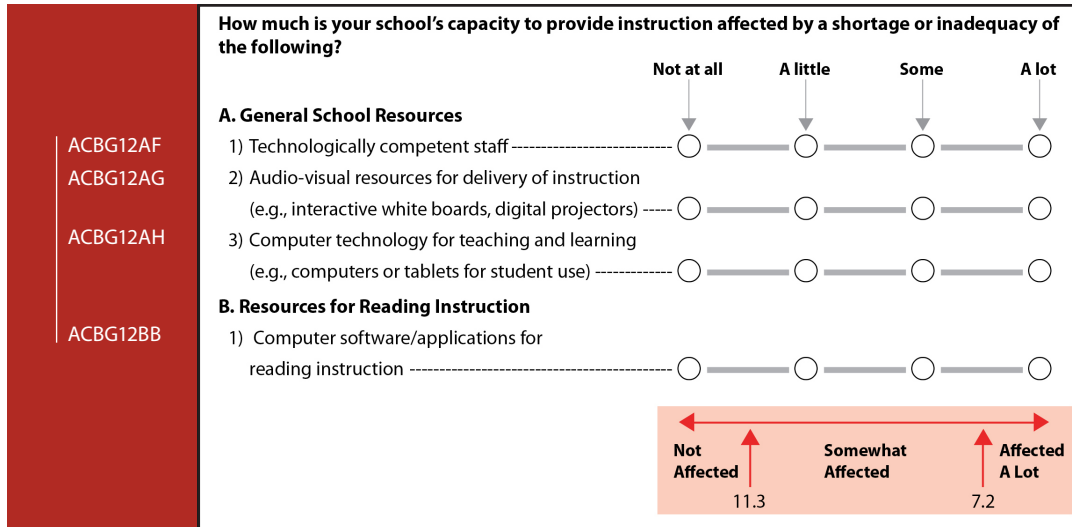


Instruction Affected by Digital Resource Shortages Scale

The *Instruction Affected by Digital Resource Shortages* (DRS) scale was created based on principals' responses concerning four school and classroom resources described below.

Items in the PIRLS 2016 *Instruction Affected by Digital Resource Shortages* Scale



Item Parameters for the PIRLS 2016 Instruction Affected by Digital Resource Shortages Scale

Item	delta	tau_1	tau_2	tau_3	Infit
ACBG12AF	-0.06232	-1.40083	-0.09454	1.49537	1.07
ACBG12AG	-0.14345	-1.27363	0.17090	1.10273	0.87
ACBG12AH	0.16006	-1.46129	0.04607	1.41522	0.88
ACBG12BB	0.04571	-1.73178	-0.08308	1.81486	1.14

Scale Transformation Constants for the PIRLS 2016 Instruction Affected by Digital Resource Shortages Scale

Scale Transformation Constants	
A = 9.264589	Transformed Scale Score = 9.264589 + 1.227112 • Logit Scale Score
B = 1.227112	

Equivalence Table of the Raw Score and Transformed Scale Scores for the PIRLS 2016 Instruction Affected by Digital Resource Shortages Scale

Raw Score	Transformed Scale Score	Cutpoint
0	4.82238	
1	6.34762	
2	7.16657	7.2
3	7.78270	
4	8.31408	
5	8.79730	
6	9.25885	
7	9.72012	
8	10.20216	
9	10.73577	
10	11.36104	11.3
11	12.19853	
12	13.75008	

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the PIRLS 2016 Instruction Affected by Digital Resource Shortages Scale

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item			
			ACBG12AF	ACBG12AG	ACBG12AH	ACBG12BB
Australia	0.85	69	0.82	0.82	0.88	0.79
Austria	0.74	57	0.60	0.81	0.85	0.74
Azerbaijan	0.76	59	0.70	0.78	0.82	0.76
Bahrain	0.87	73	0.84	0.89	0.88	0.79
Belgium (Flemish)	0.68	51	0.71	0.75	0.81	0.56
Belgium (French)	0.73	56	0.82	0.78	0.73	0.65
Bulgaria	0.69	52	0.50	0.81	0.86	0.65
Canada	0.85	68	0.82	0.85	0.88	0.76
Chile	0.72	56	0.65	0.84	0.88	0.59
Chinese Taipei	0.83	67	0.84	0.91	0.90	0.57
Czech Republic	0.69	52	0.56	0.76	0.84	0.70
Denmark	0.70	53	0.61	0.81	0.72	0.77
Egypt	0.78	61	0.66	0.82	0.81	0.82
England	0.79	62	0.76	0.84	0.84	0.70
Finland	0.76	58	0.72	0.78	0.82	0.71
France	0.72	56	0.52	0.82	0.89	0.72
Georgia	0.72	53	0.63	0.77	0.75	0.76
Germany	0.78	61	0.71	0.81	0.83	0.76
Hong Kong SAR	0.70	52	0.74	0.86	0.76	0.48
Hungary	0.67	52	0.42	0.87	0.83	0.69
Iran, Islamic Rep. of	0.77	60	0.70	0.86	0.85	0.66
Ireland	0.71	54	0.72	0.64	0.81	0.75
Israel	0.85	68	0.82	0.85	0.83	0.80
Italy	0.77	59	0.82	0.83	0.82	0.59
Kazakhstan	0.83	68	0.73	0.85	0.85	0.86
Kuwait	0.77	59	0.74	0.86	0.75	0.72
Latvia	0.75	59	0.82	0.88	0.85	0.47
Lithuania	0.77	59	0.68	0.84	0.83	0.72
Macao SAR	0.70	58	0.86	0.88	0.91	-0.07
Malta	0.80	62	0.75	0.85	0.84	0.71
Morocco	0.86	71	0.75	0.87	0.89	0.85
Netherlands	0.58	45	0.52	0.69	0.76	0.70
New Zealand	0.84	67	0.79	0.84	0.89	0.75
Northern Ireland	0.81	64	0.81	0.86	0.80	0.72
Norway (5)	0.74	56	0.69	0.79	0.79	0.73
Oman	0.81	64	0.80	0.84	0.84	0.72
Poland	0.72	55	0.69	0.83	0.86	0.56
Portugal	0.81	63	0.76	0.76	0.85	0.81
Qatar	0.94	84	0.93	0.96	0.94	0.85
Russian Federation	0.81	64	0.76	0.86	0.85	0.73
Saudi Arabia	0.78	60	0.74	0.81	0.81	0.75
Singapore	0.90	77	0.87	0.91	0.94	0.79
Slovak Republic	0.74	56	0.65	0.85	0.81	0.66
Slovenia	0.69	53	0.60	0.86	0.84	0.57
South Africa	0.88	73	0.66	0.91	0.92	0.90
Spain	0.80	63	0.78	0.84	0.86	0.69
Sweden	0.78	61	0.78	0.81	0.77	0.76
Trinidad and Tobago	0.69	52	0.41	0.70	0.87	0.83
United Arab Emirates	0.89	75	0.88	0.91	0.90	0.75
United States	0.83	67	0.84	0.82	0.85	0.75
Benchmarking Participants						
Buenos Aires, Argentina	0.82	65	0.77	0.82	0.83	0.79
Ontario, Canada	0.87	72	0.84	0.89	0.88	0.79
Quebec, Canada	0.79	61	0.78	0.74	0.87	0.73
Denmark (3)	0.70	53	0.62	0.81	0.73	0.73
Norway (4)	0.73	55	0.69	0.77	0.79	0.73
Moscow City, Russian Fed.	0.86	71	0.85	0.87	0.91	0.73
Eng/Afr/Zulu - RSA (5)	0.84	68	0.59	0.90	0.89	0.89
Andalusia, Spain	0.70	53	0.68	0.79	0.75	0.68
Madrid, Spain	0.80	63	0.76	0.80	0.87	0.76
Abu Dhabi, UAE	0.86	71	0.86	0.89	0.91	0.70
Dubai, UAE	0.92	81	0.90	0.93	0.92	0.85

SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Relationship Between the PIRLS 2016 Instruction Affected by Digital Resource Shortages Scale and PIRLS 2016 Reading Achievement

Country	Pearson's Correlation with Reading Achievement		Variance in Reading Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
Australia	0.11	0.01	0.01
Austria	-0.01	0.00	0.00
Azerbaijan	-0.17	0.03	0.03
Bahrain	0.11	0.01	0.01
Belgium (Flemish)	-0.01	0.00	0.00
Belgium (French)	0.06	0.00	0.00
Bulgaria	0.13	0.02	0.02
Canada	0.02	0.00	0.00
Chile	0.11	0.01	0.02
Chinese Taipei	0.09	0.01	0.00
Czech Republic	-0.04	0.00	0.01
Denmark	0.05	0.00	0.00
Egypt	0.10	0.01	0.02
England	0.05	0.00	0.00
Finland	0.04	0.00	0.01
France	0.04	0.00	0.00
Georgia	0.12	0.01	0.01
Germany	0.12	0.01	0.01
Hong Kong SAR	0.11	0.01	0.01
Hungary	-0.05	0.00	0.01
Iran, Islamic Rep. of	0.13	0.02	0.02
Ireland	0.08	0.01	0.01
Israel	0.24	0.06	0.04
Italy	-0.03	0.00	0.00
Kazakhstan	0.04	0.00	0.01
Kuwait	0.02	0.00	0.01
Latvia	-0.01	0.00	0.00
Lithuania	0.05	0.00	0.00
Macao SAR	-0.13	0.02	0.02
Malta	0.05	0.00	0.00
Morocco	-0.07	0.01	0.01
Netherlands	0.06	0.00	0.00
New Zealand	0.10	0.01	0.00
Northern Ireland	-0.01	0.00	0.00
Norway (5)	0.06	0.00	0.00
Oman	0.08	0.01	0.01
Poland	0.10	0.01	0.01
Portugal	0.11	0.01	0.01
Qatar	0.24	0.06	0.05
Russian Federation	0.08	0.01	0.00
Saudi Arabia	-0.11	0.01	0.02
Singapore	-0.08	0.01	0.01
Slovak Republic	0.04	0.00	0.02
Slovenia	0.04	0.00	0.00
South Africa	-0.02	0.00	0.03
Spain	0.16	0.03	0.03
Sweden	0.12	0.01	0.02
Trinidad and Tobago	0.09	0.01	0.01
United Arab Emirates	0.26	0.07	0.07
United States	-0.06	0.00	0.01
International Median	0.06	0.01	0.01
Benchmarking Participants			
Buenos Aires, Argentina	0.10	0.01	0.01
Ontario, Canada	-0.01	0.00	0.00
Quebec, Canada	0.02	0.00	0.00
Denmark (3)	0.02	0.00	0.00
Norway (4)	0.09	0.01	0.00
Moscow City, Russian Fed.	0.01	0.00	0.00
Eng/Afr/Zulu - RSA (5)	-0.03	0.00	0.00
Andalusia, Spain	0.13	0.02	0.01
Madrid, Spain	0.07	0.00	0.00
Abu Dhabi, UAE	0.28	0.08	0.06
Dubai, UAE	0.19	0.04	0.06

SOURCE: IEA's Progress in International Reading Literacy Study - PIRLS 2016

Relationship Between the PIRLS 2016 *Instruction Affected by Digital Resource Shortages* Scale and ePIRLS 2016 Online Informational Reading Achievement

Country	Pearson's Correlation with ePIRLS Achievement		Variance in ePIRLS Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r ²)	
Canada	0.05	0.00	0.00
Chinese Taipei	0.06	0.00	0.00
Denmark	0.02	0.00	0.00
Georgia	0.08	0.01	0.00
Ireland	0.10	0.01	0.01
Israel	0.25	0.06	0.04
Italy	0.02	0.00	0.00
Norway	0.06	0.00	0.00
Portugal	0.12	0.01	0.02
Singapore	-0.07	0.00	0.01
Slovenia	0.04	0.00	0.00
Sweden	0.14	0.02	0.02
United Arab Emirates	0.22	0.05	0.07
United States	-0.03	0.00	0.01
International Median	0.06	0.00	0.01
Benchmarking Participants			
Abu Dhabi, UAE	0.28	0.08	0.08
Dubai, UAE	0.09	0.01	0.03