Table 3. Variations in test-taking skills according to achievement level

			Sum of Squares	Df	Mean Square	*F*	Sig.
MOET	Test preparation	Between Groups	5.604	2	2.802	8.158	0.02
		Within Groups	2427.653	1003	2.420		
		Total	2433.257	1005			
	During test	Between Groups	2.034	2	1.017	12.102	0.00
		Within Groups	9978.212	1003	9.948		
		Total	9980.247	1005			
	After test	Between Groups	1.325	2	.662	10.217	0.001
		Within Groups	3058.440	1003	3.049		
		Total	3059.765	1005			
		Within Groups	18083.825	1003	18.030		
		Total	18133.622	1005			
MORT	Test preparation	Between Groups	6.022	2	3.011	19.180	0.01
		Within Groups	1846.913	724	2.551		
		Total	1852.935	726			
	During test	Between Groups	5.858	2	2.929	21.357	0.00
		Within Groups	5942.208	724	8.207		
		Total	5948.066	726			
	After test	Between Groups	3.734	2	1.867	19.619	0.00
		Within Groups	2183.140	724	3.015		
		Total	2186.875	726			

*** p<.0.5**

Table 4. Multiple comparisons analysis of TSS means

	Test-taking skills (X)	(Y)	Mean Difference (X-Y)	Sig.p
Before Test	Low	Average	-.715	**
	Low	High	-.751	**
	Average	High	-.283	
During test	Low	Average	-.410	
	Low	High	-.672	**
	Average	High	-.377	
After test	Low	Average	-.650	**
	Low	High	.691	**
	Average	High	-.493	**

** p<.05; X, Y indicate mean score by achievement classification

7. Discussion and Conclusion

Drawing from the findings on the test performance, it seems that the students were more open to problems in extended than restricted format. A plausible reason for the difference in performance on the test types might be as a result of the tasks embedded on each format and the scoring strategy used. The restricted open-ended test requires testees to supply the specific correct answer without necessarily showing detailed mathematical reasoning for a problem whereas the extended format requires elaborate, logical and constructive workings in response to the test item. In scoring the open-ended restricted problems, the scoring rubrics were entirely based on the correctness of an answer (holistic scoring), which have been found not to provide detailed diagnostic feedback on performance [20]. However, the scoring rubrics for the extended format adopted analytic method, which were based on the correctness and the mathematical reasoning for an answer. The analytic scoring strategy is perceived as a "part-to-whole judgement approach" [24] in which points are assigned for specific key dimensions of a problem, and the aggregation of the points formed an overall score; implying that even an incorrect answer could attract scores depending on the demonstration of the correct mathematical reasoning. Studies have reported on the usefulness of analytic rubrics for guiding the improvement of students learning 25].

The predictive analyses confirmed previous findings [2, 15], indicating positive interaction of test skills and performance in mathematics. A significant percentage of the variance in performance on the tests is accounted for by changes in the test-taking skills. The values obtained are significant enough to be considered in explaining the variation in mathematics performance among students. A student who scored highly on the test also likely reported higher use of test-taking skills. Contributing the highest variance is preparation strategy, indicating that more of the students reportedly allocate time to practice and getting information that could help before taking a mathematics tests. Practice before a test is an effective strategy for students to get information and knowledge that could enhance their confidence during-test and hence enhance achievement.

The high-scorers obtained higher mean scores on the three subscales of TSS than low-scorers, confirming findings in prior studies [2, 12,13] that high scorers, more often than low scorers, reported using appropriate strategies more frequently in taking mathematics test. Studies indicate [15] that low achievers typically tend to demonstrate low level of motivation and minimal enthusiasm to engage in learning or to expend effort to complete a task. Additionally, low achievement negatively affects motivation to learn, attitude towards test and confidence to apply testing strategies for success [23]. Confidence and attitude towards problem solving are critical filters in mathematics achievement [24, 25]. Confidence help learners to develop interest in learning a subject; confidence feeds motivation and then success. Test-taking skills are reported to have significant relationship with the motivation to learn mathematics and attitude towards tests [11] and to eliminate feelings of tension and anxiety that may affect performance [27]. It can therefore be deduced that improving the testing behavior of students will have significant impact on low performing students.

Contributing the least variance on both test types is after test skills, suggesting that a large number of the students reportedly underuse hints and feedback from marked scripts. A plausible reason from experience is because teachers hardly return marked answer scripts with comments to help students locate their deficiencies. Poor usage of after-test skills limits the opportunity for students to use the cues from their errors or learning deficiency to improve future testing behaviour. Therefore, the significance of the findings of this study is in classroom instructional practices. Mathematics teachers would help students to learn and display their knowledge more effectively by integrating test taking strategies and study techniques into classroom instruction. The study by [27, 28] has confirmed the possibility of training students on testing strategies and the effectiveness of the training for enhancing academic performance. Hence, with increasing pressure to raise performance in mathematics, the need to emphasise instructional preparation for testing has become imperative for classroom assessment. Some strategies to support students to improve testing skills are through regular practice exercises, frequent testing and constructive feedback, access to scoring rubrics, and continuous self-quizzing.

8. References

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