

## Original Research Article

# True-false analysis reveals inherent flaws in multiple true-false tests

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## ABSTRACT

**Background:** Multiple true-false tests (MTF), a component of our assessment system, have consistently generated low scores and many failures. This was attributed to the negative marking scheme. However, no study was conducted to explore the issue further. Item analysis revealed that students omitted false options more frequently and answered them wrongly more frequently than true options. The aim of this study was to determine the performance discrepancy between true and false options of MTF tests and the reasons for such discrepancy and the poor performance of MTF in general.

**Methods:** The student performance of past 7 years of year-3 medicine end-of-posting examinations was analysed. The item analysis reports of 23 MTF tests were used to determine the significance of the differences in omission rates, correct-answer rates and the discrimination index of true and false options.

**Results:** There were statistically significant differences in the omission rates, correct-answer rates and discrimination index values of true and false options. This study revealed that the false options consistently let down student performance. Although negative marking could be partly blamed for the situation, no justification could be found for the use of false options to test knowledge.

**Conclusions:** Some publications endorse MTF, but many highlight its drawbacks. The use of false options in MTF was seen as an inherent defect in this instrument. As viable alternatives like VSAQ and Constructed Response Tests are in the horizon, we conclude that MTF ought to be discarded as an assessment instrument.

**Keywords:** Multiple true-false tests, True-false analysis, Flaws in MTF tests

## INTRODUCTION

It is observed that many institutions have discarded multiple-choice true-false (MTF) tests in favour of single best answer questions (BAQ) and other types of assessments.<sup>1</sup> Our faculty also has decided to phase out MTF. Our MTF items consist of a stem and five options, of which zero to any number could be true or false. The student is required to answer them as true, false or don't know (omit). One mark is awarded to a correct answer and one negative mark to an incorrect answer, while the

omitted items get zero mark. The maximum mark awarded for one question is 5 and the minimum zero. Usually 20 to 60 questions are used in a test in our faculty. The optical mark reader (OMR) by SmartScan, which also generates item analysis reports, does the scoring. This report include the discrimination index (DISi) of each option as well as that of each question, how many candidates omitted each option, and the percentage of candidates who got each option correct [difficulty index (DIFi)]. MTF tests have been used in our assessment system ever since the inception of the Faculty