Exhibit 4.5: Parental Attitude Toward Mathematics and Science

Reported by Parents

Students were scored on the *Parental Attitude Toward Mathematics and Science* scale according to their parents' responses to eight statements about their feelings toward the subjects. Students whose parents have a **Very Positive Attitude** had a score on the scale of at least 9.3, which corresponds to their parents "agreeing a lot" with four of the eight statements and "agreeing a little" with the other four, on average. Students whose parents have a **Less than Positive Attitude** had a score no higher than 5.9, which corresponds to their parents "disagreeing a little" with four of the eight statements and "agreeing a little" with the other four, on average. All other students had parents who have a **Positive Attitude** toward mathematics and science.

Country	Very Positive Attitude		Positive Attitude		Less than Positive Attitude		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Kazakhstan	91 (0.6)	546 (4.6)	9 (0.6)	535 (7.0)	0 (0.1)	~ ~	11.4 (0.04)
Indonesia	89 (1.0)	399 (3.6)	10 (0.9)	396 (6.8)	1 (0.3)	~ ~	11.4 (0.06)
Portugal	87 (0.6)	543 (2.2)	13 (0.6)	538 (4.3)	0 (0.1)	~ ~	10.9 (0.02)
South Africa (5)	87 (0.8)	381 (3.4)	12 (0.8)	368 (6.6)	1 (0.1)	~ ~	11.2 (0.05)
Iran, Islamic Rep. of	85 (0.9)	436 (3.4)	15 (0.8)	415 (6.0)	1 (0.1)	~ ~	10.9 (0.05)
Turkey	82 (0.8)	488 (3.0)	17 (0.7)	473 (5.6)	1 (0.2)	~ ~	10.7 (0.05)
Oman	81 (0.5)	431 (2.7)	18 (0.5)	411 (4.0)	1 (0.1)	~ ~	10.6 (0.03)
Jordan	80 (0.9)	399 (3.2)	19 (0.9)	366 (5.9)	1 (0.2)	~ ~	10.6 (0.04)
Bahrain	80 (0.4)	459 (1.8)	20 (0.4)	435 (3.0)	1 (0.1)	~ ~	10.6 (0.02)
Singapore	79 (0.6)	624 (3.7)	20 (0.5)	603 (4.7)	1 (0.1)	~ ~	10.7 (0.03)
Qatar r	79 (0.9)	454 (3.4)	20 (0.9)	423 (5.1)	1 (0.2)	~ ~	10.6 (0.04)
Kuwait r	78 (0.9)	366 (5.4)	21 (0.9)	337 (3.8)	1 (0.1)	~ ~	10.6 (0.05)
Spain	77 (0.8)	512 (2.3)	22 (0.8)	501 (2.6)	1 (0.2)	~ ~	10.5 (0.03)
Northern Ireland s	77 (1.1)	588 (3.7)	22 (1.1)	577 (5.3)	1 (0.3)	~ ~	10.4 (0.05)
Lithuania	76 (0.8)	542 (2.7)	24 (0.8)	530 (3.9)	0 (0.1)	~ ~	10.3 (0.03)
Ireland	76 (1.0)	555 (2.3)	24 (1.0)	536 (3.1)	1 (0.1)	~ ~	10.5 (0.04)
Chile r	75 (0.7)	467 (2.6)	24 (0.7)	456 (3.5)	1 (0.2)	~ ~	10.4 (0.03)
Cyprus	75 (0.6)	529 (2.6)	24 (0.7)	521 (3.7)	1 (0.2)	~ ~	10.3 (0.02)
Morocco	75 (1.3)	386 (3.4)	22 (1.0)	364 (5.9)	3 (0.5)	342 (16.2)	10.4 (0.08)
Denmark	73 (0.8)	545 (2.7)	26 (0.8)	532 (3.8)	1 (0.2)	~ ~	10.2 (0.03)
United Arab Emirates	72 (0.5)	468 (2.6)	27 (0.4)	423 (3.0)	1 (0.1)	~ ~	10.4 (0.02)
Georgia	71 (1.1)	465 (3.4)	28 (1.1)	462 (5.5)	0 (0.1)	~ ~	10.3 (0.06)
Serbia	71 (1.2)	523 (3.4)	27 (1.1)	512 (6.9)	2 (0.3)	~ ~	10.3 (0.05)
Poland	71 (0.8)	541 (2.3)	29 (0.8)	523 (2.8)	1 (0.1)	~ ~	10.2 (0.04)
Saudi Arabia	70 (1.1)	391 (3.8)	28 (1.1)	377 (6.5)	2 (0.4)	~ ~	10.2 (0.06)
Canada r	70 (1.1)	522 (2.1)	29 (1.0)	510 (2.4)	1 (0.2)	~ ~	10.2 (0.04)
New Zealand s	70 (1.3)	520 (3.0)	28 (1.3)	493 (3.2)	2 (0.2)	~ ~	10.2 (0.05)
Bulgaria	69 (1.5)	532 (4.8)	28 (1.3)	518 (7.2)	3 (0.6)	493 (20.3)	10.1 (0.08)
Russian Federation	68 (1.0)	564 (3.3)	31 (1.0)	565 (4.5)	1 (0.1)	~ ~	10.1 (0.03)
Sweden	65 (1.0)	530 (2.9)	35 (1.0)	513 (3.5)	1 (0.1)	~ ~	9.9 (0.04)
Hungary	60 (1.1)	537 (3.7)	38 (0.9)	521 (3.8)	2 (0.2)	~ ~	9.7 (0.04)
Finland	60 (0.8)	545 (2.3)	38 (0.7)	527 (2.4)	2 (0.3)	~ ~	9.7 (0.04)
Hong Kong SAR	60 (1.2)	623 (3.5)	38 (1.2)	606 (3.2)	2 (0.3)	~ ~	9.7 (0.05)
Italy	52 (0.8)	511 (3.3)	45 (0.8)	508 (2.6)	3 (0.3)	497 (8.9)	9.3 (0.03)
Slovak Republic	51 (0.9)	497 (3.3)	46 (0.9)	505 (2.4)	3 (0.3)	487 (10.1)	9.3 (0.04)
France	50 (1.1)	501 (3.7)	48 (1.1)	482 (2.9)	1 (0.2)	~ ~	9.4 (0.05)
Chinese Taipei	49 (0.8)	605 (2.5)	48 (0.8)	592 (2.4)	4 (0.3)	573 (6.1)	9.2 (0.03)
Czech Republic	48 (0.8)	533 (2.8)	49 (0.8)	526 (2.6)	3 (0.3)	526 (8.6)	9.2 (0.03)
Germany s	46 (1.0)	537 (2.8)	49 (1.1)	530 (2.2)	4 (0.5)	526 (6.2)	9.1 (0.04)
Belgium (Flemish)	42 (0.8)	553 (2.6)	54 (0.8)	547 (2.2)	4 (0.3)	520 (7.1)	8.9 (0.03)
Slovenia s	34 (1.2)	538 (2.9)	63 (1.1)	525 (2.6)	3 (0.4)	510 (9.2)	8.8 (0.04)
Korea, Rep. of	34 (0.8)	625 (2.8)	62 (0.8)	602 (2.2)	5 (0.4)	583 (5.7)	8.7 (0.03)
Croatia	24 (0.8)	506 (3.3)	71 (0.8)	503 (1.6)	5 (0.5)	480 (6.2)	8.2 (0.03)
Japan	14 (0.6)	613 (4.3)	68 (0.7)	595 (2.0)	18 (0.7)	573 (3.1)	7.5 (0.03)
Australia	x x	x x	x x	x x	x x	x x	x x
Netherlands	x x	x x	x x	x x	x x	x x	x x
Norway (5)	x x	x x	x x	x x	x x	x x	x x
England	- -	- -	- -	- -	- -	- -	- -
United States	- -	- -	- -	- -	- -	- -	- -
International Avg.	66 (0.1)	510 (0.5)	32 (0.1)	495 (0.6)	2 (0.0)	509 (2.9)	

This TIMSS questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS 2015. 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 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.

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

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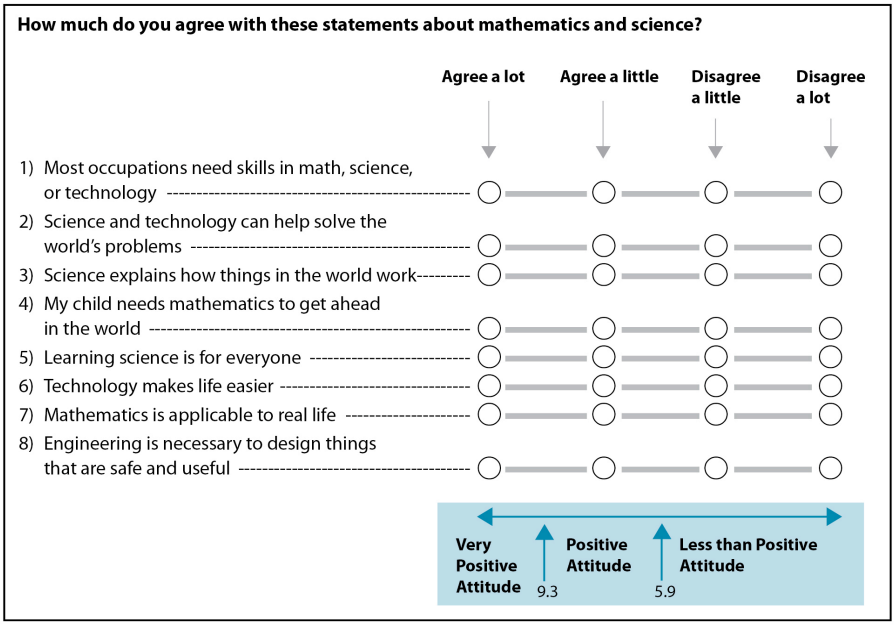
Exhibit 4.5: Parental Attitude Toward Mathematics and Science (Continued)

Country	Very Positive Attitude		Positive Attitude		Less than Positive Attitude		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Benchmarking Participants							
Dubai, UAE	80 (0.6)	519 (1.8)	19 (0.6)	487 (3.2)	1 (0.1)	~ ~	10.7 (0.03)
Ontario, Canada r	75 (2.0)	524 (2.5)	24 (1.8)	505 (3.4)	1 (0.3)	~ ~	10.4 (0.08)
Abu Dhabi, UAE r	67 (1.4)	441 (5.3)	32 (1.4)	393 (5.4)	1 (0.2)	~ ~	10.2 (0.06)
Quebec, Canada r	57 (1.5)	547 (4.4)	42 (1.4)	531 (4.0)	1 (0.3)	~ ~	9.6 (0.06)
Buenos Aires, Argentina	x x	x x	x x	x x	x x	x x	x x
Norway (4)	x x	x x	x x	x x	x x	x x	x x
Florida, US	- -	- -	- -	- -	- -	- -	- -



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