

**Exhibit 8.4: Teachers Majored in Education and Science**

Reported by Teachers

Country	Major in Science and Science Education		Major in Science but No Major in Science Education		Major in Science Education but No Major in Science		All Other Majors		No Formal Education Beyond Upper-Secondary*	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
Australia	63 (2.2)	516 (3.9)	21 (2.3)	519 (4.9)	8 (1.5)	513 (8.7)	8 (1.4)	502 (8.1)	0 (0.0)	~ ~
Bahrain	46 (3.9)	467 (4.8)	48 (3.8)	461 (3.9)	4 (0.8)	479 (10.6)	1 (0.2)	~ ~	1 (0.5)	~ ~
Botswana (9)	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
Canada	26 (2.7)	529 (5.2)	21 (2.7)	535 (5.5)	13 (2.7)	519 (6.7)	41 (3.0)	526 (3.6)	0 (0.1)	~ ~
Chile	r 36 (4.6)	477 (7.0)	25 (4.2)	468 (8.9)	10 (3.0)	450 (9.8)	28 (4.5)	422 (6.9)	1 (0.6)	~ ~
Chinese Taipei	17 (2.7)	564 (5.8)	75 (3.2)	572 (2.8)	1 (0.5)	~ ~	6 (1.8)	560 (7.7)	0 (0.0)	~ ~
Egypt	42 (3.6)	377 (7.3)	31 (3.3)	353 (7.6)	19 (3.1)	381 (11.3)	4 (1.7)	389 (27.2)	3 (1.4)	349 (9.5)
England	r 47 (3.0)	536 (5.5)	49 (3.1)	541 (6.5)	1 (0.4)	~ ~	3 (1.0)	526 (22.8)	0 (0.0)	~ ~
Georgia	33 (2.4)	446 (4.1)	63 (2.4)	443 (3.5)	1 (0.3)	~ ~	1 (0.5)	~ ~	2 (0.6)	~ ~
Hong Kong SAR	42 (4.7)	550 (7.7)	37 (3.9)	547 (6.1)	12 (3.2)	556 (10.3)	10 (2.4)	510 (16.2)	0 (0.0)	~ ~
Hungary	15 (1.6)	526 (6.0)	12 (1.5)	526 (6.6)	69 (2.3)	530 (3.6)	4 (0.7)	445 (15.2)	0 (0.0)	~ ~
Iran, Islamic Rep. of	19 (2.4)	456 (11.8)	11 (2.0)	464 (12.1)	64 (3.0)	458 (4.6)	6 (1.8)	432 (15.3)	0 (0.0)	~ ~
Ireland	44 (3.4)	535 (4.2)	49 (3.5)	532 (3.7)	2 (1.2)	~ ~	4 (1.0)	485 (15.7)	1 (0.6)	~ ~
Israel	64 (3.1)	518 (5.4)	28 (3.0)	489 (8.3)	3 (1.4)	478 (17.1)	4 (1.0)	522 (17.5)	1 (0.5)	~ ~
Italy	37 (4.1)	497 (4.9)	58 (4.3)	496 (3.8)	1 (0.9)	~ ~	4 (1.5)	508 (10.1)	0 (0.0)	~ ~
Japan	25 (3.5)	567 (4.0)	62 (4.2)	572 (2.5)	8 (2.3)	573 (8.8)	6 (2.0)	580 (5.5)	0 (0.0)	~ ~
Jordan	7 (1.9)	429 (9.9)	69 (3.3)	423 (4.4)	13 (2.6)	436 (8.7)	4 (1.4)	453 (31.6)	7 (1.9)	419 (11.4)
Kazakhstan	21 (2.9)	541 (8.0)	77 (2.9)	531 (5.2)	0 (0.3)	~ ~	0 (0.2)	~ ~	1 (0.4)	~ ~
Korea, Rep. of	42 (3.4)	556 (3.5)	51 (3.6)	555 (2.5)	7 (2.1)	557 (7.3)	0 (0.0)	~ ~	0 (0.0)	~ ~
Kuwait	29 (3.6)	434 (11.8)	60 (3.9)	394 (7.7)	9 (2.2)	429 (9.3)	2 (1.0)	~ ~	1 (0.5)	~ ~
Lebanon	22 (3.5)	408 (11.4)	56 (4.9)	405 (7.7)	0 (0.0)	~ ~	7 (2.1)	382 (14.2)	15 (3.5)	364 (18.7)
Lithuania	28 (2.1)	522 (4.5)	68 (2.1)	519 (2.9)	1 (0.3)	~ ~	3 (0.8)	494 (14.3)	0 (0.2)	~ ~
Malaysia	35 (3.6)	464 (8.1)	38 (3.0)	476 (8.1)	17 (2.8)	469 (12.4)	10 (2.4)	438 (20.8)	0 (0.0)	~ ~
Malta	38 (0.5)	490 (1.9)	56 (0.4)	474 (1.9)	1 (0.1)	~ ~	4 (0.2)	482 (5.9)	1 (0.1)	~ ~
Morocco	7 (1.2)	391 (4.7)	74 (2.1)	392 (3.1)	0 (0.0)	~ ~	0 (0.2)	~ ~	19 (1.9)	402 (3.9)
New Zealand	47 (4.0)	521 (3.8)	45 (3.5)	510 (6.6)	1 (0.4)	~ ~	7 (1.7)	499 (16.7)	0 (0.0)	~ ~
Norway (9)	15 (2.8)	515 (9.1)	27 (3.5)	515 (5.2)	12 (2.2)	512 (6.0)	46 (4.0)	506 (3.7)	0 (0.0)	~ ~
Oman	36 (2.9)	468 (3.7)	58 (2.9)	447 (3.9)	3 (1.3)	471 (13.1)	0 (0.3)	~ ~	2 (0.9)	~ ~
Qatar	29 (3.2)	475 (7.2)	61 (3.7)	446 (5.4)	4 (1.1)	445 (19.0)	4 (1.2)	471 (18.1)	2 (0.3)	~ ~
Russian Federation	50 (2.2)	549 (4.2)	48 (2.2)	540 (4.7)	1 (0.2)	~ ~	1 (0.3)	~ ~	0 (0.0)	~ ~
Saudi Arabia	17 (3.4)	376 (11.3)	63 (4.4)	391 (5.3)	15 (3.1)	433 (15.5)	2 (1.1)	~ ~	3 (1.4)	430 (9.6)
Singapore	54 (2.8)	596 (4.8)	41 (2.8)	599 (5.9)	2 (0.8)	~ ~	3 (1.0)	599 (23.3)	0 (0.0)	~ ~
Slovenia	18 (1.7)	550 (3.5)	77 (1.7)	551 (2.4)	2 (0.6)	~ ~	3 (0.7)	547 (8.5)	0 (0.0)	~ ~
South Africa (9)	23 (3.1)	379 (11.8)	50 (3.8)	350 (8.6)	9 (2.2)	360 (24.3)	8 (1.7)	352 (12.5)	10 (2.1)	351 (22.6)
Sweden	48 (4.3)	519 (4.5)	25 (3.2)	526 (7.3)	16 (3.7)	531 (6.0)	5 (1.7)	523 (7.9)	5 (1.4)	510 (18.0)
Thailand	20 (3.0)	457 (10.3)	41 (3.2)	453 (6.2)	24 (3.2)	463 (9.6)	16 (3.0)	463 (14.3)	0 (0.0)	~ ~
Turkey	30 (3.5)	486 (7.6)	27 (3.3)	508 (6.9)	42 (3.2)	490 (7.4)	0 (0.3)	~ ~	0 (0.0)	~ ~
United Arab Emirates	r 26 (2.2)	503 (6.1)	55 (2.4)	474 (4.4)	13 (1.4)	452 (8.1)	3 (0.9)	451 (15.1)	2 (0.5)	~ ~
United States	r 35 (3.0)	536 (5.1)	26 (2.6)	537 (6.4)	18 (2.4)	528 (5.6)	21 (2.1)	522 (6.8)	0 (0.4)	~ ~
International Avg.	32 (0.5)	493 (1.1)	47 (0.5)	488 (1.0)	11 (0.3)	480 (2.3)	7 (0.3)	485 (2.9)	2 (0.2)	404 (5.6)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

**Benchmarking Participants**

Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
Ontario, Canada	r 15 (3.1)	528 (5.3)	16 (3.3)	541 (6.0)	8 (2.7)	517 (8.8)	60 (4.2)	523 (3.9)	0 (0.0)	~ ~
Quebec, Canada	38 (4.7)	530 (8.8)	29 (4.7)	533 (9.6)	20 (5.6)	520 (11.6)	13 (2.6)	533 (8.2)	0 (0.2)	~ ~
Norway (8)	17 (3.2)	497 (5.4)	32 (3.8)	491 (3.9)	8 (1.6)	495 (7.9)	42 (4.2)	487 (4.1)	0 (0.0)	~ ~
Abu Dhabi, UAE	r 27 (3.7)	483 (13.3)	53 (3.9)	445 (7.3)	16 (2.9)	428 (14.9)	2 (1.3)	~ ~	2 (1.2)	~ ~
Dubai, UAE	r 33 (2.9)	537 (5.0)	53 (3.3)	524 (3.6)	11 (1.1)	494 (12.5)	1 (0.3)	~ ~	1 (0.3)	~ ~
Florida, US	s 28 (5.7)	528 (16.6)	30 (7.7)	541 (10.4)	16 (3.9)	507 (26.3)	26 (6.7)	493 (16.7)	0 (0.0)	~ ~

\* Countries have been increasing their certification requirements and providing professional development to teachers certified under earlier guidelines.

() Standard errors appear in parentheses. Because of rounding some results 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.

An "x" indicates data are available for less than 50% of students.