Spring 2016 Free Calibration Results for the Missouri Biology EOC Assessment

Presented by
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1. Introduction

This document presents the Spring 2016 free calibration results for the Missouri Biology End-of-Course (EOC) Assessment to investigate if there are any item parameter shifts for Form C from the initially estimated values to the Spring 2016 test results. Per the request of the Missouri Technical Advisory Committee (TAC), Questar Assessment, Inc. (Questar) ran the free calibration to re-estimate the item parameters and re-created the raw score-to-scale score (RSS) conversion table.

The Biology EOC operational assessment has two sessions. Session 1 has 35 1-point selected-response items. Session 2 has a 20-point performance event comprised of a main context and several prompts. Initially, Riverside field tested all items and constructed multiple test forms in 2009. After the initial form construction, the test forms have been used based on a form rotation schedule. Form C for the Biology EOC Assessment was used in Fall 2012 and again in Spring 2016.

2. Free Calibration

Winsteps 3.64.2 was used to run the free calibration. The equating population included:

1. Only students who took the general form (i.e., the online test form).
2. Students who met the completion criteria for both Session 1 and Session 2. A student met the completion criterion if he or she started the test.

3. Results

3.1. Item parameters comparison

Table 3.1 shows the Rasch value differences between the existing item parameters (estimated in 2009 by Riverside) and the newly estimated item parameters from the free calibration by using the Spring 2016 test results. The standard deviation (SD) is a bit bigger for the newly estimated Rasch values, but the Rasch values are not much different in terms of average difficulty. The difference of the average difficulty and standard deviation between the old and new Rasch values are -0.03 and 0.142, respectively. The correlation between the old and new Rasch values is -0.122.

Table 3.1. Rasch Difference between Existing and Newly Estimated Item Parameters

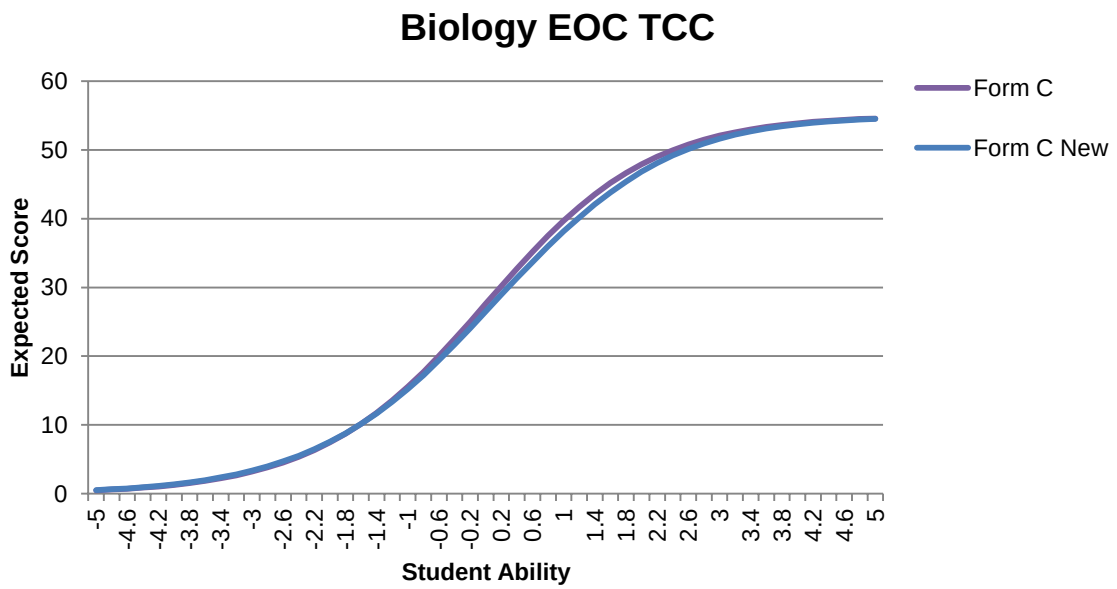
	Form C										
	Existing Parameters					Newly Estimated Parameters					
UIN	Rasch	STEP1	STEP2	STEP3	STEP4	Rasch	STEP1	STEP2	STEP3	STEP4	Rasch Difference
100076702	-0.856	--	--	--	--	-1.809	--	--	--	--	0.952
100076450	0.380	--	--	--	--	0.359	--	--	--	--	0.022
100076324	-1.647	--	--	--	--	-2.020	--	--	--	--	0.374
100076111	1.194	--	--	--	--	1.622	--	--	--	--	-0.429
100075879	0.638	--	--	--	--	0.313	--	--	--	--	0.326
100076492	-1.875	--	--	--	--	-2.330	--	--	--	--	0.454
100076816	-0.868	--	--	--	--	-0.642	--	--	--	--	-0.226
100076053	0.140	--	--	--	--	0.259	--	--	--	--	-0.119
100076821	-0.202	--	--	--	--	-0.045	--	--	--	--	-0.157

UIN	Form C										Rasch Difference
	Existing Parameters					Newly Estimated Parameters					
	Rasch	STEP1	STEP2	STEP3	STEP4	Rasch	STEP1	STEP2	STEP3	STEP4	
100076449	0.321	--	--	--	--	0.091	--	--	--	--	0.231
100076701	-1.078	--	--	--	--	-0.340	--	--	--	--	-0.738
100076669	-0.238	--	--	--	--	-0.529	--	--	--	--	0.290
100076503	-0.226	--	--	--	--	0.070	--	--	--	--	-0.296
100076641	0.921	--	--	--	--	0.953	--	--	--	--	-0.032
100076812	0.018	--	--	--	--	-0.016	--	--	--	--	0.033
100075796	-1.076	--	--	--	--	-1.095	--	--	--	--	0.019
100076142	0.194	--	--	--	--	0.014	--	--	--	--	0.180
100076708	0.863	--	--	--	--	0.530	--	--	--	--	0.333
100076841	-0.449	--	--	--	--	-0.444	--	--	--	--	-0.005
100076637	0.916	--	--	--	--	0.686	--	--	--	--	0.230
100076855	-0.476	--	--	--	--	-0.881	--	--	--	--	0.405
100075891	0.332	--	--	--	--	0.288	--	--	--	--	0.044
100076765	0.802	--	--	--	--	1.405	--	--	--	--	-0.604
100075887	0.504	--	--	--	--	0.534	--	--	--	--	-0.030
100076825	0.061	--	--	--	--	-0.075	--	--	--	--	0.136
100076326	-0.614	--	--	--	--	-0.752	--	--	--	--	0.138
100076451	-0.806	--	--	--	--	-0.877	--	--	--	--	0.071
100076813	0.150	--	--	--	--	0.564	--	--	--	--	-0.414
100076091	0.047	--	--	--	--	0.316	--	--	--	--	-0.270
100076815	0.161	--	--	--	--	-0.023	--	--	--	--	0.183
100076499	-0.492	--	--	--	--	0.052	--	--	--	--	-0.544
100076811	0.781	--	--	--	--	0.754	--	--	--	--	0.026
100076831	-0.124	--	--	--	--	0.609	--	--	--	--	-0.733
100076460	0.050	--	--	--	--	-0.330	--	--	--	--	0.380
100076820	0.505	--	--	--	--	1.340	--	--	--	--	-0.835
100076797	-0.094	--	--	--	--	-0.225	--	--	--	--	0.131
100076798	-0.274	--	--	--	--	-0.446	--	--	--	--	0.172
100076799	1.151	--	--	--	--	0.351	--	--	--	--	0.800
100076807	-0.554	0.143	-0.143	--	--	-0.204	0.315	-0.315	--	--	-0.350
100076801	-0.280	-0.614	-0.281	0.138	0.758	-0.089	-0.951	-0.472	0.210	1.213	-0.192
100076803	-0.525	-1.853	1.853	--	--	-0.508	-1.775	1.775	--	--	-0.017
100076808	-0.178	0.178	-0.178	--	--	0.144	0.353	-0.353	--	--	-0.322
100076802	0.167	-1.553	1.553	--	--	0.162	-1.353	1.353	--	--	0.005
100076804	0.786	-0.063	-0.107	0.169	--	1.569	-0.527	0.306	0.221	--	-0.784
100076805	0.525	-0.641	0.641	--	--	0.692	-0.753	0.753	--	--	-0.168
Mean	-0.030	--	--	--	--	0.000	--	--	--	--	--
SD	0.697	--	--	--	--	0.839	--	--	--	--	--

3.2. Test Characteristic Curve (TCC)

Figure 3.1 shows the Biology EOC test characteristic curve (TCC) with the existing item parameters and newly estimated item parameters. The TCC shows that Form C with the existing parameter is less difficult compared to Form C with the newly estimated item parameters.

Figure 3.1. Biology EOC TCC



3.3. Performance Level Distributions

Figure 3.2 shows the comparison of performance distributions with the existing RSS tables to the newly created RSS tables with new item parameters.

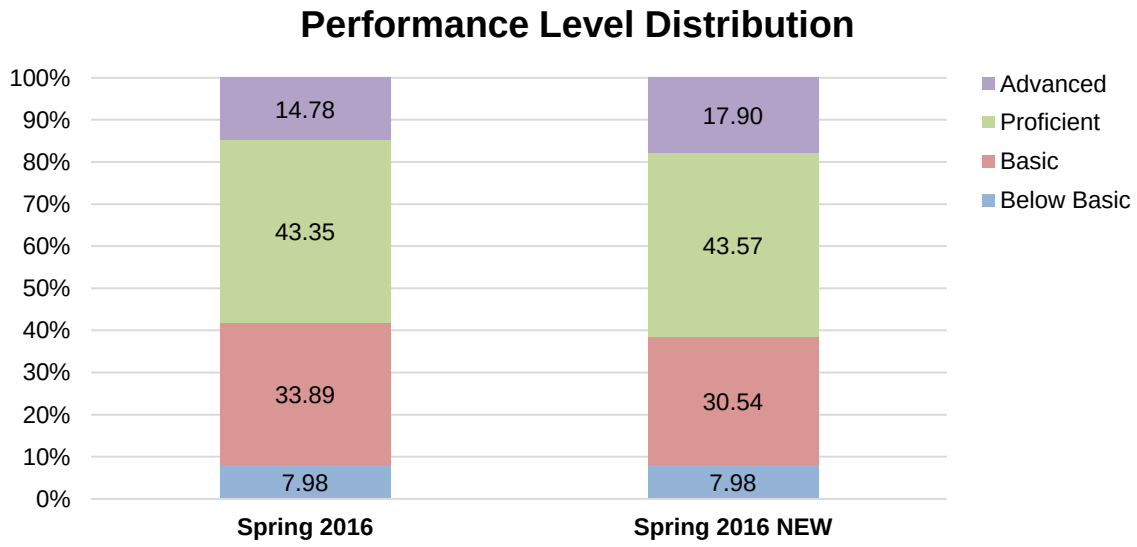



Figure 3.2. RSS Performance Distribution Comparison