

Effect of Continuous Formative Assessment on Summative Assessment among First Year MBBS Students.

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Abstract:

Background-Assessments in education should be reliable, acceptable and cost effective. Formative assessment motivates and guides the student through learning with effective feedback. Regular formative assessments improve performance in the summative assessment.

Objectives-- To study the effect of continuous formative assessment on summative assessment in the study group and to compare the scores of summative assessment between control and study groups of first year MBBS students.

Materials and methods-50 first year MBBS students were divided randomly into two groups of 25 each (study group and control group).The study group underwent weekly formative assessments on the topics covered in the week. Both the groups underwent the summative assessments. A questionnaire was designed, pretested and finally used to record different opinions of the students and data was collected, analysed and interpreted. A cross sectional descriptive study was conducted in 2019 for the 2018-19 Batch of MBBS students

Results- The summative scores of study group compared to control group is highly significant. (Independent student's t-test $t=3.54$, $df=48$, $p=0.001$).

Conclusion-Formative assessments with regular feedback improve performance in the summative assessment.

Key words-Assessments, formative, summative, learning gap, performances.

Introduction

Undergraduate medical education needs on-going improvements to meet the changing demands in the medical profession. Assessment refers to the process employed to make judgements about the achievements of students over a course of study & is a central feature of teaching and curriculum^[1]. In educational practice, assessment methods can generally be classified as either formative i.e. enhances learning or summative that is for grades. Formative assessments focus on the learning and improvement of the learner by providing them opportunities to recognize their weakness and enable teachers to identify areas where students need support^[2].Assessment has a powerful positive effect on learning and the

curriculum.^[3] Summative assessment ensures learning has occurred and acts as a motivator for student learning^[4].

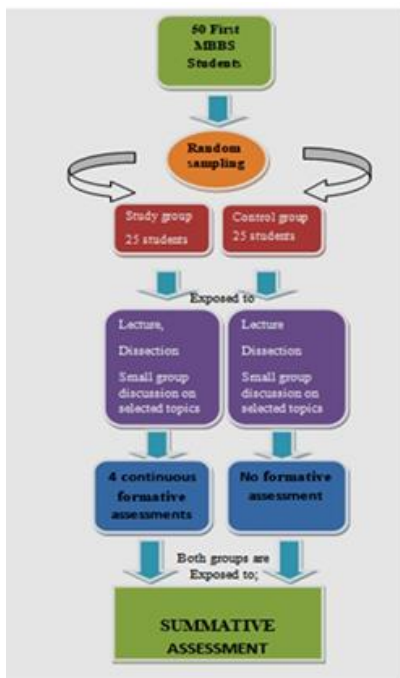
The testing effect on learning, while meant to be positive, is not invariably so. For example, obtaining a bad score in a test may discourage a student from further studying.^[5]

Methodology:

- Area of research- Medical education: Assessment methods
- Research design- Interventional comparative study
- Sampling method- Simple random sampling, Lottery method
- Sampling technique- Convenience sampling
- Study population- Fifty Phase I MBBS students (2018-19 Batch)
- Study period- May 2019 to September 2019

The study was conducted in the Department of Anatomy, Government Medical College Kannur with the permission from the Head of the Institution. Ethical clearance was taken from Institutional Ethical Committee. Consent for voluntary participation was taken from 50 Phase I MBBS students. Semi structured proforma of participants which includes name, age, Gender; college ID, address, formative and summative assessment scores was done. Fifty students were randomly selected by lottery method. The students were divided into 2 groups (study & control group) of 25 each. Lecture classes, dissection and small group discussion on selected topics in Anatomy were conducted for all 50 students by teaching faculty in-charge. Only study group comprising of 25 students underwent formative assessment in selected topics of Anatomy regularly. Formative assessments were conducted at the end of every week on selected topics covered during the week. There were 4 such assessments done for the study group. Formative assessment in Anatomy (Max- 25 marks) consisted of questions which include Modified essay question, short answer questions, diagrams & OSPE stations. This assesses cognitive & psychomotor domains. The assessment was reviewed by subject experts. The students were also be given feedback after each assessment on how to improve on learning domains. A summative assessment in Anatomy was conducted for all fifty students (study & control group) at the end of four continuous formative assessments. The scores obtained by the students in the formative and summative assessment were tabulated and statistically analysed. Also the scores of summative assessment was compared between study and control group and analysed statistically. Students perception on formative assessment was analysed by collecting feedback questionnaire from study group. (5 point Likert scale). Likert-type responses ranging from Strongly Disagree (1) to Strongly Agree (5) was given to the students.

Statistical analysis- SPSS v21 was used, Descriptive statistics such as mean, percentage, Standard deviation and inferential statistics like Students t test was used, p value less than 0.05 was considered significant.

METHODOLOGY (Flow Chart)**Study design:**

This study employed a qualitative methodology using constructivist grounded theory approach of Corbin and Strauss.^[6] This is a suitable approach to discover new areas of the subject, or to explore a known area from a new perspective.^[6] Another reason for using the grounded theory approach is the discovery of processes and social interactions.^[7] Since the educational impact of assessment system is an interactive process, and this process is a product of social interactions, and some aspects of it were not well understood, we considered using the grounded theory approach a suitable study method.

The study protocol was granted approval.

Patient and public involvement

No patient involved.

RESULTS:

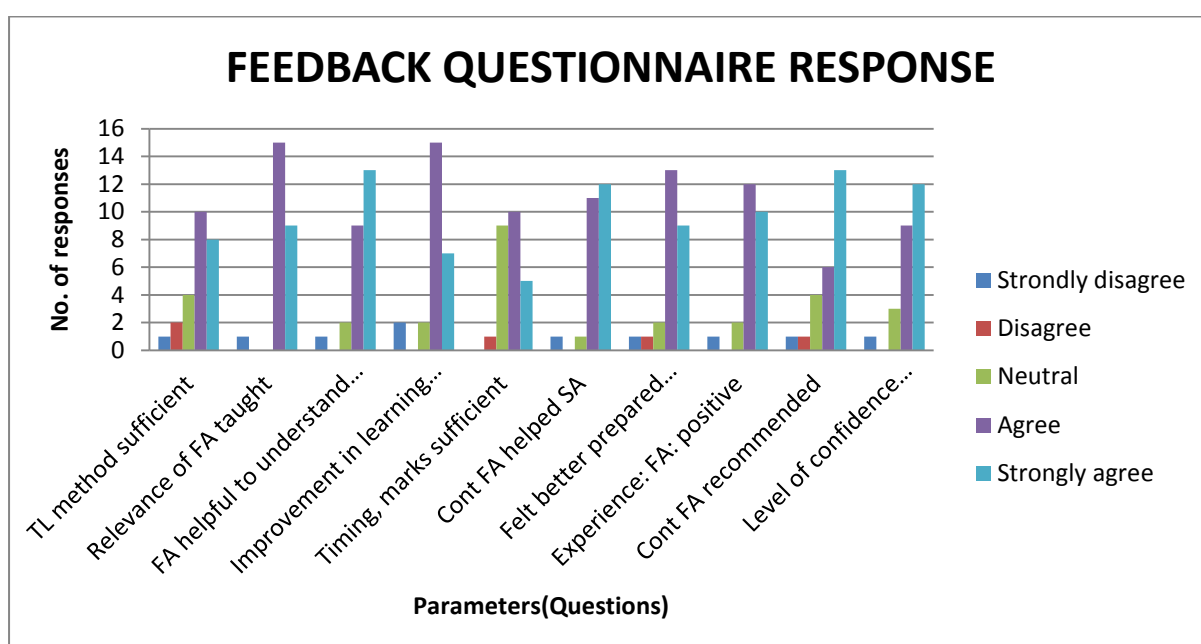
The experiences of students and faculty members were investigated regarding the effect of assessment on students' learning through interviews, focus group meetings and observations. The results of the analyses of their experiences are the findings of this study.

Table 1: Summative assessment scores of study and control group

Sl. No.	Groups	Summative marks (Mean \pm Standard Deviation)	p value
1.	Study group (n=25)	5.57 \pm 12.88	0.001**
2.	Control group (n=25)	3.21 \pm 8.32	

n=number of subjects, **highly significant

Table 1 depicts that summative scores of study group compared to control group is highly significant. (Independent student's t-test $t=3.54$, $df=48$, $p=0.001$)

Graph 1: Feedback questionnaire response from study group

Discussion:

The purpose of this qualitative study was to explore how assessment affects students' learning. The core concepts in this study were categorised into four categories: contributing factors, mechanism of action, educational consequences and contextual factors.

It is accepted by teachers in medical schools, that to facilitate learning continuous involvement of the students and their feedback is required for overall improvement. This led to the importance of continuous formative assessment and its impact on the end of term exam which is the summative assessment. A cross sectional study was conducted by Sanjith et al involving 142 students, questionnaire was prepared and opinion collected from the students. In the study 78% favoured continuous formative assessment which helps them in filling the learning gaps, identify the weak students and inspire them for deep learning. 22% were of the opinion that formative assessment affected their independent learning and hence affected the summative assessment performance⁸.

A study conducted by Sumithra et al for 100 students found that there was a definite better scoring in the students who underwent formative assessment. Most of the studies were either by giving MCQs online and offline. The present study conducted at GMC Kannur is unique as we included Long Essay, Short notes, Short answer and OSPE as a part of formative and Summative assessment and tested all the three domains of learning. The results of the study showed that the summative assessment scores of the study group were statistically highly significant as compared to the scores of control group. The feedback questionnaire showed a positive response towards formative assessment.

This finding is in accordance with several other studies. In a 2005 study by Tiwari *et al*, the students stated that the efforts they made to prepare for the assessment depended on how stringent the assessor was.^[9] Al-Kadri *et al* concluded in their study that students' and supervisors' orientation to the assessment process is one of the factors influencing students' learning from the assessment.^[10]

Similar findings in the literature were found. Result of study Kromann *et al* showed final test for resuscitation skills at medical students increased the learning outcome of them, compared with students who took the time to spend practicing resuscitation skill.^[11] In a study by Opoka *et al* to assess the perception of students, most postgraduate students believed that OSCE improved their communicative and procedural skills.^[12] In the study by McKenzie *et al*, students' experiences showed that the assessment of their procedural skills and the feedback provided to them after that increased their confidence in conducting the procedure at the patient's bedside.^[13] The study by Cilliers *et al* divided the effects of learning on summative assessment into two categories of the nature of cognitive processing activities and metacognition regulatory activities.^[14]

Conclusion

The study revealed that formative assessment had a positive effect on summative assessment. Feedback from students revealed that it encourages the student for regular learning and motivates them.

This study suggested a model for understanding the elements of the assessment which, within the context, affect learning, the mechanisms through which they impart their effects and the final outcomes obtained.

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