

Exhibit 8.3: Teachers Majored in Education and Science

Reported by Teachers

| Country | Major in Primary Education and Major (or Specialization) in Science | | Major in Primary Education but No Major (or Specialization) in Science | | Major in Science but No Major in Primary Education | | 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 | 16 (3.5) | 519 (12.9) | 77 (3.7) | 524 (2.8) | 0 (0.3) | ~ ~ | 7 (1.8) | 530 (7.7) | 0 (0.0) | ~ ~ |
| Bahrain | 24 (1.0) | 466 (4.4) | 5 (1.5) | 516 (29.1) | 68 (1.6) | 455 (2.8) | 4 (0.7) | 417 (9.7) | 0 (0.0) | ~ ~ |
| Belgium (Flemish) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bulgaria | r 22 (4.1) | 548 (11.5) | 67 (4.0) | 530 (6.9) | 9 (2.5) | 529 (23.8) | 2 (1.3) | ~ ~ | 0 (0.0) | ~ ~ |
| Canada | 11 (1.4) | 528 (8.5) | 74 (2.2) | 525 (3.1) | 3 (1.1) | 524 (7.8) | 12 (1.7) | 521 (5.3) | 0 (0.0) | ~ ~ |
| Chile | s 29 (3.8) | 483 (6.3) | 66 (4.1) | 480 (4.5) | 2 (1.1) | ~ ~ | 3 (1.6) | 461 (21.4) | 0 (0.3) | ~ ~ |
| Chinese Taipei | 26 (3.3) | 562 (3.6) | 44 (3.8) | 555 (2.8) | 11 (2.6) | 541 (6.9) | 19 (2.9) | 557 (4.2) | 0 (0.0) | ~ ~ |
| Croatia | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cyprus | 25 (4.3) | 484 (3.9) | 69 (4.0) | 480 (3.6) | 2 (1.5) | ~ ~ | 3 (1.4) | 494 (14.0) | 0 (0.0) | ~ ~ |
| Czech Republic | 4 (1.1) | 541 (12.4) | 68 (3.5) | 536 (2.8) | 10 (2.7) | 532 (5.4) | 12 (2.2) | 535 (6.4) | 6 (2.1) | 517 (10.6) |
| Denmark | r 16 (3.0) | 528 (4.6) | 26 (4.1) | 521 (5.9) | 28 (3.9) | 527 (6.2) | 24 (4.3) | 529 (6.9) | 6 (2.1) | 527 (7.9) |
| England | 17 (3.0) | 545 (8.8) | 52 (4.0) | 534 (4.2) | 10 (2.6) | 553 (9.9) | 21 (3.1) | 533 (5.8) | 0 (0.0) | ~ ~ |
| Finland | 12 (2.0) | 559 (4.8) | 81 (2.5) | 554 (2.5) | 0 (0.4) | ~ ~ | 6 (1.5) | 542 (12.8) | 1 (0.5) | ~ ~ |
| France | r 13 (3.0) | 489 (5.5) | 24 (3.6) | 485 (5.5) | 32 (4.4) | 488 (6.6) | 27 (4.0) | 481 (5.5) | 5 (1.8) | 490 (7.4) |
| Georgia | 57 (4.5) | 448 (4.8) | 11 (2.9) | 460 (8.4) | 23 (4.0) | 467 (11.9) | 9 (2.5) | 432 (11.1) | 0 (0.4) | ~ ~ |
| Germany | r 53 (3.5) | 530 (3.3) | 40 (3.4) | 529 (3.6) | 5 (1.6) | 506 (13.1) | 3 (1.1) | 515 (28.0) | 0 (0.0) | ~ ~ |
| Hong Kong SAR | 25 (4.7) | 556 (10.3) | 50 (4.8) | 558 (5.2) | 9 (3.0) | 566 (16.4) | 15 (3.4) | 545 (7.8) | 0 (0.0) | ~ ~ |
| Hungary | r 7 (2.1) | 556 (12.7) | 93 (2.2) | 541 (3.7) | 0 (0.5) | ~ ~ | 0 (0.0) | ~ ~ | 0 (0.0) | ~ ~ |
| Indonesia | 28 (3.0) | 402 (10.5) | 40 (3.6) | 406 (6.9) | 4 (1.4) | 368 (35.3) | 20 (2.4) | 410 (9.4) | 9 (1.9) | 336 (13.2) |
| Iran, Islamic Rep. of | 13 (2.3) | 442 (12.9) | 44 (3.5) | 420 (7.9) | 4 (1.3) | 444 (21.6) | 30 (3.3) | 419 (9.2) | 9 (2.3) | 410 (19.8) |
| Ireland | 5 (1.7) | 535 (10.7) | 86 (2.5) | 527 (2.5) | 3 (2.1) | 533 (18.3) | 4 (1.3) | 543 (6.8) | 1 (0.5) | ~ ~ |
| Italy | r 1 (0.7) | ~ ~ | 10 (2.7) | 528 (7.7) | 3 (1.3) | 526 (11.7) | 16 (3.1) | 515 (6.8) | 69 (3.9) | 515 (3.3) |
| Japan | 20 (3.4) | 566 (3.7) | 70 (3.7) | 570 (2.0) | 2 (1.3) | ~ ~ | 8 (2.3) | 568 (6.2) | 0 (0.0) | ~ ~ |
| Kazakhstan | 46 (4.3) | 554 (6.8) | 41 (4.0) | 558 (8.7) | 1 (0.8) | ~ ~ | 4 (1.7) | 541 (41.1) | 8 (2.6) | 533 (10.9) |
| Korea, Rep. of | 19 (3.1) | 597 (5.2) | 78 (3.3) | 588 (2.1) | 1 (0.7) | ~ ~ | 2 (1.2) | ~ ~ | 0 (0.0) | ~ ~ |
| Kuwait | 40 (4.4) | 332 (8.7) | 3 (1.3) | 353 (38.5) | 46 (4.2) | 340 (10.2) | 8 (2.2) | 350 (17.2) | 2 (1.4) | ~ ~ |
| Lithuania | 17 (2.8) | 516 (6.2) | 80 (2.9) | 532 (2.9) | 2 (0.7) | ~ ~ | 1 (0.6) | ~ ~ | 0 (0.0) | ~ ~ |
| Morocco | r 2 (0.8) | ~ ~ | 4 (0.9) | 314 (24.6) | 14 (2.0) | 375 (16.9) | 17 (3.2) | 355 (11.8) | 63 (3.9) | 338 (5.5) |
| Netherlands | x x | x x | x x | x x | x x | x x | x x | x x | x x | x x |
| New Zealand | 13 (1.8) | 515 (7.4) | 81 (2.1) | 505 (3.1) | 2 (0.7) | ~ ~ | 4 (1.1) | 510 (12.0) | 0 (0.0) | ~ ~ |
| Northern Ireland | r 9 (2.8) | 541 (12.2) | 71 (4.3) | 519 (2.9) | 3 (1.9) | 528 (6.2) | 15 (3.6) | 518 (4.9) | 2 (0.9) | ~ ~ |
| Norway (5) | 43 (4.2) | 541 (3.0) | 42 (4.0) | 536 (4.0) | 8 (2.4) | 542 (5.3) | 6 (2.0) | 542 (6.7) | 1 (0.7) | ~ ~ |
| Oman | 58 (3.0) | 434 (4.3) | 6 (1.4) | 432 (15.0) | 27 (2.9) | 429 (7.5) | 8 (1.8) | 432 (12.8) | 0 (0.2) | ~ ~ |
| Poland | s 6 (2.9) | 528 (10.5) | 0 (0.0) | ~ ~ | 94 (2.9) | 549 (3.0) | 0 (0.0) | ~ ~ | 0 (0.0) | ~ ~ |
| Portugal | 28 (3.6) | 503 (3.7) | 70 (3.6) | 510 (2.6) | 0 (0.0) | ~ ~ | 1 (0.7) | ~ ~ | 0 (0.0) | ~ ~ |
| Qatar | 12 (2.6) | 431 (17.4) | 14 (2.1) | 495 (11.5) | 63 (3.0) | 426 (4.7) | 8 (1.9) | 437 (15.9) | 3 (1.5) | 427 (19.3) |
| Russian Federation | 41 (4.4) | 565 (5.0) | 54 (4.9) | 570 (4.7) | 3 (1.3) | 588 (17.0) | 1 (0.5) | ~ ~ | 0 (0.0) | ~ ~ |
| Saudi Arabia | 29 (3.4) | 372 (9.0) | 2 (1.3) | ~ ~ | 60 (3.6) | 396 (6.6) | 0 (0.3) | ~ ~ | 9 (2.1) | 393 (14.7) |
| Serbia | r 23 (3.4) | 538 (4.8) | 72 (3.5) | 525 (4.2) | 0 (0.4) | ~ ~ | 3 (1.6) | 535 (18.1) | 1 (0.6) | ~ ~ |
| Singapore | 54 (2.7) | 592 (5.7) | 17 (1.7) | 600 (7.1) | 15 (1.9) | 577 (9.9) | 12 (1.8) | 584 (7.9) | 2 (0.7) | ~ ~ |
| Slovak Republic | 20 (2.8) | 521 (7.0) | 69 (3.4) | 522 (3.9) | 4 (1.6) | 513 (31.7) | 5 (1.3) | 501 (15.1) | 1 (0.5) | ~ ~ |
| Slovenia | 7 (1.5) | 544 (6.4) | 93 (1.5) | 543 (2.6) | 0 (0.3) | ~ ~ | 0 (0.0) | ~ ~ | 0 (0.0) | ~ ~ |
| Spain | 20 (2.5) | 523 (4.7) | 63 (3.5) | 516 (3.5) | 5 (1.6) | 524 (13.1) | 10 (1.8) | 518 (7.0) | 2 (1.0) | ~ ~ |
| Sweden | 68 (4.1) | 541 (4.3) | 18 (3.0) | 541 (8.1) | 6 (2.2) | 542 (17.6) | 3 (1.4) | 526 (18.6) | 4 (1.8) | 535 (11.0) |
| Turkey | 14 (1.9) | 492 (7.4) | 69 (3.5) | 486 (4.5) | 4 (1.4) | 477 (19.2) | 13 (2.8) | 472 (12.1) | 0 (0.0) | ~ ~ |
| United Arab Emirates | 25 (2.0) | 457 (8.5) | 16 (1.5) | 438 (10.6) | 53 (2.5) | 456 (4.3) | 5 (0.7) | 469 (14.6) | 1 (0.3) | ~ ~ |
| United States | 11 (1.5) | 547 (9.5) | 74 (2.5) | 548 (2.7) | 5 (1.4) | 544 (16.0) | 11 (1.6) | 539 (7.8) | 0 (0.0) | ~ ~ |
| International Avg. | 23 (0.5) | 511 (1.3) | 49 (0.5) | 510 (1.6) | 15 (0.3) | 496 (2.7) | 9 (0.3) | 496 (2.3) | 5 (0.2) | 457 (3.7) |

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

* 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 dash (-) indicates comparable data 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.

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

Exhibit 8.3: Teachers Majored in Education and Science (Continued)

| Country | Major in Primary Education and Major (or Specialization) in Science | | Major in Primary Education but No Major (or Specialization) in Science | | Major in Science but No Major in Primary Education | | 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 |
| 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 12 (2.6) | 549 (6.2) | 70 (3.2) | 531 (2.9) | 3 (1.1) | 541 (10.1) | 16 (2.5) | 523 (7.5) | 0 (0.0) | ~ ~ |
| Quebec, Canada | 8 (2.4) | 511 (8.4) | 81 (4.2) | 525 (4.5) | 4 (2.8) | 523 (15.3) | 6 (2.4) | 517 (11.0) | 0 (0.0) | ~ ~ |
| Norway (4) | 31 (3.8) | 489 (5.1) | 52 (3.9) | 497 (2.3) | 5 (2.4) | 476 (8.5) | 12 (2.9) | 495 (6.5) | 1 (0.8) | ~ ~ |
| Abu Dhabi, UAE | 21 (3.1) | 403 (18.9) | 30 (4.0) | 380 (14.5) | 46 (4.3) | 459 (8.2) | 3 (1.1) | 392 (33.1) | 0 (0.4) | ~ ~ |
| Dubai, UAE | 31 (2.8) | 516 (4.9) | 16 (1.4) | 551 (6.4) | 44 (3.3) | 499 (4.7) | 9 (1.9) | 540 (14.6) | 0 (0.0) | ~ ~ |
| Florida, US | r 6 (2.6) | 560 (17.3) | 79 (4.6) | 555 (5.2) | 2 (1.7) | ~ ~ | 13 (3.5) | 524 (17.3) | 0 (0.0) | ~ ~ |

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