# Formative Assessment Practice in Health Science Education

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## ABSTRACT

To explore the extent of practices of formative assessment in health science education, a self-report questionnaire was administered to faculty members of nursing and allied health sciences of a south India university. Simple percentages were computed to explore the extent of practice of formative assessment and the ways in which it is currently used to help students learn in nursing and allied health science courses. The study revealed that there is room for improvement in the way formative assessment is practiced currently in health science education.

## INTRODUCTION

Many teachers treat assessment as something one does after teaching and learning are over instead of seeing assessment as central to learning. Students seldom have adequate information about how well they are performing. Formative assessment is an important educational activity which gives learners feedback while their learning is still taking place. According to Black and Wiliam, formative assessment "encompasses all those activities undertaken by teachers and/or their students that provide information to be used as feedback to modify the teaching and learning activities in which they are engaged."[1] Central to all definitions of formative assessment is the concept of feedback, because it informs learners of their present state of learning so they can plan action to close the gap between their present state of learning and their desired goal(s).[1,2]

Because different students learn in different ways, it is important to help our students understand how they learn and how they can make progress. The extent to which teachers use assessment to support the learning of their students, or merely to record their progress, varies considerably from teacher to teacher. It is widely and empirically argued that formative assessment has the greatest impact on learning and achievement.[3-5] In a review of research on assessment and classroom learning, Professors Paul Black and Dylan Wiliam synthesized evidence from over 250 studies linking assessment and learning.[6] The review observed that initiatives designed to enhance the effectiveness of the way assessment is used in the classroom to promote learning can raise pupil achievement. Learning gains measured in terms of effect size varied between 0.4 and 0.7. These effect sizes are larger than most of those found for educational interventions. An effect size of 0.4 would mean that the average pupil involved in an innovation would record the same achievement as a pupil in the top 35% of those not so involved. An effect size gain of 0.7 in an international comparative study in mathematics would have raised the score of a nation in the middle of the pack of 41 countries to one of the top five.[6] Many other studies accepted that formative assessment is a way of improving student learning.[7-14] Although a number of studies support the usefulness of formative assessment in learning, large class sizes, busy curriculum, and diverse students influence its wider practice due to the time and commitment necessary to practice formative assessment within the classroom.[15] These findings were the motivation for conducting the present study. The objective of this study is to explore the extent of practices of formative assessment in health science education in the classroom setting and to discuss its implications.

## MATERIALS AND METHODS

Based on the characteristics of formative assessment as stated in the literature, a self-report questionnaire was prepared to

collect data from teachers about their assessment practices. The questionnaire covers items representing practice of formative assessment and utilization of feedback by the teachers to improve teaching and learning, to guide students, and to involve students in formative assessment (peer and self-assessment). Six teachers of the department of medical education reviewed the content and finalized the questionnaire. The questionnaire was administered to faculty members of nursing and allied health sciences in a south India university. The faculties were assured of confidentiality of the information given. Twenty-six faculty members of the college of nursing (93%) and 31 faculty members of the college of allied health sciences (97%) responded to the questionnaire. After the administration of the questionnaire, six teachers were randomly selected and interviewed for further clarification regarding their responses.

The data collected from the two colleges were combined as the response to various items was found similar from both the groups. The SPSS / PC + version 10 program was used to carry out data analysis. Simple percentages were computed to explore the extent of practice of formative assessment and the ways in which it is currently used to help students learn in nursing and allied health science courses.

**RESULTS**

Table 1 summarizes the response of the faculty to various aspects of formative assessment. Fifty-six percent of the faculty reported that tests are conducted at the end of each unit/system. Sixty-one percent of them reported that tests are conducted because regulatory bodies require them to. Such test marks are usually used for the computation of internal assessment marks. Other than these, 60% of the faculties reported that some tests are conducted only for the purpose of providing feedback to students (Table 1, Item 1).

The majority of the teachers (91%) reported that they assess test questions by noting the marks for each question. In addition to this, some teachers write the points student have missed (68%) or indicate how answers could be improved (81%) (Table 1, Item 2).

After correcting the test paper, 82% of the faculty discuss the results with the individual students and suggest how they can improve their answers. Only 21% of the teachers ask students to rewrite and submit the answers taking into account their suggestions for improvement. Depending on the first test score, 68% of the teachers group students with low marks and give special coaching (Table 1, Item 3).

Less than 20% of the teachers involve students in class room assessment (Table 1, Item 4). Thirty seven percent of the teachers have a dialogue with the students if he/she does not agree with the mark they have been given.
Ninety-eight percent of the teachers clarify objectives in detail. Only 32% of them reported that analysis of the questions is done after the test to assess the level of difficulty of the questions. Thirty-nine percent of the teachers distribute good and not so good answers to questions and discuss with students why those answers were good or not so good.

**Table 1.Short form of the Items representing assessment characteristics and percentage of faculty practicing them**

| Item | | Count | % (Rounded to nearest integer) |
|---|---|---|---|
| | | Total (n=57) | |
| 1) | Frequency and reason for the conduct of tests | | |
| | i)   Tests are conducted | | |
| |     a)   at the end of each unit/system | 32 | 56 |
| |     b)   at the end of every month | 7 | 12 |
| |     c)   at the end of every semester | 21 | 37 |
| | ii)  Tests are conducted because of the requirement of University/similar regulatory bodies | 35 | 61 |
| | iii) Tests are conducted for the purpose of feedback (marks obtained are not used for calculating internal assessment) | 34 | 60 |
| 2) | Ways of indicating assessment of test questions for student feedback<br>i)   by noting the mark for each question | 52 | 91 |
| | ii)  writing the points student has missed | 39 | 68 |
| | iii) indicating how answers could be improved | 46 | 81 |
| 3) | Utilizing test scores for student feedback and special coaching<br><br>After correcting the test paper<br>i)   Do you discuss with the individual students and suggest how they can improve their answers? | 47 | 82 |
| | ii)  Do you ask students to rewrite and submit the answers taking into account your suggestions for improvement? | 12 | 21 |
| | iii) Depending on the first test score do you group students with low marks and give special coaching? | 39 | 68 |
| 4) | Peer and Self assessment<br>i)   After discussing the points to be brought out in the answer, do you ask the individual students to mark their own answer paper? | 10 | 18 |
| | ii)  After the student marks his/her paper, do you mark the same paper? | 3 | 5 |
| | iii) Do you have a dialogue with the students if the student does not agree with the mark you have given? | 21 | 37 |
| | iv)  Do you ask students to exchange and correct a fellow students' paper and mark it? | 8 | 14 |
| | v)   Do you provide opportunity for a discussion between the two students after each of them have corrected and marked the others paper? | 8 | 14 |
| 5) | Modifying teaching/ Clarifying objectives<br>i)   Do you inform the students about what they should learn in detail? (Are the objectives spelt out in detail?) | 56 | 98 |
| | ii)  Do you ask questions during the class to check the students understanding? | 41 | 72 |
| | iii) Do you suggest different ways of learning with examples? | 42 | 74 |
| 6) | Analysis of the questions/ answer paper after the test to provide feedback to teachers/ students<br>i)   Is any analysis of the questions done after the test, to see how well they have performed, how difficult/easy the questions are (Item or question analysis)? | 18 | 32 |
| | ii)  Do you distribute good and not so good answers to questions and discuss with students why those answers were good or not so good? | 22 | 39 |
| | iii) Do you discuss with the students the question papers of the previous years? | 40 | 70 |

**DISCUSSION**

If our aim is to improve student performance, not just measure it, we must ensure that students know the performance expected of them, the standards against which they will be judged, and have opportunities to learn from the assessment.[16] Students seldom have adequate information about how well they are performing. Formative assessment helps to identify areas of weakness which allows for immediate remediation and corrective action.

Commonly, 91% of teachers assess test questions by noting the mark for each question (Item 2). As per the literature, feedback providing guidance to, or identification of, correct answers is more instructionally effective than feedback that simply tells learners

whether their answers are right or wrong.[17] Literature suggests that pupils at all levels of attainment do not make learning gains when work is graded or given marks for each question. Gains come from comments that tell pupils what they have demonstrated about their learning to the teacher and what they need to do next to improve. Research has shown that pupils who are given only written or spoken comments on how they can improve their work and are not given marks or grades make greater learning gains than pupils given marks or grades only. In the present study, most of the teachers preferred a combination of both marks and comments, which is possibly the most widely used form of feedback in our education system. Students who receive both marks and comments make more progress than those given only comments.[18] Oral feedback is preferable to written feedback because through actually talking to the person providing the feedback, questions could be raised and body language observed, resulting in a more accurate interpretation of the feedback. Written feedback can, at times, be illegible and utilize unfamiliar vocabulary.[19] Quite a good number of our teachers provide oral feedback to individual students about improving the answers.

Several empirical and theoretical research studies have concluded that an essential condition for the development of formative assessment is that students become engaged in self- and peer- assessment.[6,20,21] If pupils are to become increasingly responsible for their own learning, then they must also be involved in their own assessment. This is most effective if the work is structured to contain shared learning goals so that pupils can monitor their learning on a continuous basis. If learning is to be efficient, pupils must be active agents in judging the gap between what they know and what they need to know. This implies that learning will be more effective if the pupil practices self-assessment because this will make them aware of their level of understanding. The teacher can then help them to close the gap by sharing learning goals with them. The present study revealed that less than 20% of the teachers encourage self- and peer- assessment (Table 1, Item 3). Students need effective ways of monitoring learning. Student involvement in formative assessment is important, as it is a motivating factor for student learning. Peer assessment provides pupils with evidence to use in comparison with their own work. Research shows that improving skills in self-assessment and peer assessment is necessary to accomplish greater personal responsibility, more reflection on one's learning and enhanced self-esteem and motivation.[22] Peer assessment is one way of showing pupils several pieces of exemplar material, conveying the elements of success. Distributing good and not so good answers to questions and discussing with students why those answers were good or not so good is another way of showing quality answers to students. Only 39% of the teachers in our study provide feedback through discussion of good and bad answers (Item 6). If they are able to judge their work against the standard set by the teacher, to compare and determine what meets the standard and what is still lacking, they can develop a true sense of their own capability and where they need to go to next.

Thirty-two percent of the teachers in our study reported that they analyze the questions and answer paper after the test to assess the difficulty level and provide feedback to students. Personal interviews with six randomly selected teachers revealed that they were not familiar with analysis of objective type test items and their utility. It is also necessary to document the frequency of common errors and misconceptions observed while responding to open end questions. The evidence is useful for clarification to students and modification of teaching. It helps to improve the quality of questions and future teaching plans.

Wiggins stated that most important feedback is derived from situational information in response to trying to accomplish a task. [16] The challenge of designing learning is to make it possible for students to self-assess and self-adjust effectively, with minimal intervention by the teacher. Our aim must be to create assessments that provide better feedback by design, and not think of improvements in terms of more accurate evaluation. Indeed, without better feedback and guidance based on the feedback in student assessment, there is little point to precise scores and value judgments.[7]
Where anyone is trying to learn, feedback about their efforts has three elements - the desired goal, the evidence about their present position, and some understanding of a way to close the gap between the two.[2]

## CONCLUSION
This study indicates that there is room for improvement in the way formative assessment is practiced currently in health science education. The teachers require training on effective ways of providing feedback, student involvement in class room assessment, item/question analysis and their utility. Analysis of the questions is done to identify difficult topics and to improve the quality of the questions. It is necessary to document the frequency of common errors and misconceptions observed in the responses. This evidence is useful for clarification to students and modification of teaching. It can also be used to improve the quality of questions.
The present study is limited to the classroom setting. There is wide opportunity for formative assessment and timely feedback in the clinical setting of health science education. A study of assessment practice in the clinical setting would help us identify the areas for improvement and training.

Findings of the study may vary with contextual factors and institutions. Large class size, workload experienced by the faculty, and large pupil to teacher ratio may hinder the practice of formative assessment.

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