هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Alifya

IQ Digital Scale apply for all

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AUGUST 3, 2023

Why is it important to developing a new neuropsychological battery for Saudi Arabia?

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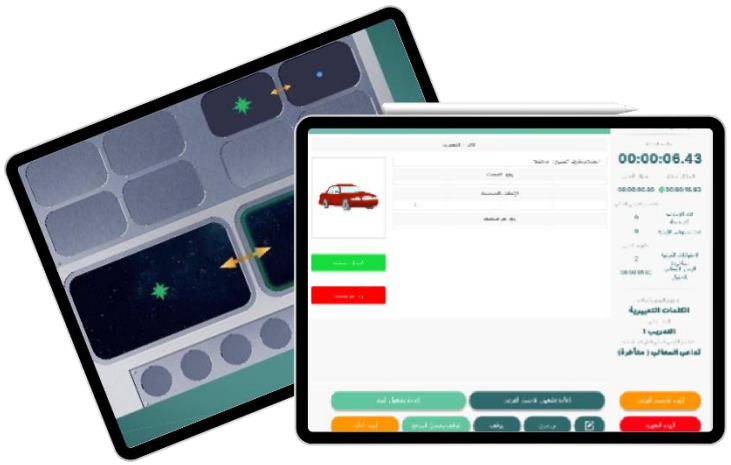
- The history of using a Western translated or adapted instruments.
- The Standards for Educational and Psychological Tests (AERA, APA, & NCME, 2014) highlight the importance of considering cultural factors when developing and using tests to ensure their accuracy and fairness.
- In light of the rapid digital and communication developments, this should be accompanied by an evolution in the mechanisms and materials for measuring intelligence.

Alifya IQ Battery

- The National Center for Assessment develops Alifya IQ Battery, which consists of a set of subtests. It aims to measure IQ (cognitive and neuropsychological components).
- The battery uses the latest technologies to make most of the subtests in adaptive mode to the examinee on computers and smart devices while it enables the clinician to track the examinee's performance through another device.



Project Partners

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The Alifya project emerged from a partnership between the GENES:IS lab in the US and Qiyas center in the KSA.

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Yale University

UNIVERSITY of HOUSTON

Major Components of the Battery

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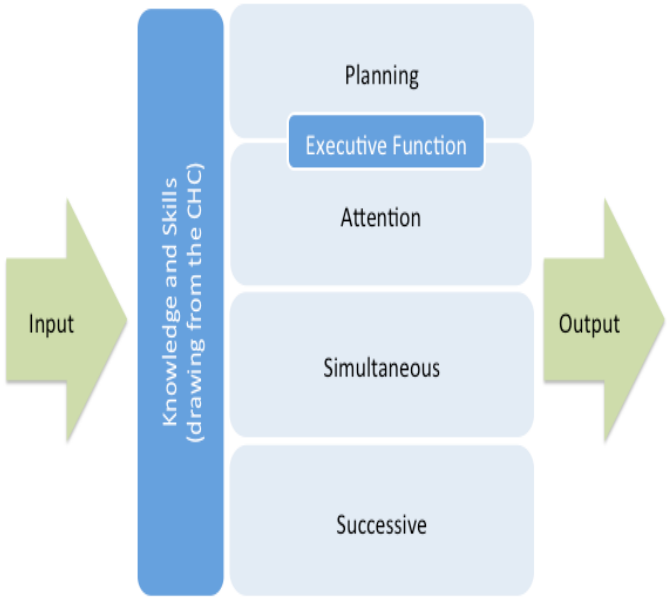
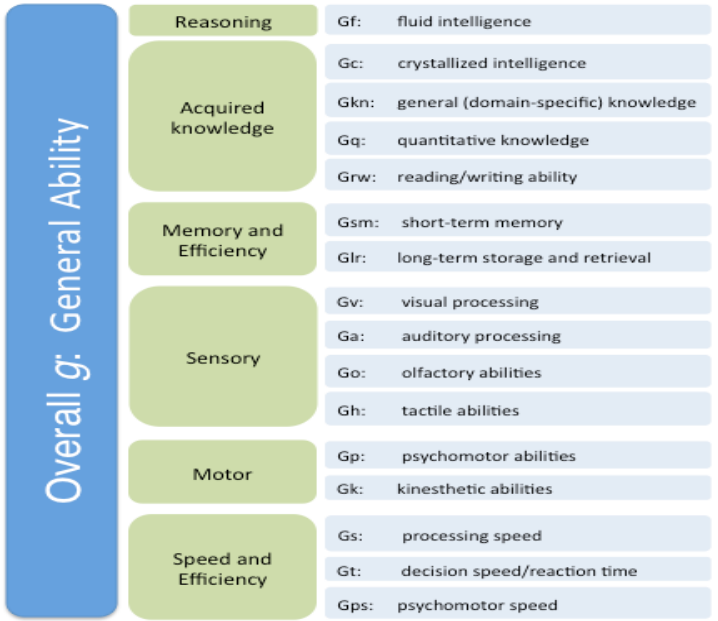
PASS Theory

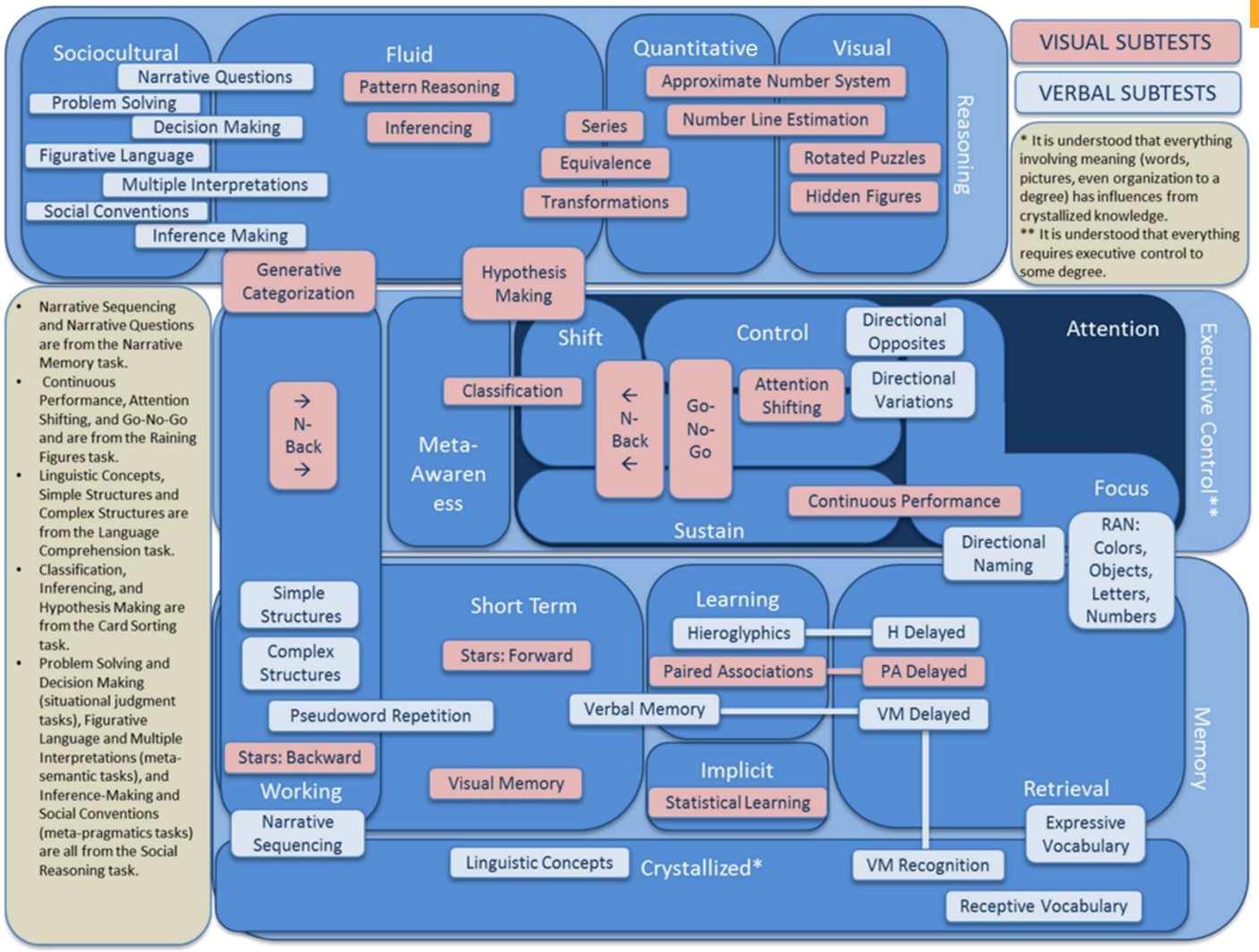


Cattell–Horn–Carroll theory



Major Components of the Battery

47 sub tests



Alifya Features

Target group

- Aged 5-18

Number of subtests

47 subtests:

- Reasoning, executive control, and memory
- Verbal and non-verbal

Uses

- IQ score
- Identifying giftedness, intellectual disability, and learning disabilities
- Providing indicators of autism spectrum disorder, attention deficit disorder, language impairment, and impaired brain functioning (e.g., traumatic brain injury, epilepsy)

Languages

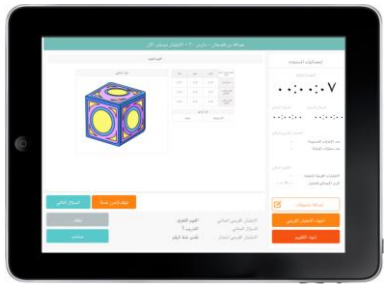
- Arabic and English

Alifya Features (cont.)

- Covers a spectrum of cognitive and neuropsychological treats.
- Mostly, adaptive in nature. Most of the tests are built on an adaptive mode.
- Designed for the Arab culture.
- Automatically scores and saves test-takers' responses and their actual time.
- Items are built on the concept of gamification, so they can be entertaining. In fact, they remove anxiety and boredom traditionally associated with testing.
- All test-takers' data and records are saved in a data base for purposes of research and beneficiary services.
- Gives clinicians ample time to closely observe and record test-takers' behaviors prior and during the session.
- All instruction and training items are built into the system. So there is no need for special preparation time and/or efforts.

Alifya features (cont.)

- A wide range of item types: multiple choice, multiple response, drag-and-drop, and open-ended
- Computerized adaptive testing (CAT): Selecting CAT algorithms through simulation studies. In addition to efficiency (less items) and accuracy (higher precision).
- It can be applied in different operating systems:



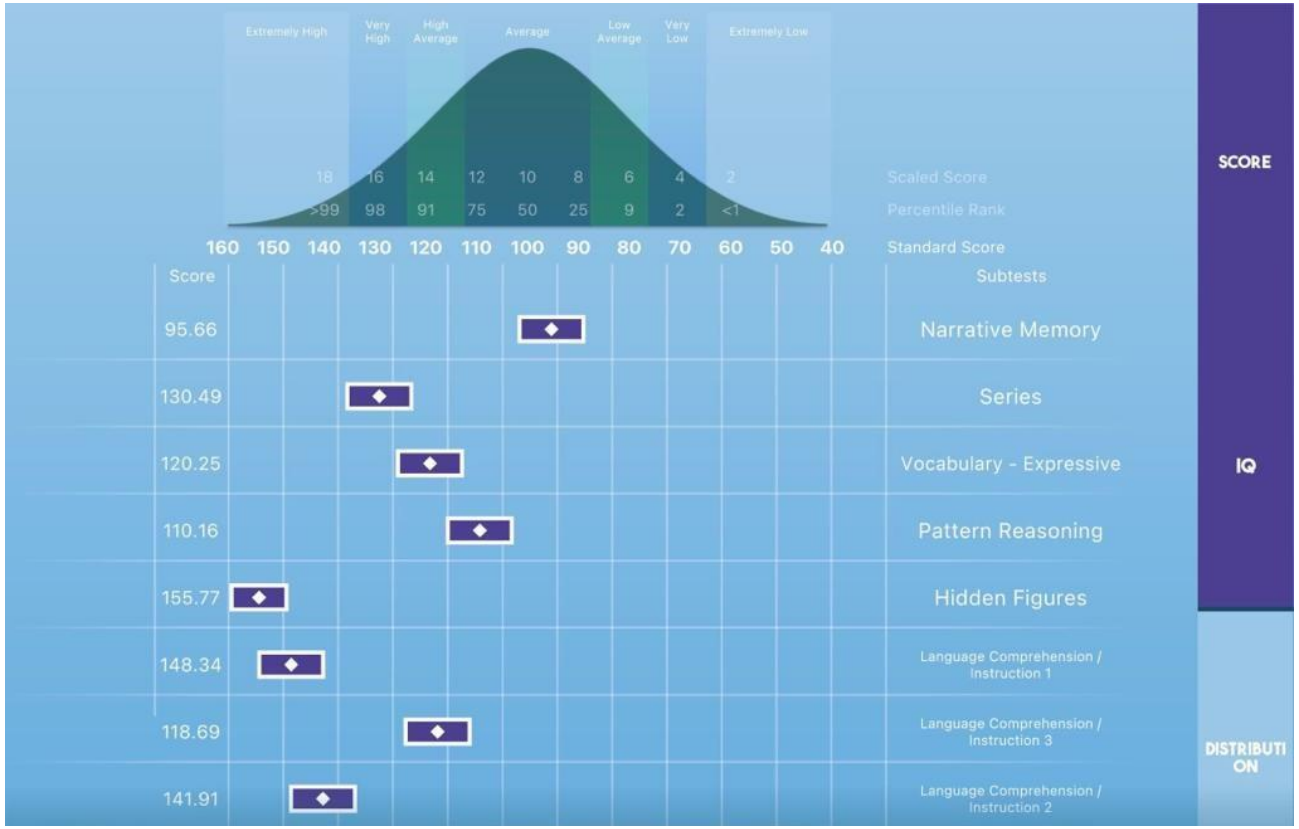
Android

iOS

Windows

Alifya features (cont.)

Score report supported by graphs: A graph within the detailed report that appears to the examiner at the end of the session



Data Collection

- **More** than 600 male and female examiners across the Kingdom have been trained.

- **Stratified** normative sample was selected from all the kingdom. More than 22,000 male and female students constituted the normative sample.

Data Collection (cont.)

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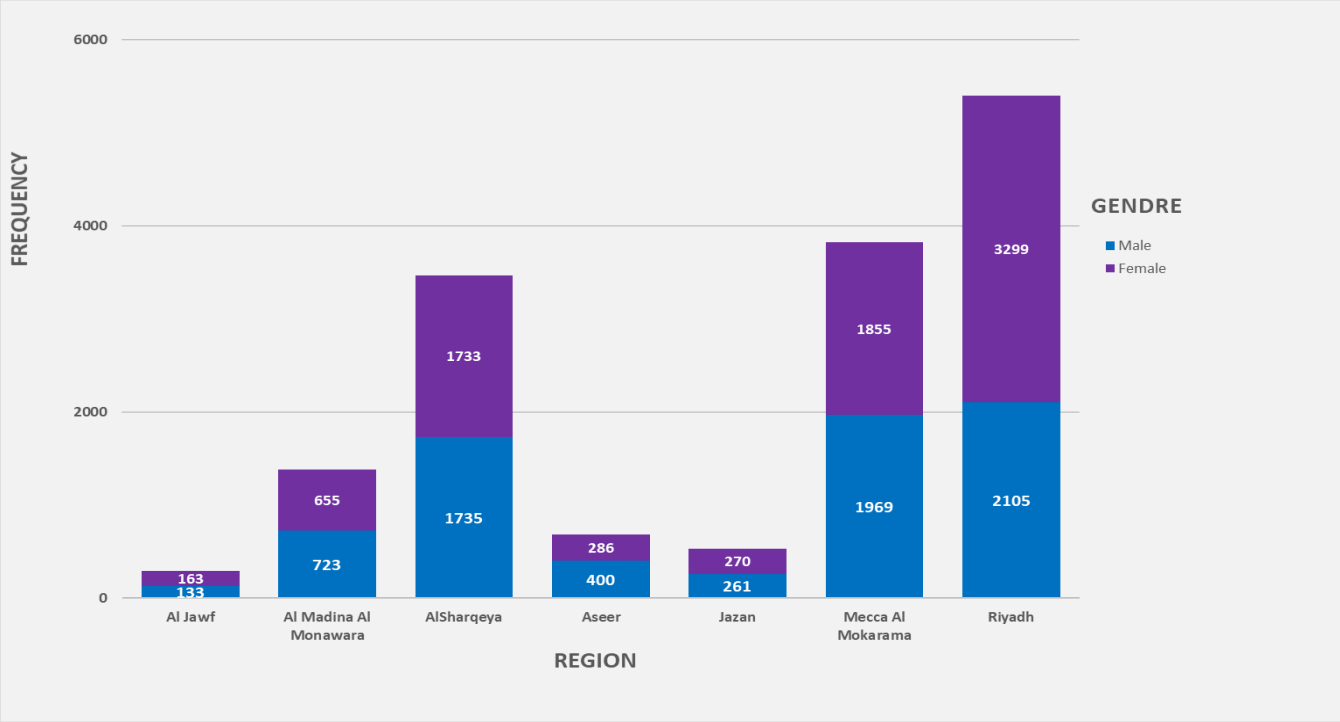
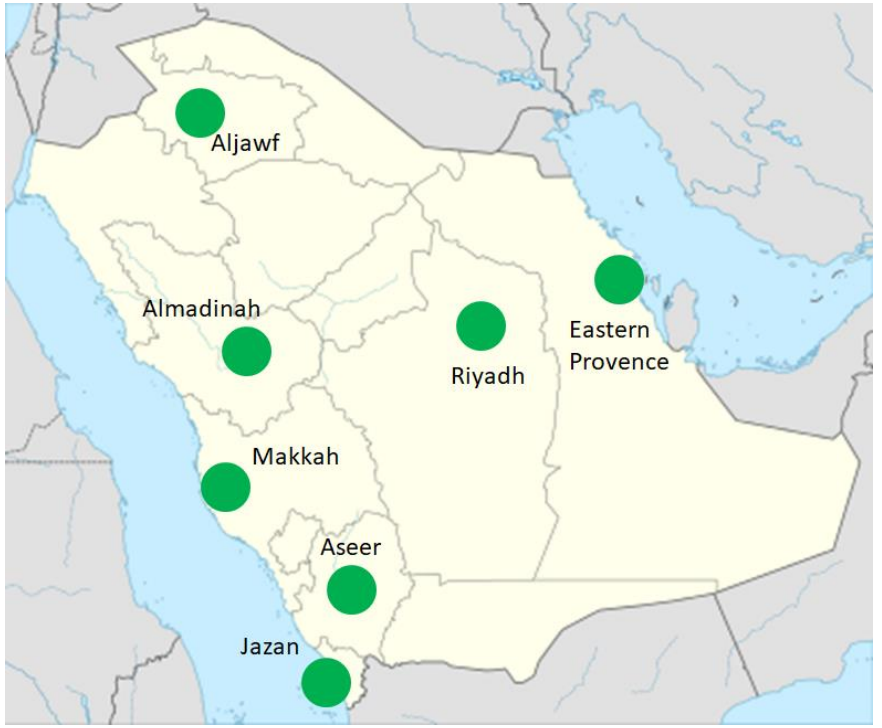
Daily monitoring to insure the coverage of all variables

Subtests	Batter	M 5	F 5	M 6	F 6	M 7	F 7	M 8	F 8	M 9	F 9	M 10	F 10	M 11	F 11	M 12	F 12	M 13	F 13	M 14	F 14	M 15	F 15	M 16	F 16	M 17	F 17	M 18	F 18
go_n_go	2,3	111	132	124	117	100	118	102	127	107	134	122	107	110	110	105	114	146	123	89	109	112	111	103	100	105	111	98	136
social_reasoning_inference_ma	3,4	114	123	122	131	106	122	123	110	140	169	141	121	142	137	114	127	144	133	108	123	106	110	128	152	135	110	93	132
rotated_puzzles_1	6,7	134	117	123	119	125	120	117	110	137	111	114	128	119	110	123	125	114	116	120	117	122	109	108	110	85	132	105	167
series	8,9	107	109	110	115	105	109	115	123	125	122	110	114	97	126	111	111	95	105	109	118	89	124	104	96	108	123	96	114
visual_memory	7,8	115	113	109	115	107	113	98	114	135	106	104	109	106	97	124	103	99	92	116	100	114	99	107	107	90	116	97	122
card_sorting_hypothesis_makir	1,12	110	77	81	84	87	93	102	69	82	82	92	84	78	70	86	99	68	87	80	85	65	90	60	118	68	107	50	60
number_line_estimation	2,10	78	91	76	73	70	84	76	85	71	93	80	79	64	81	60	84	76	82	53	64	67	73	51	66	48	55	53	97
rotated_puzzles_2	6,10	83	61	73	69	71	77	71	74	69	93	68	100	67	84	62	84	71	75	63	77	60	71	58	73	53	85	56	64
stars_backwards	5,11	59	56	57	60	58	55	60	61	66	85	71	70	67	87	75	77	70	65	61	74	73	65	58	104	74	84	52	98
name_switching_variations	2,12	70	83	75	67	70	75	69	73	74	81	78	66	70	68	63	69	75	64	56	55	68	60	52	59	50	52	52	101
ran_objects	5	61	58	55	58	56	55	54	58	54	78	69	68	64	92	69	80	69	68	61	74	76	66	56	79	79	74	50	116
ran_numbers	5	60	60	53	55	53	53	55	57	53	80	67	66	63	91	72	79	72	67	62	74	77	64	56	78	80	74	49	115
language_comprehension__inst	7,10	84	75	68	81	73	88	76	72	84	76	73	90	68	80	78	86	64	70	67	69	74	66	64	64	29	58	50	73
social_reasoning_figurative_le	5	56	50	48	60	52	54	57	55	52	76	67	66	58	86	62	80	68	67	62	70	71	58	52	78	76	72	51	122
card_sorting_classification	1	89	62	72	68	77	73	82	54	62	66	73	70	63	62	63	80	56	72	69	73	56	79	54	100	61	86	42	55
social_reasoning_social_conve	5	54	50	47	59	52	55	55	59	54	77	68	66	61	86	61	80	66	66	59	70	72	63	55	78	74	74	52	99
hidden_figures	3,11	60	56	61	65	56	61	75	64	59	83	63	58	59	62	64	63	89	64	44	61	58	61	67	79	58	75	50	48
approximate_number_system	1	90	63	69	67	70	65	85	56	66	64	66	65	57	60	60	80	54	71	70	73	56	78	56	94	62	85	41	51
n_back	3,12	68	58	63	64	63	69	57	51	60	78	70	57	60	57	68	62	94	54	48	56	60	59	62	60	62	61	49	46
generative_categorization	2	63	80	70	61	67	64	65	72	67	61	67	55	66	58	55	63	61	64	53	50	67	59	49	56	49	50	52	98
social_reasoning_multiple_inte	3,11	59	55	63	61	52	59	51	66	58	77	64	58	59	61	61	62	87	63	43	61	57	62	67	79	60	75	48	41
equivalence	1	79	57	63	62	70	71	77	54	59	60	69	67	56	59	60	81	56	76	69	73	56	82	53	98	61	84	48	54
name_switching_naming	2	59	78	70	61	62	63	63	69	63	70	65	60	60	63	53	60	64	64	51	50	62	57	50	54	48	51	51	100
attention_shifting	1	85	58	66	67	68	64	83	53	60	64	63	66	56	57	56	80	56	71	65	72	53	75	52	93	61	83	42	52
name_switching_opposites	2	59	76	71	55	60	63	60	70	64	67	66	58	60	64	51	60	64	63	49	50	60	57	45	55	48	51	51	97
pattern_reasoning	9	57	59	65	64	59	62	73	65	71	68	64	67	59	81	62	72	51	72	50	73	48	83	54	42	52	59	50	72
statistical_learning	8,A	55	61	56	62	61	61	52	77	64	70	54	57	57	56	61	64	57	53	61	60	53	50	56	58	60	69	47	46
vocabulary_receptive	5	55	52	49	59	55	55	56	59	54	79	66	70	63	89	60	82	58	56	50	57	62	50	44	57	60	55	45	97
card_sorting_inferencing	1	79	60	65	63	69	69	79	53	55	56	67	64	52	58	59	79	52	71	66	69	49	74	53	94	55	84	42	49
paired_associations_immediate	9	59	59	61	70	63	68	71	62	72	65	69	63	59	77	62	65	51	69	54	60	45	82	55	43	53	57	49	74
ran_colors	6	72	59	67	55	68	60	51	58	55	63	57	72	64	60	55	60	61	58	57	64	55	60	59	63	52	86	56	65
vocabulary_expressive	4	66	75	73	72	64	65	73	54	95	99	80	68	88	81	58	72	63	69	68	67	55	53	70	97	76	53	45	93
ran_letters	6	66	58	66	55	68	58	52	57	58	62	56	70	60	61	56	58	60	58	57	62	54	59	57	60	53	84	55	71
social_reasoning_problem_solv	6	68	58	63	52	64	54	54	62	61	74	57	76	60	60	54	58	59	58	58	65	52	54	50	64	55	76	55	52
transformations	4	62	77	66	69	68	62	77	52	95	90	86	70	89	82	63	71	61	62	66	67	56	51	66	94	75	52	44	92
rotated_puzzles_3	6	69	54	66	57	65	54	55	60	60	62	51	70	60	60	54	56	60	56	56	65	55	56	54	61	55	80	50	62
social_reasoning_decision_mal	6	69	53	61	55	62	54	53	61	59	66	54	75	60	58	54	54	59	57	59	66	50	55	57	61	56	78	53	56
paired_associations_delayed	9	52	51	55	58	52	57	71	61	70	60	66	64	58	77	58	62	51	60	54	53	42	78	47	41	51	52	48	72
continuous_performance_task	1	66	77	67	70	68	63	77	52	94	87	85	67	91	70	63	68	60	64	67	66	55	51	66	95	80	49	59	81
verbal_memory_delayed_recall	4	53	68	65	54	64	45	75	46	84	73	76	61	87	63	62	64	61	59	64	61	55	51	62	91	74	42	48	77
hieroglyphics_immediate	7	63	55	59	64	61	63	59	52	76	52	61	62	60	50	66	59	49	54	59	53	65	55	56	52	30	53	52	80
verbal_memory_immediate_rec	4	55	62	65	66	71	51	74	49	84	75	68	60	81	62	59	67	62	56	66	60	56	52	57	88	70	40	46	65
verbal_memory_delayed_recogr	4	50	63	60	54	57	45	73	44	84	72	80	61	90	66	56	68	56	64	62	62	50	52	60	95	74	43	44	79
hieroglyphics_delayed	7	55	52	57	61	56	59	60	51	77	50	58	59	60	51	65	59	50	53	57	55	65	52	50	52	29	52	51	77

Data Collection (cont.)

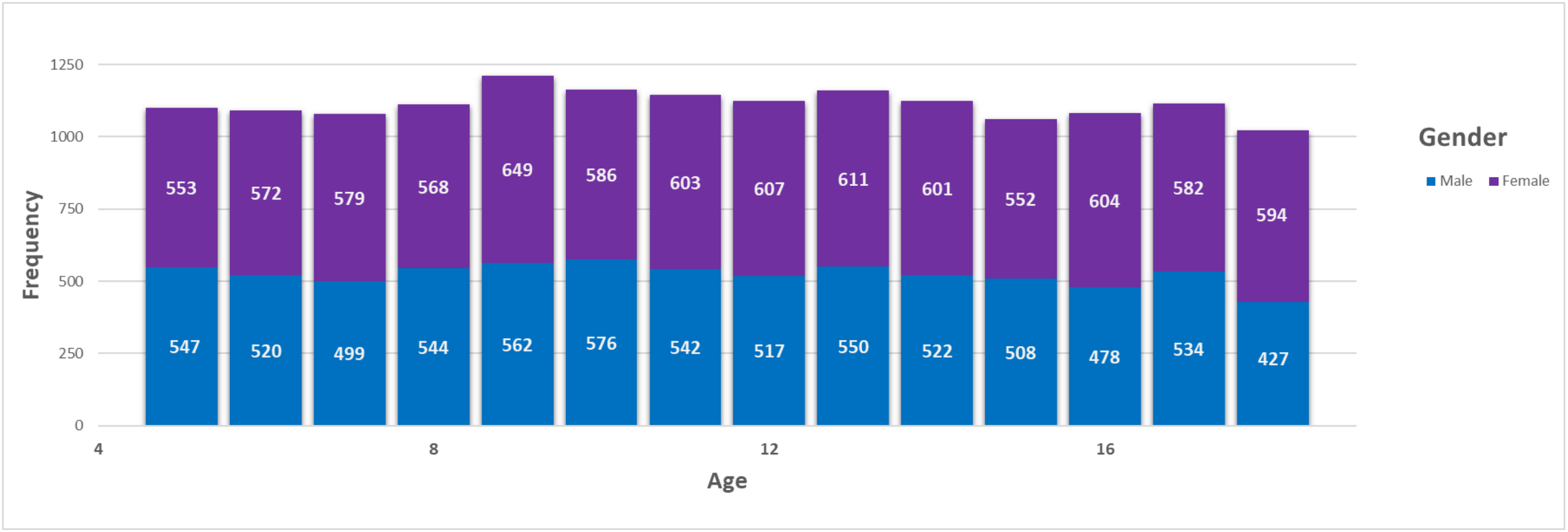
Alifya sample map across the Kingdom.





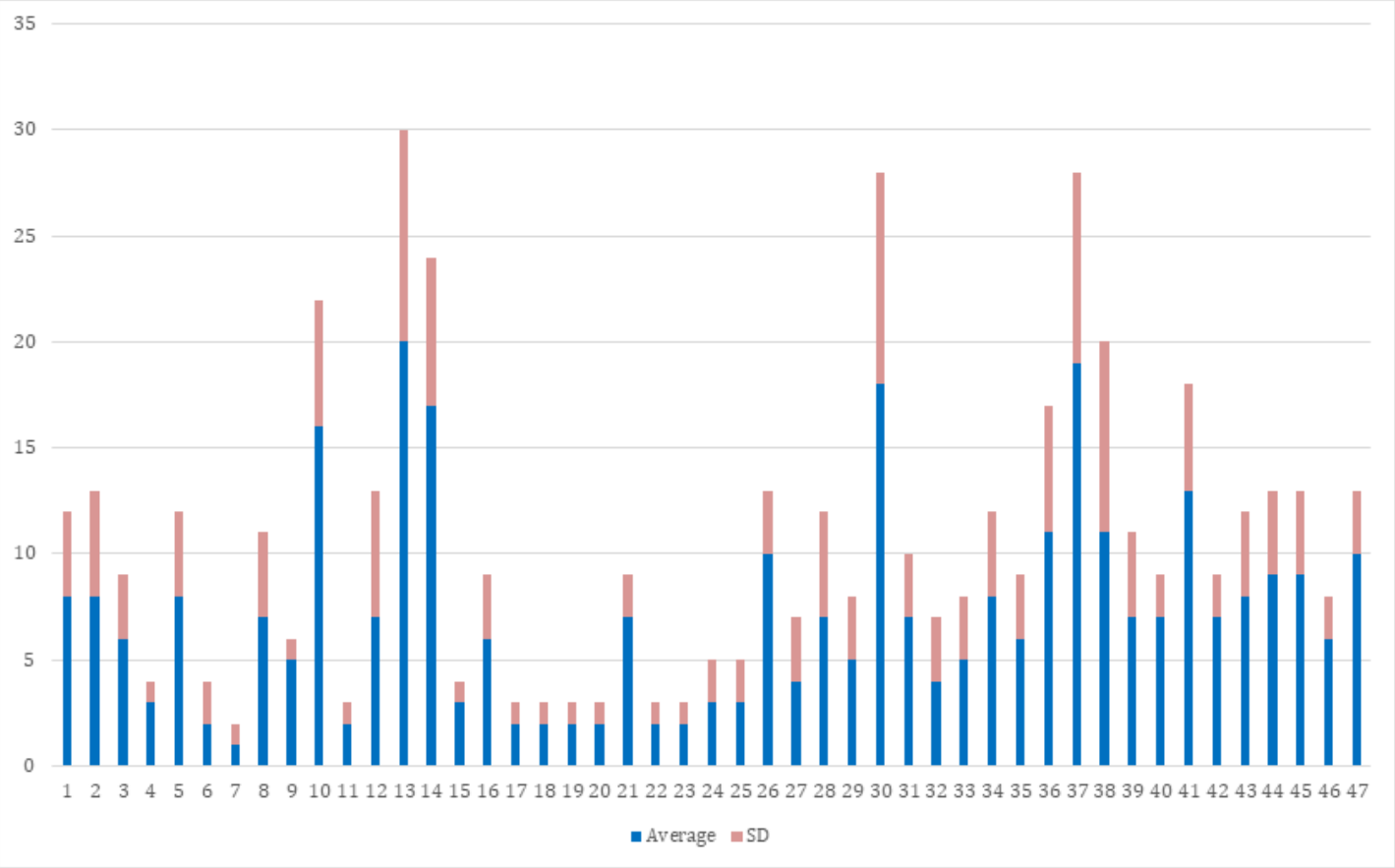
Data Collection (cont.)

Alifya sample of tested students by age

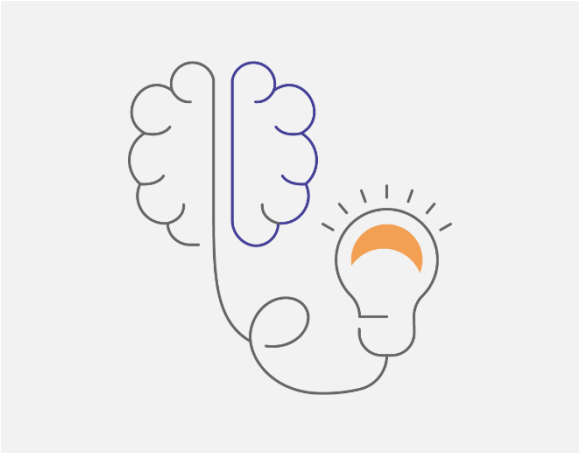


Data Collection (cont.)

Average time spent by the students and standard deviation in minutes for each subtest.



Future work

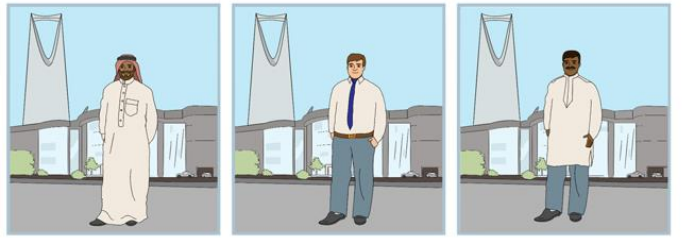


- **It** can be applied remotely (online)

Examples

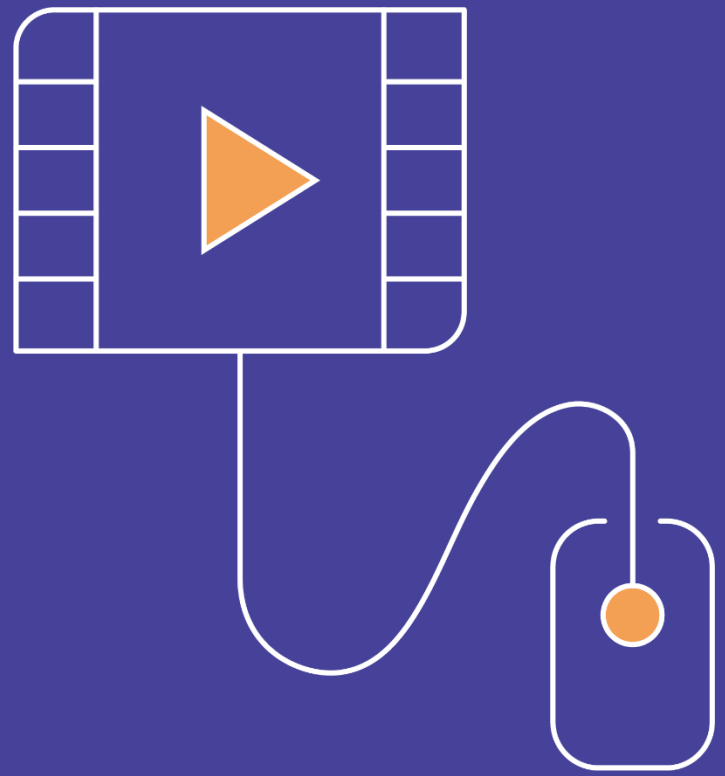
Cultural sensitivity

- Mahmoud arrives to his house and has three full bags of groceries. And when we he reaches for the door handle, and several oranges drop out of one of his bags. His nephew Sultan laughs. What should he have done instead?
  - Say, “let me get that door”
  - Say, “may I carry one of your bags for you?”
  - Ignored him instead of laughing
  - Pick up and eat an orange
  - Call to him, “You dropped some oranges!”
  - Take a bag from him, without asking



Cultural sensitivity

- Touch the one who is local.



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Thank You

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