

Exhibit 10.2: Students' Views on Engaging Teaching in Science Lessons

Reported by Students

The general/integrated science panel summarizes responses for countries where students are enrolled in science as a single subject. The following panels for biology, chemistry, physics, and earth science summarize responses for countries where students are taught science as separate subjects. For general/integrated science, students were scored according to their degree of agreement with ten statements on the *Students' Views on Engaging Teaching in Science Lessons* scale. Students who experienced **Very Engaging Teaching** in science lessons had a score on the scale of at least 10.2, which corresponds to their "agreeing a lot" with five of the ten statements and "agreeing a little" with the other five, on average. Students who experienced teaching that was **Less than Engaging** had a score no higher than 8.1, which corresponds to their "disagreeing a little" with five of the ten statements and "agreeing a little" with the other five, on average. All other students experienced **Engaging Teaching** in science lessons. For biology, chemistry, physics, and earth science, a comparable procedure was used.

Engaging Teaching in General/Integrated Science

General/Integrated Science	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Jordan	71 (1.2)	439 (3.4)	21 (0.8)	412 (3.9)	7 (0.6)	398 (8.0)	11.1 (0.05)
Egypt	69 (1.2)	390 (4.1)	24 (0.9)	343 (5.8)	7 (0.5)	331 (7.5)	10.9 (0.05)
Turkey	67 (1.4)	505 (3.7)	25 (0.9)	475 (6.6)	8 (0.8)	464 (6.3)	10.7 (0.06)
Oman	65 (1.0)	468 (2.8)	28 (0.9)	439 (3.2)	7 (0.5)	422 (6.3)	10.7 (0.04)
Kuwait	63 (1.3)	419 (5.5)	27 (0.9)	405 (6.7)	10 (1.0)	385 (9.4)	10.6 (0.06)
Iran, Islamic Rep. of	61 (1.3)	461 (4.4)	29 (0.9)	450 (4.5)	10 (0.7)	452 (7.3)	10.6 (0.06)
South Africa (9)	59 (1.2)	365 (5.3)	32 (0.8)	350 (6.8)	9 (0.6)	365 (9.3)	10.5 (0.04)
Saudi Arabia	57 (1.7)	411 (5.0)	30 (1.1)	389 (5.6)	13 (1.1)	370 (8.7)	10.4 (0.08)
Botswana (9)	56 (1.3)	415 (2.6)	32 (0.9)	370 (4.1)	11 (0.7)	383 (7.7)	10.4 (0.06)
Bahrain	54 (1.1)	482 (2.5)	31 (0.7)	457 (4.0)	15 (0.8)	441 (6.4)	10.3 (0.05)
Chile	51 (1.7)	460 (3.7)	34 (1.0)	451 (3.7)	15 (1.0)	446 (4.6)	10.2 (0.07)
United States	51 (1.0)	539 (2.9)	32 (0.7)	529 (3.2)	17 (0.9)	515 (4.5)	10.2 (0.05)
Thailand	50 (1.2)	461 (4.1)	42 (0.9)	452 (4.8)	8 (0.6)	451 (8.2)	10.2 (0.04)
Qatar	49 (1.3)	478 (3.8)	33 (0.9)	454 (4.0)	18 (1.0)	418 (5.1)	10.1 (0.06)
Malaysia	49 (1.4)	489 (3.5)	42 (1.0)	467 (4.8)	9 (0.8)	408 (10.4)	10.2 (0.05)
United Arab Emirates	47 (1.0)	495 (3.0)	38 (0.7)	469 (2.9)	15 (0.6)	451 (4.2)	10.1 (0.04)
Canada	45 (1.5)	535 (2.5)	39 (0.8)	525 (2.6)	16 (1.2)	518 (4.1)	10.0 (0.07)
Israel	45 (1.3)	517 (4.5)	31 (0.8)	512 (4.5)	23 (1.1)	489 (5.2)	9.8 (0.07)
Ireland	45 (1.4)	545 (2.9)	34 (0.9)	535 (3.3)	21 (1.3)	509 (4.6)	9.8 (0.07)
New Zealand	42 (1.4)	527 (3.5)	40 (0.8)	509 (3.6)	18 (0.9)	492 (5.4)	9.9 (0.06)
Australia	38 (1.3)	534 (2.9)	39 (0.9)	507 (2.9)	22 (1.0)	490 (4.9)	9.6 (0.06)
England	38 (1.3)	545 (4.1)	42 (0.8)	540 (4.3)	20 (1.1)	522 (5.9)	9.7 (0.06)
Italy	37 (1.5)	500 (3.0)	44 (0.9)	501 (2.9)	18 (1.1)	495 (4.4)	9.6 (0.06)
Singapore	35 (0.9)	606 (4.1)	52 (0.7)	595 (3.3)	13 (0.8)	578 (5.2)	9.8 (0.04)
Norway (9)	35 (1.6)	521 (3.5)	43 (1.2)	509 (3.4)	23 (1.6)	495 (4.4)	9.5 (0.08)
Hong Kong SAR	34 (1.5)	557 (3.9)	48 (0.9)	545 (4.4)	17 (1.3)	526 (7.2)	9.6 (0.08)
Chinese Taipei	21 (1.0)	591 (3.4)	48 (1.0)	573 (2.6)	31 (1.3)	549 (3.1)	9.0 (0.05)
Japan	11 (0.7)	592 (3.6)	46 (1.4)	581 (2.2)	43 (1.7)	555 (2.4)	8.4 (0.05)
Korea, Rep. of	10 (0.6)	604 (5.0)	47 (1.2)	567 (2.3)	43 (1.5)	533 (2.8)	8.4 (0.05)
International Avg.	47 (0.2)	498 (0.7)	36 (0.2)	480 (0.8)	17 (0.2)	464 (1.2)	

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

Benchmarking Participants Teaching General/Integrated Science

Dubai, UAE	50 (1.3)	535 (2.8)	36 (1.1)	519 (3.5)	14 (0.5)	507 (4.9)	10.2 (0.05)
Florida, US	50 (2.3)	521 (6.5)	31 (1.4)	503 (6.9)	19 (1.6)	495 (8.5)	10.2 (0.10)
Buenos Aires, Argentina	49 (1.6)	391 (5.5)	33 (1.0)	392 (5.3)	18 (1.3)	384 (6.9)	10.0 (0.08)
Ontario, Canada	49 (1.8)	532 (2.9)	35 (1.0)	520 (2.7)	17 (1.6)	517 (5.2)	10.1 (0.09)
Abu Dhabi, UAE	45 (2.3)	473 (7.8)	39 (1.3)	447 (4.9)	16 (1.5)	434 (8.8)	10.0 (0.10)
Norway (8)	44 (1.3)	497 (2.9)	40 (1.0)	487 (2.8)	16 (1.0)	479 (4.2)	9.9 (0.05)
Quebec, Canada	38 (2.3)	541 (4.3)	47 (1.3)	531 (4.5)	15 (1.9)	522 (7.4)	9.8 (0.10)

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.

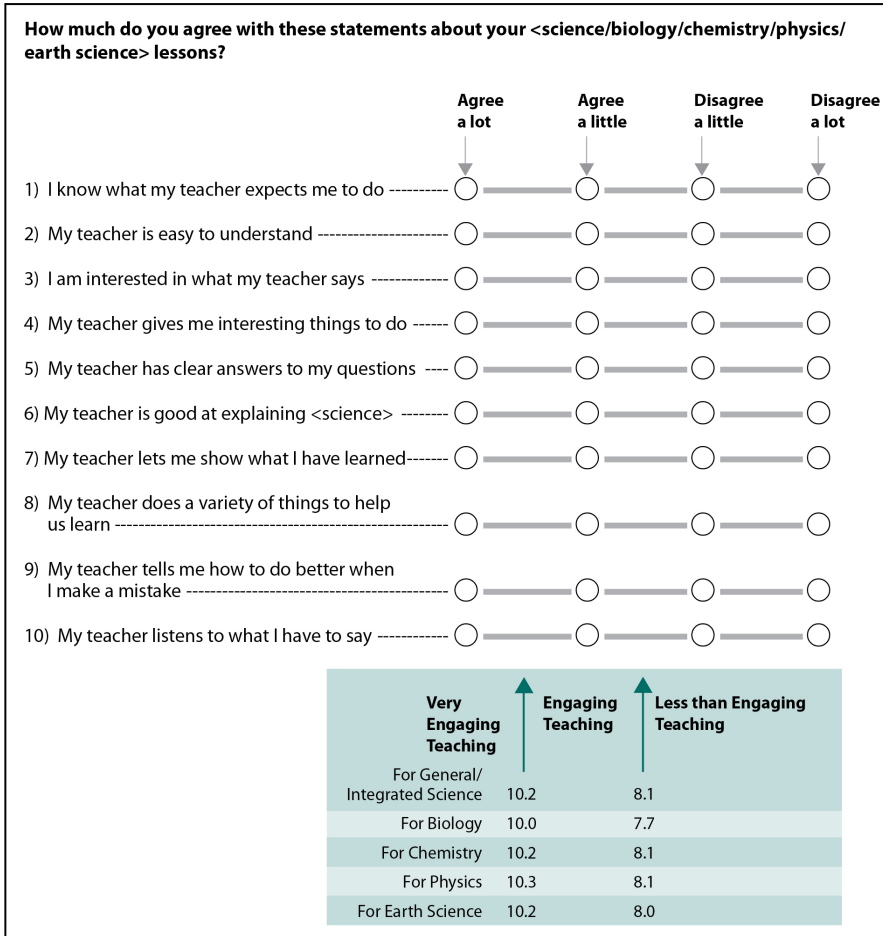
(.) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A dash (-) indicates comparable data are not available.

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



Exhibit 10.2: Students' Views on Engaging Teaching in Science Lessons (Continued)



Separate Science Panels

Engaging Teaching in Biology

Biology	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Country							
Morocco	65 (1.3)	399 (2.6)	26 (0.9)	387 (3.8)	9 (0.7)	395 (4.7)	10.5 (0.06)
Lebanon	65 (1.5)	417 (5.0)	25 (1.2)	389 (7.2)	10 (0.8)	371 (10.6)	10.7 (0.07)
Georgia	60 (1.2)	457 (3.2)	35 (1.0)	434 (4.3)	4 (0.5)	416 (9.8)	10.7 (0.05)
Malta	59 (1.4)	548 (3.0)	27 (1.3)	518 (5.8)	13 (1.0)	490 (7.2)	10.3 (0.06)
Russian Federation	53 (1.6)	547 (4.6)	39 (1.3)	543 (4.7)	8 (0.7)	539 (5.9)	10.2 (0.06)
Kazakhstan	53 (1.7)	543 (4.7)	44 (1.5)	524 (5.5)	3 (0.5)	516 (10.1)	10.4 (0.07)
Hungary	45 (1.4)	533 (4.2)	42 (1.1)	520 (3.9)	13 (1.0)	535 (7.7)	9.8 (0.06)
Lithuania	41 (1.5)	516 (4.0)	42 (1.0)	519 (2.7)	17 (1.4)	529 (5.5)	9.5 (0.08)
Sweden	30 (1.5)	534 (4.9)	49 (1.2)	527 (3.8)	21 (1.6)	513 (4.8)	9.1 (0.07)
Slovenia	25 (1.4)	555 (3.5)	54 (1.1)	551 (2.8)	21 (1.6)	551 (3.4)	9.0 (0.08)
International Avg.	50 (0.5)	505 (1.3)	38 (0.4)	491 (1.5)	12 (0.3)	485 (2.3)	

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

Exhibit 10.2: Students' Views on Engaging Teaching in Science Lessons (Continued)

Engaging Teaching in Chemistry

Chemistry	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Lebanon	66 (1.7)	415 (4.7)	22 (1.1)	380 (8.1)	12 (1.2)	377 (11.8)	10.8 (0.09)
Morocco	60 (1.2)	401 (3.0)	29 (0.9)	389 (3.5)	11 (0.6)	389 (4.5)	10.5 (0.05)
Malta	55 (1.6)	578 (3.6)	29 (1.5)	558 (6.0)	16 (1.2)	542 (8.5)	10.4 (0.07)
Georgia	54 (1.5)	459 (3.7)	36 (1.3)	436 (4.0)	10 (0.9)	420 (6.4)	10.5 (0.06)
Russian Federation	50 (2.0)	552 (4.5)	36 (1.1)	541 (4.9)	14 (1.4)	527 (5.3)	10.2 (0.09)
Kazakhstan	49 (1.4)	547 (5.1)	46 (1.2)	523 (5.2)	5 (0.5)	514 (7.8)	10.4 (0.05)
Lithuania	41 (1.8)	525 (3.3)	36 (1.0)	512 (2.9)	23 (1.8)	520 (6.3)	9.7 (0.10)
Hungary	32 (1.4)	534 (5.3)	42 (1.1)	522 (3.9)	27 (1.4)	530 (4.6)	9.3 (0.07)
Sweden	27 (1.6)	536 (5.1)	49 (1.1)	529 (3.7)	23 (1.6)	513 (4.8)	9.3 (0.07)
Slovenia	26 (1.2)	570 (3.6)	52 (1.1)	551 (2.8)	22 (1.3)	534 (3.7)	9.3 (0.06)
International Avg.	46 (0.5)	512 (1.3)	38 (0.4)	494 (1.5)	16 (0.4)	487 (2.1)	

Engaging Teaching in Physics

Physics	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Lebanon	64 (1.6)	416 (4.7)	23 (0.9)	384 (7.3)	13 (1.2)	386 (12.0)	10.7 (0.08)
Morocco	61 (1.2)	402 (2.5)	29 (0.8)	385 (3.8)	11 (0.6)	395 (4.7)	10.6 (0.05)
Malta	51 (1.0)	513 (2.4)	32 (0.9)	487 (3.8)	17 (0.7)	454 (4.7)	10.2 (0.04)
Georgia	51 (1.3)	458 (3.2)	37 (0.9)	436 (4.9)	13 (1.3)	438 (5.7)	10.4 (0.07)
Russian Federation	49 (1.4)	553 (4.7)	39 (0.9)	541 (4.5)	12 (1.0)	524 (5.1)	10.3 (0.07)
Kazakhstan	48 (1.5)	548 (4.9)	48 (1.5)	523 (5.3)	5 (0.5)	518 (7.5)	10.4 (0.05)
Lithuania	36 (1.8)	530 (4.7)	39 (1.0)	513 (3.3)	25 (1.9)	512 (4.6)	9.6 (0.10)
Hungary	36 (1.6)	538 (4.5)	42 (1.1)	520 (4.1)	22 (1.4)	527 (5.4)	9.6 (0.07)
Sweden	28 (1.5)	535 (5.2)	49 (1.1)	529 (3.6)	23 (1.5)	513 (5.5)	9.4 (0.07)
Slovenia	21 (1.1)	568 (4.3)	51 (1.0)	549 (2.9)	28 (1.6)	544 (3.3)	9.0 (0.07)
International Avg.	44 (0.5)	506 (1.3)	39 (0.3)	487 (1.4)	17 (0.4)	481 (2.0)	

Engaging Teaching in Earth Science

Earth Science	Very Engaging Teaching		Engaging Teaching		Less than Engaging Teaching		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Morocco	61 (1.2)	400 (2.9)	30 (0.9)	388 (3.2)	10 (0.8)	393 (4.9)	10.5 (0.05)
Georgia	58 (1.2)	455 (3.6)	35 (1.1)	439 (3.9)	7 (0.5)	408 (9.1)	10.6 (0.05)
Kazakhstan	49 (1.4)	544 (4.7)	47 (1.3)	525 (5.7)	4 (0.4)	532 (11.2)	10.5 (0.05)
Russian Federation	48 (1.7)	546 (4.8)	40 (1.1)	546 (4.7)	12 (1.2)	536 (6.1)	10.2 (0.08)
Lithuania	46 (1.6)	526 (4.2)	37 (1.1)	513 (3.0)	17 (1.4)	516 (4.5)	9.9 (0.08)
Malta	36 (0.9)	492 (3.9)	37 (0.8)	477 (3.5)	27 (0.9)	465 (3.9)	9.4 (0.05)
Hungary	36 (1.6)	532 (4.8)	43 (1.0)	523 (4.0)	21 (1.6)	531 (5.2)	9.5 (0.08)
Slovenia	26 (1.4)	555 (4.1)	53 (1.0)	552 (2.7)	21 (1.6)	546 (3.3)	9.2 (0.08)
Lebanon	--	--	--	--	--	--	--
Sweden	--	--	--	--	--	--	--
International Avg.	45 (0.5)	506 (1.5)	40 (0.4)	496 (1.4)	15 (0.4)	491 (2.3)	

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