

ANALYZING THE PROSPECTIVES OF INNOVATIVE MULTIPLE TRUE FALSE QUESTIONS
IN ASSESSMENT OF BIOCHEMISTRY FOR MEDICAL UNDERGRADUATESChandrika D Nayak*¹, Surekha Bhat² and Indira Adiga³

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ABSTRACT: Objective: Multiple true false (MTF) questions are a standardized format of assessment. MTF questions test a wide range of knowledge in a short period of time; however reports regarding this method are not so alluring. We attempted to take the MTF assessment method to a higher order by designing an innovative missing link MTF questions (MLMTF). This has an incomplete stem where a linking phrase is missing and has to be filled, following which the students are able to answer the bit statements.

Method: The study was conducted among year I MBBS students of Melaka Manipal Medical College. Students were asked to study a topic in biochemistry and were assessed by both regular MTF and MLMTF tests, consecutively one after the other. Care was taken to maintain the standard of questions and to avoid repetition. Students responded to a questionnaire after the tests.

Results: Group A (n=35) included students with average scores >75% in previous assessment exams; group B (n=65) with scores between 60-75% and group C (n=21) with scores < 60%. Students of group C (90%) felt that traditional MTF were easier than MLMTF compared to groups B & C (88%; 83%). Group A (100%) preferred MTF because they felt they are more accustomed to it than groups B & C (88%, 90%). Groups A& C (100%) concurred in their views that it was more suited for competitive exams than for regular exams.

Conclusion: Students opined that MLMTF questions are a bit more challenging and of a higher order, and that they would prefer the routine MTF for assessment.

Key words: Missing link, multiple true false, assessment, biochemistry

INTRODUCTION

Examinations are assessment & evaluation tools in any education system. Multiple true false (MTF) questions are a standard format of assessment. Fairness is an important concept in evaluation. Fairness depends on psychometric adequacy, diligence of construction, attention to consequential validity and appropriate standard setting (Paul McCoubrie 2004). MTF questions test a greater range of syllabus content in less time. However there are adverse reports quoting MTF to assess trivial knowledge and claim that they are potentially weak in discriminating deep learners (Chandratilake M et al, 2011). The current study was designed to take the regular MTF format to a higher order so as to negate its drawbacks. An innovative MTF called the missing link MTF (MLMTF) was implemented for the year I MBBS students in Biochemistry for a regular formative classroom assessment activity. The scores of this innovative test were then compared with their performance in the same topic in a consecutively following regular MTF test. The study was also an attempt to compile the opinions of different academic grade groups of students regarding these MTF tests.

METHODS

The medical curriculum at Melaka Manipal Medical College (MMMC) is designed for five years and divided into two phases, Phase I and Phase II. The uniqueness of this medical programme is that students study the Phase I subjects, which includes pre and paraclinical subjects in Manipal in India weaved in with a final six month clinical teaching phase. For the Phase II study they then move to Melaka campus at Malaysia for clinical study.

Biochemistry is a year I subject of Phase I which is taught in a horizontal integration pattern with physiology and Anatomy in a system wise approach. The formative and summative assessments include evaluation through a variety of assessment tools which include restricted response essay questions (RREQ), problem based learning (PBL) evaluation, small component of MTF and objective structured practical examinations (OSPE). Year I MBBS is divided into four academic blocks with a formative block exam at the end of each block. A small batch of Year I MBBS students at our college were selectively divided into three groups A, B and C, based on the average of their academic scores of previous formal assessment exams. This innovative test was conducted in the fourth block. The average scores of the students in the first three blocks were calculated and accordingly they were divided into three groups. Group A included students with average scores of previous assessment exams >75% (n=35). Group B with scores between 60-75% (n=65) and Group C with scores < 60% (n=21).

We designed an innovative version of MTF called the missing link MTF or MLMTF. This MLMTF test was conducted on an experimental basis as a part of the ongoing regular assessment tests. Students were asked to study a topic in Biochemistry and then were assessed by both regular MTF and MLMTF tests, consecutively one after the other. Care was taken to maintain the uniformity in the standard of questions and to avoid repetition. Performance in MLMTF test was then compared with the performance in regular MTF tests among students of different academic grades.

Sample question of an MLMTF

MLMTF is comparable to a MTF question except that it has an incomplete stem where a linking phrase is missing. Students can attempt answering the bit statements only after completion of this phrase in the stem.

A sample question

During starvation, the metabolite _____ released along with glycerol from adipose tissue

1. Is utilized by the skeletal muscles
2. Gets metabolized in the liver to produce ketone bodies
3. Is transported in the blood by albumin

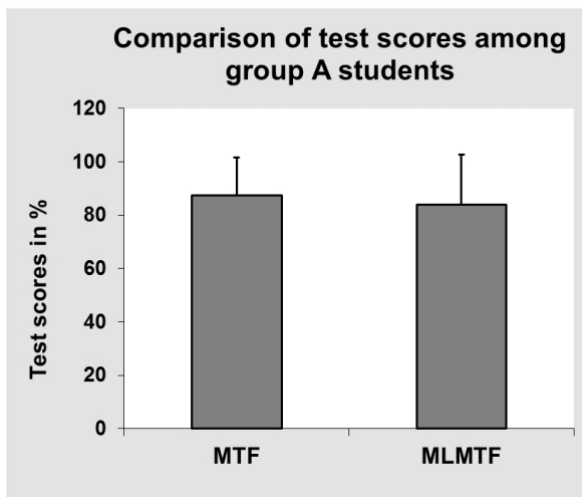
The results of both the tests were compiled and compared among these groups. Students were then made to respond to a closed ended questionnaire of 6 items using a bipolar Likert scale.

RESULTS

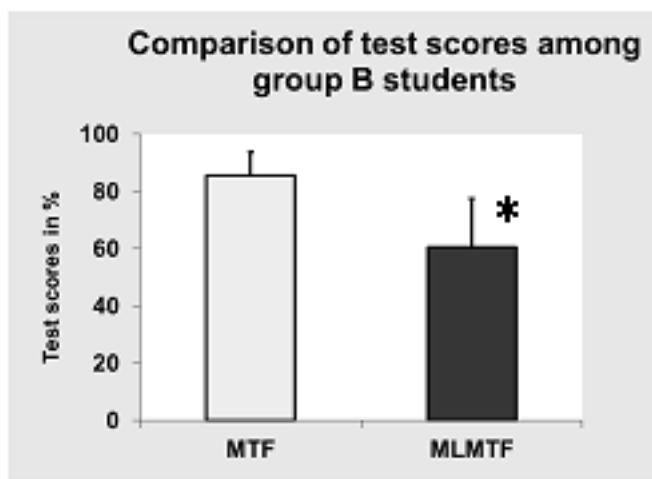
The comparison of the scores in MLMTF and regular MTF tests in group A showed no significant change and was statistically not significant (Graph 1). A similar trend was observed among group C students (Graph 3). However a significant decrease in MLMTF test scores as compared to regular MTF test scores was observed in group B students (Graph 2). After the two consecutive tests, students were made to respond to a closed ended questionnaire with a bipolar Likert scale. Groups A and B expressed their unwillingness to change to the new version of MTF, the reason for which was quoted that it was easier to score better in MTF tests than MLMTF tests. Majority of students in all the three groups opined that the MLMTF test is more effective for competitive exams and that it was more than a simple recall type of exam.

Table 1: Student opinions regarding the comparison of MLMTF and regular MTF tests.

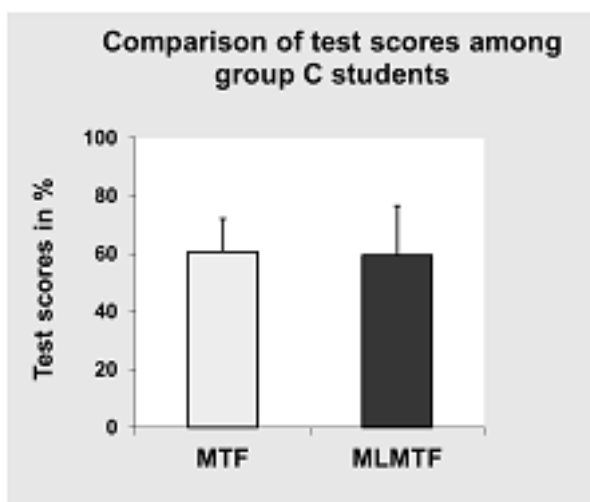
Student opinions (Agree responses expressed as %)	A	B	C
I prefer MTF over MLMTF	100%	100%	80%
I prefer MTF because I am used to it for long time	100%	88%	90%
I prefer MTF because I can score better	98%	100%	80%
MTF is easier than MLMTF	83%	88%	90%
MLMTF is more than a recall type of exam	98%	88%	100%
MLMTF is more effective for competitive type of exams	100%	83%	100%



Graph 1: Comparison of MLMTF and regular MTF test scores among group A students (n=35)



Graph 2: Comparison of MLMTF and regular MTF test scores among group B students (n=65)



Graph 3: Comparison of MLMTF and regular MTF test scores among group C students (n=21)

DISCUSSION

Like multiple choice questions, true/false questions are most often used to assess familiarity with course content and to check for popular misconceptions. The advantage of this MTF test is that, it allows students to respond quickly and so exams can use a large number of them to test their knowledge of a broad range of content. At MMMC, we have incorporated and retained this MTF test for its following strong points i.e. to diversify our assessment strategies, to minimize variations in marking as compared to essay evaluation and to assess the large number of students over a broader range of syllabus content. It is also quick and easy way to grade and to minimize the chances of guess work among students we have implemented the negative marking scheme. The design of an innovative version of MTF called MLMTF was an attempt by us to make this a higher order of assessment tool. It has been an attempt to discriminate the deep learners from rote learners. We regard that MLMTF has the double advantage of testing the factual recall and also the incorporation of application and analytical skills.

CONCLUSION

Innovations in teaching and assessment have become the need of the hour in medical education today. Assessment using objective type questions is a common practice in many medical schools and competitive exams. In this regard, efforts made to step up the utility of assessment methods will serve to be advantageous to medical students. Even though many of our students opined that MLMTF questions are a bit more challenging and more suited for competitive exams, we conclude that such innovative practices should be experimented. We assume that their opinions were made as an initial outlook for changing assessment techniques and that with time they will definitely benefit from the positive effects of such changes.

REFERENCES

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