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Research Article



A study of the association between the internal assessment and the final summative examination scores in Physiology

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Abstract

The aim of this work was to study how well the internal assessment scores predict success in the final summative examination by comparing the internal assessment scores of students with their scores on the final examination. This study included 3 batches of first year medical students. The ability of internal assessment scores in theory and practical components to predict performance in the final summative examination was examined by computing the correlations of internal assessment scores with the final summative examination scores. Results showed a high positive correlation between internal assessment scores and final summative examination scores in theory as well as practical for all three batches, though the correlation in practical was not as high as in the case of theory. There was a high correlation between internal assessment scores of theory and practical for all three batches. There was also a positive correlation between theory and practical examination scores in final summative examination for all three batches. This finding supports the predictive validity value of our progress examinations.

Keywords: continuous assessment; predictive validity; physiology; progress examinations

Introduction

Assessments have the potential to motivate students and hence influence their learning in a number of ways.¹ Successful completion of an assessment may be rewarding for some students, while having some control over the process of assessment may be motivating for others.²

Assessment attempts to fulfill a number of important functions such as encouraging students to work, measuring the level of student understanding and providing feedback to both students and staff as to how they are performing. The outcome of the assessment depends upon a range of factors, including student effort, student ability, the quality of the teaching, the design of the assessment, and the implementation of the assessment procedure.³ Assessment procedures also influence student study patterns.^{4,5} Progress examinations are intended to

encourage a regular and organized study pattern. They monitor student's learning progress and provide ongoing feedback to students as well as faculty about student progress during the course.⁶ The aim of this work was to study how well the internal assessment scores predict success in the final summative examination by comparing the internal assessment scores of students with their scores on the final examination. Do those students who have high internal assessment scores also tend to have high scores on the final examination? Do those who have low internal assessment scores also tend to have low scores on final examination? If this is the case, we are inclined to agree that our internal assessment scores tend to be accurate in predicting achievement in the final summative examination and are quite reliable. In this perspective, this study was conducted to analyse the association between the internal assessment and the

final summative examination scores in Physiology at Melaka Manipal Medical college (MMMMC), Manipal,India.

Materials and Methods

The undergraduate medical course (MBBS) at Melaka Manipal Medical College, Manipal, is a five-year academic program. This course has a two-phase design. Phase I involves two and a half years of preclinical training in Manipal, followed by Phase II which consists of another two and a half years of clinical training in Malaysia. The Phase I curriculum is conducted in two stages, namely, Stage I(one year duration) and Stage II (one and a half year duration). There are two student admissions per academic year, one in March and the other in September. Students are taught basic science subjects in Stage I, which include Anatomy, Physiology and Biochemistry. The first year curriculum is spread over four blocks, each block of ten-week duration. Each block comprises two to three systems, which are indicated below.

Block 1: Basic concepts, blood, and nerve-muscle physiology.

Block 2: Cardiovascular, respiratory and gastrointestinal physiology.

Block 3: Endocrine, reproductive, and renal physiology.

Block 4: Central nervous system and special senses.

Evaluation methods

For the study group, continuous assessment in Physiology was in the form of class tests and progress

examinations. At the end of each block, there was a progress or block examination including theory and practical components. The first, third and the fourth block examinations also included viva voce component. The continuous/internal assessment marks in theory contributed 30% of the total marks in the theory component and that of practical contributed 20% of the total marks in the practical component of the final summative examination which was conducted at the end of stage I. In most of the other medical schools in India, internal assessment contributed 20% and 10% each to the final examination scores in theory and practical components respectively.

This study included 3 batches of first year MBBS students (March 2003 batch; n=142, September 2003 batch; n=138 and March 2004 batch; n=149) of Melaka Manipal Medical College.

The ability of internal assessment scores in theory and practical components to predict performance in the final summative examination was examined by computing the correlations of internal assessment scores with the final summative examination scores.

Results

The association between internal assessment scores and final summative examination scores in theory and practical components of students of March 2003, September 2003 and March 2004 batches was assessed through simple correlation.

Table 1. Correlations between internal assessment scores and final summative examination marks in theory

Batch	n	Correlation coefficient (r)
March 2003	142	0.876
September 2003	138	0.886
March 2004	149	0.893

* Correlation is significant at 0.01 level.

Results showed a high positive correlation between internal assessment scores and final summative

examination scores in theory for all three batches. Highest correlation was found with March 2004 batch.

Table 2. Correlations between internal assessment scores and final summative examination marks in practical

Batch	n	Correlation coefficient (r)
March 2003	142	0.699
September 2003	138	0.719
March 2004	149	0.671

* Correlation is significant at 0.01 level

Results revealed a positive correlation between internal assessment scores and final examination scores in practical for all three batches, though the

correlation was not as high as in the case of theory particularly with March 2003 and March 2004 batches.

Table 3. Correlations between internal assessment scores of theory and practical

Batch	n	Correlation coefficient (r)
March 2003	142	0.828
September 2003	138	0.836
March 2004	149	0.821

* Correlation is significant at 0.01 level.

Results revealed a high correlation between internal assessment scores of theory and practical for all three

batches. Highest correlation was found with September 2003 batch.

Table 4. Correlations between final summative examination scores of theory and practical

Batch	n	Correlation coefficient (r)
March 2003	142	0.771
September 2003	138	0.759
March 2004	149	0.719

* Correlation is significant at 0.01 level.

There was a positive correlation between theory and practical examination scores in final summative examination for all three batches.

Discussion

Student assessment is the strongest determinant of what students actually learn as opposed to what they are taught and is considered to be uniquely powerful as a tool for manipulating the whole education process.⁷ Assessment is the process of collecting

information about the quality and quantity of change in a student or group.⁸ As technology in education evolves to emphasize more cognitive learning, the time devoted to assessment and the research on assessment will become increasingly important.⁹

In our study on the relation between the internal assessment scores and the final summative examination scores in theory (table 1), we observed that the internal assessment scores in theory were

correlating very well with final examination marks of students of all three batches (March 2003: $r=0.876$, September 2003: $r=0.886$ and March 2004: $r=0.893$) which indicated that students who were scoring well in progress examinations were also scoring high in the final examination. This finding supports the predictive validity value of our progress examinations. Highest correlation was observed with March 2004 batch.

The study on the association between the internal assessment and the final summative examination scores in practical (table 2), revealed that the internal assessment scores in practical were correlating well with final examination marks of students of all three batches (March 2003: $r=0.699$, September 2003: $r=0.719$ and March 2004: $r=0.671$) which indicated that students who were scoring well in progress examinations were also scoring high in the final examination. However, we observed that the correlation was not as high as in the case of theory. This finding may be attributed to the fact that the involvement of external examiners in the final examination might have affected student performance to some extent (stress factor). Highest correlation was observed with September 2003 batch.

In our study on the association between the internal assessment scores of theory and practical (table 3), we found a high correlation between scores of theory and practical in progress examinations with all three batches (March 2003: $r=0.828$, September 2003: $r=0.836$ and March 2004: $r=0.821$). This implies that students who performed well in theory performed well in practical too in progress examinations. Highest correlation was observed with September 2003 batch. The study on the association between the final summative examination scores of theory and practical (table 4), disclosed that the theory scores were correlating well with the scores in practical with all three batches (March 2003: $r=0.771$, September 2003: $r=0.759$ and March 2004: $r=0.719$) which indicated that students who were scoring well in theory were also scoring high in the practical examination in the final examination. However, the degree of correlation was found to be slightly lower when compared to correlation between the two in the progress examinations. Highest correlation was observed with March 2003 batch.

Thus in the present work on the relation between the internal assessment scores which reflect student

performance in progress examinations and performance in final summative examination, we observed that the internal assessment scores in theory and practical were correlating well with the theory and practical scores in the final summative examination respectively in all three batches which indicated that students who had performed well in progress examinations also performed well in the final examination. This implies that our internal assessment scores were quite accurate in predicting achievement in the final summative examination and were quite reliable.

Competing interests

The author(s) declare that they have no competing interests.

Contributors

ST planned the study, collected the data, interpreted the data and drafted the manuscript. KR and JG collaborated in the design of the study, contributed to the data analysis, participated in the interpretation of data and helped draft the manuscript. All authors have read and approved of the final manuscript.

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Ethical approval

The study was approved by the institutional research committee.

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