

**A STUDY OF STUDENT AND TEACHER
UNDERSTANDING AND EXPERIENCE OF
FEEDBACK ON KNOWLEDGE BASED ASSESSMENT,
AND ITS INTENDED EFFECTS ON LEARNING,
WITH IMPLICATIONS FOR FUTURE DESIGN**

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Date

26 August 2017

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ABSTRACT

Background: The importance of feedback as a key component of formative assessment has been acknowledged by many researchers, little is known about the effectiveness of feedback on knowledge assessments.

Aims: This study aimed to explore the understanding of faculty and students towards the effectiveness of feedback on knowledge assessments, and design improved methods for providing effective feedback which will provide substantial knowledge gains.

Methods: Semi structured interviews were conducted with 2nd year MBBS students who had completed their 1st year at Shifa College of Medicine and with basic sciences faculty members teaching them to determine their perceptions about feedback sessions on knowledge assessments, designed to be formative. The interviews were analysed qualitatively using grounded theory.

Results: Four main themes emerged. Although formative assessment was rightly understood to be for learning purposes, grades were considered necessary. This appeared to derail the initial formative attempt to motivate learning and to reflect competitive culture learnt at school. This suggested modifications at three levels, early years of school, on entry into medical college and during undergraduate years to ensure that students use feedback effectively to enhance learning. Using constructivist grounded theory approach a framework was developed for effective feedback on knowledge based assessment. This included feedback after regular and frequent formative assessment that is detailed, immediate, individual, interactive and specific, removes misconceptions, provides guidance on time management and on the ways to attempt questions.

Conclusions: Major adjustments in the assessment-feedback process are required to promote self-directed learning and effective utilization of feedback for improved learning.

LIST OF ABBREVIATIONS

MCQ	Multiple choice questions
SAQ	Short answer questions
LCME	Liaison Committee on Medical Education
GMC	General Medical Council
OSCE	Objective Structured Clinical Examination
IRB	Institutional Review Board

INTRODUCTION

Assessment is one of the most important elements of students learning. Assessment can be classified as summative or formative. Formative assessment is defined as ‘the process used by teachers and students to recognize and respond to student learning in order to enhance that learning, during the learning’ (Bell and Cowie, 2001). Feedback is an important part of formative assessment (Cantillon, 2008). Assessment can enhance learning if it is part of a feedback process and guidance is continuously provided to the students (Konopasek et al, 2016). Researchers recognize the usefulness of feedback (Shute, 2008). It is said to allow the students to reflect and improve their future performance, however, it may not be appropriately acknowledged and dealt with by the students (Sadler, 1989; Sinclair and Cleland, 2007). Feedback is a source of motivation for the students to work harder, remove their misconceptions and a guide for them to move towards the right direction (Hattie and Timperley, 2007). It also provides an opportunity for the teachers to reflect and improve their teaching (Bell and Cowie, 2001). Its impact on learning depends both on how it is delivered, and how well it is received and used by the learner (Kluger and DeNisi, 1996). Summative assessment, however, still remains the main focus of attention in medical education with little emphasis on formative assessment (Rauf et al, 2014).

Shifa College of Medicine uses a Flexnerian curriculum with the first two years consisting of integrated modules of basic science learning with periodic knowledge based tests in the form of multiple choice questions (MCQ), short answer questions (SAQ) or viva, which are followed by feedback. The course director has the authority to decide how frequently these tests will be conducted and what the exact format of these tests will be for their respective

module. These knowledge tests carry low weighted grades that are added to the scores of end of module assessment. The end of module assessment is based on 70% MCQs and 30% SAQs. The scores of the end of module assessments are part of the continuous assessment added to the final grades of high stakes summative examination held at the end of each year. Teachers give feedback on multiple knowledge tests and end of module assessments to the students in groups, common mistakes are identified and students are informed about the correct responses and guided towards more effective learning in the future. Periodic knowledge tests were primarily developed for formative purposes building the students knowledge before the final summative assessment; however it was the observation of the institute's faculty that despite significant hard work and time spent by the teachers on giving feedback, the students did not make effective use of formative feedback unless it was graded. It was also observed that the students tended not to attend. Therefore, grades were assigned to the knowledge tests which were to be used as continuous assessment. It was expected that students would take graded tests more seriously, and actively participate in the process. However, there still is a need to know whether the adding of grades to what was designed as a continuous formative assessment has contributed to or detracted from feedback. There is increasing evidence that grades with or without feedback do not lead to learning gains (Butler, 1988; Black and William, 1998; Harrison et al, 2016). Some researchers argue that the grades on assessment may result in the student being more focused on getting a higher grade rather than trying to gain knowledge (Lefroy et al, 2015). There is a need to explore the effectiveness of current assessment/feedback practices with both students and the faculty and develop improved methods of providing meaningful feedback to make its use more effective.

AIMS OF THE STUDY

To explore the understanding of faculty and students towards the effectiveness of feedback on knowledge assessments, and design improved methods for providing effective feedback which will provide substantial knowledge gains.

LITERATURE REVIEW

The purposes of the literature review

The purpose of this literature review was the critical appraisal of past and current literature relating largely to feedback given on knowledge based assessment, particularly the graded assessments in undergraduate medical education. This provided a deeper understanding on the topic of research and helped in identifying the gaps that are present in the available research. The literature review gave an overview of the factors that enhance or limit effective use of feedback by medical students during the learning process, and the impact of grades assigned to knowledge assessments on effective use of feedback. Furthermore, it enabled me to justify the research showing its capacity to address the gaps and what it adds on to the currently existing knowledge. It also ensured that this research is not a replication of previous work; instead it is aimed at addressing problems that are unsolved or unanswered.

The keywords/search terms used

Feedback, Summative Assessment, Formative Assessment, Summative Feedback, Formative Feedback, 'Feedback and Formative assessment', 'Feedback and summative assessment', 'Grades and Formative assessment', 'Grades and Formative feedback'.

Information sources used (primary, secondary and tertiary)

Initial search through Google Scholar provided a general idea of the literature available on the research topic. This general overview helped to focus key words for the search, Boolean search was used to further narrow down the search specific to the area of research related to

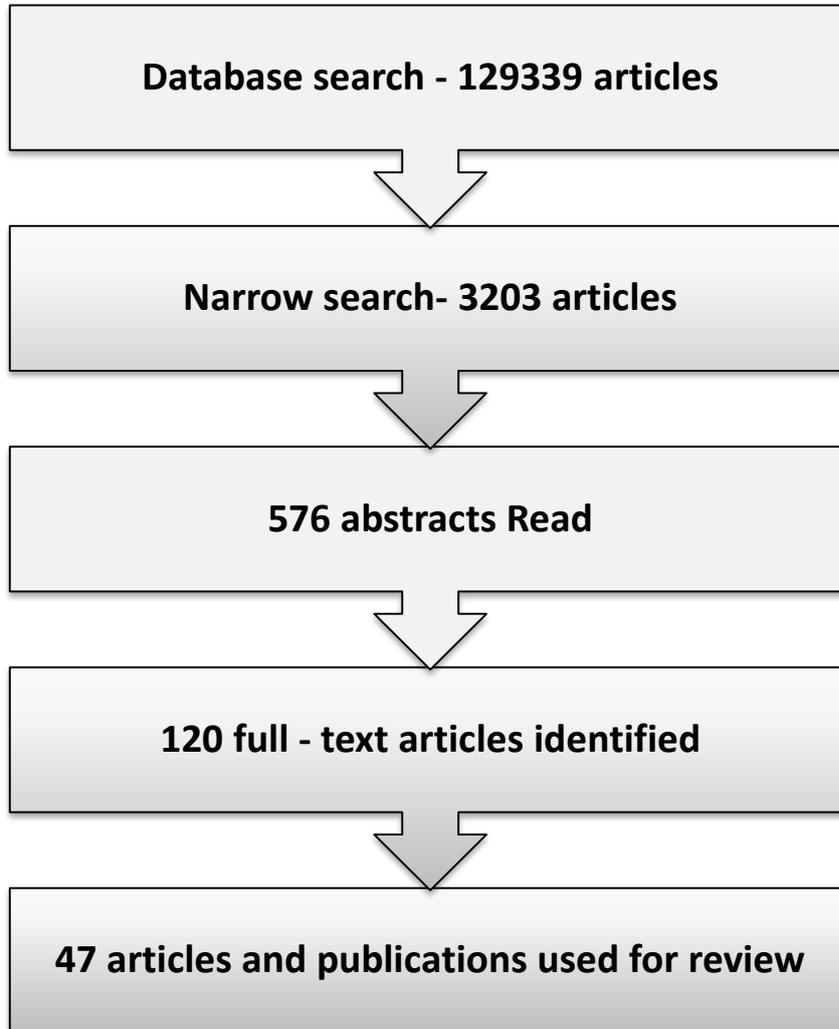
feedback on assessment in general and in undergraduate medical education in particular. Narrower search provided an easier access to obtain a good survey of literature. As a primary information source research articles published in high impact, peer reviewed scholarly journals were searched using PubMed and PubMed Central. Initially the abstracts were read and the relevant articles were identified to get the required information.

As a secondary information source the key review papers were identified on the research related to the topic and reviewed. Books were the tertiary source of information.

Criteria for inclusion/exclusion of literature

All the relevant literature related to feedback on formative and graded assessments; factors promoting and hindering its effective use and improved frameworks of providing feedback in different social contexts, that could be retrieved from the available sources were included in the literature review.

Figure 1: Literature Review Flow Chart



Assessment

Assessment is an essential component of teaching learning process. Within the academic context, assessment is generally classified into summative and formative types of assessment. The main difference between these two types is that the summative assessment is for ‘making an overall judgment about competence, fitness to practice, or qualification for advancement to higher levels of responsibility’ (Epstein, 2007,p.388), whereas formative assessment is defined as ‘all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged’ (Black and Wiliam,1998,p.1). I found these two definitions the most helpful and relevant to take my research forward. Formative assessment is an on-going process that monitors students’ learning with an aim to improve the competence of the student. Summative assessment on the other hand takes place at the end of the course especially for certification purposes, unlike formative assessment it does not have an immediate effect on learning but may have significant consequences for the student. Thus, the two types of assessments differ both in their purpose as well as the effect (Sadler, 1989). The need for incorporating formative assessment or ‘assessment for learning’; the idea which was proposed earlier by Martinez and Lipson (1989), is being emphasized strongly more recently (Konopasek et al., 2016). In most developing countries however, formative assessment has not yet been fully incorporated into the educational system and it may still take time to make it a part of the curricula (Harrison et al, 2016). Summative assessment, therefore, remains the dominant method of assessment in most developing countries, especially, in the context of medical education. Formative assessment is a process which helps the students to find out about their learning, reflect on it and

modify their learning accordingly. The information may be gained either through self-assessment or feedback from teachers and peers. It also helps the teachers to find out about the effectiveness of the learning strategies that are being used by them (Bell and Cowie, 2001; Sadler, 1989).

Feedback

Feedback on Formative Assessment:

One of the key components of formative assessment is feedback, which is defined by Ende (1983,p.777) as ‘Information describing students’ or house officers’ performance in a given activity that is intended to guide their future performance in the same or related activity’. The Power of feedback has been acknowledged by the researchers (Hattie and Timberley, 2007). Many studies have highlighted the usefulness of feedback on formative assessments (Shute, 2008; Carrillo-de-la-Peña et al., 2009). A need to develop ‘feedback culture’ in the education system has been emphasized (Archer, 2010). Effective feedback, not only helps in identifying the gap between intended goals and current understanding, but also provides guidance on how to fill this gap and make action plans for future learning (Sadler,1989). Formative assessment and feedback enables the students to become self-regulated learners, and brings cognitive motivational and behavioural change. It helps the student to go through a reflective process for achieving the required goals (Nicol and Dick, 2006). Students view feedback given on written assessment positively and consider it to be motivational (Patel et al., 2016). The need to fully incorporate formative feedback into curricula, in order to raise the standard of education has widely been recognized (Rauf et al., 2014). Liaison Committee on Medical Education (LCME) (2016) and General Medical

Council (GMC) (2009) have emphasized on the need to provide feedback to the students. Pakistan Medical and Dental College also stresses on the importance of on-going feedback in postgraduate training (PMDC, 2010).

The current processes of effective feedback can be explained by the social constructivist theory, which involves active reconstruction of knowledge by the students within a social and cultural context (Shepard, 2000). Clear understanding of what is being conveyed through feedback is of paramount importance for future improvement and restructuring the concepts (Sadler, 2010). Although, the positive impact of feedback on the students learning has frequently been emphasized, this feedback may not always be appropriately acknowledged and dealt with by the students. It has been observed that struggling students do not seek feedback as enthusiastically as high achievers (Sinclair and Cleland, 2007), and fail to actively receive or use feedback given by the teachers for their improvement (Havnes et al., 2012).

Therefore, it is important to shape feedback according to the needs of students and teachers to make it more effective. Meaningful feedback helps to achieve better learning outcomes; however its impact on learning depends on the quality of feedback. Poor quality feedback fails to produce any beneficial effects; rather it may in fact sometimes have a detrimental effect on students learning (Black and Williams, 1998). Unclear system of feedback, lack of teachers training on feedback and the fear of embarrassment that students may face during the process are considered as the major barriers for feedback effectiveness by the undergraduate students (Al-Haqwi et al., 2012).

For effective utilization of feedback by the students, it is important that the message that is being conveyed through feedback is understood clearly by the learners (Shute, 2008).

Effective feedback is defined as ‘Feedback in which information about previous performance is used to promote positive and desirable development’ (Archer, 2010, p.101). Trusted teacher-student relationship is important for the students’ receptivity for feedback. Students should be encouraged by the teachers to develop a habit of reflecting on their performances for continuous improvement in order to achieve their learning goals (Konopasek et al., 2016), this will not only help them improve their performance in summative examination but also make them lifelong learners which will in the long-run be beneficial to them as well as the society. The effectiveness of feedback depends not only on how it is provided by the teachers but also on student’s receptiveness and correct interpretation of what is being conveyed through feedback (Eva et al.,2012). Furthermore, another factor that plays a major role is the way in which students make use of this feedback for improved and deeper understanding (Kluger and DeNisi, 1996). Motivation plays an important role in the learner’s response to feedback (Hattie and Timperley, 2007).

Feedback on Summative Assessment:

Continuous assessment has an advantage of providing frequent feedback to the students (Sadler, 1989), thereby, helping them to show improvement in subsequent assessments. However, students often fail to use feedback after summative assessment as they ought to due to their focus mainly relying upon passing the exam instead of using feedback to improve their understanding. The fear of failing, and taking re sit exam. leads to anxiety amongst the students, which diverts their attention from feedback. A competition may start with other students caring less for feedback on their performance (Harrison et al., 2015). A sense of competition among students can sometimes have a detrimental effect on feedback

outcomes as the desired level of learning is not achieved when students are only trying to get ahead of their classmates instead of the basis of their understanding being knowledge driven. Furthermore, they start believing that they need not put much effort for an assessment that is not marked (Sadler, 1989). Examination related feedback is not properly utilized for better performance even at the workplace at a later stage (Harrison et al., 2015). Other studies suggest that not only does self-reflection, motivation, and emotional response stimulated by feedback motivate the learners to utilize feedback, but its effective use is also enhanced by giving feedback with summative assessment (Sudarso et al,2016). Feedback on summative assessment can serve as a step forward for continuum of lifelong learning (Archer, 2010). Although the need to provide feedback after all assessments has been emphasized (Norcini et al., 2011), not much research has been done to explore the importance of feedback following summative assessment and the efficacy of feedback in the summative setting is less well established (Harrison et al., 2013). It is suggested that both formative and summative functions are combined in all assessments (Harrison et al., 2015). On the other hand Harlen and James (1997) raise concerns over the unclear distinction between formative and summative assessments.

Critical conclusions

It is clear from the literature that we need to develop a clearer understanding of the process of feedback provided in the traditional culture for summative assessments, particularly for knowledge testing. Although the use of feedback after summative assessment has been explored for objective structured clinical examination (OSCE) (Harrison et al, 2015), however not much work has been done on feedback related to knowledge assessment.

There is a lack of evidence in the literature, indicating the role of grades in formative assessment. It is rather counterintuitive to add grades when it is meant to be formative.

We need to explore the effectiveness of current assessment/feedback practices in our setting in Pakistan, for developing a more formative approach to basic science knowledge testing.

The setting at Shifa provides the ideal opportunity to fill in a gap in the literature and address the questions of how students and faculty view the feedback received after assessments of knowledge with regards to its purpose, content, process and the role of grades in this. How they use the results of feedback to inform their future performance as learners or teachers and how can the process and content of feedback on assessment of knowledge be developed to improve its effectiveness?

RESEARCH QUESTIONS

1. What do medical students and their teachers understand to be the purpose of feedback received after assessments of knowledge throughout the academic year?
2. How do teachers and students respectively understand and experience the content and process of giving and receiving feedback? What is the role of the grade in this?
3. How do students and teachers use the results of feedback to inform their future performance as learners or teachers?
4. How can the process and content of feedback on assessment of knowledge be developed to improve its effectiveness?

METHODS

Context

This study was conducted at Shifa College of Medicine Islamabad Pakistan, which follows a system based integrated modular curriculum. During the first and second year of curriculum Anatomy, Physiology and Biochemistry are taught in relation to the clinical context in various modules. During each of these modules the students are exposed to multiple knowledge tests which are followed by feedback on their performance in the test. These knowledge based tests carry grades which are added to the scores of the end of module assessment. The scores of the end of module assessments are part of the continuous assessment that is added to the final grades of high stakes summative examination held at the end of each year. Timely group feedback is given by the teachers both on periodic knowledge based tests and end of module assessments.

Participants

Students were recruited for focus group and interviews from the second year MBBS class, who were exposed to feedback on graded assessment of knowledge in their first year of MBBS.

Senior and junior basic sciences faculty from the disciplines of Anatomy, Biochemistry and Physiology, who have been involved in teaching first year MBBS students of Shifa College of Medicine.

Recruitment to the study

All the Year 2 students were invited through email to volunteer for participation in the study, to ensure the inclusiveness of all the students. However I did not get enough response, only five students responded to the email, probably because most of the correspondence with the students is direct and they are not used to this method, I therefore had to approach the students directly during their small group discussion sessions. The students were briefly explained about the study, and invited to take part in the study after which 27 students out of a total of 106 students (25.47%) volunteered for participation. These included 12 females and 15 males. Purposive sampling technique was used, aiming for gender balance and ability balance by looking at their performance in the end of first year exams. Eight students including 4 male and 4 female students were selected from those who volunteered for initial focus group.

From the remaining group of students who volunteered to take part in the study, I selected the students sequentially for semi structured interviews. The selection of the students for interviews aimed at gender balance and varying abilities determined by looking at the result of summative examination at the end of their first year MBBS. The interviews were continued until I stopped getting any new information and theoretical saturation appeared to have been reached (Fusch and Ness, 2015). Ten students, including five male and five female students of second year MBBS class were interviewed. Students selected for semi structured interviews were different from those selected for the focus group.

Senior and junior basic sciences faculty from the disciplines of Anatomy, Biochemistry and Physiology, who have been involved in teaching first year MBBS students of Shifa College of Medicine, were invited through email to volunteer for participation in the study. Twenty

one faculty members out of a total of 22 (95.45%) agreed to participate in the study. These included 5 males and 16 females. Seven faculty members including 3 males and 4 females were identified for the focus group, keeping in consideration their availability so that they can take time out of their busy teaching schedule. Faculty members were selected from both the genders and from different seniority levels.

From the remaining group of faculty members who volunteered to participate in the study I selected faculty members sequentially for semi structured interviews, which continued until I stopped getting new information and theoretical saturation appeared to have been reached. Eight faculty members including two male faculty members and six females were interviewed. Faculty members selected for semi structured interviews were different from those selected for the focus group.

Data Gathering

A prior approval for conducting the study was taken from the Institutional Review Board (IRB) and Ethics Committee of Shifa International Hospital, Shifa College of Medicine and Shifa College of nursing, Islamabad. It is a qualitative study, designed to get deeper understanding of the students' and the faculty's views on feedback given on graded knowledge assessments throughout the academic year during first year MBBS. (Lingard and Kennedy, 2010). Focus group was conducted both with the faculty and the students to be used for developing a set of questions for the semi structured interview schedule.

Focus Group

Faculty:

Written consent was taken from the faculty members and one focus group was conducted. Discussion was led by guiding questions formulated to match the purpose of research synchronizing with the research questions (Appendix A) and revolved around the perceptions of faculty regarding purpose, content and process of feedback given on knowledge tests, impact of grades assigned to these knowledge tests on the feedback, how did they use the results of the feedback for their own improvement and how can the process be improved. Notes were taken by a colleague during the focus group, and audio recording of the discussion was done. The focus group lasted for about 52 minutes. The notes taken by the facilitator were studied in detail and validated by listening to the audio recording. The points that were highlighted during discussion were identified and used to develop a framework for semi structured interviews schedule, which were conducted with individual faculty members.

Students:

A second focus group was conducted with the students from second year MBBS class who have recently completed their first year course, to determine their perceptions about feedback sessions on periodic knowledge tests and end of module assessments during their first year. Eight students including 4 male and 4 female students were identified for focus group to maintain gender balance and students with varying abilities were identified for ability balance. Written consent was taken from the students participating in focus groups. Discussion was led by guiding questions formulated to match the purpose of research,

synchronizing with the research questions (Appendix B), and was based on their views about the purpose, content and process of feedback, how they used this feedback, how did grading of knowledge tests impact their learning and how the process can be further improved to maximize the effectiveness of feedback. The focus group with the students lasted for about 57 minutes. Notes were taken by a colleague during the focus group, and audio recording of the discussion was done. The students were offered chocolates during the focus group, but no other incentives were given. The notes taken by the facilitator were studied in detail and validated by listening to the audio recording. The points that were highlighted during discussion were identified and used to develop a framework for semi structured interviews schedule, which were conducted with individual students to investigate the research questions (Gill et al.,2008)

Semi structured interviews

The set of questions developed from these two focus groups were discussed with the colleague who was present in the focus groups and was taking notes and also with my supervisor (Appendix C, Appendix D). The questions were finalized and validated by piloting with one student and one faculty member. However in order to explore the research questions fully a need was felt to include a direct question about the impact of grades on student learning during piloting, therefore a question was added on how the students or the faculty viewed the role of the grade in relation to the feedback?

Students:

Interviews were conducted by the principal investigator in her office with individual students. Each interviewee was given a brief description of the purpose of the study and

written consent was taken before the interview. The interview was audiotaped. The questions asked by the principal investigator, were kept open probing more deeply with questions like how, why etc.

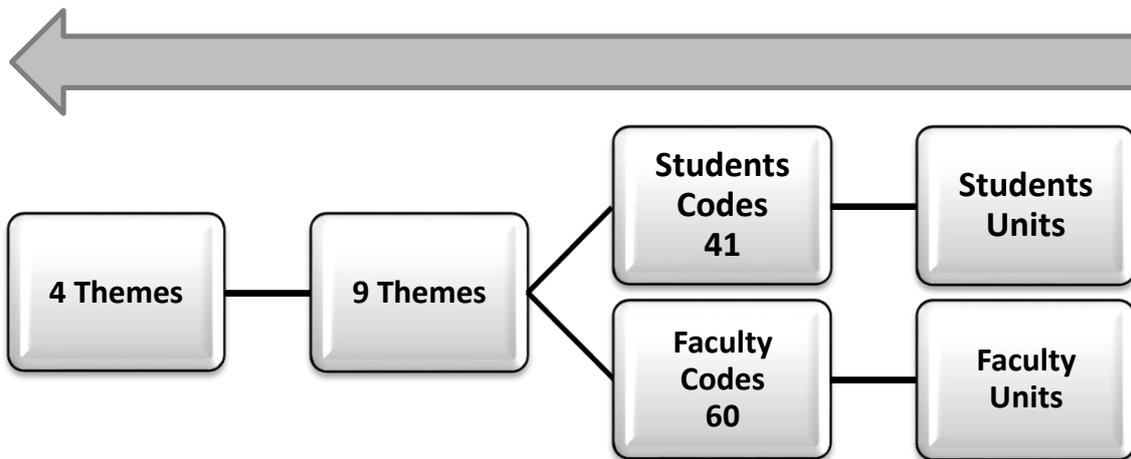
Faculty:

Faculty members were interviewed individually by the principal investigator in her office. Each faculty member was explained about the purpose of study and written consent was taken before the interview. Questions were asked by the principal investigator and the interview was audiotaped. The questions were kept open probing more deeply by questions like how, why etc.

Data Analysis

The data were analysed systematically using thematic analysis approach (Lacey and Luff, 2007). The First step was listening to the audio taped data from the individual semi structured interviews and transcription of the data (Edwards and Holland, 2013). Content analysis of the transcribed data was done. Ascribed units were identified for relevance and grouped to form codes. Similar codes were clustered to extract the themes manually. Initially nine themes were extracted from the data gathered from the students and faculty. These themes were internally validated through discussions during regular meetings with a colleague who has an experience in qualitative research and with my supervisor through regular Skype meetings. However during further meetings with my supervisor we reached a consensus to merge these into four main themes and I organized the data around four principal themes. (Figure 2)

Figure 2: Process of Development of Themes



RESULTS

The four main themes that emerged from the data were: *1. Practice derails theory, 2. Grades drive learning, 3. Fuelling the engine of learning 4. Light at the end of tunnel*

These themes are described using quotes from the data. S 1-8 identifies the student and T 1-8 identifies faculty. Gender is identified by M for male and F for female.

Practice derails theory:

Overall students understood in theory the purpose of formative assessment and associated it with day to day learning during the course. Students found formative assessment less stressful as compared to the summative. They thought that formative assessment is spontaneous, it does not only allow teachers to judge the students level of performance but is also helpful for the students own self-assessment. Students believed the feedback to be an important part of formative assessment, which removes misconceptions and helps to improve their understanding. They further thought that it helps to identify and fill the knowledge gaps, and is a guide for better preparation of the future examinations.

'It shows you your place and where you stand, and whether you need to work harder and which specific area you should focus on and that can really help the students.' (Student 1 (S1), Male (M))

Students also felt that feedback helped them understand clinical relevance and application of knowledge thus preparing them to be good professionals.

'Feedback improves learning because we are not doctors yet so we can correct the mistakes so that we don't make mistake again. But after we become doctors we don't have

a chance to undo that mistake. If we make a mistake then it's a matter of life and death which is the hard truth. ' (S5, M)

They thought relating basic science knowledge with its clinical application enables the students to become better doctors. Students believed that feedback allows the teachers to identify and address any issues in teaching.

'It can also help the instructors in a way that they find out what things the students are lacking in so they can focus on that more. ' (S1, M)

Faculty perceived formative assessment to be an on-going process, which helps to assess the understanding of students about the content that is taught.

'Formative assessment is basically giving knowledge in chunks. In bits or chunks it absorbs readily where to a whole bulk of food is difficult to be engulfed. It's better to take small bites and churn it well and then digest it. ' (S7, F)

Faculty believed that the purpose of formative assessment is to remove any misconceptions and improve students learning.

'When we give feedback we outline the deficiencies or the weak areas that students have and subsequently help them to overcome those weaknesses and clear their concepts and improve their learning process. '(Faculty 5 (T5), Male (M))

Teachers felt that it helps them identify the weak areas of students' learning and also reflect on their own teaching strategies in order to modify their ways for future improvement. They thought feedback following formative assessment stimulates thinking process in the students and promotes self-directed learning. Feedback was considered to be a source of guidance for improvement in future performance.

However, despite these initial favourable responses which indicate that formative assessment is fully understood by both students and teachers, there is still a wide gap between knowledge and practicality where these two facets do not seem to intersect — formative feedback is accepted in theory as a useful form of assessment but students are still reluctant to formally utilize this form of assessment to improve their learning.

'My experience was that it was not very well received by the students some students who actually study or who work hard do respond and they do try to make them better for the future exam but not all the students many of the students actually they argue they don't want to listen the changes' (T4, F)

'They are given MCQs they compare with other students, they compare with books and they know how much they have performed before we give them their feedback so they don't want to come, they don't take it seriously, the only thing they get to know is the key and probably I think the last feedback I gave there were hardly 20 students in the class out of 100 so I don't think it was good experience.' (T3, F)

Faculty feels that they are not achieving much by giving feedback.

'Honestly speaking we are not achieving anything, because we are not giving feedback in a proper way.' (T3, F)

Grades drive learning:

Both the students and the faculty felt grades to be an important element of teaching learning process. Although formative assessment was rightly understood to be for learning purposes, grades were considered necessary to measure the level of understanding of the students.

Students believed that grades allow the students to self-assess themselves, without grades they wouldn't know where they stand or what their deficiencies are.

'Marks motivate students definitely. I think it is important because it actually reflects how well or how much you need to work on because if you are not given marks you don't know what you are at in the class as a whole. I think it is important to have marks even for these "assessment for learning" because you are trying to improve every time. If you know how many marks you have that gives idea about how well you have done in the test and accordingly you can ask the teacher.....'(S4, F)

Students considered grades to be important because they provide information about their performance.

'The marks are beneficial because they tell us "as you sow so shall you reap", you know that next time you will put in more effort. Even small amount of marks give you a drive to do better in next exam.'(S6, F)

Graded assessment helps to identify the weak areas, and the feedback that follows helps to focus on these areas and improve understanding.

'Grades are necessary for assessment on which feedback is given because if you have not performed well you know that this feedback will make a difference at the end if you learn from it.' (S5, F)

'Marks should be given because that's how you assess yourself against the class and they know how well or how bad we have done. If we don't have idea about how good or bad we are for us, feedback will not matter. Grades want us to listen to feedback. Even if you have done good you want to do even better and you still listen to feedback. The students self-assess themselves through marks and you focus more on feedback.'(S6, F)

Students thought that many of them do not make enough effort for the assessment if it is not graded; they do not take the assessment seriously if marks are not associated with it.

'There should be marks because if they do not give weightage we will not prepare for that and ultimately everything will be left to the end for summative.' (S3, F)

However half of them believed that graded assessment causes stress and shifts the focus towards achieving good grades. A sense of competition prevails to perform better than other fellow students rather than to strive for learning.

'Simple formative should be for the sake of learning should not have grades, because grades cause pressure it doesn't feel good when they tell you your position in class. Pressure is on getting good grades and not on becoming good doctors, two very separate things.' (S2, M)

We found most of the faculty members aware of the fact that the purpose of formative assessment is learning and it should not be graded. They felt the focus of the students revolves around grades rather than learning if the assessment is graded.

'Yes we are doing wrong because again the purpose of the students would then be to acquire marks rather than to acquire concepts or to gain knowledge.' (T2, F)

However the majority believed that the students do not take the assessment seriously unless it is graded, they therefore assumed grades to be essential.

'If something is not marked they think that is not important for them so that is the context in which we have to do this because if we don't do this there is no attendance. I have conducted different tests and if the students know that this is formative assessment that is not going to be marked, attendance of the students in such tests is much less as compared to the tests in which we have put in marks.' (T1, F)

Teachers thought grades were important for them to judge the performance of the students, as well as to reflect on their own performance. They further thought that grades help the students in self-assessment.

Faculty felt that the students are more receptive towards feedback after graded assessment.

'I think that with the grades they will focus more on feedback. They will not be concerned then if they are not assessed or given marks the students wouldn't bother to look for the feedback or to know about the thing.' (T8, F)

However one faculty member was of the opinion that students do not listen to the feedback if the assessment is graded and another one thought that feedback is not affected by grades.

'I think their level of participation or their level of interest in feedback decreases slightly because they know that they have already been graded for that particular part of content or course or whatever. So I think their level of interest decreases but still that has a benefit still that can help.' (T5, M)

One faculty member thought that regular grading of all teaching sessions should be done followed by feedback. Another faculty member said that scores of multiple graded assessments should be combined rather than having a single examination at the end.

It was believed by the faculty that good scores are a source of motivation for the students; on the other hand low scores may cause demotivation.

'Students feel degraded if he or she does not score well of course if not degraded he feels behind the other students who have scored well and this is not the purpose of formative assessment.' (T2, F)

Fuelling the engine of learning:

Students felt that successful results of feedback depend on how teachers give feedback as well as on how much attention the students pay to the feedback. They admitted that without mandatory attendance feedback sessions are taken less seriously, and the students tend to skip these sessions. Students thought that teachers should emphasize the importance of ‘assessment for learning’, in order to create awareness about the usefulness of formative assessment. One of the students thought it necessary to prepare the students in earlier years of their student life, to study for learning rather than for achieving marks.

‘So from basic level we should tell our children that marks do not matter it’s the learning that matters and their future matters as a person and as a professional.’ (S7, F)

Similarly faculty also considered it necessary to prepare the students during their early school days to focus on learning rather than marks.

‘Effort has to be done right from the start because when the student reaches the medical school we can’t bring any change in their personality or behaviour or attitude because they have learned to study for marks and our students are also like that.’ (T2, F)

Faculty believed that in our culture students enter the medical college at relatively early age when they are still immature and unsure about actually what they want to do in future. They were of the opinion that students should have internal motivation to learn.

‘In our culture some of the students are forced by their parents and certain number of to join the medical school so the internal motivation is not there so we need to devise a process that we must assess at entry level the internal motivation of the student we are able to select only those students who are motivated to become a doctor so naturally their focus will be for learning’ (T5, M)

They thought that the students will focus on learning if they understand the importance of its application in practical life. Faculty felt that the students will focus more on learning if it has clinical relevance.

'Students are much more interested in clinicals in 1st we do something like this that whatever we teach them the basics we make it integrated if it is possible to integrate the each topic with the clinicals, it is not possible to show patients from hospital we can show videos. They will be more interested they learn more for their knowledge.' (T 4, F)

'May when the students understand the importance of knowledge and where they are going to apply it and how important is for general healthcare system so then they will understand the importance of formative tests.....' (T1,F)

'We can tell them this knowledge will be useful if this type of patient comes to you then you will require the knowledge of anatomy and physiology' (T2, F)

Teachers thought that the faculty should try to train the students to become self-directed learners, taking the ownership and responsibility of their own learning with an aim to become good future doctors.

'They themselves the students should take ownership responsibility and they themselves should take responsibility of their learning. Rather than somebody forcing them to learn this thing they should be internally motivated.' (T5,M)

They emphasized the need to direct the students towards lifelong learning to keep pace with the rapid development in the field of medicine.

'We have to motivate them for this continuous lifelong learning process especially for the doctors because in the medical there are changes that are occurring very rapid they need to be a motivated self-learners in order to keep pace.' (T5, M)

Light at the end of tunnel:

It is indeed a big challenge to overcome the misperceptions about “assessment for learning” and implement it in a culture where the idea of traditional learning is deep rooted. Despite the negativity there was indication that there might be an opportunity to change the culture.

‘We can bring a big change if we manage to move to assessment for learning that will be a change for better. That will definitely make good doctors.’ (T2, F)

Students valued feedback because it helped to clarify their concepts and improve learning.

‘Personally feedback has helped me a couple of times last year especially in the CSF-A module because that was a relatively confusing module so feedback in it removed a lot of misconceptions.’ (S2, M)

Faculty and the students suggested measures that would strengthen the process of feedback.

Timely Feedback

It was agreed both by the students and faculty that formative assessment is useful and should be frequent and regular. Teachers can facilitate learning through interactive teaching, by asking questions to assess their understanding and giving immediate feedback.

‘I think we need to make it very regular and we need to give feedback not necessarily after assessments but during delivery of curriculum we should always looking for outlining the deficiencies of the students and helping them giving them feedback.’ (T5, M)

Many students were in favour of regular formative assessments after every theme or every week. This, they thought will help the teachers to maintain a check on the students understanding during the on-going session and the students will be able to judge their own performance, making timely rectification of the misconceptions before the summative

examination. Similarly faculty also thought that more frequent formative assessment will be helpful.

Both teachers and the students believed that timely feedback given immediately without much delay is more useful.

Detailed Feedback

Most students felt that the feedback after assessment should be specific and given in detail, discussing all the questions one by one, rather than pointing out generally the mistakes made by majority of the students. Students thought that sometimes teachers give feedback so quickly that the students are unable to grasp the concepts. It was suggested that they give feedback at a pace on which the students are able to get its benefit. They further thought that when formal feedback is given after assessment their response sheets should be given to them so that they can compare their work with what should have been the response.

One of the students said that teachers should guide them on time management, as well as on writing skills.

'It's not only just the knowledge it is already in books if we are to just go and read surely we will but some of the things that you don't have in books e.g. time management, length of answers, key words and how to write your answers or whether you should add diagrams or tables. We don't get this sort of help from feedback.' (S4, F)

Individual Feedback

Most of the students emphasized the need of individual feedback to gain maximum benefit from it.

'If formative feedback is one to one so that I can convey my issues and my concerns with my module head. The one to one interaction will help me to remove misconceptions more.' (S2, M)

Faculty felt that feedback is more useful when given individually to each student; it allows discussion of specific problems with each student individually.

'Proper way is to focus on individual learner and not to focus on the class so if you focus on the individual learner deficiencies and gaps I think the feedback can be helpful.' (T3, F)

They further thought that individual interaction with the students will encourage them to discuss various issues that can help the teachers to reflect and modify their teaching and assessment strategies.

'We do realize our mistakes and we definitely try to work on that.' (T2, F)

'When we get the results of feedback, when we interact with students during feedback, we get to know which are the points on which we need to stress upon more when we are teaching and we can improve our teaching by stressing more on those points when giving lectures may be device new strategies so that the students learn and get interested in that topic in the first place rather than we get to know afterwards.' (T1, F)

'I always learn from the feedback that I give by interacting with the students, what are the flaws.' (T7, F)

Feedback Delivery:

One of the teachers laid emphasis on the need to improve the delivery of feedback. Feedback should be specific, avoid blaming and aimed at improvement of learning.

'The way we give feedback needs to be improved, because we need to be very very specific and it needs to be for the improvement of learning and the attitude should be that we are helping the students rather than blaming them.' (T5,M)

Another faculty member felt that feedback delivered face to face may be associated with embarrassment to some of the learners, making them uncomfortable. They may be given feedback through e-mail.

DISCUSSION

I aimed to explore the understanding of students and faculty about the effectiveness of feedback given on graded knowledge assessments throughout the academic year and to suggest measures for improved feedback practices.

The present study investigates the understanding of students and faculty about the purpose, content and process of feedback (Research question 1 and 2). This study demonstrates how students and the faculty view formative assessment. The students link formative assessment with day to day learning that helps teachers judge the students' performance levels and also allows them to identify and address any modifications required in teaching methods. They believe feedback to be an important part of formative assessment, which removes misconceptions and helps to improve their learning. Further, it helps in self-assessment, enabling them to identify and fill the knowledge gaps and provides guidance to prepare them for future examinations; this is supported by evidence provided by Carrillo et al (2009) in a study which shows that the students who participate in formative assessments perform better in the summative exams. Students view formative assessment to be less stressful as compared to the summative form of assessment. Students' views from another study about summative exams leading to anxiety are consistent with our findings (Al Kadri et al, 2011).

Faculty considers formative assessment to be an on-going process that occurs during the course and helps assess the understanding of students about the content that is taught, remove any misconceptions and improve students learning. It helps them identify the weak areas of students' learning as well as reflect on their own teaching strategies in order to modify their ways for future improvement. This is consistent with the views of the faculty

depicted in the research conducted by Bell and Cowie (2001) who consider formative assessment to be an on-going process which allows the teachers to judge where the students stand and then use this information to improve their own teaching. My findings are supported by the seven principles of good feedback identified by Nicol and Macfarlane (2006).

Although students and the teachers understand the purpose of formative assessment in theory, the students do not use it to improve their learning. The findings for my second research question which probes the role of grades indicate that grades are considered essential for the students to take the assessment seriously. Most students justify the grading system by saying that without grades they wouldn't know where they stand among peers; however evidence suggests that use of grades is not as such effective for improving students' performance (Lipnevich and Smith, 2008). Another study shows that with grading students are superficially contented to reach a certain level without actually striving to excel in learning (Harrison et al, 2016). Butler (1988) argued that grades have a lesser effect on improving performance compared to feedback alone. The truth appears to be that if an assessment is graded students become competitive, and they begin to make an effort to surpass their peers in achieving grades rather than to acquire knowledge that would last to make them good professionals.

Despite their belief that grades shift the focus of students towards marks rather than learning, faculty consider grades to be important for them to judge the students' performance and for students' self-assessment. Some teachers think students are more receptive to feedback when the assessment is graded. However one faculty member feels that the students do not pay attention to feedback if the assessment is graded. My study

shows that the faculty believes good scores to be a source of motivation for the students; on the other hand low scores are thought to cause demotivation. Schinske and Tanner (2014) infer in their review that high scorers are motivated but low scorers get demotivated. However, Butler (1988) argues that feedback given without grades enhances motivation.

This study provides an insight into how students receive and use feedback. Success of feedback depends not only on the way it is delivered but also on how eager the students are to receive it. Eva et al (2012) believe it to be important, how feedback is received and interpreted.

This study also examined (research question 3) how the students and teachers use the results of feedback to inform their future performance as learners or teachers. It appears from the student's and the faculty's views that the students do not take formative assessment and feedback seriously unless they are pushed to do so. Grades and mandatory attendance are therefore used as tools to ensure students participation in assessment and feedback. The students care less about learning during feedback sessions because they have been brought up in a culture where focus of education has always revolved around achieving marks to avoid failing. These findings are supported by another study conducted by Harrison et al (2015), who found that in summative assessment students have a fear of failure and study to get through the exams thereby losing the opportunity to learn. It is emphasized by teachers and the students that this culture needs to be changed. Awareness about the importance of studying for the sake of learning rather than to study for marks should be created from the early years of school. Students will aspire to learn if they have been trained to do so from the beginning. When they enter medical college they come with a mind set to study for getting good grades, hence they consider any assessment without

grades to be unimportant. These findings are consistent with those found in a study conducted to explore cultural challenges for implementation of formative assessment in Saudi Arabia, in which students regarded test grades a priority (Al-Wassia et al, 2015). Teachers themselves have to be convinced about the importance of ‘assessment of learning’ to make the students conscious of its benefits.

My study found another reason for the student’s lack of motivation to learn. Teachers are of the opinion that students in our setting enter medical college at an age when they are still not mature enough to make their career choice and are unsure about their future career plans. At times, familial pressures are the sole reason for their entry into the medical field, this leads to a dearth of enthusiasm to learn. The faculty emphasizes on a need to devise a mechanism through which students at the time of entry into medical college are assessed for internal motivation. Findings are supported by a study which reports age to be a predictor of strength of motivation (Kusurkar, 2010).

Teachers feel a need to encourage the students to become self-directed learners, taking the ownership and responsibility of their own learning. They will seek learning when they realize its importance for becoming good doctors in the future. Faculty deems it necessary to direct the students to become lifelong learners in order to keep pace with rapid development in the field of medicine.

This study demonstrates teachers’ beliefs that the students will focus more on learning if they understand the application of knowledge in clinical practice. This will help them relate their learning with future practice.

Although recent trends in medical education have led the world to move towards a constructivist approach, most developing countries still have a long way to go. It is a big

challenge to move from a behaviourist to a constructivist mind set especially when it comes to assessment. 'Grade culture' deeply embedded in the education of our country is hindering the process of learning (Rauf et al, 2014). However, despite all these challenges it is encouraging to find in this study that both the faculty and the students consider assessment for learning to be a better change, and value feedback for enhancement of learning.

The study finally (research question 4) aimed to explore, how the process and content of feedback on assessment of knowledge can be developed to improve its effectiveness. This study gives an insight into the characteristics of feedback that will strengthen the process by increasing its effectiveness in our context. It is suggested that assessing students regularly on whatever has been taught will allow the teachers to identify and rectify any misconceptions through immediate feedback. This will help the students to build further knowledge on correct concepts. If there is a delay in assessment and clarification of concepts, their further learning will be held up. Similar findings have been found in a study conducted by Alhaqwi (2012), in which the students considered feedback to be important for their learning and thought receiving regular feedback was essential. They further emphasize a need for immediate feedback. Literature shows mixed evidence related to timing of feedback. Some studies support immediate feedback; others emphasize the benefits of delayed feedback (Shute, 2008). Hattie and Timberly (2007), support the effectiveness of immediate feedback. Butler (2007) on the contrary shows the beneficial effect of delayed feedback.

Another characteristic identified by most students is that the feedback after assessment should be specific and given in detail. Study by Lipnevich and Smith (2008) also indicates

that specific and detailed feedback is beneficial. Students think teachers should discuss all the questions, rather than pointing out generally the mistakes made by majority of the students; in this way the misconceptions of the minority will never be addressed. These findings are consistent with another study in which students thought feedback should cover all the questions (Weston-Green and Wallace, 2016). Students think that sometimes the teachers give feedback so quickly that the students are unable to grasp the concepts. It is suggested that they give feedback at a pace with which the students are able to keep up and are able to reap the maximum benefit from it. This problem can be dealt with by allocating ample time for feedback in the time table, considering that it plays a pivotal role in the improvement of learning. They further think that when formal feedback is given after assessment their answer sheets should be given to them so that they can compare their work with the correct answer explained during feedback. Furthermore they need guidance on time management and the way to answer different formats of questions. They may be clear on concepts but their expression may not be appropriate.

This study demonstrates the need for individual feedback. Both faculty and the students emphasize on the importance of interacting with individual students during feedback. These findings are comparable with views of students found in the study conducted by Alhaqwi (2012) in which students supported individual feedback. During one to one interaction each student will be encouraged to discuss various issues that may help the teachers to reflect and modify their teaching accordingly (Bell and Cowie, 2001).

An important characteristic of feedback identified by one of the faculty members of this study is to focus more specifically on learning rather than blaming the student. Feedback should be aimed at improvement of learning, negative comments towards the student can

discourage them from attending feedback sessions and use it effectively, resulting in a negative impact on learning. One way of avoiding the embarrassment caused to some of the students by face to face interaction with the teacher during feedback, it is suggested, is to give feedback through email.

This study proposes robust measures to facilitate the receptivity, use and effectiveness of feedback, which is an integral part of formative assessment. This may enhance learning, which will have long term implications on the healthcare system.

Using constructivist grounded theory approach (Mills et al, 2008) the themes were analysed through constant comparative technique, and a framework was developed for effective feedback on knowledge based summative assessment in our setting. (Figure 3)

The results of this study suggest modifications at three levels. (Figure 4)

1. Early years of school
2. Entry into medical college
3. Undergraduate medical education

Level 1

If the students are exposed to ‘assessment for learning’ during their early education in school, they will be cognisant with the idea of studying for learning rather than to study for getting pass grades. This will encourage them to study in pursuit of knowledge, and inculcate a habit of self-directed learning in them from the beginning. When they enter the medical college with this mind set they will have a quest for learning. It is difficult to change their attitude towards learning when they enter the medical college if they have been brought up in a behaviourist environment.

Level 2

Students in our country enter the medical schools at a relatively early age when they are still immature and unsure about the path they want to follow in the future. Sometimes their parents make a decision about their career choice. So when they enter the medical school they lack internal motivation and do not have the drive to learn. We need to design mechanisms to assess the students for internal motivation, selecting those who have a desire to become doctors and are passionate to learn.

Level 3

At the undergraduate level, the medical faculty should emphasize on the importance of 'assessment for learning', and make students aware about the usefulness of formative assessment. This will promote self-directed learning. Formative assessment should be done regularly at the end of every theme during the module. The content and process of feedback, which is an important part of formative assessment needs to be improved to make it more effective.

What to deliver:

Feedback should be given in detail, discussing all the questions in the paper rather than discussing only those questions which have been attempted wrongly by the majority of the students. The discussion on MCQ's should be in detail about why the correct option is correct and the reason why other options are wrong. Any misconceptions should be corrected and students should be explained in detail how they are expected to attempt the questions including more specific details such as the length of the answers for short answer questions.

When to deliver:

Immediate feedback after the formative assessment is useful. Delayed feedback may not be as effective.

How to deliver:

Answer sheets should be given so that the students are able to compare their answers with the correct answer explained during feedback, identify the deficiencies and clarify the concepts. More time should be allocated for feedback in the timetable to allow the teachers to deliver feedback at a pace that enables the students to grasp the concepts.

Feedback should be given individually rather than in large groups. When feedback is given in small groups of 10 to 12 students, it is possible to address the problems of students individually. Feedback should be an interactive discussion which helps students as well as the teachers to reflect on their teaching. Feedback should be specific to the performance aiming at improvement of learning and blaming should be avoided.

LIMITATIONS

This study helped faculty and the students to reflect on the process of feedback recognizing its significance as a valuable resource for knowledge building and improved learning. The study allowed the faculty to reflect on the weaknesses in the process and the ways which can strengthen it.

Students were asked to volunteer via e-mail, but the responses were not sufficient and hence, I had to approach them directly during their small group discussion sessions, describing the purpose and process of the study in order to get more students to volunteer to participate in the study. However this could have biased my findings because probably only those students volunteered who valued feedback.

Some of the main challenges during this study included time constraints; i.e. students were unavailable initially for the focus group, as some of them were out of the city on an excursion trip. Moreover, end of module examinations coincided with the planned interview timings and thus, the individual interviews had to be postponed to match the availability of students and the faculty. The study was conducted in a single institution and the results may not be generalizable to other institutions. However the results may be applicable to other medical colleges within Pakistan as well which have similar settings, as the students entering the medical profession across the country have more or less similar cultural and educational background.

Being one of the senior faculty members, the students might have been reluctant to talk freely during face-to-face encounter due to fear of its negative impact on them. They were,

however, reassured of complete anonymity and confidentiality which encouraged them to be more cooperative and expressive of their views.

It was a good decision to conduct in depth interviews both with faculty and the students to gather their views however a questionnaire along with the interviews would have been helpful to triangulate the data.

CONCLUSIONS

“Assessment for learning” is the need of the day. Both faculty and the students understand the purpose and significance of formative assessment. However deeply embedded culture of grades may hinder the process of learning. The modifications in the system starting from the level of school, entry into medical college and then at undergraduate medical education level are required to enhance the internal motivation for learning. Major adjustments in the assessment-feedback process are required to promote self-directed learning.

Further research into the ways to develop motivated self-learners at the level of early school years and improve the assessment of the motivation level of the candidate at the time of entry into medical college is needed for efficient learning during medical education.

Figure 3: Framework for Effective Feedback

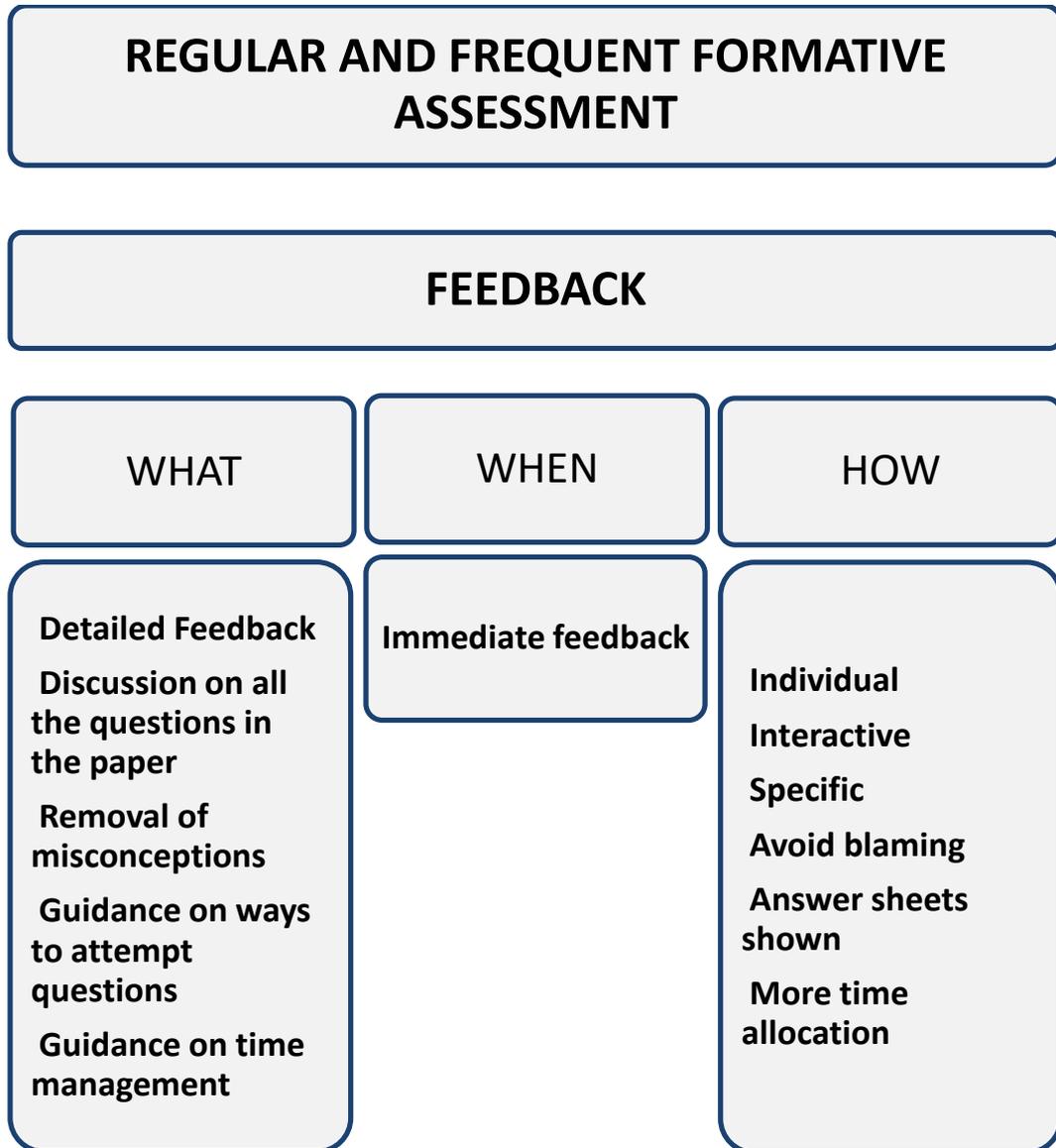
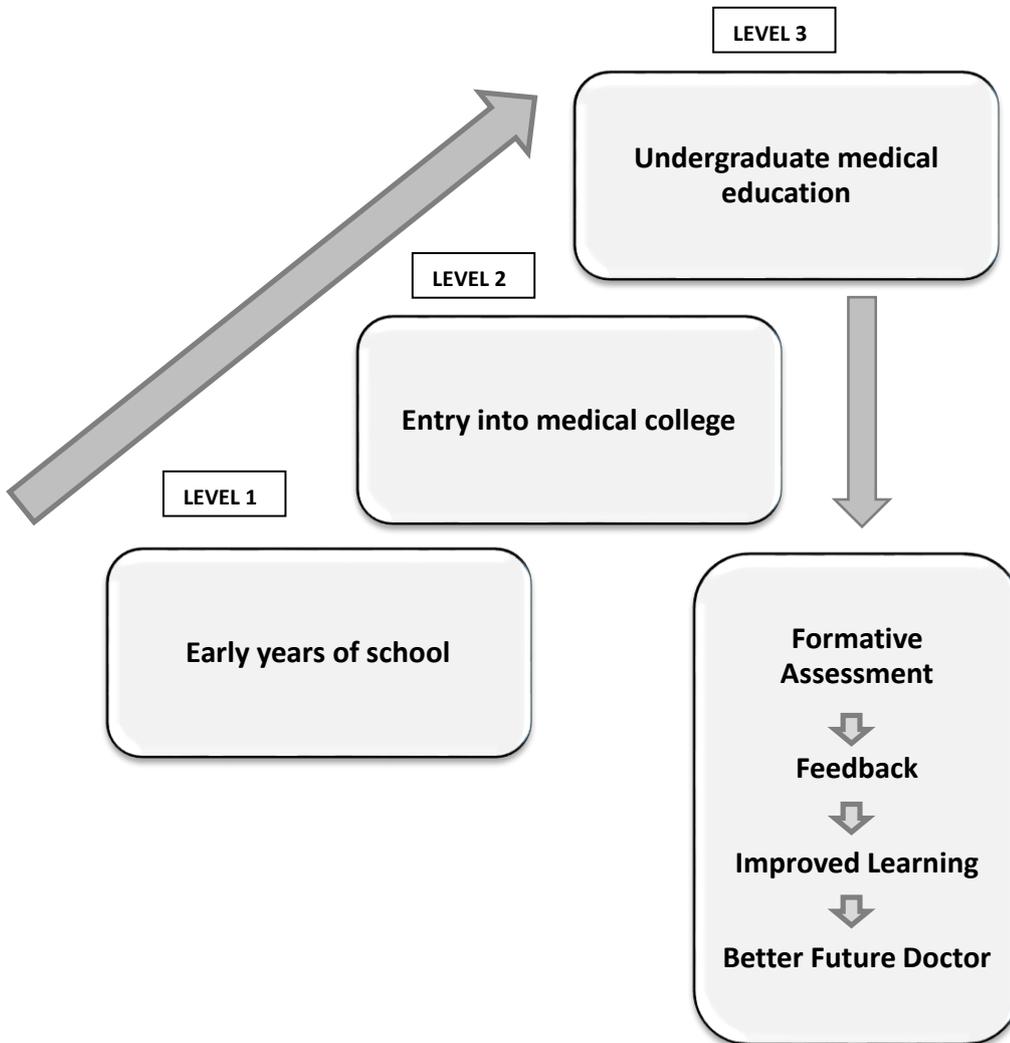


Figure 4: Three Levels suggested for modifications



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Appendix A

Questions for faculty focus group

1. What in your view is the purpose of giving feedback on knowledge based tests during modules and on end of module assessment throughout the year?
2. What are your views about content and process of the feedback given on knowledge based tests during the modules and on end of module assessments to the 1st year students?
3. What is the role of the grade in this assessment/feedback process?
4. How do you use this feedback to improve your future performance as a teacher?
5. How can the process and content of feedback on assessment of knowledge be developed to improve its effectiveness?

Appendix B

Questions for students focus group

1. What in your view is the purpose of giving feedback on knowledge based tests during modules and on end of module assessment throughout the year?
2. What are your views about content and process of the feedback on knowledge based tests during the modules and on end of module assessments that you experienced during 1st year?
3. What is the role of the grade in this assessment/feedback process?
4. How do you use this feedback to improve your future performance?
5. How can the process and content of feedback on assessment of knowledge be developed to improve its effectiveness?

Appedndix C

Semi structured interview questions for students

1. What do you understand to be the difference between formative (assessment for learning) and summative assessment (assessment of learning)?
2. Why do you think there is an international move to assessment for learning rather than assessment of learning?
3. What do you think the faculty is trying to achieve by giving feedback on knowledge assessment?
4. What do you think we are achieving by giving feedback on knowledge assessment at Shifa College of Medicine?
5. What is your experience about receiving feedback after knowledge assessment?
6. How do you view the role of the grade in relation to the feedback you are receiving?
7. How did you use the results of feedback? How does that help in improving your learning?
8. What do you think will work for you in particular to move towards assessment for learning?
9. Give your views about what will move the students towards assessment for learning?
10. What would you like faculty to do to achieve this?

Appendix D

Semi structured interview questions for faculty

1. What do you understand to be the difference between formative (assessment for learning) and summative assessment (assessment of learning)?
2. Why do you think there is a move to assessment for learning rather than assessment of learning?
3. What do you think the faculty is trying to achieve by giving feedback on knowledge assessment?
4. What do you think we are achieving by giving feedback on knowledge assessment at Shifa College of Medicine?
5. What is your experience about giving feedback after knowledge assessment?
6. How do you view the role of the grade in relation to the feedback you are giving?
7. How did you use the results of feedback? How does that help in improving your performance as a teacher?
8. What do you think will work for you in particular to move towards assessment for learning?
9. Give your views about what will move the students towards assessment for learning?
10. What should the faculty do to achieve this?