

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

Reported by Principals

Students were scored according to their principals' responses concerning thirteen school and classroom resources on the *Mathematics Resource Shortages* scale. Students in schools where instruction was **Not Affected** by resource shortages had a score on the scale of at least 11.1, which corresponds to their principals reporting that shortages affected instruction "not at all" for seven of the thirteen 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 6.9, which corresponds to their principals reporting that shortages affected instruction "a lot" for seven of the thirteen 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	73 (3.9)	607 (2.8)	27 (3.9)	610 (4.5)	0 (0.0)	~ ~	12.5 (0.18)	0.7 (0.24)	▲
Slovenia	59 (4.4)	518 (2.5)	41 (4.4)	525 (2.8)	0 (0.0)	~ ~	11.6 (0.15)	-0.2 (0.19)	
Singapore	49 (0.0)	614 (5.6)	43 (0.0)	617 (5.5)	8 (0.0)	650 (13.5)	10.9 (0.00)	0.4 (0.00)	▲
England	49 (4.6)	557 (5.4)	51 (4.6)	537 (5.2)	0 (0.0)	~ ~	11.2 (0.15)	0.1 (0.23)	
Poland	48 (3.9)	540 (2.9)	50 (3.8)	532 (3.4)	2 (1.4)	~ ~	11.1 (0.16)	∅ ∅	
Qatar	47 (3.1)	458 (5.9)	33 (3.2)	428 (6.5)	20 (2.2)	412 (6.8)	10.3 (0.20)	1.1 (0.31)	▲
Australia	44 (3.8)	526 (4.7)	55 (3.7)	512 (5.3)	1 (0.5)	~ ~	11.1 (0.15)	0.0 (0.21)	
United States	39 (3.1)	547 (5.4)	59 (3.2)	534 (3.3)	2 (0.9)	~ ~	10.8 (0.13)	-0.2 (0.18)	
Czech Republic	39 (3.6)	532 (4.0)	61 (3.6)	526 (2.5)	0 (0.0)	~ ~	11.1 (0.10)	0.3 (0.16)	
New Zealand	37 (3.8)	501 (4.1)	62 (3.8)	487 (3.9)	1 (0.6)	~ ~	10.8 (0.12)	-0.1 (0.17)	
Cyprus	37 (4.6)	532 (4.0)	60 (4.6)	519 (3.7)	3 (1.5)	502 (11.3)	10.6 (0.21)	∅ ∅	
Canada	37 (3.2)	520 (3.4)	63 (3.1)	505 (3.7)	0 (0.2)	~ ~	10.9 (0.12)	∅ ∅	
Bulgaria	37 (5.0)	532 (10.4)	62 (5.2)	521 (5.2)	1 (1.2)	~ ~	10.8 (0.16)	∅ ∅	
Georgia	36 (3.9)	471 (7.8)	64 (4.0)	458 (4.6)	0 (0.3)	~ ~	10.9 (0.13)	0.4 (0.19)	
Kazakhstan	34 (3.9)	546 (8.0)	63 (4.0)	543 (5.3)	3 (1.1)	551 (22.3)	10.3 (0.19)	0.2 (0.29)	
Norway (5)	34 (4.3)	556 (3.6)	66 (4.3)	545 (3.8)	0 (0.0)	~ ~	10.7 (0.11)	∅ ∅	
Northern Ireland	r 33 (4.8)	571 (7.3)	67 (4.8)	570 (4.4)	0 (0.0)	~ ~	10.7 (0.16)	r 0.1 (0.24)	
Netherlands	s 32 (5.4)	535 (3.4)	68 (5.4)	534 (2.3)	0 (0.0)	~ ~	10.6 (0.15)	s -0.5 (0.21)	
Sweden	30 (4.3)	518 (5.4)	70 (4.3)	519 (3.2)	0 (0.0)	~ ~	10.7 (0.13)	0.2 (0.19)	
Chinese Taipei	30 (3.4)	605 (3.1)	69 (3.5)	594 (2.3)	1 (1.0)	~ ~	10.5 (0.13)	1.7 (0.19)	▲
Denmark	r 30 (3.5)	535 (5.1)	70 (3.6)	544 (3.4)	1 (0.8)	~ ~	10.6 (0.11)	r 0.7 (0.14)	▲
Spain	29 (3.1)	513 (3.1)	71 (3.1)	502 (3.3)	0 (0.0)	~ ~	10.6 (0.09)	-0.3 (0.19)	
United Arab Emirates	28 (1.7)	494 (5.2)	58 (1.9)	426 (3.4)	14 (1.2)	444 (5.3)	9.8 (0.11)	0.0 (0.15)	
Finland	27 (3.7)	538 (3.1)	73 (3.7)	535 (2.8)	0 (0.0)	~ ~	10.5 (0.11)	0.3 (0.17)	
Chile	25 (3.5)	476 (5.9)	72 (3.7)	455 (3.4)	3 (1.7)	426 (11.0)	10.1 (0.18)	0.5 (0.24)	
Russian Federation	25 (3.7)	572 (6.4)	72 (4.0)	561 (4.3)	3 (1.4)	550 (11.6)	10.1 (0.14)	0.1 (0.21)	
Belgium (Flemish)	25 (3.6)	550 (4.5)	75 (3.6)	546 (2.6)	0 (0.0)	~ ~	10.3 (0.11)	-0.4 (0.17)	
Japan	24 (3.6)	595 (4.3)	75 (3.7)	592 (2.1)	1 (0.8)	~ ~	10.2 (0.15)	-0.2 (0.20)	
Ireland	23 (3.2)	552 (5.9)	76 (3.2)	546 (2.2)	1 (0.7)	~ ~	10.1 (0.11)	-0.3 (0.19)	
Hong Kong SAR	22 (3.5)	638 (7.9)	76 (3.6)	608 (3.8)	2 (1.2)	~ ~	9.9 (0.13)	1.7 (0.15)	▲
Croatia	22 (3.6)	505 (4.3)	78 (3.6)	502 (2.3)	0 (0.0)	~ ~	10.2 (0.12)	-0.3 (0.20)	
Lithuania	22 (3.1)	532 (8.2)	76 (3.6)	536 (2.8)	3 (1.5)	540 (9.5)	10.2 (0.13)	0.0 (0.18)	
Germany	20 (3.4)	524 (4.6)	79 (3.4)	520 (2.7)	0 (0.5)	~ ~	10.2 (0.10)	-0.3 (0.14)	
Bahrain	20 (0.2)	465 (3.8)	62 (0.2)	446 (1.7)	19 (0.2)	447 (5.6)	9.0 (0.01)	-0.2 (0.36)	
Portugal	19 (2.9)	542 (6.0)	81 (2.9)	541 (2.4)	0 (0.0)	~ ~	9.9 (0.10)	0.4 (0.17)	
Hungary	16 (3.0)	524 (11.3)	79 (3.5)	530 (3.9)	4 (1.9)	540 (15.4)	9.5 (0.14)	-1.0 (0.22)	▼
France	16 (3.5)	492 (8.6)	83 (3.5)	487 (3.2)	0 (0.4)	~ ~	9.7 (0.14)	∅ ∅	
Serbia	15 (2.7)	526 (7.9)	82 (3.1)	518 (3.9)	3 (1.5)	515 (21.0)	9.6 (0.12)	0.1 (0.19)	
Slovak Republic	13 (2.4)	503 (7.5)	84 (2.6)	498 (3.2)	3 (1.1)	472 (19.3)	9.3 (0.12)	-0.7 (0.15)	▼
Oman	13 (2.4)	412 (8.4)	77 (2.9)	429 (3.2)	10 (1.9)	417 (8.4)	8.9 (0.13)	r 0.4 (0.16)	▲
Kuwait	12 (3.0)	387 (16.0)	71 (4.4)	343 (4.8)	17 (4.2)	361 (16.0)	8.6 (0.23)	∅ ∅	
Saudi Arabia	9 (2.2)	418 (11.0)	81 (2.5)	378 (4.9)	10 (2.1)	398 (11.2)	8.9 (0.15)	-0.2 (0.21)	
Morocco	8 (1.9)	373 (13.9)	88 (2.0)	377 (3.9)	4 (1.3)	394 (27.2)	9.7 (0.09)	-0.2 (0.13)	
Jordan	7 (2.4)	437 (16.4)	78 (3.7)	376 (3.5)	15 (3.1)	431 (11.4)	8.5 (0.15)	∅ ∅	
South Africa (5)	5 (1.4)	498 (30.3)	88 (2.6)	371 (3.6)	7 (2.2)	341 (13.6)	9.0 (0.11)	∅ ∅	
Iran, Islamic Rep. of	4 (1.4)	469 (43.7)	88 (2.1)	429 (4.1)	8 (1.8)	436 (12.1)	8.5 (0.10)	0.1 (0.16)	
Italy	2 (1.3)	~ ~	98 (1.3)	506 (2.7)	0 (0.0)	~ ~	9.3 (0.07)	-0.4 (0.11)	▼
Turkey	1 (1.1)	~ ~	79 (3.0)	483 (4.1)	20 (2.8)	486 (7.5)	7.9 (0.12)	-0.1 (0.14)	
Indonesia	0 (0.3)	~ ~	97 (1.1)	395 (3.9)	3 (1.0)	476 (14.0)	9.1 (0.05)	∅ ∅	
International Avg.	27 (0.5)	519 (1.5)	69 (0.5)	502 (0.5)	4 (0.2)	466 (3.1)			

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

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.

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

Exhibit 5.6: Instruction Affected by Mathematics 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	45 (0.2)	530 (2.1)	36 (0.2)	489 (2.2)	19 (0.2)	497 (3.1)	10.6 (0.01)	-0.1 (0.02) ▼
Quebec, Canada	43 (6.5)	545 (4.4)	57 (6.5)	531 (5.2)	0 (0.2)	~ ~	11.2 (0.27)	0.4 (0.31)
Florida, US	42 (7.5)	534 (7.9)	56 (7.8)	556 (7.5)	2 (2.3)	~ ~	10.7 (0.32)	-0.3 (0.40)
Buenos Aires, Argentina	39 (5.2)	440 (7.8)	56 (5.3)	427 (5.2)	5 (1.7)	432 (11.7)	10.9 (0.23)	0 (0.00)
Norway (4)	34 (4.6)	500 (3.7)	66 (4.6)	490 (3.2)	0 (0.0)	~ ~	10.7 (0.11)	0.3 (0.16)
Ontario, Canada	32 (5.3)	518 (4.3)	68 (5.3)	509 (3.0)	0 (0.0)	~ ~	10.6 (0.17)	0.2 (0.22)
Abu Dhabi, UAE	25 (4.2)	468 (15.2)	66 (4.4)	389 (7.1)	9 (2.4)	429 (17.2)	9.7 (0.27)	0.4 (0.34)

Significantly higher than 2011 ▲
Significantly lower than 2011 ▼

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

