

Exhibit 5.6: Instruction Affected by Science Resource Shortages – Principals' Reports

Reported by Principals

Students were scored according to their principals' responses concerning twelve school and classroom resources on the *Science Resource Shortages* scale. Students in schools where instruction was **Not Affected** by resource shortages had a score on the scale of at least 11.2, which corresponds to their principals reporting that shortages affected instruction "not at all" for six of the twelve resources and "a little" for the other six, on average. Students in schools where instruction was **Affected A Lot** had a score no higher than 7.2, which corresponds to their principals reporting that shortages affected instruction "a lot" for six of the twelve resources and "some" for the other six, on average. All other students attended schools where instruction was **Affected** by resource shortages.

Country	Not Affected		Affected		Affected A Lot		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Korea, Rep. of	76 (3.8)	589 (2.3)	24 (3.8)	591 (4.6)	1 (0.7)	~ ~	12.7 (0.19)	0.6 (0.26)
Slovenia	58 (4.9)	538 (3.4)	42 (4.9)	550 (3.1)	0 (0.0)	~ ~	11.7 (0.15)	-0.2 (0.19)
Qatar	50 (3.1)	453 (6.2)	26 (2.8)	427 (8.4)	24 (2.3)	410 (8.7)	10.3 (0.20)	1.0 (0.32) ●
Singapore	49 (0.0)	588 (5.5)	42 (0.0)	589 (5.1)	9 (0.0)	621 (12.2)	10.9 (0.00)	0.3 (0.00) ●
Poland	45 (3.8)	551 (3.4)	52 (3.8)	545 (3.2)	3 (1.5)	550 (10.4)	11.1 (0.15)	◇ ◇
Georgia	40 (4.3)	459 (7.7)	59 (4.3)	446 (4.6)	0 (0.3)	~ ~	11.0 (0.13)	0.5 (0.19)
England	40 (4.3)	546 (4.9)	60 (4.3)	530 (4.5)	0 (0.0)	~ ~	11.0 (0.15)	0.0 (0.22)
Czech Republic	40 (3.8)	535 (4.0)	60 (3.8)	534 (2.5)	0 (0.0)	~ ~	11.1 (0.11)	0.2 (0.18)
United States	36 (3.3)	555 (5.5)	61 (3.3)	540 (3.3)	2 (1.0)	~ ~	10.7 (0.12)	-0.1 (0.17)
Bulgaria	36 (5.1)	543 (12.1)	63 (5.3)	532 (6.4)	1 (1.2)	~ ~	10.8 (0.14)	◇ ◇
Cyprus	34 (4.8)	488 (3.5)	60 (4.8)	477 (3.2)	6 (2.7)	489 (20.5)	10.6 (0.22)	◇ ◇
Chinese Taipei	31 (3.3)	565 (3.2)	67 (3.4)	551 (2.2)	1 (1.0)	~ ~	10.6 (0.12)	2.0 (0.21) ●
Canada	31 (3.6)	533 (3.5)	68 (3.6)	521 (3.5)	0 (0.2)	~ ~	10.6 (0.10)	◇ ◇
Kazakhstan	31 (3.5)	553 (8.1)	64 (3.7)	548 (5.5)	6 (1.6)	556 (18.2)	10.3 (0.18)	0.1 (0.29)
Australia	30 (3.5)	531 (4.9)	69 (3.4)	521 (4.3)	1 (0.5)	~ ~	10.7 (0.14)	0.1 (0.19)
United Arab Emirates	30 (1.7)	491 (6.1)	54 (1.9)	426 (4.5)	16 (1.2)	441 (6.3)	9.8 (0.12)	0.0 (0.16)
Spain	29 (2.9)	529 (3.4)	70 (3.0)	514 (3.3)	1 (0.8)	~ ~	10.6 (0.08)	-0.3 (0.18)
Chile	28 (3.5)	496 (5.5)	68 (3.7)	473 (3.9)	4 (1.9)	445 (9.4)	10.2 (0.18)	0.5 (0.23)
Sweden	27 (4.2)	536 (6.8)	73 (4.2)	542 (3.8)	0 (0.0)	~ ~	10.6 (0.13)	0.1 (0.20)
New Zealand	26 (3.7)	518 (5.2)	74 (3.7)	503 (3.9)	1 (0.6)	~ ~	10.5 (0.12)	0.1 (0.15)
Norway (5)	25 (4.1)	542 (4.1)	74 (4.1)	536 (3.5)	1 (1.0)	~ ~	10.6 (0.10)	◇ ◇
Japan	25 (3.9)	573 (4.1)	73 (4.1)	568 (1.9)	2 (1.2)	~ ~	10.3 (0.15)	0.0 (0.20)
Finland	22 (3.6)	556 (3.4)	78 (3.6)	553 (2.8)	0 (0.0)	~ ~	10.5 (0.10)	0.3 (0.17)
Russian Federation	22 (3.5)	576 (5.9)	71 (3.7)	565 (4.2)	7 (2.1)	560 (7.2)	10.0 (0.15)	0.1 (0.21)
Croatia	22 (3.1)	537 (4.9)	78 (3.1)	532 (2.4)	0 (0.0)	~ ~	10.3 (0.12)	-0.3 (0.20)
Denmark	r 21 (3.1)	525 (5.9)	78 (3.2)	530 (2.7)	1 (0.8)	~ ~	10.4 (0.12)	r 0.6 (0.15) ●
Germany	21 (3.3)	532 (5.3)	79 (3.4)	527 (3.0)	0 (0.5)	~ ~	10.3 (0.10)	-0.3 (0.14)
Portugal	21 (3.0)	507 (4.2)	79 (3.0)	509 (2.4)	0 (0.0)	~ ~	10.1 (0.10)	0.5 (0.17) ●
Lithuania	21 (3.3)	525 (8.1)	76 (3.6)	528 (2.8)	4 (1.7)	540 (5.1)	10.1 (0.14)	-0.2 (0.18)
Bahrain	20 (0.2)	472 (7.5)	55 (0.2)	453 (3.0)	25 (0.2)	454 (4.2)	9.0 (0.01)	-0.3 (0.37)
Netherlands	s 20 (4.4)	525 (6.4)	80 (4.4)	524 (3.2)	0 (0.0)	~ ~	10.1 (0.12)	s -0.4 (0.18)
Northern Ireland	r 20 (4.4)	526 (7.7)	80 (4.4)	517 (3.4)	0 (0.0)	~ ~	10.3 (0.14)	r -0.1 (0.23)
Hong Kong SAR	18 (3.1)	583 (9.6)	79 (3.3)	551 (4.0)	3 (1.4)	551 (20.5)	9.9 (0.14)	1.7 (0.16) ●
Belgium (Flemish)	17 (2.9)	522 (6.1)	82 (2.9)	511 (2.5)	1 (0.9)	~ ~	10.2 (0.11)	-0.5 (0.17) ▼
Serbia	16 (2.8)	531 (6.6)	80 (3.2)	525 (4.3)	4 (1.6)	513 (17.3)	9.7 (0.12)	0.2 (0.19)
Hungary	15 (2.9)	533 (11.9)	77 (3.6)	543 (4.1)	8 (2.6)	550 (8.8)	9.6 (0.14)	-0.9 (0.22) ▼
Ireland	15 (2.7)	533 (6.2)	84 (2.8)	528 (2.6)	1 (0.9)	~ ~	10.0 (0.10)	-0.2 (0.17)
Oman	14 (2.5)	419 (8.7)	71 (3.2)	434 (3.9)	16 (2.0)	429 (8.7)	9.0 (0.14)	r 0.4 (0.16)
Kuwait	14 (3.2)	369 (19.1)	59 (5.4)	323 (8.2)	27 (5.1)	347 (13.3)	8.7 (0.24)	◇ ◇
Slovak Republic	13 (2.5)	517 (9.1)	82 (2.9)	521 (3.2)	4 (1.5)	508 (15.8)	9.5 (0.11)	-0.7 (0.15) ▼
Saudi Arabia	12 (2.4)	445 (13.9)	75 (2.8)	380 (6.1)	13 (2.4)	399 (14.1)	9.0 (0.16)	-0.2 (0.22)
France	11 (3.1)	491 (11.3)	86 (3.4)	486 (2.8)	2 (1.2)	~ ~	9.6 (0.14)	◇ ◇
Morocco	9 (1.9)	345 (14.9)	87 (2.2)	351 (5.4)	4 (1.3)	374 (34.6)	9.8 (0.08)	-0.3 (0.13)
Italy	4 (1.8)	530 (14.1)	95 (1.9)	516 (2.8)	1 (0.6)	~ ~	9.3 (0.07)	-0.3 (0.11) ▼
Iran, Islamic Rep. of	3 (1.0)	434 (57.6)	82 (3.0)	418 (5.1)	16 (2.8)	435 (12.8)	8.6 (0.10)	0.2 (0.18)
Indonesia	2 (0.8)	~ ~	95 (1.2)	394 (5.1)	4 (1.0)	489 (13.5)	9.2 (0.06)	◇ ◇
Turkey	1 (1.1)	~ ~	64 (3.8)	483 (4.5)	35 (3.6)	485 (5.8)	7.8 (0.14)	-0.1 (0.16)
International Avg.	25 (0.5)	517 (1.7)	69 (0.5)	504 (0.6)	5 (0.2)	483 (3.1)		

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

Significantly higher than 2011 ●
Significantly lower than 2011 ▼

This TIMSS questionnaire scale was established in 2011 based on the combined response distribution of all countries that participated in TIMSS 2011. To provide a point of reference for country comparisons, the scale centerpoint of 10 was located at the mean of the combined distribution. The units of the scale were chosen so that 2 scale score points corresponded to the standard deviation of the distribution.

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

A diamond (◇) indicates the country did not participate in the 2011 assessment.

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.

Exhibit 5.6: Instruction Affected by Science Resource Shortages – Principals' Reports (Continued)

Country	Not Affected		Affected		Affected A Lot		Average Scale Score	Difference in Average Scale Score from 2011
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement		
Benchmarking Participants								
Dubai, UAE	46 (0.2)	532 (2.8)	35 (0.2)	503 (3.2)	19 (0.2)	503 (3.9)	10.6 (0.01)	-0.1 (0.02) ⬇
Florida, US	42 (7.5)	537 (8.4)	56 (7.8)	560 (7.4)	2 (2.3)	~ ~	10.6 (0.32)	-0.4 (0.40) ⬇
Buenos Aires, Argentina	35 (4.8)	440 (7.4)	61 (4.8)	404 (7.5)	4 (1.3)	426 (24.9)	10.9 (0.23)	0 (0)
Quebec, Canada	32 (6.4)	541 (5.1)	67 (6.4)	518 (4.5)	1 (0.5)	~ ~	10.7 (0.19)	0.1 (0.24)
Ontario, Canada	29 (5.9)	532 (5.9)	71 (5.9)	528 (3.5)	0 (0.2)	~ ~	10.5 (0.17)	0.1 (0.22)
Abu Dhabi, UAE	28 (4.3)	460 (16.7)	59 (4.6)	382 (9.8)	13 (2.9)	414 (19.1)	9.9 (0.28)	0.4 (0.36)
Norway (4)	24 (4.1)	497 (4.3)	74 (4.1)	492 (2.8)	1 (1.0)	~ ~	10.6 (0.10)	0.1 (0.16)

Significantly higher than 2011 ⬆
Significantly lower than 2011 ⬇

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

