (4.0)	63 (4.3)	60 (4.7)	56 (4.1)
Hungary	51 (3.9)	53 (3.3)	28 (3.9)	26 (3.6)	34 (4.1)	32 (3.7)
Indonesia	71 (3.9)	69 (4.2)	77 (3.8)	29 (4.0)	57 (4.4)	69 (4.0)
Iran, Islamic Rep. of	57 (4.3)	78 (3.1)	47 (3.8)	28 (3.4)	52 (3.9)	44 (3.8)
Israel	r 59 (3.6)	r 63 (3.6)	r 50 (3.7)	r 35 (3.5)	r 45 (3.6)	r 33 (3.6)
Italy	16 (2.1)	34 (3.3)	15 (2.0)	43 (3.1)	9 (1.6)	17 (2.7)
Japan	74 (3.4)	76 (3.4)	31 (3.5)	27 (3.3)	39 (3.7)	39 (3.5)
Jordan	57 (4.2)	78 (3.3)	62 (3.9)	65 (4.4)	67 (3.5)	53 (3.4)
Korea, Rep. of	48 (3.3)	50 (3.5)	41 (3.3)	31 (3.2)	22 (2.8)	33 (3.2)
Kuwait	r 45 (4.4)	r 62 (4.2)	r 30 (3.8)	r 45 (5.1)	r 69 (4.6)	r 43 (4.7)
Lebanon	68 (3.6)	67 (3.6)	54 (4.7)	50 (5.0)	68 (4.2)	70 (3.7)
Lithuania	85 (2.7)	81 (3.1)	71 (3.3)	69 (3.5)	52 (3.8)	65 (3.8)
Malaysia	57 (4.0)	46 (4.2)	52 (4.0)	61 (3.7)	27 (3.8)	38 (3.6)
Malta	47 (0.2)	71 (0.2)	60 (0.2)	83 (0.2)	31 (0.2)	68 (0.2)
Norway	40 (3.9)	39 (3.9)	44 (4.0)	35 (3.7)	18 (3.2)	22 (3.3)
Oman	54 (4.7)	42 (4.0)	58 (4.5)	24 (3.9)	36 (4.1)	48 (4.1)
Palestinian Nat'l Auth.	44 (4.3)	47 (4.5)	34 (4.4)	26 (3.6)	45 (4.4)	35 (4.3)
Qatar	43 (0.1)	56 (0.2)	37 (0.1)	54 (0.2)	50 (0.1)	43 (0.2)
Romania	71 (3.4)	55 (3.4)	53 (3.9)	57 (3.9)	56 (3.8)	69 (3.6)
Russian Federation	84 (2.4)	73 (3.0)	74 (3.1)	67 (3.1)	62 (3.0)	60 (2.8)
Saudi Arabia	26 (4.1)	47 (4.6)	19 (3.2)	24 (4.1)	34 (4.0)	24 (4.1)
Scotland	80 (3.4)	93 (2.0)	74 (3.3)	79 (3.0)	56 (4.1)	71 (3.1)
Serbia	72 (4.1)	50 (4.4)	45 (4.3)	33 (3.8)	37 (4.1)	46 (4.0)
Singapore	81 (1.8)	88 (1.7)	65 (2.3)	74 (2.0)	63 (2.2)	61 (2.4)
Slovenia	70 (2.8)	65 (2.9)	66 (3.2)	62 (3.0)	37 (2.8)	72 (2.8)
Sweden	41 (3.1)	48 (3.3)	38 (3.1)	9 (1.8)	28 (3.2)	46 (3.2)
Syrian Arab Republic	13 (2.5)	20 (3.4)	17 (3.3)	15 (2.6)	49 (4.1)	32 (4.1)
Thailand	82 (3.3)	80 (3.3)	79 (3.6)	73 (3.7)	82 (3.1)	83 (3.1)
Tunisia	24 (3.6)	35 (4.4)	26 (3.8)	22 (3.4)	36 (4.1)	32 (4.1)
Turkey	47 (4.0)	48 (4.5)	69 (4.0)	18 (3.3)	24 (4.0)	27 (3.8)
Ukraine	79 (3.6)	82 (3.1)	81 (3.5)	75 (3.7)	80 (3.3)	83 (3.4)
United States	81 (2.1)	76 (2.4)	80 (1.7)	61 (3.0)	65 (2.8)	69 (2.5)
‡ Morocco	24 (4.2)	37 (4.8)	29 (4.2)	22 (5.0)	21 (3.6)	24 (3.9)
<b>International Avg.</b>	<b>56 (0.5)</b>	<b>59 (0.5)</b>	<b>51 (0.5)</b>	<b>45 (0.5)</b>	<b>46 (0.5)</b>	<b>48 (0.5)</b>
<b>Benchmarking Participants</b>						
Basque Country, Spain	24 (4.0)	26 (4.3)	27 (4.7)	32 (4.5)	19 (3.9)	19 (3.7)
British Columbia, Canada	77 (3.0)	70 (3.6)	69 (3.5)	51 (3.9)	75 (2.8)	58 (4.0)
Dubai, UAE	s 65 (3.6)	s 57 (3.4)	s 60 (4.6)	s 57 (3.8)	s 67 (4.7)	s 62 (4.7)
Massachusetts, US	94 (2.9)	91 (3.6)	75 (4.6)	64 (5.6)	65 (6.3)	61 (4.9)
Minnesota, US	r 78 (6.6)	r 75 (5.4)	r 80 (5.6)	r 57 (7.7)	r 62 (7.5)	r 63 (6.6)
Ontario, Canada	82 (2.9)	73 (3.4)	76 (3.3)	51 (4.5)	67 (4.1)	61 (4.7)
Quebec, Canada	57 (3.9)	74 (3.7)	78 (3.6)	27 (3.8)	35 (4.3)	78 (3.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

Background data provided by teachers.

‡ Did not satisfy guidelines for sample participation rates (see Appendix A).

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

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

with such professional development in mathematics assessment (37%) and integrating information technology into mathematics (29%). At the eighth grade, the participation in professional development in the areas asked about by TIMSS was somewhat higher, but the pattern was similar. Approximately half the eighth grade students, on average internationally, had teachers that had participated in some type of professional development during the past two years in mathematics content (56%), mathematics pedagogy (59%), mathematics curriculum (51%), mathematics assessment (48%), improving students' critical thinking or problem solving skills (46%), and integrating information technology into mathematics (45%).

Teachers also were asked about opportunities for collaboration with other teachers. Exhibit 6.5 contains the results in relation to students' average mathematics achievement and with changes from 2003. Internationally on average, the largest percentages of students at both grades (59 to 61%) had teachers that collaborated with other teachers about 2–3 times a month. Other than that, collaboration tended to be more frequent (at least weekly) rather than less frequent (never or almost never). At the fourth grade, between 2003 and 2007 the frequency of collaboration increased to some extent. In particular, in Armenia, Italy, Morocco, Scotland, Singapore, and Tunisia greater percentages of students had teachers that reported collaborating with other teachers at least weekly (and only Lithuania showed a decrease). At the eighth grade, the percentages of students whose teachers reported at least weekly collaboration increased between 2003 and 2007 in Armenia, Japan, Jordan, Lebanon, Slovenia, and Tunisia as well as the benchmarking province of Quebec. The percentages decreased in Botswana, Egypt, Indonesia, Norway, Serbia, and Sweden.

**Exhibit 6.5 Frequency of Collaboration Among Mathematics Teachers with Trends**

**TIMSS2007**  
**Mathematics** 4<sup>th</sup> Grade

Country	Percentage of Students by Their Teachers' Frequency of Collaboration with Other Teachers								
	Never or Almost Never			2 or 3 Times per Month			At Least Weekly		
	2007 Percent of Students	Average Achievement	Difference in Percent from 2003	2007 Percent of Students	Average Achievement	Difference in Percent from 2003	2007 Percent of Students	Average Achievement	Difference in Percent from 2003
Algeria	5 (2.0)	378 (21.8)	0 0	55 (4.6)	374 (8.1)	0 0	40 (4.4)	373 (9.0)	0 0
Armenia	2 (1.0)	~ ~	-3 (1.5) ▼	35 (3.2)	498 (6.9)	-30 (5.5) ▼	63 (3.2)	500 (6.0)	34 (5.4) ▲
Australia	9 (2.2)	515 (16.7)	-4 (3.0)	60 (3.2)	515 (4.8)	-1 (5.1)	31 (3.2)	518 (6.5)	5 (4.8)
Austria	23 (2.6)	512 (3.9)	0 0	66 (2.9)	503 (2.7)	0 0	11 (1.9)	509 (5.5)	0 0
Chinese Taipei	20 (3.3)	571 (4.0)	12 (3.9) ▲	70 (4.3)	576 (2.2)	-5 (5.5)	10 (2.7)	577 (9.2)	-7 (4.0)
Colombia	8 (2.2)	350 (13.9)	0 0	42 (4.9)	361 (8.0)	0 0	50 (4.7)	356 (9.2)	0 0
Czech Republic	13 (2.5)	493 (6.9)	0 0	76 (3.3)	486 (3.2)	0 0	10 (2.6)	475 (7.7)	0 0
Denmark	20 (3.4)	519 (6.5)	0 0	70 (4.0)	525 (2.8)	0 0	10 (2.7)	528 (7.1)	0 0
El Salvador	16 (3.5)	344 (10.0)	0 0	55 (4.6)	330 (5.9)	0 0	29 (3.8)	321 (9.2)	0 0
England	11 (2.6)	541 (9.6)	-2 (3.9)	58 (3.9)	544 (4.0)	-2 (6.2)	31 (3.4)	537 (5.3)	5 (5.7)
Georgia	0 (0.0)	~ ~	0 0	37 (4.5)	430 (7.1)	0 0	63 (4.5)	445 (5.3)	0 0
Germany	20 (2.7)	531 (3.8)	0 0	73 (3.0)	526 (2.7)	0 0	8 (1.6)	495 (10.0)	0 0
Hong Kong SAR	4 (1.6)	593 (10.5)	-18 (4.2) ▼	87 (2.8)	609 (3.7)	18 (5.4) ▲	9 (2.3)	602 (9.4)	0 (3.6)
Hungary	3 (1.5)	525 (38.0)	-3 (2.3)	62 (3.8)	513 (5.1)	-1 (4.9)	34 (3.7)	504 (5.9)	3 (5.1)
Iran, Islamic Rep. of	5 (1.7)	387 (17.9)	-1 (2.7)	65 (3.7)	404 (4.9)	11 (6.1)	30 (3.9)	398 (7.9)	-10 (6.3)
Italy	6 (1.5)	504 (10.8)	-6 (2.8) ▼	69 (2.9)	506 (4.1)	-1 (4.2)	26 (2.5)	508 (5.5)	7 (3.5) ▲
Japan	9 (1.9)	575 (4.1)	-2 (3.2)	73 (3.3)	565 (2.4)	5 (4.9)	18 (2.9)	575 (5.0)	-3 (4.3)
Kazakhstan	1 (0.7)	~ ~	0 0	26 (4.2)	531 (14.5)	0 0	73 (4.3)	556 (7.0)	0 0
Kuwait	4 (1.8)	296 (13.2)	0 0	40 (4.9)	311 (8.2)	0 0	57 (5.0)	318 (6.0)	0 0
Latvia	8 (1.7)	545 (7.6)	8 (1.7) ▲	77 (3.1)	538 (2.4)	1 (5.5)	16 (3.0)	534 (5.3)	-8 (5.5)
Lithuania	8 (1.5)	525 (6.6)	5 (2.1) ▲	71 (3.2)	530 (3.2)	13 (4.9) ▲	20 (3.0)	532 (7.4)	-18 (4.8) ▼
Morocco	18 (3.2)	333 (13.6)	-37 (6.7) ▼	60 (3.9)	344 (6.4)	25 (6.5) ▲	22 (3.2)	337 (12.6)	11 (4.6) ▲
Netherlands	32 (3.6)	536 (4.4)	0 (5.5)	62 (4.1)	535 (3.0)	-3 (5.8)	7 (2.3)	530 (4.5)	3 (3.1)
New Zealand	5 (1.2)	493 (7.5)	-3 (2.2)	65 (2.4)	495 (3.2)	4 (3.9)	30 (2.4)	489 (4.4)	-1 (3.8)
Norway	8 (1.7)	465 (9.0)	-2 (3.4)	58 (3.8)	470 (3.5)	-6 (5.7)	34 (3.8)	480 (4.0)	7 (5.0)
Qatar	6 (0.1)	319 (4.9)	0 0	48 (0.2)	296 (1.9)	0 0	46 (0.2)	295 (1.6)	0 0
Russian Federation	0 (0.2)	~ ~	-1 (0.7)	50 (3.6)	542 (4.9)	-3 (4.8)	50 (3.5)	547 (7.5)	4 (4.7)
Scotland	17 (3.1)	494 (8.3)	-2 (4.6)	54 (3.9)	492 (3.4)	-12 (6.0) ▼	29 (3.2)	500 (4.9)	14 (4.8) ▲
Singapore	9 (1.6)	621 (11.1)	-6 (3.2)	77 (2.6)	600 (4.3)	-2 (4.1)	14 (2.0)	583 (8.7)	8 (2.6) ▲
Slovak Republic	2 (0.8)	~ ~	0 0	60 (3.4)	495 (5.8)	0 0	38 (3.4)	499 (7.2)	0 0
Slovenia	11 (1.9)	504 (5.8)	-2 (3.7)	73 (2.9)	501 (2.0)	-3 (4.8)	16 (2.5)	501 (5.1)	5 (3.6)
Sweden	19 (2.9)	506 (4.4)	0 0	62 (3.2)	501 (3.4)	0 0	19 (3.0)	505 (4.5)	0 0
Tunisia	12 (3.0)	312 (19.5)	-20 (5.1) ▼	52 (4.4)	331 (6.5)	3 (6.0)	36 (4.1)	311 (8.3)	16 (5.2) ▲
Ukraine	1 (0.7)	~ ~	0 0	20 (3.2)	476 (6.2)	0 0	79 (3.3)	467 (3.5)	0 0
United States	9 (1.7)	531 (7.4)	-4 (2.5)	65 (2.8)	531 (2.9)	4 (3.9)	25 (2.5)	526 (4.9)	0 (3.6)
Yemen	16 (3.5)	219 (18.8)	0 0	65 (4.3)	226 (7.4)	0 0	19 (3.7)	217 (11.6)	0 0
International Avg.	10 (0.4)	468 (2.3)		59 (0.6)	472 (0.9)		31 (0.5)	471 (1.2)	

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

**Benchmarking Participants**

Alberta, Canada	11 (3.0)	494 (11.5)	0 0	66 (3.9)	506 (3.5)	0 0	23 (3.0)	506 (5.3)	0 0
British Columbia, Canada	23 (3.4)	505 (5.6)	0 0	63 (4.0)	507 (4.1)	0 0	13 (2.5)	493 (7.0)	0 0
Dubai, UAE	3 (0.2)	439 (5.5)	0 0	47 (6.0)	437 (4.8)	0 0	50 (5.9)	436 (8.3)	0 0
Massachusetts, US	10 (3.8)	565 (14.2)	0 0	56 (5.9)	575 (5.1)	0 0	34 (5.2)	573 (7.2)	0 0
Minnesota, US	12 (3.5)	574 (10.5)	0 0	65 (7.3)	552 (5.6)	0 0	23 (6.7)	556 (17.5)	0 0
Ontario, Canada	14 (3.6)	508 (5.7)	-4 (5.0)	62 (4.9)	510 (3.9)	-3 (6.4)	25 (4.2)	517 (8.1)	8 (5.5)
Quebec, Canada	17 (2.8)	523 (6.3)	-1 (4.3)	68 (3.8)	520 (4.0)	-3 (5.6)	15 (3.1)	516 (7.0)	3 (4.1)

- ▲ 2007 percent significantly higher
- ▼ 2007 percent significantly lower

Based on teachers' reports on the frequency of four types of interactions with other teachers: 1) Discussions about how to teach a particular concept; 2) Working on preparing instructional materials; 3) Visits to another teacher's classroom to observe his/her teaching; 4) Informal observation of my classroom by another teacher. Frequency is computed by averaging across four items based on a 4-point scale: 1. Never or Almost Never; 2. 2 or 3 times per month; 3. 1-3 times per week; 4. Daily or almost daily.

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

A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

A diamond (0) indicates the country did not participate in the assessment.

**Exhibit 6.5 Frequency of Collaboration Among Mathematics Teachers with Trends (Continued)**
**TIMSS2007**  
**Mathematics** **8<sup>th</sup>**  
**Grade**

Country	Percentage of Students by Their Teachers' Frequency of Collaboration with Other Teachers								
	Never or Almost Never			2 or 3 Times per Month			At Least Weekly		
	2007 Percent of Students	Average Achievement	Difference in Percent from 2003	2007 Percent of Students	Average Achievement	Difference in Percent from 2003	2007 Percent of Students	Average Achievement	Difference in Percent from 2003
Algeria	9 (2.2)	388 (7.2)	0 0	63 (3.9)	388 (2.7)	0 0	28 (3.6)	386 (3.3)	0 0
Armenia	4 (1.7)	491 (14.1)	0 (2.3)	32 (3.1)	499 (5.3)	-31 (4.5) ▾	64 (3.6)	499 (3.9)	31 (4.8) ▲
Australia	17 (2.9)	482 (9.9)	6 (3.8)	67 (3.9)	507 (5.2)	-10 (5.2)	16 (2.9)	475 (8.8)	4 (4.1)
Bahrain	6 (1.7)	410 (8.7)	-2 (2.9)	61 (2.8)	392 (2.3)	-2 (4.3)	32 (2.3)	402 (3.0)	3 (3.6)
Bosnia and Herzegovina	10 (2.3)	449 (10.0)	0 0	61 (4.1)	450 (4.1)	0 0	29 (4.1)	471 (4.8)	0 0
Botswana	12 (3.2)	366 (10.7)	7 (3.9)	61 (3.8)	366 (3.4)	12 (5.7) ▲	27 (3.7)	358 (4.3)	-18 (5.7) ▾
Bulgaria	14 (2.5)	473 (11.8)	-2 (4.3)	68 (3.6)	466 (5.9)	0 (5.6)	18 (3.5)	453 (17.1)	2 (4.6)
Chinese Taipei	28 (3.7)	575 (8.0)	-3 (5.4)	65 (4.0)	610 (5.4)	3 (5.5)	7 (2.2)	576 (12.0)	0 (3.2)
Colombia	15 (2.8)	371 (10.7)	0 0	65 (4.1)	382 (4.8)	0 0	21 (3.4)	384 (9.1)	0 0
Cyprus	5 (0.8)	475 (7.3)	0 (1.3)	53 (3.1)	466 (2.6)	-3 (4.1)	43 (3.1)	462 (2.8)	2 (4.2)
Czech Republic	34 (4.0)	507 (4.4)	0 0	63 (3.9)	503 (3.2)	0 0	3 (1.1)	494 (7.2)	0 0
Egypt	3 (1.5)	346 (18.6)	2 (1.7)	55 (4.4)	392 (5.5)	14 (5.8) ▲	42 (4.2)	392 (5.4)	-15 (5.7) ▾
El Salvador	39 (4.6)	342 (5.2)	0 0	41 (4.2)	338 (5.9)	0 0	19 (3.4)	337 (6.6)	0 0
England	17 (2.5)	515 (10.5)	0 (4.9)	62 (4.1)	509 (6.4)	-3 (7.3)	21 (3.7)	526 (11.2)	2 (6.2)
Georgia	6 (2.7)	435 (15.2)	0 0	55 (4.6)	402 (7.6)	0 0	39 (4.4)	416 (8.9)	0 0
Ghana	9 (2.1)	295 (13.0)	-2 (3.6)	35 (4.0)	308 (7.2)	-9 (6.1)	56 (4.2)	314 (6.3)	11 (6.4)
Hong Kong SAR	17 (3.3)	604 (11.9)	-7 (4.8)	72 (4.0)	564 (8.1)	0 (5.6)	11 (3.1)	581 (12.6)	6 (3.6)
Hungary	10 (2.4)	537 (18.0)	0 (3.5)	71 (4.0)	513 (3.8)	0 (5.2)	18 (3.2)	519 (8.9)	0 (4.5)
Indonesia	4 (1.9)	402 (25.7)	2 (2.3)	64 (4.4)	402 (5.8)	13 (6.0) ▲	32 (4.6)	414 (10.7)	-15 (6.1) ▾
Iran, Islamic Rep. of	21 (3.1)	395 (6.6)	6 (4.4)	69 (3.1)	401 (5.0)	-7 (4.5)	10 (2.4)	426 (16.0)	2 (3.2)
Israel	16 (3.3)	477 (14.1)	4 (4.0)	76 (3.3)	464 (5.3)	-3 (4.6)	9 (2.1)	442 (19.5)	-1 (3.2)
Italy	35 (3.1)	482 (4.5)	7 (4.5)	58 (3.3)	478 (3.9)	-6 (4.8)	8 (1.7)	483 (7.6)	-1 (2.7)
Japan	14 (3.0)	573 (11.7)	-22 (5.0) ▾	65 (3.9)	574 (3.3)	12 (5.6) ▲	20 (2.9)	554 (6.1)	10 (3.7) ▲
Jordan	7 (1.8)	439 (15.9)	-5 (3.3)	58 (3.8)	423 (6.2)	-6 (5.7)	36 (3.5)	432 (6.7)	10 (5.1) ▲
Korea, Rep. of	13 (2.3)	586 (7.3)	-23 (4.0) ▾	82 (2.3)	599 (3.4)	25 (4.0) ▲	4 (1.3)	592 (12.6)	-2 (2.2)
Kuwait	1 (1.1)	~ ~	0 0	42 (5.3)	355 (4.7)	0 0	57 (5.3)	359 (3.7)	0 0
Lebanon	12 (3.1)	460 (10.1)	-3 (4.5)	56 (4.6)	459 (5.5)	-10 (6.2)	33 (5.0)	428 (7.5)	13 (6.1) ▲
Lithuania	22 (3.2)	493 (5.3)	9 (4.1) ▲	67 (3.3)	509 (3.4)	-4 (4.8)	11 (2.5)	507 (12.1)	-5 (3.7)
Malaysia	10 (2.5)	497 (18.1)	3 (3.4)	77 (3.6)	469 (5.5)	3 (5.1)	13 (2.9)	485 (12.5)	-6 (4.3)
Malta	37 (0.2)	488 (1.7)	0 0	58 (0.2)	488 (1.4)	0 0	5 (0.1)	478 (2.4)	0 0
Norway	19 (2.9)	471 (5.5)	7 (4.0)	68 (3.6)	469 (2.1)	5 (5.3)	13 (2.7)	467 (4.6)	-11 (4.3) ▾
Oman	5 (2.0)	357 (12.1)	0 0	63 (4.1)	368 (3.9)	0 0	32 (3.8)	385 (8.0)	0 0
Palestinian Nat'l Auth.	11 (2.9)	354 (15.7)	7 (3.1) ▲	61 (4.4)	363 (4.7)	-5 (6.2)	29 (4.0)	380 (8.1)	-2 (5.9)
Qatar	6 (0.1)	290 (4.1)	0 0	48 (0.1)	306 (1.8)	0 0	46 (0.1)	311 (2.0)	0 0
Romania	4 (1.6)	446 (15.9)	1 (2.2)	50 (4.2)	472 (6.2)	3 (6.1)	46 (4.1)	453 (7.4)	-4 (5.9)
Russian Federation	4 (1.3)	511 (20.8)	-1 (2.2)	57 (4.5)	507 (5.2)	8 (6.0)	39 (4.5)	518 (5.2)	-6 (6.0)
Saudi Arabia	16 (3.2)	329 (8.4)	--	66 (3.7)	325 (4.0)	--	19 (2.5)	336 (7.6)	--
Scotland	17 (2.6)	491 (10.0)	1 (4.3)	61 (3.5)	496 (4.9)	-8 (5.7)	22 (3.2)	458 (10.9)	7 (4.5)
Serbia	13 (2.7)	489 (8.4)	4 (3.6)	67 (3.8)	483 (4.3)	7 (5.6)	20 (3.3)	492 (6.8)	-11 (5.0) ▾
Singapore	14 (1.9)	561 (13.2)	-5 (2.9)	74 (2.8)	595 (5.0)	6 (3.7)	12 (1.8)	620 (11.6)	-1 (2.5)
Slovenia	14 (1.9)	510 (7.1)	-15 (4.2) ▾	75 (2.2)	500 (2.7)	7 (4.5)	11 (1.7)	495 (5.4)	8 (2.2)
Sweden	25 (2.7)	487 (5.1)	10 (3.9) ▲	64 (2.9)	494 (2.8)	-3 (4.6)	11 (1.8)	487 (3.9)	-7 (3.3) ▾
Syrian Arab Republic	19 (3.4)	399 (7.9)	0 0	61 (4.1)	392 (4.8)	0 0	20 (3.4)	400 (9.8)	0 0
Thailand	5 (1.7)	432 (16.5)	0 0	55 (4.2)	441 (7.1)	0 0	40 (3.9)	443 (9.8)	0 0
Tunisia	26 (3.5)	423 (4.6)	2 (5.3)	62 (3.5)	422 (3.1)	-9 (5.4)	12 (2.6)	411 (5.7)	7 (3.2) ▲
Turkey	18 (2.9)	428 (7.9)	0 0	71 (3.5)	433 (6.4)	0 0	11 (2.4)	430 (18.3)	0 0
Ukraine	1 (0.7)	~ ~	0 0	47 (3.7)	451 (5.5)	0 0	52 (3.7)	471 (5.1)	0 0
United States	28 (2.7)	511 (6.2)	3 (3.7)	57 (2.9)	506 (4.0)	-6 (4.3)	15 (1.8)	514 (6.7)	3 (2.7)
‡ Morocco	52 (5.0)	371 (4.8)	--	38 (5.0)	390 (7.6)	--	10 (4.0)	420 (21.5)	--
International Avg.	15 (0.4)	451 (1.7)		61 (0.5)	451 (0.7)		24 (0.5)	452 (1.4)	

**Benchmarking Participants**

Basque Country, Spain	19 (3.6)	490 (5.7)	0 (5.2)	69 (4.3)	503 (3.4)	0 (6.5)	13 (2.8)	489 (6.8)	0 (4.6)
British Columbia, Canada	31 (4.0)	518 (6.4)	0 0	54 (4.2)	504 (4.7)	0 0	15 (3.2)	520 (11.5)	0 0
Dubai, UAE	7 (2.9)	449 (36.4)	0 0	59 (4.6)	465 (6.1)	0 0	34 (3.4)	448 (8.6)	0 0
Massachusetts, US	25 (5.9)	554 (12.0)	0 0	60 (5.8)	544 (7.3)	0 0	14 (4.4)	542 (17.9)	0 0
Minnesota, US	28 (7.5)	525 (8.8)	0 0	61 (6.0)	533 (8.3)	0 0	12 (5.4)	536 (11.5)	0 0
Ontario, Canada	18 (3.5)	525 (7.5)	-3 (5.4)	68 (4.5)	514 (4.5)	7 (6.6)	13 (3.5)	525 (6.5)	-3 (5.3)
Quebec, Canada	20 (3.7)	530 (12.0)	-4 (5.4)	70 (4.0)	530 (4.8)	-2 (5.9)	10 (2.0)	515 (12.4)	6 (2.7) ▲

▲ 2007 percent significantly higher

▾ 2007 percent significantly lower

Based on teachers' reports on the frequency of four types of interactions with other teachers: 1) Discussions about how to teach a particular concept; 2) Working on preparing instructional materials; 3) Visits to another teacher's classroom to observe his/her teaching; 4) Informal observation of my classroom by another teacher. Frequency is computed by averaging across four items based on a 4-point scale: 1. Never or Almost Never; 2. 2 or 3 times per month; 3. 1-3 times per week; 4. Daily or almost daily.

‡ Did not satisfy guidelines for sample participation rates (see Appendix A).

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

A dash (-) indicates comparable data are not available. A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70 but less than 85% of the students. An "s" indicates data are available for at least 50 but less than 70% of the students.

A diamond (◊) indicates the country did not participate in the assessment.



### How Well Prepared Do Teachers Feel They Are to Teach Mathematics?

TIMSS 2007 asked the students' teachers of mathematics how prepared they felt to teach a subset of the mathematics topics included in the TIMSS 2007 mathematics framework. At the fourth grade, teachers were asked about 20 topics in total, including 10 topics in number, 7 topics in geometric shapes and measures, and 3 topics in data display. At the eighth grade, teachers were asked about 18 topics in total, including 5 topics in number, 4 topics in algebra, 6 topics in geometry, and 3 topics in data and chance. The percentages of students with teachers that reported feeling "Very Well" prepared to teach the various topics are presented in Exhibits 6.6 and 6.7. In Exhibit 6.6, the results are summarized across all the mathematics topics and by content domain, and Exhibit 6.7 presents the results for each topic.

At the fourth grade, the average across all mathematics topics was 72 percent. The number content domain had the highest average percent across topics internationally (77 percent), approaching 90 percent for the whole number topics and never falling below 70 percent for any topic. The average across the topics in the geometric shapes and measures content domain was 68 percent, with considerable variation from topic to topic. Most fourth grade students (83%) were taught by teachers who reported feeling very well prepared to teach about finding areas and perimeters, but the percents were lower for other topics—down to as low as about half (51%) for reflections and rotations. The percents for the data display topics were very similar (69–74%).



**Exhibit 6.6 Summary of Students Whose Teachers Feel “Very Well” Prepared to Teach the TIMSS Mathematics Topics\***
**TIMSS2007**  
**Mathematics** **4<sup>th</sup>**  
**Grade**

Country	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach the TIMSS Mathematics Topics**			
	All Mathematics (20 topics)	Number (10 topics)	Geometric Shapes and Measures (7 topics)	Data Display (3 topics)
Algeria	64 (2.2)	73 (2.5)	67 (2.3)	53 (4.1)
Armenia	47 (3.1)	47 (3.3)	47 (3.4)	45 (3.4)
Australia	81 (1.9)	81 (1.9)	72 (2.5)	88 (2.0)
Austria	64 (1.9)	r 79 (1.5)	r 67 (1.9)	r 46 (3.1)
Chinese Taipei	61 (3.6)	62 (3.6)	56 (3.6)	65 (4.1)
Colombia	75 (2.6)	82 (2.5)	68 (3.3)	74 (3.6)
Czech Republic	73 (2.5)	85 (2.2)	r 70 (3.0)	62 (3.9)
Denmark	92 (1.2)	94 (1.2)	92 (1.2)	91 (1.9)
El Salvador	63 (2.6)	62 (2.7)	56 (2.7)	70 (3.5)
England	89 (1.4)	89 (1.5)	87 (1.7)	91 (2.1)
Georgia	76 (2.8)	88 (1.8)	r 78 (2.5)	67 (4.6)
Germany	62 (1.9)	s 69 (2.3)	r 65 (2.2)	60 (2.8)
Hong Kong SAR	57 (3.0)	55 (3.7)	r 51 (3.7)	67 (3.6)
Hungary	88 (1.3)	94 (1.1)	s 81 (1.8)	r 85 (2.3)
Iran, Islamic Rep. of	56 (2.8)	62 (2.8)	r 55 (2.9)	53 (3.7)
Italy	63 (2.6)	67 (2.7)	59 (2.8)	63 (2.8)
Japan	35 (2.5)	37 (2.7)	r 34 (2.7)	33 (3.1)
Kazakhstan	--	--	--	--
Kuwait	r 79 (2.3)	r 84 (2.1)	r 78 (2.4)	r 75 (3.6)
Latvia	81 (1.4)	87 (1.3)	r 68 (1.9)	87 (2.3)
Lithuania	52 (2.5)	54 (2.8)	50 (2.5)	55 (3.3)
Morocco	75 (2.2)	r 82 (2.3)	r 73 (2.1)	r 70 (3.5)
Netherlands	73 (2.9)	78 (3.1)	r 56 (3.3)	81 (3.2)
New Zealand	77 (1.4)	76 (1.8)	69 (1.9)	86 (1.5)
Norway	84 (1.4)	88 (1.3)	82 (1.8)	83 (2.3)
Qatar	75 (0.1)	85 (0.1)	74 (0.1)	66 (0.2)
Russian Federation	--	--	--	--
Scotland	91 (1.5)	92 (1.4)	85 (2.0)	94 (1.7)
Singapore	85 (1.5)	89 (1.4)	76 (1.8)	89 (1.8)
Slovak Republic	77 (2.5)	r 90 (1.9)	x x	r 65 (3.4)
Slovenia	75 (1.6)	75 (1.8)	s 59 (2.5)	84 (2.1)
Sweden	76 (1.8)	78 (1.9)	69 (2.0)	81 (2.2)
Tunisia	64 (2.7)	r 62 (3.2)	61 (2.7)	66 (3.4)
Ukraine	85 (2.0)	93 (1.4)	s 85 (2.1)	78 (3.6)
United States	90 (0.9)	91 (1.0)	85 (1.3)	94 (1.0)
Yemen	63 (2.3)	77 (2.1)	63 (2.7)	51 (4.0)
<b>International Avg.</b>	<b>72 (0.4)</b>	<b>77 (0.4)</b>	<b>68 (0.4)</b>	<b>71 (0.5)</b>
<b>Benchmarking Participants</b>				
Alberta, Canada	85 (1.6)	87 (1.8)	77 (2.0)	91 (2.0)
British Columbia, Canada	83 (1.8)	85 (1.9)	76 (2.6)	89 (1.7)
Dubai, UAE	r 93 (1.0)	r 97 (0.8)	s 91 (1.6)	s 91 (2.3)
Massachusetts, US	95 (0.9)	96 (1.0)	90 (1.6)	98 (0.8)
Minnesota, US	89 (2.2)	92 (2.1)	84 (3.1)	93 (2.6)
Ontario, Canada	89 (1.4)	86 (2.1)	84 (2.1)	97 (0.8)
Quebec, Canada	85 (1.6)	88 (1.7)	82 (2.1)	85 (2.1)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

Background data provided by teachers.

\* See Exhibit 6.7 for data on individual topics.

\*\* The TIMSS topics were summarized to reduce teachers' response burden.

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

A dash (–) indicates comparable data are not available.

An “r” indicates data are available for at least 70 but less than 85% of the students. An “s” indicates data are available for at least 50 but less than 70% of the students. An “x” indicates data are available for less than 50% of the students.





**Exhibit 6.6 Summary of Students Whose Teachers Feel “Very Well” Prepared to Teach the TIMSS Mathematics Topics\* (Continued)**

**TIMSS2007**  
Mathematics **8<sup>th</sup>** Grade

Country	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach the TIMSS Mathematics Topics**				
	All Mathematics (18 topics)	Number (5 topics)	Algebra (4 topics)	Geometry (6 topics)	Data and Chance (3 topics)
Algeria	66 (2.2)	77 (2.8) r	66 (3.1) r	63 (2.6)	54 (3.2)
Armenia	51 (2.2)	54 (3.0)	49 (3.3)	52 (2.9)	45 (3.4)
Australia	91 (1.6)	92 (1.6)	89 (2.2)	88 (2.0)	93 (1.8)
Bahrain	88 (0.8)	94 (0.7)	88 (0.8)	86 (1.0)	83 (1.9)
Bosnia and Herzegovina	67 (2.9)	78 (3.1)	75 (3.3)	72 (3.2) r	43 (3.3)
Botswana	82 (1.6)	89 (1.5)	83 (2.2)	84 (2.1)	73 (3.0)
Bulgaria	89 (1.0)	100 (0.2)	98 (0.6)	95 (1.1)	65 (3.0)
Chinese Taipei	74 (2.7)	83 (2.8)	81 (2.8)	70 (2.7)	65 (3.5)
Colombia	88 (1.7)	97 (1.1)	93 (1.8)	83 (2.2)	80 (3.2)
Cyprus	83 (1.6)	91 (1.4)	91 (1.6)	85 (1.6)	65 (2.7)
Czech Republic	85 (1.3)	98 (0.9)	93 (1.2)	90 (1.4)	60 (3.0)
Egypt	86 (1.3)	90 (1.5)	90 (1.5)	89 (1.2)	74 (2.5)
El Salvador	67 (2.7)	78 (2.9)	70 (3.1)	56 (3.3)	62 (3.5)
England	95 (1.0)	96 (1.1)	96 (1.0)	92 (1.5)	95 (1.3)
Georgia	86 (2.4)	97 (1.3)	89 (3.3)	86 (2.8)	75 (3.5)
Ghana	85 (1.4)	90 (1.6)	88 (1.5)	81 (2.0)	81 (2.4)
Hong Kong SAR	67 (3.1)	67 (3.5)	73 (3.0)	67 (3.2)	61 (4.0)
Hungary	89 (2.2)	95 (2.2)	94 (2.2)	91 (2.3)	76 (3.1)
Indonesia	81 (1.9)	87 (1.9)	79 (2.3)	84 (2.0)	72 (3.2)
Iran, Islamic Rep. of	78 (1.5)	90 (1.1)	77 (1.9)	80 (1.7)	64 (2.8)
Israel	r 84 (2.2)	r 87 (2.3) r	91 (2.2) r	80 (2.4) r	r 81 (2.5)
Italy	65 (2.1)	77 (2.5)	62 (2.8)	70 (2.2)	51 (2.7)
Japan	51 (2.6)	50 (3.2)	59 (2.8)	62 (3.2)	33 (2.9)
Jordan	89 (1.5)	94 (1.5)	92 (1.5)	85 (2.0)	84 (2.4)
Korea, Rep. of	70 (2.3)	72 (2.7)	75 (2.2)	73 (2.5)	60 (2.8)
Kuwait	r 76 (2.3)	r 89 (2.4) r	74 (3.1) r	73 (2.6) r	r 69 (3.8)
Lebanon	85 (1.9)	91 (1.8)	90 (1.9)	84 (2.3)	77 (3.0)
Lithuania	70 (2.2)	81 (2.7)	73 (2.3)	69 (2.6)	56 (3.1)
Malaysia	79 (1.9)	83 (2.6)	82 (2.2)	80 (1.9)	69 (2.8)
Malta	91 (0.1)	96 (0.1)	94 (0.1)	90 (0.1)	85 (0.2)
Norway	87 (1.1)	97 (0.8)	91 (1.4)	89 (1.2)	72 (2.3)
Oman	84 (1.4)	92 (1.3)	86 (1.8)	84 (1.8)	76 (2.6)
Palestinian Nat'l Auth.	86 (1.5)	93 (1.5)	89 (1.5)	83 (1.8)	80 (2.8)
Qatar	86 (0.1)	95 (0.1)	86 (0.1)	83 (0.1)	83 (0.1)
Romania	87 (1.3)	96 (1.1)	92 (1.3)	90 (1.3)	70 (2.8)
Russian Federation	--	--	--	--	--
Saudi Arabia	68 (2.4)	82 (2.6)	74 (2.8)	70 (2.8) r	49 (3.7)
Scotland	96 (0.6)	98 (0.6)	97 (0.8)	96 (0.9)	95 (0.9)
Serbia	74 (2.4)	86 (2.4)	79 (3.1)	79 (2.6)	51 (3.7)
Singapore	82 (1.3)	88 (1.4)	84 (1.4)	82 (1.4)	72 (2.1)
Slovenia	79 (1.2)	92 (1.2)	85 (1.3)	82 (1.4)	56 (2.2)
Sweden	79 (1.5)	90 (1.5)	79 (1.7)	73 (1.8)	76 (1.8)
Syrian Arab Republic	74 (1.6)	87 (2.1)	80 (1.8)	73 (1.8)	59 (3.1)
Thailand	47 (2.3)	56 (3.1)	40 (3.1)	47 (2.6)	41 (3.3)
Tunisia	80 (2.1)	89 (2.0)	80 (2.3)	79 (2.3)	71 (3.2)
Turkey	68 (2.7)	78 (3.1)	66 (3.4)	67 (3.1)	62 (3.4)
Ukraine	90 (1.3)	97 (0.9)	96 (1.2)	93 (1.3)	71 (3.0)
United States	93 (0.8)	97 (0.7)	95 (0.8)	88 (1.3)	92 (1.3)
‡ Morocco	73 (2.7)	86 (3.1)	79 (3.3) r	77 (2.1) r	r 53 (4.9)
<b>International Avg.</b>	<b>79 (0.3)</b>	<b>87 (0.3)</b>	<b>82 (0.3)</b>	<b>79 (0.3)</b>	<b>68 (0.4)</b>
<b>Benchmarking Participants</b>					
Basque Country, Spain	88 (1.7)	98 (1.0)	94 (1.7)	85 (2.6)	77 (3.4)
British Columbia, Canada	91 (1.3)	95 (1.1)	93 (1.4)	86 (2.0)	89 (2.1)
Dubai, UAE	s 88 (1.4)	s 95 (1.3) s	94 (1.5) s	84 (1.6) s	s 81 (2.5)
Massachusetts, US	96 (0.9)	98 (1.3)	97 (0.8)	93 (1.3)	97 (1.8)
Minnesota, US	r 97 (1.1)	r 99 (0.5) r	98 (1.1) r	91 (3.1) r	r 98 (1.0)
Ontario, Canada	83 (2.4)	88 (2.3)	80 (2.8)	78 (3.0)	85 (3.0)
Quebec, Canada	87 (1.7)	95 (1.4)	87 (2.3)	89 (1.7)	79 (2.7)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

Background data provided by teachers.

\* See Exhibit 6.7 for data on individual topics.

\*\* The TIMSS topics were summarized to reduce teachers' response burden.

‡ Did not satisfy guidelines for sample participation rates (see Appendix A).

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

A dash (–) indicates comparable data are not available.

An “r” indicates data are available for at least 70 but less than 85% of the students. An “s” indicates data are available for at least 50 but less than 70% of the students.

**Exhibit 6.7 Students Whose Teachers Feel “Very Well” Prepared to Teach the TIMSS Mathematics Topics**

**TIMSS2007**  
**Mathematics** **4<sup>th</sup> Grade**

Country	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach the TIMSS Mathematics Topics*									
	Number (10 topics)									
	Whole Numbers Including Place Value and Ordering	Operations (+, -, ×, ÷) with Whole Numbers	Fractions as Part of Whole and Location on Number Line	Fractions Represented by Words, Numbers, or Models	Comparing and Ordering Fractions	Adding and Subtracting with Fractions	Adding and Subtracting with Decimals	Number Sentences	Number Patterns	Relationships Between Given Pairs of Whole Numbers
Algeria	72 (3.8)	87 (2.5)	74 (4.3)	67 (4.8)	82 (3.3)	80 (3.3)	83 (3.2)	74 (3.8)	60 (5.1)	57 (4.8)
Armenia	49 (4.0)	48 (3.4)	49 (3.6)	49 (3.9)	45 (3.7)	46 (3.7)	46 (3.7)	50 (3.8)	47 (3.3)	49 (4.0)
Australia	92 (1.7)	94 (1.7)	81 (3.1)	77 (2.7)	72 (3.4)	68 (3.9)	76 (3.6)	92 (1.6)	85 (2.7)	77 (2.8)
Austria	94 (1.4)	98 (0.9)	81 (2.3)	76 (2.3)	74 (2.6)	73 (2.4)	70 (2.9)	70 (2.9)	70 (2.7)	73 (2.9)
Chinese Taipei	65 (4.2)	66 (4.4)	60 (4.4)	55 (4.4)	66 (4.2)	69 (3.9)	70 (3.9)	58 (4.1)	60 (3.9)	54 (4.6)
Colombia	85 (3.1)	94 (1.8)	84 (3.3)	82 (3.0)	81 (3.9)	90 (2.8)	88 (3.3)	74 (4.5)	64 (5.5)	74 (4.9)
Czech Republic	94 (2.0)	98 (1.4)	85 (3.3)	83 (3.1)	81 (3.8)	82 (3.5)	83 (3.9)	82 (2.9)	82 (3.5)	83 (2.9)
Denmark	97 (1.9)	98 (1.8)	99 (0.7)	96 (1.7)	96 (1.7)	92 (2.4)	98 (1.2)	94 (1.8)	86 (3.1)	83 (3.6)
El Salvador	67 (3.8)	81 (3.3)	58 (4.1)	57 (4.4)	60 (4.0)	74 (3.7)	76 (3.7)	44 (4.6)	43 (4.5)	57 (3.5)
England	98 (1.0)	95 (1.7)	89 (2.6)	87 (2.8)	83 (2.8)	76 (3.2)	89 (2.5)	94 (1.6)	93 (1.8)	90 (2.2)
Georgia	93 (2.2)	94 (2.1)	84 (3.3)	91 (2.4)	92 (2.3)	88 (2.7)	82 (4.1)	84 (4.5)	92 (1.9)	79 (4.1)
Germany	92 (1.8)	97 (1.1)	55 (4.3)	54 (4.4)	r 47 (5.1)	r 47 (5.0)	81 (2.3)	73 (3.4)	60 (3.1)	66 (3.1)
Hong Kong SAR	61 (4.2)	68 (4.1)	55 (4.4)	53 (4.6)	53 (4.0)	58 (4.3)	67 (4.2)	48 (4.5)	47 (4.6)	45 (4.5)
Hungary	99 (0.6)	99 (0.6)	92 (2.1)	93 (2.0)	93 (2.0)	92 (3.0)	r 90 (5.2)	95 (1.6)	97 (1.1)	86 (2.7)
Iran, Islamic Rep. of	76 (3.3)	84 (2.8)	63 (3.8)	55 (4.3)	73 (3.8)	81 (3.1)	58 (4.8)	44 (4.0)	44 (4.1)	45 (4.3)
Italy	73 (2.7)	78 (2.6)	68 (3.2)	69 (3.0)	63 (3.3)	64 (3.3)	73 (3.1)	56 (3.5)	62 (3.3)	60 (3.2)
Japan	48 (3.8)	55 (4.1)	47 (4.0)	31 (3.3)	40 (3.8)	39 (4.1)	43 (4.0)	28 (3.7)	19 (3.3)	17 (2.9)
Kazakhstan	--	--	--	--	--	--	--	--	--	--
Kuwait	r 96 (1.9)	r 94 (2.2)	r 86 (3.1)	r 83 (3.4)	r 89 (2.5)	r 89 (3.0)	r 76 (4.2)	r 84 (3.4)	r 73 (4.5)	r 72 (4.6)
Latvia	98 (1.1)	99 (0.6)	77 (3.0)	76 (2.8)	76 (3.2)	85 (3.0)	77 (3.6)	91 (2.4)	97 (1.2)	90 (2.6)
Lithuania	59 (3.5)	76 (2.9)	56 (3.6)	45 (3.8)	49 (3.7)	46 (3.9)	50 (3.7)	49 (4.0)	61 (3.3)	47 (3.4)
Morocco	89 (2.5)	94 (1.9)	82 (3.5)	75 (4.0)	87 (2.8)	85 (3.0)	86 (2.9)	84 (2.9)	67 (4.2)	72 (4.2)
Netherlands	83 (3.4)	89 (2.9)	81 (3.4)	80 (3.3)	75 (3.8)	75 (3.9)	76 (3.8)	85 (3.3)	72 (4.0)	64 (4.4)
New Zealand	87 (2.2)	90 (1.7)	77 (2.4)	76 (2.5)	73 (2.4)	62 (2.9)	61 (2.6)	84 (2.1)	81 (2.1)	74 (2.2)
Norway	99 (0.6)	99 (0.8)	91 (1.8)	88 (1.9)	85 (2.5)	92 (1.8)	95 (1.5)	79 (2.9)	74 (3.0)	76 (3.0)
Qatar	95 (0.1)	96 (0.0)	87 (0.1)	86 (0.1)	90 (0.1)	92 (0.1)	77 (0.1)	84 (0.1)	68 (0.2)	74 (0.2)
Russian Federation	--	--	--	--	--	--	--	--	--	--
Scotland	98 (1.1)	99 (0.8)	95 (1.5)	92 (2.1)	93 (1.7)	81 (3.2)	87 (2.5)	94 (1.7)	93 (2.2)	90 (2.6)
Singapore	93 (1.5)	94 (1.3)	90 (1.9)	90 (1.9)	89 (1.8)	91 (1.6)	93 (1.5)	83 (2.2)	82 (2.0)	82 (2.1)
Slovak Republic	96 (1.3)	97 (1.2)	87 (2.7)	87 (2.8)	79 (4.3)	70 (5.7)	81 (4.6)	83 (3.1)	92 (2.1)	99 (0.5)
Slovenia	91 (1.6)	96 (1.1)	75 (2.7)	79 (2.7)	61 (3.2)	55 (3.6)	55 (3.8)	80 (2.5)	65 (3.3)	74 (2.9)
Sweden	93 (2.1)	97 (1.2)	80 (2.9)	71 (3.2)	71 (3.3)	68 (3.2)	80 (3.1)	75 (3.2)	79 (2.9)	67 (3.4)
Tunisia	75 (3.4)	71 (3.3)	58 (4.3)	56 (4.3)	56 (4.7)	56 (4.6)	65 (3.8)	68 (3.6)	62 (3.2)	64 (3.8)
Ukraine	95 (1.7)	98 (0.9)	93 (2.3)	96 (1.7)	93 (2.2)	92 (2.6)	84 (3.8)	95 (1.8)	87 (3.0)	88 (2.8)
United States	97 (0.9)	97 (0.9)	90 (1.6)	91 (1.8)	82 (2.2)	89 (1.8)	92 (1.5)	93 (1.4)	92 (1.3)	92 (1.3)
Yemen	82 (3.1)	92 (2.7)	66 (4.3)	71 (4.4)	88 (2.7)	89 (2.8)	80 (4.1)	60 (4.1)	63 (4.9)	65 (4.2)
<b>International Avg.</b>	<b>85 (0.4)</b>	<b>89 (0.4)</b>	<b>76 (0.5)</b>	<b>74 (0.6)</b>	<b>75 (0.6)</b>	<b>75 (0.6)</b>	<b>76 (0.6)</b>	<b>74 (0.5)</b>	<b>71 (0.6)</b>	<b>70 (0.6)</b>

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

**Benchmarking Participants**

Alberta, Canada	95 (1.6)	96 (1.5)	83 (3.0)	87 (2.4)	75 (3.2)	73 (3.8)	91 (2.3)	90 (2.5)	89 (2.6)	86 (2.9)
British Columbia, Canada	91 (1.8)	95 (1.0)	86 (2.5)	86 (3.0)	r 80 (2.8)	r 80 (3.1)	86 (2.3)	80 (2.8)	83 (3.3)	78 (3.3)
Dubai, UAE	r 100 (0.0)	r 100 (0.0)	r 98 (1.0)	r 96 (2.8)	r 98 (0.1)	r 97 (1.1)	s 97 (1.1)	r 92 (2.3)	s 93 (1.7)	s 94 (1.9)
Massachusetts, US	100 (0.0)	98 (1.2)	97 (1.7)	97 (1.7)	95 (2.2)	90 (3.0)	95 (2.3)	96 (2.2)	95 (2.1)	94 (3.0)
Minnesota, US	98 (1.6)	100 (0.0)	92 (3.5)	88 (4.5)	82 (4.9)	86 (4.3)	94 (3.0)	94 (2.2)	94 (2.1)	90 (3.2)
Ontario, Canada	95 (2.0)	95 (1.9)	84 (3.1)	85 (3.4)	79 (3.9)	76 (4.6)	86 (3.1)	89 (2.6)	89 (2.7)	80 (3.9)
Quebec, Canada	96 (1.7)	97 (1.3)	88 (3.1)	90 (2.7)	84 (3.2)	82 (2.8)	92 (2.5)	86 (2.8)	84 (3.3)	82 (3.4)

Background data provided by teachers.

\* The TIMSS topics were summarized to reduce teachers' response burden.

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

A dash (–) indicates comparable data are not available.

An “r” indicates data are available for at least 70 but less than 85% of the students. An “s” indicates data are available for at least 50 but less than 70% of the students.

**Exhibit 6.7 Students Whose Teachers Feel “Very Well” Prepared to Teach the TIMSS Mathematics Topics (Continued)**

**TIMSS2007**  
Mathematics **4<sup>th</sup>** Grade

Country	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach the TIMSS Mathematics Topics*									
	Geometric Shapes and Measures (7 topics)							Data Display (3 topics)		
	Comparing and Drawing Angles	Elementary Properties of Common Geometric Shapes	Relationship Between 2D and 3D Shapes	Finding Areas and Perimeters	Estimating Areas and Volumes	Using Informal Coordinate Systems to Locate Points in a Plane	Reflections and Rotations	Reading Data from Tables, Bar Graphs, or Pie Charts	Drawing Conclusions from Data Displays	Displaying Data Using Tables, Bar Graphs, or Pie Charts
Algeria	84 (2.8)	83 (3.1)	50 (5.0)	89 (2.7)	77 (3.8)	40 (4.4)	39 (4.4)	48 (4.8)	58 (4.3)	52 (4.7)
Armenia	50 (3.7)	46 (3.4)	48 (4.2)	45 (4.0)	44 (4.3)	46 (3.8)	49 (4.3)	50 (4.1)	43 (3.5)	43 (3.7)
Australia	70 (3.1)	75 (3.4)	73 (3.7)	88 (2.3)	65 (3.7)	74 (3.4)	61 (3.9)	92 (2.1)	86 (2.3)	86 (2.5)
Austria	67 (2.9)	81 (2.2)	51 (3.7)	93 (1.3)	48 (3.5)	71 (3.0)	52 (3.8)	49 (3.4)	52 (3.3)	36 (3.7)
Chinese Taipei	63 (4.1)	69 (4.2)	58 (4.3)	65 (4.2)	54 (4.5)	49 (4.4)	31 (4.4)	68 (4.0)	62 (4.5)	65 (4.2)
Colombia	79 (4.1)	72 (4.2)	51 (4.7)	82 (3.7)	73 (4.5)	68 (4.5)	46 (5.0)	77 (4.0)	76 (4.2)	69 (4.0)
Czech Republic	70 (4.6)	93 (2.2)	63 (4.4)	91 (2.3)	62 (4.3)	63 (5.1)	52 (5.0)	64 (4.3)	64 (4.2)	56 (4.2)
Denmark	96 (2.0)	96 (1.1)	70 (4.3)	99 (0.5)	97 (1.5)	98 (1.0)	88 (2.8)	96 (1.5)	88 (2.7)	89 (2.8)
El Salvador	74 (3.6)	67 (4.0)	28 (4.2)	67 (3.8)	55 (4.1)	67 (4.2)	34 (4.5)	80 (3.7)	55 (4.4)	76 (3.7)
England	93 (1.8)	85 (2.7)	84 (2.8)	96 (1.3)	83 (3.2)	90 (2.6)	78 (3.3)	92 (2.1)	90 (2.3)	90 (2.4)
Georgia	88 (2.9)	82 (4.5)	64 (4.8)	95 (2.2)	81 (3.8)	70 (4.5)	53 (5.1)	63 (5.0)	74 (5.0)	65 (5.0)
Germany	67 (4.0)	88 (2.0)	54 (3.3)	70 (3.1)	50 (3.5)	61 (3.3)	62 (3.2)	66 (3.0)	61 (3.1)	54 (3.4)
Hong Kong SAR	60 (4.4)	52 (4.3)	53 (4.7)	59 (4.1)	46 (4.6)	43 (5.5)	40 (5.2)	72 (3.8)	62 (4.4)	68 (3.6)
Hungary	88 (2.5)	95 (1.2)	64 (4.3)	97 (1.2)	76 (4.3)	73 (4.4)	73 (3.5)	88 (2.4)	84 (2.5)	81 (3.1)
Iran, Islamic Rep. of	88 (2.8)	60 (4.4)	34 (4.2)	81 (3.0)	60 (4.2)	27 (4.3)	26 (4.1)	55 (4.1)	51 (4.4)	53 (4.2)
Italy	66 (3.2)	73 (3.0)	61 (3.2)	71 (3.3)	51 (3.8)	47 (3.2)	40 (3.5)	63 (3.0)	66 (2.8)	60 (3.0)
Japan	53 (3.9)	45 (3.8)	25 (3.6)	55 (3.6)	32 (3.6)	19 (3.3)	16 (3.3)	40 (3.6)	23 (3.5)	34 (3.8)
Kazakhstan	--	--	--	--	--	--	--	--	--	--
Kuwait	r 95 (2.1)	r 88 (2.8)	r 67 (4.2)	r 90 (2.9)	r 82 (3.6)	r 56 (4.5)	r 63 (4.7)	r 75 (4.4)	r 76 (4.1)	r 72 (4.1)
Latvia	92 (2.1)	95 (1.8)	37 (4.2)	96 (1.8)	79 (2.9)	28 (4.2)	26 (4.1)	91 (2.1)	86 (2.6)	85 (2.9)
Lithuania	59 (3.2)	61 (3.4)	35 (3.8)	77 (3.1)	37 (3.7)	36 (3.8)	24 (4.2)	61 (3.7)	53 (3.8)	50 (3.6)
Morocco	84 (3.0)	92 (1.9)	66 (3.4)	92 (2.0)	75 (3.5)	56 (4.3)	r 40 (3.8)	69 (4.1)	79 (3.5)	63 (4.3)
Netherlands	46 (4.3)	47 (4.3)	40 (4.3)	80 (3.4)	58 (4.3)	70 (4.0)	51 (4.3)	85 (3.1)	78 (3.9)	81 (3.4)
New Zealand	56 (2.7)	75 (2.5)	73 (2.1)	77 (2.2)	65 (2.6)	60 (3.0)	74 (2.1)	88 (1.6)	85 (1.8)	85 (1.6)
Norway	83 (2.7)	90 (1.9)	70 (3.4)	94 (1.5)	85 (2.4)	82 (2.5)	70 (3.4)	89 (2.3)	83 (2.7)	78 (2.8)
Qatar	91 (0.1)	83 (0.1)	57 (0.2)	91 (0.1)	76 (0.2)	61 (0.2)	59 (0.2)	68 (0.2)	67 (0.2)	64 (0.2)
Russian Federation	--	--	--	--	--	--	--	--	--	--
Scotland	86 (2.7)	86 (2.9)	90 (2.6)	95 (1.9)	81 (3.3)	87 (3.3)	71 (3.5)	96 (1.7)	94 (2.1)	94 (2.0)
Singapore	86 (2.0)	87 (1.9)	68 (3.0)	89 (1.9)	77 (2.4)	55 (3.4)	55 (3.3)	92 (1.7)	88 (2.0)	88 (2.0)
Slovak Republic	77 (5.3)	96 (1.5)	58 (4.8)	93 (2.1)	69 (4.3)	51 (5.4)	43 (5.6)	69 (3.5)	64 (4.1)	61 (4.2)
Slovenia	39 (3.7)	80 (2.2)	89 (1.9)	60 (3.7)	50 (3.5)	35 (3.6)	--	88 (2.0)	81 (2.6)	81 (2.3)
Sweden	84 (2.7)	88 (2.4)	44 (3.9)	91 (1.8)	74 (3.1)	72 (3.3)	29 (3.7)	89 (2.0)	77 (2.6)	76 (3.1)
Tunisia	71 (3.3)	71 (3.0)	56 (3.8)	73 (3.5)	59 (4.1)	55 (4.3)	49 (4.6)	60 (4.0)	70 (3.7)	67 (3.7)
Ukraine	94 (1.9)	98 (1.2)	77 (3.8)	99 (0.8)	80 (3.7)	72 (5.2)	63 (5.9)	79 (3.9)	81 (3.6)	76 (4.1)
United States	86 (1.7)	91 (1.3)	81 (2.0)	95 (1.2)	78 (2.4)	87 (2.0)	79 (1.8)	96 (0.9)	92 (1.4)	92 (1.4)
Yemen	83 (3.0)	75 (4.2)	51 (5.5)	81 (4.0)	74 (3.9)	38 (5.5)	38 (5.5)	58 (4.6)	49 (5.4)	45 (5.3)
<b>International Avg.</b>	<b>76 (0.5)</b>	<b>78 (0.5)</b>	<b>58 (0.7)</b>	<b>83 (0.5)</b>	<b>66 (0.6)</b>	<b>59 (0.7)</b>	<b>51 (0.7)</b>	<b>74 (0.6)</b>	<b>70 (0.6)</b>	<b>69 (0.6)</b>

**Benchmarking Participants**

Alberta, Canada	72 (3.9)	87 (2.5)	83 (3.0)	92 (2.0)	74 (3.5)	71 (3.2)	59 (3.9)	93 (2.1)	88 (2.4)	91 (2.2)
British Columbia, Canada	77 (3.8)	82 (3.3)	74 (4.0)	88 (2.4)	r 76 (3.1)	72 (4.0)	59 (3.6)	91 (1.8)	89 (1.9)	88 (2.1)
Dubai, UAE	s 99 (1.1)	r 95 (1.1)	s 85 (2.6)	r 99 (0.1)	s 94 (2.6)	s 79 (3.6)	s 79 (4.4)	s 93 (2.2)	s 91 (1.7)	s 90 (4.5)
Massachusetts, US	96 (1.9)	96 (2.3)	85 (3.4)	96 (2.2)	85 (4.3)	96 (2.2)	77 (3.7)	100 (0.0)	95 (2.3)	98 (1.5)
Minnesota, US	87 (4.6)	92 (3.2)	77 (6.2)	97 (2.2)	72 (6.6)	85 (3.4)	76 (6.0)	97 (2.0)	93 (3.3)	89 (4.8)
Ontario, Canada	85 (3.4)	90 (2.7)	87 (2.7)	96 (1.5)	79 (3.7)	84 (3.4)	70 (4.0)	99 (0.5)	95 (1.6)	98 (1.2)
Quebec, Canada	85 (3.3)	92 (1.9)	77 (3.8)	92 (2.3)	76 (3.7)	81 (3.7)	68 (3.8)	88 (2.0)	83 (3.0)	84 (2.7)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

**Exhibit 6.7 Students Whose Teachers Feel “Very Well” Prepared to Teach the TIMSS Mathematics Topics (Continued)**

**TIMSS2007**  
Mathematics **8<sup>th</sup>** Grade

Country	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach the TIMSS Mathematics Topics*									
	Number (5 topics)					Algebra (4 topics)				
	Computing, Estimating, or Approximating with Whole Numbers	Representing Decimals and Fractions Using Words, Numbers, or Models	Computing with Fractions and Decimals	Representing, Comparing, Ordering, and Computing with Integers	Problem Solving Involving Percents and Proportions	Numeric, Algebraic, and Geometric Patterns or Sequences	Simplifying and Evaluating the Algebraic Expressions	Simple Linear Equations and Inequalities, and Simultaneous (Two Variable) Equations	Equivalent Representations of Functions as Ordered Pairs, Tables, Graphs, Words, or Equations	
Algeria	71 (4.3)	61 (4.7)	82 (3.4)	89 (2.8)	81 (3.5)	r 28 (4.9)	88 (2.7)	79 (3.7)	56 (4.4)	
Armenia	53 (3.6)	51 (3.7)	54 (3.3)	54 (3.3)	59 (3.2)	49 (3.3)	48 (4.1)	50 (3.8)	47 (3.8)	
Australia	92 (2.5)	95 (1.8)	91 (2.6)	90 (2.7)	94 (2.0)	88 (2.6)	93 (2.2)	87 (2.7)	88 (2.6)	
Bahrain	97 (0.8)	91 (1.0)	95 (1.3)	95 (1.6)	92 (0.9)	72 (2.1)	96 (0.5)	98 (1.1)	88 (1.2)	
Bosnia and Herzegovina	77 (3.7)	78 (3.4)	81 (3.2)	80 (3.4)	73 (3.6)	65 (3.9)	79 (3.3)	81 (3.3)	76 (3.7)	
Botswana	89 (2.8)	86 (3.1)	94 (2.0)	88 (2.9)	85 (3.1)	77 (4.1)	94 (1.8)	92 (2.7)	69 (4.9)	
Bulgaria	98 (0.7)	99 (0.4)	100 (0.0)	100 (0.0)	100 (0.2)	92 (2.1)	100 (0.2)	100 (0.0)	98 (1.0)	
Chinese Taipei	83 (3.1)	83 (3.1)	85 (3.0)	86 (2.9)	76 (3.4)	80 (3.2)	85 (2.9)	85 (2.7)	75 (3.7)	
Colombia	99 (0.8)	97 (1.5)	97 (1.5)	98 (1.1)	95 (2.1)	89 (2.6)	95 (2.0)	94 (2.7)	93 (2.4)	
Cyprus	92 (1.7)	79 (2.9)	94 (1.4)	95 (1.3)	95 (1.3)	83 (2.5)	97 (1.3)	96 (1.6)	88 (2.0)	
Czech Republic	98 (1.1)	96 (1.5)	99 (0.7)	98 (1.2)	98 (0.9)	78 (3.3)	98 (1.1)	98 (1.0)	95 (1.6)	
Egypt	92 (2.1)	83 (3.0)	92 (1.9)	94 (1.9)	87 (2.7)	77 (3.5)	97 (0.8)	97 (1.3)	88 (2.7)	
El Salvador	80 (3.3)	76 (3.8)	85 (3.4)	80 (3.7)	69 (4.1)	51 (4.8)	80 (3.5)	79 (3.5)	72 (4.1)	
England	96 (1.6)	95 (1.8)	97 (1.5)	98 (1.2)	95 (1.4)	98 (0.9)	100 (0.3)	96 (1.4)	92 (2.4)	
Georgia	99 (0.8)	97 (1.6)	98 (1.2)	95 (2.4)	93 (3.4)	89 (4.0)	95 (2.8)	90 (3.8)	84 (4.3)	
Ghana	89 (2.3)	88 (2.7)	91 (2.3)	91 (2.5)	91 (2.5)	80 (3.3)	98 (1.1)	92 (2.2)	83 (3.1)	
Hong Kong SAR	61 (4.4)	65 (4.3)	75 (3.8)	75 (3.9)	60 (4.3)	66 (3.9)	78 (3.7)	80 (3.6)	68 (3.8)	
Hungary	95 (2.2)	94 (2.4)	96 (2.2)	95 (2.2)	95 (2.2)	92 (2.4)	96 (2.2)	94 (2.3)	93 (2.3)	
Indonesia	73 (3.9)	86 (3.2)	96 (1.6)	92 (2.5)	87 (2.8)	67 (4.0)	80 (2.9)	92 (2.2)	77 (3.6)	
Iran, Islamic Rep. of	88 (2.2)	77 (2.9)	96 (1.3)	97 (1.3)	92 (2.1)	53 (3.9)	98 (1.0)	92 (1.9)	63 (3.9)	
Israel	r 85 (2.7)	r 85 (2.5)	r 89 (2.4)	r 89 (2.5)	r 86 (2.4)	r 89 (2.4)	r 92 (2.2)	r 93 (2.1)	r 89 (2.5)	
Italy	74 (2.6)	77 (2.8)	79 (2.8)	82 (2.6)	74 (3.0)	42 (3.4)	76 (2.9)	64 (3.5)	67 (3.1)	
Japan	43 (4.3)	48 (4.2)	54 (3.7)	60 (3.6)	45 (3.5)	44 (3.9)	73 (3.1)	70 (3.4)	49 (4.0)	
Jordan	94 (1.9)	93 (2.1)	97 (1.3)	96 (1.8)	90 (2.4)	78 (3.5)	97 (1.5)	97 (1.3)	94 (1.9)	
Korea, Rep. of	66 (3.4)	68 (3.5)	77 (3.2)	79 (3.0)	70 (3.3)	53 (3.3)	85 (2.6)	87 (2.5)	74 (3.1)	
Kuwait	r 92 (2.7)	r 83 (4.1)	r 91 (2.7)	r 92 (2.7)	r 89 (3.1)	r 51 (5.4)	r 82 (3.9)	r 86 (3.5)	r 75 (3.9)	
Lebanon	93 (1.9)	91 (2.4)	94 (1.9)	92 (2.4)	85 (3.3)	86 (3.1)	95 (1.8)	92 (2.4)	86 (2.7)	
Lithuania	81 (2.7)	80 (3.1)	84 (2.9)	81 (3.3)	79 (3.1)	52 (3.3)	83 (3.0)	82 (2.8)	71 (3.2)	
Malaysia	87 (3.0)	81 (3.4)	85 (3.2)	86 (2.9)	75 (3.5)	82 (3.2)	91 (2.6)	82 (3.4)	73 (3.4)	
Malta	95 (0.1)	93 (0.1)	95 (0.1)	99 (0.1)	97 (0.1)	90 (0.1)	98 (0.1)	97 (0.1)	91 (0.2)	
Norway	97 (1.2)	98 (1.0)	99 (0.8)	97 (1.2)	95 (1.6)	87 (2.2)	95 (1.5)	94 (1.7)	86 (2.2)	
Oman	96 (1.8)	86 (2.8)	89 (2.5)	97 (1.7)	93 (2.0)	62 (4.1)	95 (2.0)	96 (1.8)	89 (3.1)	
Palestinian Nat'l Auth.	95 (1.9)	90 (2.8)	95 (2.3)	94 (2.0)	92 (2.3)	69 (3.6)	96 (1.7)	98 (1.3)	93 (2.2)	
Qatar	95 (0.1)	93 (0.1)	96 (0.1)	98 (0.0)	92 (0.1)	71 (0.2)	94 (0.1)	97 (0.0)	86 (0.1)	
Romania	96 (1.6)	95 (1.8)	98 (0.9)	97 (1.1)	96 (1.7)	81 (3.1)	97 (1.1)	97 (1.0)	92 (2.1)	
Russian Federation	--	--	--	--	--	--	--	--	--	
Saudi Arabia	87 (3.0)	75 (4.1)	83 (3.7)	90 (2.5)	71 (4.0)	47 (4.5)	85 (3.1)	76 (4.1)	84 (3.3)	
Scotland	98 (0.7)	98 (1.0)	98 (0.8)	98 (0.9)	97 (1.1)	97 (1.3)	99 (0.3)	100 (0.3)	91 (2.1)	
Serbia	78 (4.1)	88 (2.7)	92 (2.3)	89 (2.9)	84 (3.3)	63 (4.1)	84 (3.7)	91 (2.8)	76 (4.0)	
Singapore	87 (1.9)	87 (1.8)	91 (1.4)	89 (1.5)	87 (1.8)	70 (2.3)	93 (1.4)	91 (1.5)	83 (2.0)	
Slovenia	95 (1.1)	88 (1.8)	95 (1.2)	95 (1.2)	86 (1.9)	66 (2.6)	92 (1.4)	92 (1.6)	90 (1.7)	
Sweden	93 (1.5)	89 (1.6)	90 (1.8)	90 (1.8)	88 (2.0)	73 (2.5)	89 (1.6)	78 (2.5)	72 (2.5)	
Syrian Arab Republic	87 (3.0)	79 (3.4)	90 (2.7)	92 (2.3)	82 (3.3)	49 (4.3)	92 (2.4)	93 (2.2)	78 (3.5)	
Thailand	55 (4.4)	48 (4.0)	61 (4.4)	64 (4.3)	51 (3.8)	23 (3.8)	29 (4.3)	53 (4.1)	52 (4.5)	
Tunisia	88 (2.9)	88 (2.8)	94 (2.2)	95 (1.7)	78 (3.6)	62 (3.9)	91 (2.3)	87 (3.0)	76 (3.4)	
Turkey	80 (4.0)	70 (3.9)	82 (3.4)	87 (3.3)	73 (4.6)	56 (4.5)	80 (3.9)	75 (4.1)	49 (4.9)	
Ukraine	96 (1.5)	95 (1.7)	99 (0.9)	98 (1.3)	98 (1.0)	94 (1.7)	96 (1.8)	98 (1.3)	95 (1.6)	
United States	97 (0.8)	97 (0.8)	97 (0.8)	98 (0.7)	95 (1.0)	93 (1.1)	98 (0.7)	95 (1.2)	94 (1.2)	
‡ Morocco	86 (4.0)	78 (4.5)	91 (3.4)	91 (3.1)	84 (4.3)	r 56 (4.5)	85 (3.8)	89 (3.5)	79 (4.3)	
International Avg.	86 (0.4)	84 (0.4)	89 (0.3)	90 (0.3)	84 (0.4)	70 (0.5)	89 (0.3)	88 (0.4)	80 (0.4)	

**Benchmarking Participants**

Basque Country, Spain	99 (1.0)	98 (1.4)	98 (1.4)	100 (0.0)	98 (1.3)	92 (2.7)	99 (1.0)	98 (1.3)	87 (3.6)
British Columbia, Canada	96 (1.8)	94 (2.1)	98 (1.2)	95 (1.9)	94 (1.7)	89 (2.3)	99 (0.8)	92 (2.4)	93 (2.2)
Dubai, UAE	s 96 (1.2)	s 95 (2.5)	s 96 (1.3)	s 93 (2.2)	s 95 (1.8)	s 96 (0.7)	s 92 (2.3)	s 94 (2.6)	s 93 (1.5)
Massachusetts, US	99 (1.3)	98 (1.6)	99 (1.3)	100 (0.0)	97 (1.8)	94 (2.1)	100 (0.0)	98 (1.5)	98 (1.6)
Minnesota, US	r 100 (0.3)	r 98 (1.9)	r 100 (0.3)	r 100 (0.3)	r 100 (0.3)	r 93 (4.4)	r 100 (0.3)	r 99 (0.8)	r 99 (0.9)
Ontario, Canada	89 (2.6)	82 (3.5)	90 (2.5)	90 (2.6)	86 (3.3)	83 (3.4)	87 (2.8)	73 (4.4)	80 (3.6)
Quebec, Canada	96 (1.4)	96 (1.8)	96 (1.6)	90 (3.2)	96 (1.9)	88 (3.1)	96 (1.7)	82 (3.8)	82 (3.8)

Background data provided by teachers.

\* The TIMSS topics were summarized to reduce teachers' response burden.

‡ Did not satisfy guidelines for sample participation rates (see Appendix A).

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

A dash (–) indicates comparable data are not available.

An “r” indicates data are available for at least 70 but less than 85% of the students. An “s” indicates data are available for at least 50 but less than 70% of the students.

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007



**Exhibit 6.7 Students Whose Teachers Feel “Very Well” Prepared to Teach the TIMSS Mathematics Topics (Continued)**

**TIMSS2007**  
Mathematics **8<sup>th</sup>** Grade

Country	Percentage of Students Whose Teachers Report Feeling Very Well Prepared to Teach the TIMSS Mathematics Topics*									
	Geometry (6 topics)						Data and Chance (3 topics)			
	Geometric Properties of Angles and Geometric Shapes	Congruent Figures and Similar Triangles	Relationship Between 3D Shapes and Their 2D Representation	Measurement Formulas for Perimeters, Surface Areas and Volumes	Cartesian Plane (Ordered Pairs, Equations, Intercepts, Intersections, and Gradient)	Translation, Reflection, and Rotation	Reading and Displaying Data Using Tables and Graphs	Interpreting Data Sets	Judging, Predicting, and Determining Chances of Possible Outcomes	
Algeria	94 (2.0)	76 (4.0)	33 (4.7)	75 (3.9)	r 34 (5.3)	47 (4.5)	80 (3.7)	43 (4.3)	38 (4.5)	
Armenia	55 (3.4)	58 (3.2)	50 (3.4)	50 (3.5)	45 (3.5)	53 (4.1)	45 (4.1)	45 (4.1)	43 (3.7)	
Australia	95 (1.8)	87 (2.6)	86 (3.0)	94 (1.7)	88 (2.3)	79 (3.0)	96 (1.6)	93 (2.2)	91 (2.4)	
Bahrain	98 (0.9)	96 (1.8)	70 (2.2)	91 (1.4)	67 (2.5)	91 (2.1)	88 (2.2)	87 (2.1)	75 (2.7)	
Bosnia and Herzegovina	77 (3.5)	68 (3.8)	58 (4.1)	79 (3.5)	75 (3.7)	72 (3.8)	43 (3.7)	43 (3.4)	41 (3.5)	
Botswana	96 (1.9)	76 (3.5)	71 (4.4)	93 (2.5)	80 (3.9)	80 (3.8)	94 (2.2)	62 (4.7)	63 (4.6)	
Bulgaria	99 (1.0)	99 (1.1)	95 (1.6)	99 (0.9)	82 (3.2)	93 (1.8)	82 (2.9)	57 (3.9)	55 (4.0)	
Chinese Taipei	84 (2.8)	78 (3.2)	61 (3.8)	79 (3.5)	70 (3.8)	47 (4.5)	75 (3.5)	54 (4.5)	64 (4.3)	
Colombia	91 (2.2)	88 (3.2)	64 (4.4)	92 (2.8)	95 (1.7)	71 (4.6)	89 (2.9)	80 (3.5)	72 (4.8)	
Cyprus	95 (1.5)	94 (1.8)	66 (3.2)	97 (1.3)	95 (1.4)	60 (3.4)	79 (2.7)	60 (3.0)	56 (3.3)	
Czech Republic	97 (1.4)	94 (1.9)	88 (2.6)	99 (0.9)	80 (3.0)	82 (2.9)	84 (3.1)	53 (3.7)	42 (4.2)	
Egypt	94 (1.9)	95 (1.9)	60 (4.2)	90 (2.6)	94 (1.7)	97 (1.5)	87 (2.3)	67 (3.7)	68 (3.9)	
El Salvador	71 (4.0)	63 (4.7)	33 (4.3)	67 (4.3)	69 (4.1)	34 (4.6)	85 (3.2)	56 (4.5)	46 (5.0)	
England	97 (1.1)	89 (2.3)	83 (3.3)	98 (1.0)	89 (2.8)	94 (1.7)	96 (1.4)	92 (2.2)	97 (1.1)	
Georgia	98 (1.0)	90 (3.6)	71 (4.3)	91 (3.5)	81 (4.7)	86 (3.9)	83 (3.4)	73 (4.5)	68 (4.4)	
Ghana	90 (2.5)	77 (3.7)	64 (4.0)	87 (3.0)	81 (3.4)	89 (2.5)	93 (2.0)	77 (3.5)	75 (3.8)	
Hong Kong SAR	75 (3.9)	73 (4.0)	57 (4.7)	71 (3.6)	69 (4.0)	54 (4.9)	70 (4.1)	59 (4.9)	52 (4.8)	
Hungary	95 (2.2)	92 (2.4)	74 (3.9)	95 (2.2)	92 (2.5)	92 (2.6)	89 (2.9)	75 (3.7)	63 (4.3)	
Indonesia	92 (2.3)	91 (2.3)	59 (4.7)	95 (1.8)	88 (2.6)	79 (3.9)	87 (3.3)	54 (4.5)	72 (4.2)	
Iran, Islamic Rep. of	95 (1.4)	86 (2.7)	39 (3.9)	90 (2.5)	90 (2.0)	76 (3.6)	80 (3.0)	63 (4.1)	43 (4.1)	
Israel	r 89 (2.5)	r 86 (3.0)	r 66 (3.2)	r 83 (2.9)	r 85 (2.9)	r 66 (3.1)	r 89 (2.7)	r 78 (3.0)	r 76 (3.1)	
Italy	82 (2.7)	75 (3.0)	72 (3.2)	86 (2.4)	67 (3.1)	38 (3.1)	65 (3.1)	46 (3.1)	41 (3.3)	
Japan	69 (3.8)	69 (3.8)	56 (4.4)	65 (3.7)	63 (3.9)	51 (4.2)	31 (4.0)	23 (3.4)	47 (4.0)	
Jordan	89 (2.8)	94 (2.2)	61 (4.1)	93 (2.1)	95 (1.9)	77 (3.2)	93 (2.2)	80 (3.5)	78 (3.7)	
Korea, Rep. of	76 (3.2)	82 (2.9)	55 (3.5)	81 (2.9)	81 (2.9)	60 (3.4)	64 (3.6)	58 (3.2)	56 (3.1)	
Kuwait	r 88 (3.0)	r 88 (3.2)	r 43 (4.9)	r 78 (3.9)	r 40 (5.2)	r 88 (3.2)	r 80 (4.2)	r 66 (4.7)	r 61 (4.8)	
Lebanon	94 (1.9)	90 (2.3)	72 (4.3)	91 (2.3)	89 (2.5)	65 (5.0)	79 (3.2)	76 (4.0)	79 (3.6)	
Lithuania	78 (2.9)	75 (3.4)	56 (3.7)	83 (2.9)	66 (3.6)	49 (4.0)	71 (3.3)	49 (3.9)	45 (3.9)	
Malaysia	84 (2.3)	76 (3.3)	70 (3.3)	85 (2.9)	78 (3.4)	85 (2.2)	82 (2.8)	69 (4.0)	57 (4.0)	
Malta	100 (0.0)	85 (0.2)	74 (0.2)	97 (0.1)	93 (0.1)	86 (0.2)	92 (0.2)	79 (0.2)	87 (0.2)	
Norway	97 (1.1)	92 (1.7)	67 (2.8)	98 (0.9)	94 (1.6)	84 (2.5)	90 (1.7)	65 (3.3)	61 (3.7)	
Oman	91 (2.3)	90 (2.8)	52 (4.3)	91 (2.1)	88 (2.9)	91 (2.5)	90 (2.7)	71 (3.7)	67 (4.0)	
Palestinian Nat'l Auth.	94 (2.3)	94 (2.1)	64 (3.5)	90 (2.5)	82 (3.2)	74 (3.4)	86 (3.0)	75 (3.6)	79 (3.6)	
Qatar	92 (0.1)	93 (0.1)	68 (0.2)	87 (0.1)	64 (0.2)	97 (0.1)	95 (0.1)	80 (0.1)	73 (0.2)	
Romania	95 (1.8)	96 (1.7)	90 (2.2)	97 (1.1)	93 (1.7)	70 (3.4)	86 (2.7)	54 (3.4)	70 (4.1)	
Russian Federation	--	--	--	--	--	--	--	--	--	
Saudi Arabia	85 (3.1)	88 (3.1)	39 (4.9)	62 (4.2)	66 (4.6)	70 (3.8)	63 (4.9)	39 (4.5)	49 (4.4)	
Scotland	97 (1.0)	96 (1.5)	92 (1.9)	100 (0.3)	98 (0.7)	91 (2.1)	98 (0.9)	94 (1.4)	94 (1.5)	
Serbia	89 (2.9)	77 (4.0)	65 (4.2)	90 (2.8)	83 (2.9)	71 (3.7)	62 (4.2)	53 (4.5)	38 (4.0)	
Singapore	87 (1.6)	83 (1.9)	67 (2.8)	94 (1.0)	89 (1.7)	71 (2.6)	89 (1.8)	70 (2.9)	56 (3.0)	
Slovenia	92 (1.5)	86 (1.7)	75 (2.2)	92 (1.4)	73 (2.5)	74 (2.1)	78 (2.0)	51 (3.0)	38 (3.0)	
Sweden	90 (2.0)	82 (2.5)	54 (3.0)	92 (1.8)	81 (2.3)	32 (2.9)	86 (1.9)	72 (2.5)	70 (2.7)	
Syrian Arab Republic	98 (1.2)	95 (1.9)	56 (4.1)	78 (3.4)	36 (4.9)	60 (4.4)	64 (3.9)	56 (3.9)	58 (3.9)	
Thailand	57 (4.0)	59 (4.0)	35 (4.2)	50 (4.0)	23 (4.0)	54 (4.0)	64 (4.0)	29 (4.4)	28 (4.3)	
Tunisia	95 (1.8)	90 (2.7)	73 (3.8)	79 (3.5)	70 (4.0)	67 (4.0)	72 (4.0)	76 (3.5)	65 (3.7)	
Turkey	81 (3.5)	80 (3.8)	41 (4.6)	72 (4.4)	69 (4.6)	58 (4.9)	68 (4.2)	63 (4.5)	56 (3.8)	
Ukraine	98 (1.2)	94 (2.0)	83 (2.9)	98 (1.2)	99 (0.9)	89 (2.4)	86 (2.9)	67 (3.9)	61 (4.2)	
United States	93 (1.5)	93 (1.5)	85 (1.8)	95 (1.2)	85 (1.8)	79 (2.6)	95 (1.1)	92 (1.5)	89 (1.8)	
‡ Morocco	93 (2.4)	94 (2.1)	r 57 (4.8)	86 (3.9)	66 (4.7)	62 (5.0)	64 (6.2)	47 (4.6)	51 (6.6)	
<b>International Avg.</b>	<b>89 (0.3)</b>	<b>85 (0.4)</b>	<b>64 (0.5)</b>	<b>86 (0.4)</b>	<b>77 (0.5)</b>	<b>72 (0.5)</b>	<b>79 (0.5)</b>	<b>64 (0.5)</b>	<b>62 (0.5)</b>	
<b>Benchmarking Participants</b>										
Basque Country, Spain	97 (1.8)	89 (2.8)	74 (4.6)	98 (1.5)	85 (3.8)	64 (5.2)	88 (3.2)	75 (4.3)	66 (4.7)	
British Columbia, Canada	91 (2.4)	91 (2.6)	78 (3.5)	95 (2.0)	84 (3.2)	75 (3.6)	95 (1.9)	88 (2.5)	83 (3.1)	
Dubai, UAE	s 97 (1.1)	s 87 (1.6)	s 71 (2.8)	s 92 (1.7)	s 78 (3.1)	s 80 (4.1)	s 92 (1.6)	s 75 (3.6)	s 77 (3.4)	
Massachusetts, US	97 (1.9)	97 (1.7)	83 (4.2)	98 (1.7)	96 (2.9)	91 (4.4)	96 (2.8)	98 (1.7)	96 (2.9)	
Minnesota, US	r 94 (4.1)	r 96 (3.9)	r 85 (5.8)	r 99 (0.4)	r 91 (4.7)	r 84 (6.1)	r 99 (0.4)	r 99 (0.9)	r 96 (2.7)	
Ontario, Canada	78 (3.6)	82 (3.9)	74 (4.1)	92 (2.8)	64 (4.7)	77 (4.0)	91 (2.7)	86 (3.5)	78 (3.7)	
Quebec, Canada	91 (2.6)	94 (2.2)	73 (3.8)	95 (1.8)	86 (3.1)	92 (2.3)	89 (3.1)	70 (4.0)	76 (3.5)	

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2007

At the eighth grade, the average across all topics was 79 percent. Again, number had the highest percent on average across topics, with 87 percent of the students having teachers that reported being very well prepared to teach those topics. The averages for the algebra and geometry topics were similar, 82 and 79 percent, respectively. Within the algebra topics, the highest percents were for working with algebraic expressions and equations (88–89%), next for working with functions (80%), and lowest for patterns and sequences (70%). Again there was quite a range across the geometry topics from 89 percent for properties of angles and shapes to 64 percent for relationships between three-dimensional shapes and their two-dimensional representations. The average for data and chance was 68 percent. Within the three data and chance topics, reading and displaying data in graphs in tables was 79 percent, but the other two topics were lower—interpreting data sets (64%) and chances of possible outcomes (62%).



