
Assessment of perception of first professional MBBS students in India about a teaching learning activity in Biochemistry

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Abstract

Objectives: To obtain feedback from the 1st Professional MBBS students on their perception of the existing method of lecture classes in Biochemistry.

Method: A semi-structured questionnaire based study was conducted at the Department of Biochemistry, Medical College and Hospital, Kolkata, West Bengal, India, under the West Bengal University of Health Sciences. The subjects were the 1st Professional MBBS students in the 1st semester of the academic year 2008 – 2009.

Results: Three items with the highest and least Satisfaction Index were segregated and compared against an 'average satisfaction' of 66.67%. The summary of the consolidated observation on the most appreciated and least appreciated aspects and suggestions for improvements were taken into consideration and discussed. Further, Interpretation of the feedback reflected that the learners still preferred to be taught in a predominantly individualized care-based environment.

Conclusion: Feedback from the students facilitates a change in preconceived notions about teaching-learning principles on the part of the faculty. At the same time, it is evident from the feedback obtained that the students still prefer to be taught in an individualized care-based environment which reflects their lack of or incomplete attitudinal shift towards the more institutionalized care-based environment of a medical education institution.

Keywords: medical students; undergraduate teaching; students' feedback evaluation; attitudinal shift, lecture session.

Introduction

The undergraduate medical curriculum in India is oriented towards training students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, promotive, curative and rehabilitative aspects of medicine.

During the training period, adequate emphasis is placed on inculcating logical and scientific habits of thought; clarity of expression and independence of judgment; and ability to collect and analyse information and to correlate them. In view of the above objectives, the broad goal of teaching Biochemistry to undergraduate students is to make them understand the scientific basis of life processes at the molecular level and to orient them towards the application of knowledge acquired in solving clinical problems.

The rules, regulations and guidelines for undergraduate medical education in India are under the governance of the Medical Council of India (MCI). The duration of the course in basic sciences had been one-and-a-half years

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comprising of three semesters until the year 2000. Subsequently, as per recommendations of the MCI, the duration has been reduced to one year comprising of two semesters. The knowledge in biomedical sciences is progressing in leaps and bounds. Consequently, a reform in undergraduate teaching is the need of the hour. On the other hand, MCI has specified 240 hours of teaching for completion of the curriculum in this discipline (Regulations on Graduate Medical Education, 1997). Hence judicious and optimum utilization of these teaching hours is of utmost importance for attaining the specified objectives. In this regard, the Department of Biochemistry, Medical College, Kolkata, follows a systematic policy for lectures, which involves division of each broad section into a requisite number of individual lectures and outlining the specific learning objectives for each of these classes in accordance with the guidelines laid down by the MCI. This system permits the assignment of each lecture to a particular faculty member without the possibility of omission or repetition of any part of the topic, while simultaneously ensuring that any particular section is covered by a group of speakers thus avoiding bias and monotony.

Moreover, in the state of West Bengal, there has been a change in the scenario of medical education with the establishment of West Bengal University of Health Sciences (WBUHS) in the year 2003 (Statutes of the West Bengal University of Health Sciences). All the medical colleges in the state that were under the purview of different universities were brought under WBUHS in an attempt to ensure uniformity in syllabus, teaching and evaluation procedures. Subsequently, the University formulated a revised syllabus in accordance with the curriculum recommended by the MCI in the year 2003 (Syllabus in Biochemistry for 1st Professional MBBS of the West Bengal University of Health Sciences). This syllabus has outlined the specific learning objectives of each lecture and the total hours of lectures required for completion of the syllabus. The University has been conducting the 1st Professional Examination for the last four years. Hence, it is deemed to be the ripe time to assess the students' perception of the usefulness and relevance with regard to content of the syllabus, teaching-learning methods and teaching-learning media.

In addition, a majority of the students who are admitted to the undergraduate medical course in

India come through an elaborate system of private tuitions and coaching classes during their '10+2' level. This makes them habituated to learning in an individualized care-based environment. Hence these students have to cope with a drastically different set up when they attend the first semester lecture classes in a medical college.

Therefore, the present study was undertaken to elicit the perception of the students regarding the utility of the prevailing system of lectures and to evaluate the extent to which the students are benefited by these teaching methodologies. For this purpose, a semi-structured evaluation questionnaire was developed with the scope of giving individual opinion on content of the syllabus, teaching-learning (T-L) methods and teaching-learning (T-L) media. It was perceived that this feedback obtained from students could then be used to modify the mode of imparting knowledge according to the students' perceived learning needs. Also, an assessment of the attitudinal shift of these students may be performed from their feedback to gauge how far they have been able to cope with the existing predominantly institutionalized care-based medical education system.

Materials and Methods

The first semester students who had completed 3 months of the curriculum were selected for the study. A total of 107 respondents were selected by random sampling from the total student strength of 157 after having obtained their informed consent. The questionnaire devised for the present study was divided into three sections viz. A, B and C. Sections A and B consisted of ten questions with three options each. The students were instructed to pick the option to each question which they felt was most appropriate. The respondents were also encouraged to furnish their independent and unbiased opinion regarding certain other aspects of T-L principles viz. things most appreciated, things least appreciated, suggestions for improvement and any other remarks in section C of the questionnaire. The participants were also instructed not to provide any personal information, nor to reveal their identity in the questionnaire. Further, the students were discouraged to put in writing any individualized comment about the faculty members or their way of teaching. The completed response sheets were collected and statistically analysed to compute the results using Microsoft Excel.

Results

The responses obtained under section A, were statistically treated to calculate the Satisfaction

Indices (SI) for each item therein (Guilbert, 1991). 'Average Satisfaction' for the particular method and parameters for calculation of SI was 66.67 %. These results are depicted in table 1.

Table 1: Satisfaction Indices (%) of responses (n = 107) for items in Section A of the questionnaire

Teaching – Learning Process	Satisfaction Index (%)*
1. Are the objectives (what is to be taught) clearly outlined at the beginning of each lecture class?	82.78
2. Do you generally understand the concepts outlined?	85.89
3. Do your teachers give enough opportunity to clarify your doubts?	75.00
4. Do you think that the language of presentation is simple?	94.60
5. Are the topics of lecture arranged in logical sequence well suited to your understanding?	81.23
6. Do you think continuity between individual lectures is maintained adequately?	74.07
7. Do you think your teachers encourage interactive learning in the form of asking or raising questions themselves or allowing you to ask questions?	87.14
8. Are the most important points summarized at the end of a presentation?	66.60

* Statistical Calculation for computing the Satisfaction Indices in Table 1 yielded an 'Average Satisfaction' of 66.67%.

The percentage of responses for section B is depicted in figure 1. The consolidated observations for number of appraisals regarding

overall assessment in section C of the questionnaire are presented in figures 2, 3 and 4.

Figure 1: Percentage of responses (n = 107) for items in Section B of the questionnaire

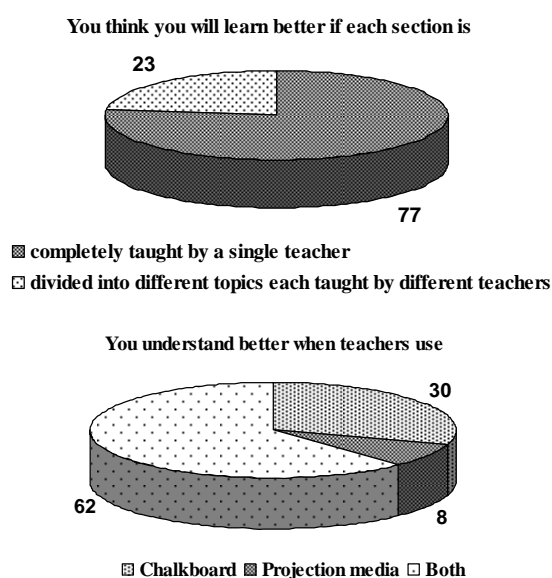
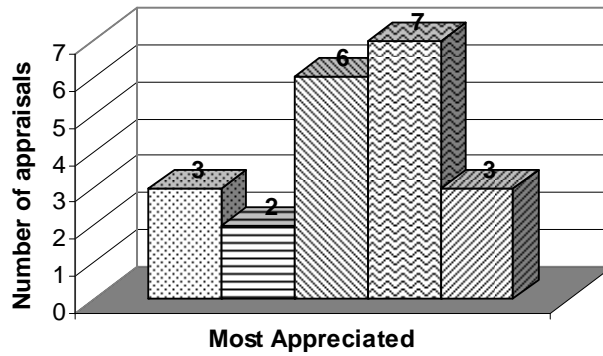
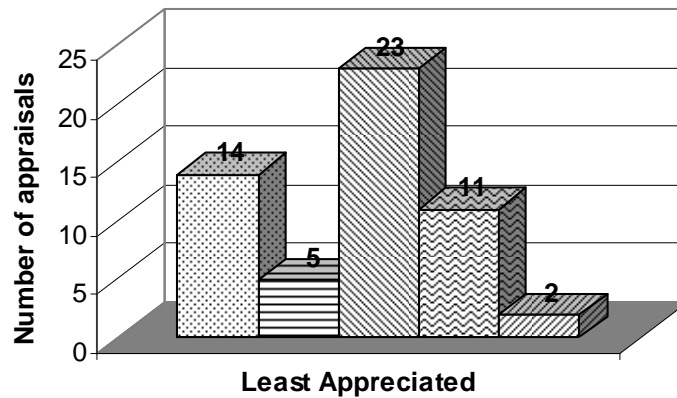


Figure 2: Number of Appraisals for 'Most Appreciated Aspects' of Lecture Presentations



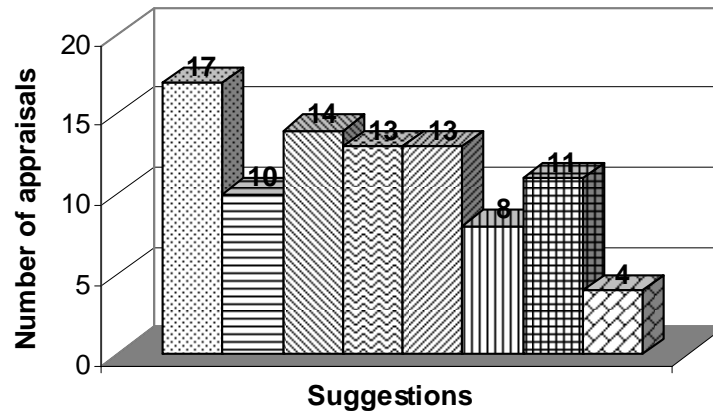
- Conceptual mode of presentation
- Continuation of a single topic in simultaneous lectures
- Judicious use of T-L media
- Maintenance of connectivity and coherence between lectures
- Summarising at the end of a session with overview of next topic

Figure 3: Number of appraisals for 'Least Appreciated Aspects' of Lecture presentations



- Monotonous 'one-way' mode of communication
- Diminished scope for clarification of doubts
- Injudicious use of T-L media (particularly 'Projected media')
- Poor audibility of a lecture presentation
- Poor visibility of T-L media

Figure 4: Number of students' appraisals for suggestions for improvement of a lecture Presentation



- More interactive session with schematic presentations
- Better quality of slides and more time allotted to each slide while using projected media
- More use of microphones and sound system
- Evaluation of learners at frequent intervals improve learning outcome of lectures
- Group discussions and interactive session improve learning outcome of lectures
- Summarising of important concepts at the end of a session improves learning outcome
- More stress on applied and clinical aspects
- More use of chalkboard in preference to other T-L media

Discussion

An evaluation made by students can provide the teacher with useful feedback information, obtained through informal mutual communication or preferably by a designed questionnaire. Many psychometric studies have revealed the validity and accuracy of students' opinion as well as their close correlation with 'objective' measurements of the instructor's effectiveness. The many biases which were earlier ascribed to the student evaluators have mostly proved to be of negligible importance (d'Lvernois, 1991). Therefore the present study has been designed in the form of a questionnaire with the objective to elicit the perception of the students regarding the utility of the prevailing system of

lectures and to evaluate the extent to which the students are benefited by these T-L methodologies.

The questionnaire was subdivided into three sections viz. A, B and C. Section A comprised of 8 items which the students were asked to score on a three-point scale each. In order to arrive at a general consensus regarding the total positive trend of each response, the 'Satisfaction Index' (%) against each was calculated. As per criteria, the 'average satisfaction', a statistical measure for denoting the watershed mark of positivity of responses for the present study was calculated to be 66.67%. Although the calculated SI for each question under this section was above the average value, three items with the highest SI were related to simple

language of presentation, encouragement of interactive learning on the part of teachers and proper understanding of the outlined concepts. On the other hand, three items that had least SI were related to summarization of important points at the end of the presentation, maintenance of continuity between individual lectures and scope for clarification of doubts. In a similar study, Garg *et al.* (2004) elicited the students' opinion about the quality of lectures. A majority of students opined that the lectures as a whole were informative and interesting. However, 20% of the student evaluators felt that most of the lectures were boring and only a few were interesting. Thus from the present study, the authors opined that a few modifications in the planning of each lecture session may prove beneficial. In this context, Anantkrishnan (2000) has stressed the importance of microteaching sessions for teachers as a preparatory vehicle for imparting quality teaching. The present study highlights that summarization of key concepts at the end of a lecture, an essential and very important part of any lecture session, was not being practiced to the desired extent. This may be ascribed to a paucity of time towards the end of the class. This same reason may be attributed to the teachers' inability to appraise the students on the topics to be covered in the next lecture. These reasons have contributed in an additive manner in hindering the maintenance of continuity between the lectures as perceived by the students. A proper prior planning of each lecture session on the part of the lecturer with due importance on these above mentioned activities towards the end of each session may prove more beneficial for the learners. However, as regards to the students' perceived need for increased scope for clarification, the authors are of the opinion that this can only be dealt with by encouraging students to interact with their teachers outside the hours of lecture classes.

The responses for Section B of the questionnaire are provided in figure 1. A majority of the students preferred that each section be completely taught by a single teacher. But the present practice in the authors' institution is to divide a single section into different topics (each being taught by different teachers) after outlining the specific learning objectives for each of

these classes in accordance with guidelines laid down by the MCI. As mentioned earlier, this system permits the assignment of each lecture to a particular faculty member without the possibility of omission or repetition of any part of the topic, while simultaneously ensuring that any particular section is covered by a group of speakers thus avoiding bias and monotony. However, the perceived effectiveness of this practice has not been satisfactory from the students' point of view. One of the principal reasons for the same may be ascribed to a lack of continuity between each lecture session, as discussed earlier. It is presumed that if this drawback in particular can be properly addressed, then the prevailing system may become more acceptable to the learners. The later part of the section B focused on the utility of teaching aids as preferred by the students. A majority of the students supported the combined use of overhead projector with chalk and blackboard, while a lower percentage was in favour of using only chalk board. Only 7.48% were in favour of using the overhead projector alone.

Section C of the questionnaire was an overall assessment where the students were encouraged to put in their own observations regarding the most appreciated and least appreciated aspects of T-L methodology. In addition, they were also asked to furnish suggestions for improvement, for any of the existing T-L process. The consolidated observations are provided in figures 2, 3 and 4. Though a majority (52) of the respondents appreciated the attitude and teaching technique of the faculty in general, they have simultaneously pointed out several lacunae in the existing T-L process which provided scope for further improvement. These included injudicious use of projection (23), monotonous one-way communication (14) and inaudibility of the lectures (11). The learners provided useful suggestions regarding making the lecture sessions more interactive (17) along with inclusion of group discussions (13). A similar finding has also been reported by Garg *et al.* (2004) where 34.92 % of the respondents opted for introduction of group discussion in the teaching programme. Further suggestions included the use of the microphone, which may be traced to their inability to hear the lectures clearly as mentioned above and the

inclusion of an evaluation system or items at regular intervals. Conspicuously, some respondents (11) have opted for more stress on applied and clinical aspects of each topic. A similar report from the College of Medicine of the University of Arkansas, USA, outlines changes in the students' attendance from poor to high on introducing changes to teaching methods such as introducing clinically oriented topics, independent learning etc (McMillan & Wenger, 1987). The findings of the present study suggest that it may be possible to enhance students' perception of the value of a teaching session by modifying the session in the light of student's based evaluation.

According to the prevailing system of education in India, a transition occurs from individualized care in '10+2' level to an institution-based care during their medical education course. As a result, the students face certain difficulties to adapt to this new environment. This calls for a shift of attitude on the part of the learners to get accustomed to this new mode teaching-learning. Hence, in the present study, the students' feedback obtained should also be interpreted in this context. Some of the items included in the questionnaire were specifically designed to elicit responses to assess the extent of this adaptation. The observations of the study in particular, the finding that 77% of the students expressing their preference of each broad section to be taught by a single teacher, their 'suggestions for improvement' including the need of more interactive sessions in small groups, increased scope for clarification of doubts, extra tutorial classes, repetition of important concepts, discussion of model questions and answers and preference for frequent formative oral evaluation (items) of individual students in presence of a single facilitator - a junior or senior faculty member, reflected that the learners still prefer to be taught in a predominantly individualized care-based environment.

Surprisingly, not a single student mentioned Computer Assisted Learning (CAL) as a potential vehicle of teaching-learning. One reason for this could be ignorance regarding the advantages of CAL. In one study on the use of CAL (Bhavsar *et al.*, 1994) it was pointed out by the authors that a large number of students expressed the advantages of

CAL and that if properly introduced, CAL can go a long way in teaching undergraduate medical students in future. The present study, however suffers from certain drawbacks. The probability for objectivity would have increased if the responses had been elicited on a five point scale for each question instead of the given three. This would also have been more appropriate in evaluating the attitudinal parameter of the students. Further, the questionnaire had been designed encompassing a limited aspect of the teaching learning process which was deemed by the authors to be sufficient for the objectives of the present study.

Thus, it may be concluded from the present study that the feedback from the students had facilitated a change in the preconceived notions about teaching-learning principles on the part of the faculty. On the other hand, it should also be taken into consideration of how far the inability of the students to cope with the existing predominantly institutionalized care-based medical education system may be attributed to a lack of or incomplete attitudinal shift.

References

- Ananthkrishnan, N. (2000) Microteaching as a vehicle of teacher training: An appraisal, In: Ananthkrishnan N., Sethuraman K.R., & Kumar S., (eds.) *Medical Education: Principles and practice*, 2nd ed. Pondicherry: JIPMER, pp. 93-97.
- Bhavsar, V.H., Vajpayee, S.K., Joshi, N.J., Mistry, S.D., Kantharia, N.D., Sharma, A.K., *et al.* (1993) Training during practical pharmacology sessions for undergraduate medical students: An experience with a modified teaching programme, *Indian Journal of Pharmacology*, 31, pp. 176-186.
- d'Lvernois, J.F. (1991) Evaluation by students of programmes, teaching techniques and teachers, In: Guilbert J.J. (ed.) *Educational handbook for health personnel*, 6th ed. Geneva: World Health Organization, pp. 4.15-4.19.
- Guilbert, J.J. (1991) Workshop in educational planning, In: Guilbert J.J., (ed.) *Educational handbook for health personnel*, 6th ed. Geneva: World Health Organization, pp. 5.31.
- Garg, A., Rataboli, P.V., & Mulchandani, K. (2004) Students' opinion on the prevailing teaching methods in pharmacology and changes recommended, *Indian Journal of Pharmacology*, 35(3), pp. 155-158.

McMillan, D.E. & Wenger, G.R. (1987) Effects of curriculum and format changes in a medical pharmacology course, *Academic Medicine*, 62, pp. 836-341.

Medical Council of India (1997) *Regulations on Graduate Medical Education (Appendix C)*. New Delhi: Medical Council of India, pp. 95.

Statutes of the West Bengal University of Health Sciences [online] Available at http://www.thewbuhs.org/Downloads/statutes_total.pdf. [Accessed January 12 2009]

Syllabus in Biochemistry for 1st Professional MBBS of the West Bengal University of Health Sciences [online]. Available at: <http://www.thewbuhs.org/syllabus/MBBS/Biochemistry.doc> [Accessed January 12 2009].