

Exhibit M4.1: Home Educational Resources

Reported by Advanced Mathematics Students

Students were scored according to their responses concerning the availability of four home resources on the *Home Educational Resources* scale. Students with **Many Resources** had a score of at least 11.6, which is the point on the scale corresponding to students reporting that they had more than 100 books in the home, both of the home study supports, and that at least one parent had finished university and that at least one parent was a professional, on average. Students with **Few Resources** had a score no higher than 6.0, which is the scale point corresponding to students reporting that they had 25 or fewer books in the home, neither of the home study supports, and that neither parent had gone beyond upper-secondary education and that neither parent was a small business owner or had a clerical or professional occupation, on average. All other students were assigned to the **Some Resources** category.

Country	Many Resources		Some Resources		Few Resources		Average Scale Score
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	
Norway	49 (2.3)	476 (4.1)	50 (2.1)	444 (4.9)	1 (0.2)	~ ~	11.2 (0.10)
Sweden	40 (1.5)	464 (4.7)	58 (1.4)	410 (4.4)	1 (0.2)	~ ~	10.7 (0.07)
United States	35 (1.9)	511 (6.5)	62 (1.8)	474 (5.4)	2 (0.4)	~ ~	10.5 (0.09)
Russian Federation 6hr+	30 (1.6)	567 (6.7)	70 (1.6)	529 (9.4)	0 (0.1)	~ ~	10.6 (0.06)
France	28 (1.1)	493 (3.7)	71 (1.1)	452 (3.2)	1 (0.3)	~ ~	10.2 (0.05)
Slovenia	23 (1.1)	489 (6.1)	77 (1.1)	452 (3.6)	0 (0.1)	~ ~	10.1 (0.06)
Portugal	20 (1.1)	513 (3.5)	73 (1.1)	476 (2.6)	7 (0.5)	461 (6.1)	9.3 (0.06)
Russian Federation	20 (1.0)	514 (5.2)	80 (1.0)	477 (6.2)	0 (0.1)	~ ~	10.1 (0.04)
Italy	16 (1.0)	471 (8.3)	79 (1.0)	416 (5.5)	5 (0.6)	347 (17.2)	9.3 (0.05)
Lebanon	8 (0.8)	546 (13.9)	82 (1.2)	535 (3.1)	10 (0.9)	496 (6.2)	8.7 (0.05)
International Avg.	27 (0.5)	497 (2.3)	70 (0.5)	460 (1.5)	3 (0.1)	435 (6.4)	

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

The Russian Federation 6hr+ results are for a subset of the Russian Federation students. This subset of students are in an Intensive stream that have at least 6 hours of mathematics lessons per week.

This TIMSS Advanced questionnaire scale was established in 2015 based on the combined response distribution of all countries that participated in TIMSS Advanced 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 tilde (~) indicates insufficient data to report achievement.

Number of books in the home:

- 1) 0-10
- 2) 11-25
- 3) 26-100
- 4) 101-200
- 5) More than 200

Number of home study supports:

- 1) None
- 2) Study desk/table or own room
- 3) Both

Highest level of occupation of either parent:

- 1) Has never worked outside home for pay, general laborer, or semi-professional (skilled agricultural or fishery worker, craft or trade worker, plant or machine operator)
- 2) Clerical (clerk or service or sales worker)
- 3) Small business owner
- 4) Professional (corporate manager or senior official, professional, or technician or associate professional)

Highest level of education of either parent:

- 1) Finished some primary or lower secondary or did not go to school
- 2) Finished lower secondary
- 3) Finished upper secondary
- 4) Finished post-secondary education
- 5) Finished university or higher

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Many Resources **Some Resources** **Few Resources**

11.6 6.0