Reviewer's report

Title: Pattern recognition as a concept for multiple-choice questions in a national licensing exam

Version: 1 Date: 28 March 2014

Reviewer: Danette McKinley

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Major Compulsory Revisions

The authors categorized MCQ questions in their item bank to determine whether pattern recognition was required on the part of the examinee in responding. This effort is admirable and could improve item writing activities.

Introduction

The authors noted that 'analytical thinking requires feedback and can therefore possibly not be similarly applied in MCQ exams' yet they go on to categorize items that had been administered in examinations to determine the extent to which pattern recognition is needed to choose the correct response. I was not sure why this concern was raised, unless they were making a distinction between pattern recognition and analytical thinking.

Methods

The description of the administration of the National Licensing Exam was not clear, and was not necessarily needed since the pool of items for examination forms administered between 2006 and 2012 was reviewed. The detailed description of the questions was also not required unless this related to the classification of the items.

Some information on the training/instruction given to item writers would be useful, particularly since it may account for item distribution. Are items written to match each of the disciplines listed? That is, does the content outline include specification of the percentage of items by discipline? By taxonomy? Are item writers asked to write to certain disciplines and taxonomy levels?

It was not clear why the other disciplines were excluded from the analysis. While the sample sizes (i.e., number of items) might have been small, since this was a descriptive paper, it was not clear why statistical tests were needed. In fact, if the whole item bank was considered, then the statistics are population statistics so the 'sample size' was irrelevant.

Were item statistics available for analysis? It would be useful to examine performance on the items as well as the distribution in the item pool. Differences in the distribution of items in the pool by discipline can be addressed by targeting item writing to meet needs based on the blueprint for the examination. Since this
was a retrospective analysis of the item pool, differences are not surprising. What would be interesting is whether there are performance differences as well. Are items that are considered patter recognition more difficult overall? Are they more difficult in certain disciplines?

Minor essential revisions

Some of the phrasing was awkward and the manuscript should be reviewed by a native English speaker.

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.