Exhibit 10.3: Students Like Learning Mathematics

Reported by Students

Students were scored according to their degree of agreement with nine statements on the *Students Like Learning Mathematics* scale. Students who **Very Much Like Learning Mathematics** had a score on the scale of at least 10.1, which corresponds to their "agreeing a lot" with five of the nine statements and "agreeing a little" with the other four, on average. Students who **Do Not Like Learning Mathematics** had a score no higher than 8.3, which corresponds to their "disagreeing a little" with five of the nine statements and "agreeing a little" with the other four, on average. All other students **Like Learning Mathematics**.

Country	Very Much Like Learning Mathematics		Like Learning Mathematics		Do Not Like Learning Mathematics		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			
Turkey	79 (1.0)	497 (2.7)	18 (0.8)	439 (5.5)	4 (0.4)	436 (9.9)	11.3 (0.04)	0.3 (0.06)	⬀
Oman	70 (0.9)	443 (2.8)	25 (0.8)	391 (3.2)	5 (0.3)	374 (7.0)	11.0 (0.04)	0.5 (0.06)	⬀
Kazakhstan	69 (1.4)	552 (4.5)	29 (1.2)	530 (5.7)	2 (0.4)	~ ~	11.0 (0.05)	0.1 (0.07)	
Jordan	68 (1.5)	409 (3.5)	25 (1.3)	350 (5.8)	7 (0.6)	364 (10.4)	11.0 (0.06)	◊ ◊	
Morocco	67 (1.3)	399 (3.6)	28 (1.1)	346 (4.9)	5 (0.4)	324 (12.9)	10.9 (0.04)	0.7 (0.08)	⬀
Indonesia	66 (1.4)	415 (3.3)	31 (1.2)	376 (4.6)	4 (0.6)	337 (16.5)	10.7 (0.04)	◊ ◊	
Iran, Islamic Rep. of	65 (1.4)	449 (3.7)	28 (1.2)	398 (5.5)	7 (0.5)	411 (8.6)	10.8 (0.05)	0.1 (0.07)	
Portugal	61 (1.0)	556 (2.4)	28 (0.8)	522 (2.9)	10 (0.7)	508 (4.8)	10.6 (0.05)	0.2 (0.08)	⬀
Bulgaria	56 (1.3)	540 (4.9)	30 (1.0)	511 (6.2)	14 (0.9)	498 (6.5)	10.4 (0.06)	◊ ◊	
Cyprus	56 (1.2)	538 (2.6)	27 (0.9)	514 (3.7)	17 (0.9)	501 (4.8)	10.3 (0.05)	◊ ◊	
Bahrain	55 (0.9)	471 (1.9)	32 (0.6)	428 (2.3)	13 (0.6)	435 (3.7)	10.4 (0.04)	0.2 (0.08)	
Kuwait	55 (1.5)	371 (4.9)	31 (1.2)	330 (5.8)	13 (0.9)	336 (6.6)	10.3 (0.06)	◊ ◊	
United Arab Emirates	55 (0.8)	472 (2.7)	33 (0.5)	427 (2.9)	12 (0.6)	437 (5.1)	10.4 (0.03)	-0.1 (0.05)	
Saudi Arabia	54 (1.3)	406 (3.7)	33 (1.0)	364 (5.6)	13 (1.0)	367 (6.7)	10.3 (0.05)	-0.2 (0.08)	
Russian Federation	52 (1.1)	577 (4.4)	37 (0.8)	555 (3.4)	11 (0.9)	536 (3.9)	10.2 (0.04)	-0.3 (0.06)	⬂
Georgia	52 (1.5)	481 (3.9)	45 (1.4)	452 (4.4)	4 (0.4)	420 (10.6)	10.5 (0.05)	-0.8 (0.06)	⬂
Italy	51 (1.2)	515 (3.2)	31 (0.9)	502 (3.0)	18 (0.8)	496 (4.2)	10.1 (0.05)	0.0 (0.07)	
France	50 (1.1)	501 (3.0)	35 (0.9)	480 (3.8)	14 (0.7)	466 (3.9)	10.1 (0.04)	◊ ◊	
Lithuania	50 (1.1)	545 (2.6)	36 (1.1)	530 (3.3)	13 (0.7)	514 (5.0)	10.2 (0.04)	-0.2 (0.06)	⬂
England	50 (1.4)	555 (3.7)	32 (0.9)	546 (3.5)	17 (1.0)	523 (4.4)	10.1 (0.05)	0.3 (0.08)	⬀
Serbia	50 (1.5)	527 (5.2)	30 (1.1)	517 (4.1)	19 (1.0)	502 (5.0)	10.1 (0.06)	0.3 (0.09)	⬀
Qatar	49 (1.3)	462 (3.6)	36 (1.1)	423 (4.6)	15 (0.8)	414 (5.3)	10.2 (0.06)	0.2 (0.08)	⬀
Chile	47 (1.3)	476 (2.9)	33 (0.8)	447 (2.9)	19 (1.0)	442 (3.4)	10.0 (0.06)	0.1 (0.07)	
Spain	46 (1.3)	516 (3.1)	34 (1.0)	500 (2.6)	19 (1.0)	492 (3.1)	9.9 (0.05)	-0.1 (0.08)	
South Africa (5)	46 (1.4)	416 (3.5)	46 (0.9)	345 (3.9)	8 (0.4)	350 (6.7)	10.1 (0.04)	◊ ◊	
Norway (5)	43 (1.4)	558 (3.4)	36 (1.0)	548 (3.1)	20 (1.0)	534 (3.7)	9.8 (0.05)	◊ ◊	
New Zealand	43 (0.9)	498 (3.1)	34 (0.7)	488 (3.2)	23 (0.8)	485 (3.4)	9.8 (0.04)	-0.1 (0.06)	
United States	42 (0.8)	555 (2.8)	35 (0.5)	536 (2.7)	23 (0.7)	524 (2.3)	9.7 (0.04)	0.0 (0.05)	
Slovak Republic	42 (1.2)	504 (3.4)	38 (0.9)	497 (3.0)	20 (0.9)	490 (3.9)	9.8 (0.05)	-0.1 (0.07)	
Singapore	39 (0.8)	640 (4.1)	38 (0.7)	611 (4.1)	23 (0.8)	591 (4.5)	9.6 (0.03)	-0.3 (0.05)	⬂
Hungary	39 (1.1)	548 (3.9)	38 (0.9)	523 (4.0)	22 (1.1)	507 (4.3)	9.7 (0.05)	-0.3 (0.07)	⬂
Canada	38 (0.9)	529 (2.2)	38 (0.6)	508 (2.6)	24 (0.9)	491 (3.0)	9.6 (0.04)	◊ ◊	
Germany r	38 (1.2)	537 (2.6)	35 (0.9)	525 (2.6)	27 (1.1)	511 (3.0)	9.5 (0.05)	r -0.1 (0.07)	
Ireland	38 (1.2)	561 (3.0)	39 (0.9)	547 (2.6)	23 (1.1)	528 (3.2)	9.6 (0.05)	0.0 (0.08)	
Denmark	38 (1.4)	553 (3.6)	42 (1.1)	538 (2.9)	21 (1.1)	518 (4.0)	9.6 (0.05)	0.1 (0.07)	
Australia	37 (1.0)	535 (4.7)	36 (0.8)	516 (3.1)	27 (0.7)	496 (4.2)	9.5 (0.04)	-0.2 (0.07)	⬂
Northern Ireland	35 (1.1)	585 (4.0)	38 (1.0)	573 (3.8)	27 (1.1)	547 (4.4)	9.5 (0.05)	0.1 (0.08)	
Hong Kong SAR	35 (1.1)	631 (3.2)	38 (1.0)	612 (3.6)	27 (1.2)	596 (3.8)	9.5 (0.05)	-0.5 (0.07)	⬂
Sweden	35 (1.3)	523 (4.1)	40 (1.1)	518 (3.2)	25 (1.3)	514 (3.3)	9.5 (0.05)	-0.3 (0.08)	⬂
Czech Republic	35 (0.9)	539 (2.8)	40 (0.8)	530 (2.8)	25 (0.9)	511 (3.2)	9.5 (0.04)	-0.4 (0.06)	⬂
Poland	35 (1.0)	547 (2.9)	41 (1.1)	532 (2.7)	25 (1.3)	524 (3.2)	9.4 (0.05)	◊ ◊	
Slovenia	35 (1.1)	535 (2.7)	39 (0.9)	518 (2.7)	27 (1.4)	505 (2.5)	9.4 (0.06)	-0.4 (0.08)	⬂
Netherlands	33 (1.0)	543 (2.2)	39 (1.1)	528 (1.9)	27 (1.0)	517 (2.7)	9.3 (0.04)	0.1 (0.06)	
Belgium (Flemish)	31 (1.2)	552 (2.3)	38 (0.8)	546 (2.7)	31 (1.5)	540 (2.9)	9.2 (0.05)	0.1 (0.08)	
Croatia	29 (1.2)	515 (2.7)	41 (1.0)	500 (2.7)	29 (1.2)	494 (2.6)	9.3 (0.05)	0.2 (0.07)	⬀
Finland	28 (1.0)	550 (3.4)	41 (0.9)	537 (2.4)	31 (1.0)	521 (2.5)	9.2 (0.04)	0.0 (0.06)	
Japan	26 (0.9)	621 (2.6)	44 (0.9)	594 (2.3)	30 (1.2)	567 (2.4)	9.2 (0.04)	-0.1 (0.06)	
Chinese Taipei	23 (1.0)	618 (3.4)	38 (1.0)	598 (2.7)	38 (1.1)	582 (2.3)	8.9 (0.05)	-0.2 (0.07)	⬂
Korea, Rep. of	19 (0.7)	645 (3.3)	46 (1.0)	610 (2.4)	35 (1.0)	586 (2.7)	8.9 (0.03)	-0.1 (0.05)	
International Avg.	46 (0.2)	521 (0.5)	35 (0.1)	495 (0.5)	19 (0.1)	483 (0.8)			

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.

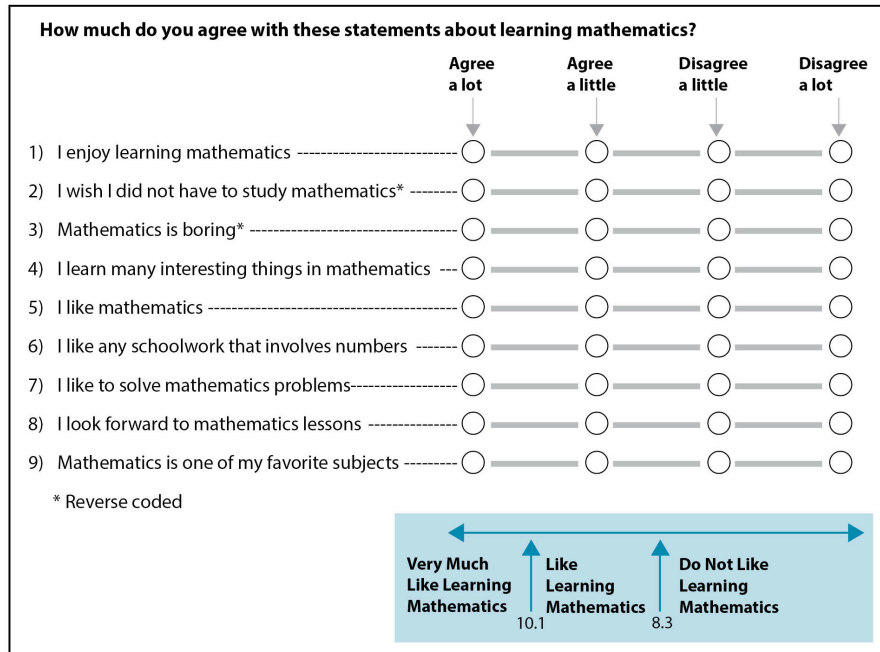A tilde (~) indicates insufficient data to report achievement.

An "r" indicates data are available for at least 70% but less than 85% of the students.

IEA
TIMSS & PIRLS
International Study Center
Lynch School of Education, Boston College

Exhibit 10.3: Students Like Learning Mathematics (Continued)

Country	Very Much Like Learning Mathematics		Like Learning Mathematics		Do Not Like Learning Mathematics		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	59 (0.8)	523 (2.2)	30 (0.7)	496 (2.4)	11 (0.5)	492 (4.4)	10.5 (0.03)	0.0 (0.06)
Norway (4)	55 (1.7)	503 (2.6)	30 (0.9)	487 (3.4)	15 (1.2)	471 (5.3)	10.3 (0.07)	0.1 (0.11)
Abu Dhabi, UAE	50 (1.5)	445 (5.4)	36 (1.0)	393 (5.7)	14 (1.0)	405 (7.7)	10.2 (0.06)	-0.2 (0.09)
Florida, US	49 (1.8)	563 (5.4)	32 (1.3)	538 (6.4)	19 (1.4)	525 (4.8)	10.0 (0.08)	0.2 (0.10)
Buenos Aires, Argentina	49 (1.2)	444 (3.1)	33 (0.7)	429 (3.8)	18 (1.0)	437 (4.4)	10.0 (0.05)	◊ ◊
Quebec, Canada	43 (1.4)	547 (4.4)	41 (1.2)	533 (5.1)	16 (1.1)	516 (5.0)	9.9 (0.06)	0.3 (0.08) ⬥
Ontario, Canada	37 (1.3)	530 (2.5)	37 (1.0)	509 (2.9)	26 (1.5)	494 (3.7)	9.5 (0.06)	0.1 (0.08)

Significantly higher than 2011 ⬥
Significantly lower than 2011 ⬥

How much do you agree with these statements about learning mathematics?

	Agree a lot	Agree a little	Disagree a little	Disagree a lot
1) I enjoy learning mathematics	○	○	○	○
2) I wish I did not have to study mathematics*	○	○	○	○
3) Mathematics is boring*	○	○	○	○
4) I learn many interesting things in mathematics	○	○	○	○
5) I like mathematics	○	○	○	○
6) I like any schoolwork that involves numbers	○	○	○	○
7) I like to solve mathematics problems	○	○	○	○
8) I look forward to mathematics lessons	○	○	○	○
9) Mathematics is one of my favorite subjects	○	○	○	○

* Reverse coded

Very Much Like Learning Mathematics | Like Learning Mathematics | Do Not Like Learning Mathematics
10.1 | 8.3