

Learning and Teaching in Microbiology: Students' Perception

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Abstract: Aims and objectives: The aim of the study was to evaluate the students' perception regarding the existing teaching system in Microbiology in our college. We also attempted to implement the changes suggested by the students' after analyzing the feedback. Feedback was taken again after the changes were made. Materials and methods: A structured validated questionnaire on teaching methodology was distributed among one hundred and ninety two second year MBBS students at the end of second term. The changes suggested were implemented and a questionnaire was given at the end of third term. The data was collected and analysed using simple statistical methods. Results: Sixty nine percent (69%) of students felt that the changes suggested in the second term were implemented in third term. Students were taught using tutorials and seminars and seventy six percent (75.9%) students said they benefitted from them. Students found revision practicals were conducted systematically. Conclusion: Feedback should be an ongoing process to know about students' perspectives. The feedback from the student's facilitated a change in teaching methodology by the faculty. It is evident from the feedback that the students' were satisfied with the changes adopted in our department. They found the department student-friendly & approachable after the feedback. [Shazia C NJIRM 2016; 7(6): 25-28]

Key Words: Second MBBS, medical students, Microbiology, Feedback

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Introduction: Medical microbiology is a study of the medically important pathogens which is a part of the second year MBBS curriculum. Students Learn about the aetiology, pathogenesis and diagnosis of infectious diseases which further helps them to become a clinician with sound knowledge of clinical microbiology.

Needs of students are changing and the role of educators is being redefined at the same time. One has to keep pace with the ever-changing needs of the students and changing trends¹. It is accepted that reviewing the teaching and evaluation methods by feedback from students and modification of methodology accordingly is very important in the undergraduate medical teaching^{2,3}. Students' feedback represents the primary means used by most programs to assess their methodology⁴.

A PubMed search with keywords microbiology and teaching showed that this is one of the few studies to be done for the subject of Microbiology where not only feedback was taken from students but it was also acted upon and reviewed again in the next term.

Aims and objectives: The aim of the study was to evaluate the students' perception regarding the existing teaching system in Microbiology. Furthermore the study also attempted to implement the changes suggested by the students' after analysing their feedback. The students' perceptions were again

studied after implementing the changes suggested in teaching system.

Methods: Setting and participants: This cross sectional study was conducted at the Department of Microbiology, Grant Government Medical College, Mumbai, India. Second year undergraduate medical students participated in the study.

Data collection: A structured prevalidated questionnaire was developed by the authors to know students' perception about learning and teaching in microbiology. The questionnaire containing 13 questions was distributed amongst 192 second year MBBS students of year 2012 at the end of the second term. The second year of MBBS is of eighteen months duration consisting of three terms and each term is of six months duration. Feedback was obtained at the end of the second term. The changes suggested by the students' in the second term were implemented and again a structured questionnaire was given at the end of the third term.

The students were asked not to disclose their identities in order to make them express their ideas freely. The students were asked to tick the option they considered was the best. A section on comment or a suggestion was included where the students could add their ideas for the same. The study was approved by the Institutional Ethics Committee.

Analysis: The data collected by taking feedback in the second and the third term was then analysed using simple statistics.

Results: In the second term, out of one hundred and ninety two students (192), one hundred and sixty two students responded (162) to all the questions and were considered while analysing the results. In the third term, one hundred and eighty (180) students responded to all the questions.

The tenure in Microbiology is for one and half years and thus the topics covered in the second and third term are different thus the questionnaires for second and third term include different questions. There were 2 common questions which have been shown in the figures I and II.

The result of feedback taken in second term is shown in table I and in third term is shown in table II.

Table I – showing results of feedback taken in second term from 162 students, Grant Government Medical College, Mumbai, India, 2012.

Question	Yes	Not Always	No	Never	No comments
Do you think revision should be kept at the end of lecture?	92 (56.79%)	58 (35.80%)	6 (3.70%)	6 (3.70%)	-
Were complex issues simplified in the lecture?	52 (32.09%)	98 (60.49%)	9 (5.55%)	3 (1.85%)	-
Did the lecture arouse curiosity in you?	51 (31.48%)	90 (50.55%)	17 (10.49%)	3 (1.85%)	1 (0.61%)
Was participation encouraged during teaching?	62 (38.27%)	76 (28.39%)	18 (11.11%)	5 (3.08%)	1 (0.61%)
Did students have opportunity to :					
Discuss	48 (29.62%)	69 (42.59%)	37 (22.83%)	4 (2.46%)	4 (2.46%)
Clarification	82 (50.61%)	62 (38.27%)	9 (5.55%)	2 (1.23%)	7 (4.32%)
To raise issues	74 (45.67%)	54 (33.33%)	21 (12.96%)	7 (4.32%)	6 (3.70%)
Provide feedback	73 (45.06%)	63 (38.88%)	19 (11.72%)	5 (3.08%)	1 (0.61%)
Which lecture session did you enjoy?	Bacteria 86 (53.08%)	Mycology 48 (29.6%)	Virology 28 (17.2%)		
Do you want improvement in presentation?	Yes 47 (29.01%)	No 68 (41.97%)	No comment 47 (29.01%)	-	-
How are the practical classes conducted?	Excellent 62 (38.27%)	Good 74 (45.67%)	Average 15 (9.25%)	Needs improvement 11 (6.79%)	-

Footnote: Two questions were common to both the questionnaires used in second and third term which are shown in Figure 1 and Figure 2.

This table shows the response to the questionnaire distributed in second term of MBBS amongst 162 students in Grant Government Medical College. The

portion for second term consists of Bacteriology, Virology and Mycology and these questions were used to analyse the current teaching methodology practiced in our college. A comment section was included at the end of the questionnaire for students for individual comments.

Table II-showing results of feedback taken in third term from 180 students, Grant Government Medical College, Mumbai, India, 2012

Question	Excellent	Good	Average	Needs improvement	No comments
How was the Parasitology lecture session?	36 (20%)	102 (56.66%)	30 (16.66%)	12 (6.66%)	-
How are revision practicals conducted?	120 (66.66%)	56 (31.11%)	2 (1.11%)	2 (1.11%)	-
How was teaching in third term?	48 (26.46%)	111 (61.66%)	18 (10%)	3 (1.66%)	-
How were the practicals conducted?	79 (43.88%)	101 (56.11%)	-	-	-
How were seminars conducted?	79 (43.88%)	75 (41.66%)	20 (11.11%)	6 (3.33%)	-
How were the tutorials conducted?	80 (44.44%)	90 (50%)	6 (3.33%)	4 (2.22%)	-

Question	Yes	No	-	-	-
How was the overall teaching in third term?	57 (31.66%)	113 (62.77%)	8 (4.44%)	2 (1.11%)	-
Were the changes implemented?	125 (69.44%)	55 (30.55%)	-	-	-
Did tutorials benefit them?	137 (75.9%)	43 (24.1%)	-	-	-
Did you enjoy the seminar?	152 (84.33%)	28 (15.67%)	-	-	-

Footnote: Two questions were common to both the questionnaires used in second and third term which are shown in Figure 1 and Figure 2.

This table shows the response to the questionnaire distributed in third term of MBBS amongst 180 students in Grant Government Medical College. We modified the questionnaire based on the teaching practices adapted at the end of second term (as per the feedback obtained from the first questionnaire). The third term consists of parasitology and revision sessions. This questionnaire evaluated the feedback to the changes implemented and their effectiveness.

Discussion: It has been stated that learning is enhanced by feedback and this is true not only for students' but also for the staff involved in teaching them⁵. Feedback taken in second term made us aware of the students' perception in teaching Microbiology and it was divided mainly in terms of theory and practicals.

This study is unique because as per our knowledge no studies have been carried out in the subject of Microbiology especially the ones which utilise the feedback and act upon it and study the results.

As seen in table II, 29.01 % (n=47) said that the presentation used for teaching topics must be changed. This maybe because of the fact that the professors may not have incorporated the changes from the new edition into their old presentations and perhaps they used a lot of written matter rather than using a pictorial presentation which may have kept the students more engaged. As shown in table 1, the session which students liked more was bacteriology followed by Mycology and Virology.

The comment section showed that they wanted the lectures to be more interactive, clinically oriented and of less duration so that they could be equated with medicine. They suggested comparative type of teaching as many organisms are taught in Microbiology. They also suggested that the teaching should be done by both blackboard and audio-visual

aids which correlates with the study done by Bhowmick et al and Dash et al^{6,7}. The reason for use of blackboard could be as students felt few teachers read the slides without actually explaining the topic. They also suggested weekly multiple choice questionnaires and monthly tests. It was found that the students prefer small group teaching which is why the tutorials, seminars were fashioned in such a way that not more than ten to fifteen students were in a batch at a time. This also corroborated with a study carried out by Jaykaran et al¹. Tutorials and seminars were conducted in third term. Feedback taken in third term showed that 75.9 (n=137) of the students benefitted from tutorials and 84.33 % (n=152) of the students enjoyed the seminars as shown in table II. We think that they enjoyed the seminars very much as each student's participation was encouraged and they got an opportunity to interact, discuss, seek clarification, ask questions and provide feedback.

The teaching material was changed by using more pictures in the presentation as well as actively using the blackboard whenever possible. This reflected in the change in the answer to the quality of materials used where 22.77 % (n=41) of the students' felt the teaching material used was excellent and now only 0.55 % (n=1) thought that it needed improvement, as seen in Figure II.

Regarding practicals the feedback of students' in second term was that 38.27 % (n=62) thought they were excellent, 45.67 % (n=74) felt they were good and 6.79% (n=11) thought they needed improvement as seen in Table I. The reason for this need of improvement was found in the comments section where they said that the batch teacher should be changed every term. They appreciated the idea of keeping culture media and biochemical reactions in every practical in second term. They also requested that a particular teacher who put maximum efforts to explain difficult topics and make subjects easier to understand should take a common briefing in practical followed by other batch teachers showing the spots. They also wanted a separate session for focusing microscopes as they had a lot of difficulties in

that. These changes were implemented in the third term. They were divided into small batches and given individual attention and slides to focus, till they were comfortable with the use of microscopes. More revisions were kept and they were given printouts of revision spots a day prior so they need not waste time in writing it down. In our department we have made lists of spots along with clues for identification of spots and probable questions which can be asked on the spots. This was given to them before revision practicals so that it became easy for them to understand the spots. Thus the third term showed that now 66.66% (n=120) thought that the practicals were conducted in an excellent manner.

In the third term 37.22%(n=67) of the batch felt that the overall teaching in microbiology was excellent compared to the meager 10.49% (n=17) in the second term as seen in figure I. The need for improvement dropped down from 1.23% (n=2) to 0%. The only other comment we saw was that the seminars should not be held in the last few months of the term as they felt it was very close to the university exams. This was taken into consideration for the next batch.

A discussion session organised in the end of the year showed that the students were satisfied with the overall teaching in Microbiology. A total of 69.44% (n=125) felt that the changes and comments given in the second term were acted upon and were implemented by the department. They also felt that the idea of taking feedback was novel and beneficial as no department had done it before and that it does become difficult to convey to senior teachers face to face about what they feel about lectures and practicals which was done via the anonymous questionnaire. They said that Microbiology department is student friendly, approachable and is trying to introspect. They also wrote that "Microbiology Department Rocks". A survey done in our college to know the best academic department for UG teaching showed that our department is the one that is most liked by the students' which was personally communicated by the Dean of the college to the Head of the Department.

Conclusion: We conclude that the feedback from the students' helped facilitate a change in the teaching methodology principles on the part of the faculty. This result can be used in planning and designing teacher-training programs. We hope that this paper will encourage other faculty to work with their students' in establishing what the students' most and least

preferred teaching styles and the reasons for it. This feedback can be discussed by staff and can begin the process of involving students' in the teaching process.

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Conflict of interest: None
Funding: None
Cite this Article as: Shazia C, Sarala M, Ashwini R, Abhay C Learning and Teaching in Microbiology: Students' Perception. <i>Natl J Integr Res Med</i> 2016; 7(6): Page no: 25-28