Analyzing the Role and Relevance of Feedback in Medical Education

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ABSTRACT *Background:- Feedback has been identified as key strategy in learning and teaching, little known research has been focused on students' perception for feedback and the contribution feedback provide to their learning process.*

Method:- This study aimed to determine the benefits and challenges students and faculties experience in the feedback process. To achieve this aim six research questions were raised and descriptive survey method was adopted; five point Likert type questionnaires were used for data collection.

The questionnaire was validated by experts and the Cronbach alpha method of internal consistence reliability was 0.89 and 0.82 for students and faculty respectively.

Study population composed of 188 students from 3rd and 4th year pharmacy school and 2nd year pre-medicine school as well as 31 faculties from foundation, natural science and pharmacy department.

Results:- Data was collected and analyzed, comparison was made among different classes of students using ANOVA and Post HOC test. Faculty perception was evaluated for feedback and its importance in providing advice to the advisors.

Conclusion:- Students considered feedback as an opportunity to improve study skills for the course, skill in solving MCQ's and to discuss different concepts. Challenges experienced most by students was about anxiety with open scrutiny, difficulty regarding self-assessment and difficulty in application of future exams while faculty perceived feedback being good for planning instructional strategies, refining teaching methodologies and learning the students understanding of concepts. Even faculty considered feedback significant as an advising tool. Feedback method acceptable deferred from students and faculty perception.

INTRODUCTION

Everyone is eager to know how they are doing or did in their life, job and education, so that they can attain success. In order to be successful, one must get positive and negative views about one's effort and accomplishment. These views or comments are known as feedback. In education it plays an essential part. It helps learner to maximize their potential at different stages of training, raise their awareness, so that they can improve their performance. It is important to check that the learner understands the content of the feedback so that they are encouraged to imbibe the content and prevent distortion or misunderstanding of feedback content. Thus, feedback is central to develop the learner competence and confidence throughout their medical career.

Definition of feedback used by various researchers is related to information presented that allows comparison between an actual outcome and a desired outcome (MoryE 2004).Feedback must be seen as an opportunity for learning and for encouraging an orientation towards learning goals; development of respect by students for future development is indicated via feedback (AnnPet.,al 2008). Feedback for undergraduate students has powerful influence on their learning and achievement, showing their strengths and weaknesses (HattieJet .,al 2007).

Effective feedback has three prime questions to be asked by an individual who gives feedback -teacher, peer, parents or self. Firstly, where I am going i.e., what are the goals? Secondly, how am I going i.e., what progress is be-

ing made towards the goal? Lastly, where to reach next i.e., what activities are needed to be taken to progress better?There are five main facets as to how feedback should beprovided. It should be timely, intimate and individual, empowering, should open doors not close and manageable (PhilR 2009).There are different ways teacher can bridge gap between students' performance and extent of the desired goal by clarifying goals, enhancing commitment or increasing effort to reach them via feedback.

Feedback model differs by the number of students (large group/ small group) as well as the mode of teaching (full time/ part time/ distance learning). One to one feedback is the best but cannot be given in large group student setting or distance learning mode.Feedback models for large group class are different from small group classes which include use of model answers, assignment returns sheets, write an assignment report, collective feedback in small groups, computed assisted assessment, other than involving students in their own assessment (PhilR 2009).

The primary purpose of this study was to identify effective feedback methods for the large class environment. What are students' and faculties perception of the different models being used in the institute?

Hattie and Thimperley (2007) identified four levels of feedback focuses and states that "the level at which feedback is directed influences its effectiveness." They explained those levels of feedback focus starts from feedback about the task or product then about the processing of the task

then self-regulation finally about the self as a person. These steps of feedback focus help students become more independent learner (Assessment for Learning 2010).Feedback is not a perception for change. Learner ought to decide to change thus allowing their self-esteem to increase. Concept of feedback should be well understood by the learner before taking it then only his change will motivate him to change towards his strength(ChowdhuryRRet.,al 2004).In medical and health professional institutes student should be able to make qualitative judgments'. Thus providing feedback to them is important in a professional setting, although it is not well programmed in various institutes specifically when large number of students is registered for the course. Moreover models framed by various researchers may not fit well with every institutional set up, which has to be modified accordingly.

With developing computer technology new ways of feedback can be employed to enhance effectiveness of feedback, specifically in large teaching class setting. Some of the models used with them are like clickers, e-feedback, screen casts, TERISSA etc (CharlesJet.,al 2004, HepplestoneSet.,al 2009, CotnerSet.,al 2008, HarlandJ 2007, HarlimJet., al 2007).Evidence in literature has shown that various methods for an effective feedback in large class group for learning enhancement.The research study reported contributes in building a picture of students' and faculties' view about the feedback. This work was under taken based on six research questions conducted in Oman Medical College.

Research Questions
- What are the benefits of feedback for learning enhancement by students?
- What are the challenges of feedback for learning enhancement by students?
- What are the benefits of feedback for learning enhancement by faculties?
- What are the challenges of feedback for learning enhancement by faculties?
- In large group of teaching which method of feedback is appreciated by students and faculties?
- How was feedback helpful to faculty as an advisor?

METHOD OF STUDY
The descriptive survey research design was adopted for this study in order to get the perception of a large number of people and to make it general to an even larger number of people. The population of this study is 188 students; 73 from 2nd year pre medical school, 58 from 3rd year pharmacy school and 57 from 4th year pharmacy school, besides this 31 faculty members from pharmacy and pre medical department in Oman Medical College. The data collection instrument was based on survey questionnaire for students as well as faculty separately based on 5 point Likert scale with options 1 to 5 starting from strongly disagree, disagree, indifferent/ neutral, agree and strongly agree.

Survey questionnairesfor students had three components. 14 questions regarding advantage of feedback for learning enhancement, 7 questions for challenges of the feedback to learning enhancement in student's questionnaire. Other than these questionnaires 7 different methodsofproviding feedback were listed which are either being used or can be easily incorporated in our institute in large class group.

Survey questionnaires for faculty had four components. 11 questions for advantages and 7 questions for challenges of the feedback to learning enhancement, other than choosing method of feedback out of 7 listed last component were 5 questions for advisory benefits of feedback for learning enhancement.

Two medical education experts certified the instruments validity. The reliability was determined by the Cronbach alpha method of internal consistence reliability, when administering the instruments to 20 students and 10 teaching faculty. Reliability coefficients of 0.89 and 0.82 were obtained.

Data was collected and analyzed using SPSS-19.

RESULT
Research question 1
What are the benefits of feedback for learning enhancement by students?

Table-1:Perceived benefits of feedback from students

Advantage of Feedback	Mean	SD	ANOVA	Post Hoc Test	Mean %
1. Better interaction with instructor	3.78	0.99	0.631	NS	75.6
2. Better interaction with peers	3.48	0.99	0.915	NS	69.6
3.Opportunity to ask why an answer was marked in correct	3.9	1.2	0.408	NS	78.0
4. Opportunity to discuss difficult concepts	4	1.04	0.116	NS	80.0
5. Guidance to improve performance	3.86	0.95	0.432	NS	77.2
6. Increased enthusiasm to be a better learner	3.9	0.95	0.555	NS	78.0
7. Understanding what content is to be stressed	3.88	0.97	0.252	NS	77.6
8. Opportunity to improve study skill for the course	3.97	0.91	0.453	NS	79.4
9. Opportunity to improve skill in solving MCQ's	4.06	1.05	0.36	NS	81.2
10. Build up trust factor with the instructor	3.73	1.04	0.207	NS	74.6
11. Understanding how to take constructive criticism	3.65	0.97	0.438	NS	73.0
12. Transparency of assessment	3.52	1.18	0.294	NS	70.4
13.Making learning interesting	3.74	1.08	0.528	NS	74.8
14. Help to build trust in the instructor	3.7	1.05	0.917	NS	74.0

Number of students= 188

Table 1 shows that the three greatest benefits of feedback as perceived by students are: "opportunity to improve skill in solving MCQ's," Opportunity to discuss difficult concepts," "Opportunity to improve study skill for the course" with mean percentage of 81.2%, 80% and 79.4% respectively. ANOVA sig. for three different student groups is 0.36, 0.116 and 0.453 respectively. The three benefits perceived to the least value are: "interaction with the peer," "transparency in assessment" and "understanding how to take constructive criticism with mean percentage of 69.6%, 70.4% and 73% respectively.

Post hoc test showed no significant difference with the three groups for any question.

Research Question 2
What are the challenges of feedback for learning enhancement by students?

Disadvantages for Feedback	MEAN	SD	ANOVA	Post HOC test results	Mean %
1. Difficulty in interpreting the feedback	2.78	1.07	0.216	NS	55.6
2. Anxiety with open scrutiny	3.02	1.19	0.02	Significant difference with in all groups	60.4
3. Time consuming	2.47	1.23	0.001	Significant difference between medicine and pharmacy 3rd & 4th year	49.4
4. Difficulty in applying feedback to future exams	2.81	1.2	0.002	Significant difference between 2nd year medicine & 3rd year pharmacy	56.2
5. Difficulty regarding self assessment	2.86	1.06	0.34	NS	57.2
6. Difficulty in understanding explanation for the correct answer	2.7	1.16	0.05	NS	54.0
7. Failing to understand reason for giving the feedback	2.31	1.09	0.001	Significant difference between 2nd year medical pharmacy 3rd & 4th year	46.2

Table 2: Perceived challenges of feedback by students
Number of students= 188
Table 2 shows that of seven perceived challenges three experienced the most are: "anxiety with open scrutiny," "difficulty regarding self assessment," " difficulty in applying feedback to future exams," with mean percentage of 60.4%, 57.2% and 56.2% respectively.

Significant difference was found in all the three groups for anxiety with open scrutiny question. Significant difference was found between pre medical and pharmacy students for time consuming, application of feedback to future exams as well as failing to understand the reason for giving feedback. This shows that pharmacy and pre- medical students have different view about the various challenges of the feedback to learning enhancement process.

Research Question 3
What are the benefits of feedback for learning enhancement by faculties?

Table 3: Perceived benefits of feedback for learning by faculty

Benefits for Feedback	N	Mean	Std. Deviation	Mean %
1. Learning of students' understanding of concepts	31	4.13	1.118	82.6
2. Understanding students' learning progress	30	3.93	1.112	78.6
3. Better communication with students	31	3.74	1.210	74.8
4. Refining teaching methodology to make it more interesting and explanatory	30	4.23	1.135	84.6
5. Planning instructional strategies	31	4.26	.729	85.2
6. Help in sustaining students interest	30	3.50	1.042	70.0
7. Easier to explain assessment criteria	27	3.89	.698	77.8
8. Quality assurance in assessment	31	4.06	.854	81.2
9. Motivate weak students to come forward to communicate	31	3.61	1.283	72.2
10. Help to build trust in the instructor	31	3.81	1.046	76.2
11. Motivate faculty to write better exam questions	31	3.68	1.107	73.6

Number of faculties= 31

Table 3 shows that the three benefits of feedback perceived as the greatest by teachers are: "planning instructional strategies," "refining teaching methodologies," "learning the students understanding of concepts," with mean percentages of 85.2%, 84.6% and 82.6% respectively. The three benefits least valuable by the faculties are: "help in sustaining student's interest," "motivating weak students to communicate," and "motivating faculty to write better assessment questions," with mean percentage of 70%, 72.2% and 73.6% respectively.

Research question 4
What are the challenges of feedback for learning enhancement by faculties?

Table 4:Perceived challenges of feedback for learning by faculty

Challenges for Feedback	N	Mean	Std. Deviation	Mean %
Maintaining objectivity in scoring	27	3.48	.935	69.6
Time consuming	31	3.58	.992	71.6
Poor presentation of concerns by students	26	3.58	1.027	71.6
Confrontation with students with low grades	31	3.68	.909	73.6
Generating large number of queries in students' minds	30	3.43	1.073	68.6
Some students feel exposed	30	3.23	1.040	64.6
Students sometimes feel confused	31	3.32	.979	66.4

Number of faculties= 31

Table 4 shows that the two greatest challenges of feedback for leaning enhancement as perceived by teachers are: "confrontation with students with low grades," "time consuming,"poor presentation of concerns by students," with mean percentage of 73.6%, 71.6% and 71.6% respectively. "Some students feel exposed" and "sometime feel confused" were perceived as the least significant challenges of feedback for learning enhancement with mean percentage of 64.6% and 66.4% respectively.

Research Question 5
In large teaching group which method of feedback is appreciated by students and faculties?

Table 5: Method of feedback accepted by students and faculty in OMC

Majority of the students from three different groups wanted feedback by providing their exam papers with the correct answer key, while majority of faculties believe that questions should be discussed with the option in the class as feedback method.

Research Question 6
How was feedback helpful to faculty as an advisor?

Table 6:Perception of faculty for importance of feedbacks in advancing.

	N	Mean	Std. Deviation	Mean %
Help the students to know his/ her strengths and weaknesses	31	4.10	.831	82.0
Level of the students can be assessed so that they can withdraw or continue the course	31	4.19	.601	83.8
Help the students with time management skills	31	3.71	1.071	74.2
Update parents about students' strengths and weaknesses	30	3.93	.944	78.6
Help in motivating students' learning	31	4.06	.964	81.2

Table 6 shows that majority of faculties consider feedback important for advising the student to withdraw from any course (83.8%) other than mentoring students about their strengths and weaknesses (82.0%), 81.2% consider feedback helpful in motivating the students learning process.

DISCUSSION
Student's feedback has always proved to be a powerful tool in improving student's outcome in general particularly when it comes to academic performance and enhancing interaction with instructors.Implication of feedback to a large group of students has various benefits, like improving skill of solving multiple choices and critical thinking questions and their learning of the core concepts (Smith-TAet., al 2010). Other than building the trust factor with the instructor,increasing enthusiasm to be a better learner which in agreement with the findings of Black &Harrison (2001) & Black & William (1999) (AnnPet.,al 2008, BlackPet.,al 2001, BlackPet.,al 1998, DavidJNet.,al 2006, NicolDet.,al 2008).

In many instances, feedback focuses on the student-instructors relationship in a semi-professional manner in that what student actually expect from their instructors and

QNo	Feedback methods used/ can be used in the OMC	Students Perception			Faculties perception
		2nd year pre- medical N= 73	3rd year pharmacy N= 58	4th year pharmacy N= 57	N= 31
1	Questions on exam discussed with options	13	13	7	10
2	Questions on exam discussed without options	1	0	1	4
3	Concept to be re-taught then the question to be asked with options	20	9	13	4
4	Concept to be re-taught then the question to be asked without options	5	1	0	2
5	Only concepts should be revised and explained	2	1	0	5
6	Exam papers to be provided without answer key	2	2	1	3
7	Answer key to be provided with exam papers	30	32	35	3

where their instructors have failed to be up to the expectation. Ironically, instructors hope that feedback would focus on student's weaknesses and motivate their strengths rather than improving themselves.

Since clearing exam is mandatory for all students so their approach is mostly outcome based in terms of scoring high rather than spending more time discussing difficult concepts and improving their study skills which although always goes parallel with enhancing skills to become better learners. Moreover, students have strong tendency to explore ways that can help them to improve their exam performance. To the contrary, common values like transparency and interaction with peers are less appealing which is translated by the student's focus on scoring in an exaggerated individual manner.Duncann(DuncanN2007)[8] initially provided a linear approach to assessment and feedback the way it is provided at our institute where they failed to explore practice, to understand if students do 'connect' with any of our feedback strategies and seek an opportunity for development. Student's also found difficulty in applying given feedback to their future exams.

The outcome of feedback challenges differed between medicine and pharmacy students although they have some of the common consensus about difficulty in interpreting feedback and self-assessment after it. Anxiety with open scrutiny followed by difficulty regarding self- assessment topped the list of challenges to feedback. This reflects the conservative nature of most students about their academic performance and how intolerable they are to open scrutiny or close inspection even by their instructors.

For faculty, feedback is frequently used as a tool to develop their delivery and sustain a level of systematic courses progression. Assessments followed by feedbacks provide an indispensable approach to refine instructional strategies and modify teaching methodology to make it appealing for students learning (AnnPet.,al 2008, DavidJNet.,al 2006). In a medical and pharmacy school, it's always important to ensure that students have grasped the basic concepts clarification by the instructor while details should be worked out by themselves (HirokoS 1994, OmorogiuwaKO 2010). Moreover, faculty recognises that motivating students by sustaining their interest in the subject cannot be achieved through feedback. Faculties do agree that sometimes feedback in large classes generates large number of queries within students' mind, thus leaving them bit confused and exposed.Moreover, faculty recognises that motivating students by sustaining their interest in the subject cannot be achieved through feedback.

It is becoming an increasing concern for faculty that feedback can create a confrontation with students particularly those with low marks leading to an unhealthy discussions and deviation from the sole objective of student feedback.

Student's feedbacks perception differs markedly with that of faculties'. Moreover, methods used show clear differences where faculty prefers discussion of exam questions in the class without providing the answer options. In addition, faculty prefer to focus more on conceptual learning even in feedbacks as they feel that students tend to score low because they lack in-depth understanding of the concepts even if they spend lengthy periods studying for the exam. In contrast to the above, students prefer to have answer keys provided with the exam paper while discussing the questions which necessary means that they are reluctant to take the feedback as a brain storming session which em-

phasis that they have anxious open scrutiny and so are not willing to get exposed. Feedback methods should focus on improving scoring but with deeper understanding of concepts and the applied aspects of the courses. The clear variation between faculty and students in feedback methodology reflects how wide the gap is between the two in terms of the objectives exam and feedbacks are designed for.

In both approaches there are positive as well as negative aspects since feedback functions not only as an error correction mechanism but strengthening of correct responses in memory is an equally important function (SmithTAet.,al 2010). This was reported by Smith &Kimbalin their two different experiments in which it was found that a delayed feedback improved performance on a one week retention test where locus of the effect was increased in correct response perseveration rather than concept understanding. Feedback methodology should be student/ objective oriented or exam/ assessment oriented still has to be worked out thoroughly.

The dilemma is even more evident by knowing that 82% of faculty members generally perceive feedbacks in a more academic sense in that to provide a window for students to decide whether the course is appropriate for them or not and also provide an opportunity to make students become more aware about their points of strengths and weaknesses.

CONCLUSION& RECOMMENDATIONS
The study reveals various advantages and disadvantages of feedback for students' learning enhancement form students' as well as faculty prospective. Feedback after formative assessment although being time consuming has many positive aspects which improves not only students learning process but also teachers' way of teaching methodology and scope of changing the instructional strategy for better understanding to learners. Feedback also directs advisor regarding the advisees' strength and weaknesses and guide them appropriately.

The researcher recommends that there should be better way of delivering the feedback to students individually even in large group of class. Provision of e-feedback to the students formative assessment would be better if face to face is not acceptable. Student need to have written feedback not only for their formative assessment but also for their personal approach to the course from the instructor; so that students' would be better motivated and encouraged towards the course.

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