Student feedback on structured large group learning sessions in Pharmacology in a medical school in Nepal

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Abstract

Background: The department of Clinical Pharmacology at KIST Medical College, Lalitpur, Nepal has introduced structured, large group interactive sessions.

Aims: The present study was carried out to obtain student feedback about the educational innovation.

Methods: A questionnaire was administered to first year students during May 2009 after obtaining written informed consent. The agreement of students with a set of twenty-five questions using a modified Likert-type scale was noted. Free text comments were invited.

Results: All 75 students participated. Majority were male, self-financing and educated in private schools. The total median score was 95 (maximum 125) and was higher among female students, students from outside the Kathmandu valley but from a non-remote area, and students educated in private schools. Students wanted more information about which books to read, more frequent revision sessions and copies of lecture slides.

Conclusion: The overall student opinion was positive. We plan to continue and further develop structured large group interactive teaching.

Keywords: *Large group teaching, Lectures, Nepal, Pharmacology*

Introduction:

In Nepal, a country sandwiched between China and India, the teaching of Pharmacology is integrated, problem-oriented and emphasizes the rational selection and use of medicines (Joshi and Jayawickramarajah, 1996; Shankar et al., 2004). Pharmacology is taught in an integrated, organ system based manner with other basic science subjects during the first four semesters (two years) of the undergraduate medical (MBBS) course.

KIST Medical College (KISTMC) is a new medical school in Lalitpur district, Nepal committed to excellence in holistic health care, education and research. The department of Clinical Pharmacology and Therapeutics has the vision of creating healthcare professions who can use essential medicines rationally and to inculcate in them the capacity to keep up to date with developments in medicines and therapeutics. Besides teaching undergraduate medical students, the department has taken a number of initiatives to promote the rational use of medicines in the teaching hospital (Shankar et al., 2009).

Teaching in pharmacology mainly takes place through didactic lectures and problem-stimulated learning sessions. At another Nepalese medical school Manipal College of Medical Sciences, the department of Pharmacology emphasizes the rational use of medicines. Selection of personal or P-drugs for common disease conditions, critical analysis of drug promotional material and communicating drug and non-drug information to simulated patients are among the exercises conducted (Shankar, 2006). Innovative teaching methods were mainly applied in small group teaching in that institution.

Lecture or large group teaching has been described as the oldest method of teaching (Cantillon, 2003). Lectures are an efficient means to transfer knowledge and concepts to large groups. In a recent article an author had described how lectures can be modified to maximize learning and increase student interaction (Cantillon, 2003). Interactive lecturing promotes active learning, heightens student attention and motivation, gives feedback to both students and teachers and improves satisfaction for both (Steinert and Snell, 1999). The department of Clinical Pharmacology at KISTMC has adopted strategies to make lectures more interactive. A lesson plan is prepared before each lecture. Learning objectives are prepared and shared with students. Each lecture starts with a 'Review-preview' session by a student. An activity called 'Quick think' is conducted in the middle of the lecture to increase alertness and interest level of the students. At the end of the session, feedback is obtained from students using a 'One minute' paper. The areas which were 'clear and which

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were muddy at the end of 'today's lecture' were noted. Periodically students graded the lecturer and the lecture. Interactive lecturing has been used for around seven months in Pharmacology. The present study was carried out with the following objectives

- Obtain information about student opinion regarding the sessions and

- Compare the opinion among various groups of students

Methods:

The study was carried out among first year medical students at KIST Medical College, Lalitpur, Nepal during May 2009. Student feedback regarding the structured large group learning sessions was obtained using a questionnaire. Written informed consent was obtained from all participants. The questionnaire used in shown in the appendix. The questionnaire was administered to two students to check for clarity and readability. Both agreed that the questionnaire was non ambiguous and easily understandable. Their results were included in the final analysis.

Basic demographic information of the respondents was collected. Gender, native place, ethnic or caste group, whether students were scholarship or self-financing, place of schooling and whether the school was a government or a private school were noted. Student opinion regarding the structured large group learning sessions was obtained by noting their degree of agreement with a set of twenty-five questions using a modified Likert-type scale. The statements dealt with the 'Review-Preview' sessions, learning objectives, the 'Quick think' exercises in the middle, the 'One minute' paper at the end of the session, summarizing the topic by the teacher at the end and obtaining regular student feedback about the sessions. General free text comments about the sessions were also invited.

To avoid automatic responses certain statements were negative and these were reverse scored while calculating the total score. Subgroups of respondents according to different demographic characteristics were determined. The median

total score was calculated and compared among different categories of respondents. The median scores of individual statements were also calculated. A p value of less than 0.05 was taken as statistically significant. The free text comments were tabulated and the common ones noted.

To identify latent factors or dimensions from the study questionnaire an exploratory principal component analysis (PCA) with Varimax rotation was carried out. As the sample size was small, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity was done to ascertain whether PCA is usable with this data.

Results:

All 75 students participated in the study. Fifty students (66.7%) were male; 38 students (50.7%) were from the Kathmandu valley, 27 (38%) were from non-remote areas of the country while four students were from remote areas. A remote area for the purpose of the study was defined as more than six hours walk from the nearest road head. Table I shows the details of the demographic characteristics of the respondents. Most of the students were from the ethnic/caste groups Brahmin, Chettri or Newar, were self-financing and had studied in private schools.

Table II shows the median scores of individual statements. The students were ambivalent about the exercises chosen for the quick think sessions, still had an impression that pharmacology is a difficult subject to learn and understand and were not fully comfortable with the hall where the sessions are conducted. Most of the other statements had a median score of 4 except statement 18 regarding the principles of Pharmacology and their application to future practice which had a score of 5.

The total median score was 95 (maximum score 125) and the interquartile range was 11.25. Table III shows the median total scores according to selected demographic characteristics. The median total score was higher among female students, students from a non remote area of Nepal and students educated in private schools. Free text comments were provided only by a few participants. The comments were that the last slide or transparency of the presentation should

Table I: Demographic characteristics of the student respondents

Characteristic		Number (percentage)[*]
Gender	Male	51 (68)
	Female	24 (32)
Native place	Kathmandu valley	38 (50.7)
	Non remote area	27 (36)
	Remote area	4 (5.3)
Ethnic/	Brahmin	24 (32)
caste group	Chettri	20 (26.7)
	Newar	12 (16)
	Others	12 (16)
Financing	Scholarship	8 (10.7)
	Self-financing	66 (88)
Schooling in	Kathmandu valley	40 (53.3)
	Non-remote area	24 (32)
	Remote area	3 (4)
	Outside the country	1 (1.3)
Nature of school	Government	11 (14.7)
	Private	60 (80)

[*] Certain respondents did not fill in all their personal details

Table II: Median scores of individual statements

Statement number	25th, 75th percentiles	Median score
One	4, 5	4
Two	4, 5	4
Three	2, 5	4
Four	4, 5	4
Five	4 ,5	4
Six	3, 4	4
Seven	3, 4	4
Eight	3, 5	4
Nine*	3, 4	3
Ten	3, 4	4
Eleven	3, 5	4
Twelve	3, 4	4
Thirteen	3, 4	4
Fourteen*	4, 5	4
Fifteen	4, 5	4
Sixteen	4, 5	4
Seventeen	3, 4	4
Eighteen	4, 5	5
Nineteen	4, 5	4
Twenty	3, 4	4
Twenty One	3, 4	4
Twenty Two*	2, 3	2
Twenty Three*	4, 5	3
Twenty Four	4, 5	4
Twenty Five	2, 4	3

* The reversed scores have been included

contain some information about which book should be consulted and the depth to which the student should study. The students were also in favor of lecture slides being provided and they also wanted more frequent revision of the sessions. A student complained that the problems mentioned and feedbacks given in the one minute paper were not always discussed the next day in the class.

Since the KMO test was 0.668 (> 0.6) and the Bartlett's test of sphericity ($\chi^2_{300} = 649.52$) was also found to be statistically significant (p-value < 0.001), then PCA as a method could be used with the data.

Although it is revealed that up to nine dimensions could be extracted from the data explaining 71% of total variance, the scree plot suggested extracting only 2-4 latent factors. Figure I shows the Scree plot. Thus, three latent factors explaining 39% of variance was extracted from the data as they were found to be more plausible. These were

> 1) Logistics/preparation,
>
> 2) Planning/Organization and,
>
> 3) Wrap-up/Feedback for the large group session.

The rotated component matrix (Table IV) shows the simple structure that explained these dimensions (Table IV here).

Discussion:

The student feedback on the structured large group sessions was positive. Certain suggestions for improvement were mentioned. KISTMC is a private medical school affiliated to Tribhuvan University. Since the mid-1990s a number of medical schools have been opened in the private sector in the country (Shankar et al., 2006). These medical schools are not supported by the government and depend on student fees and income generated by the teaching hospitals. KISTMC admits 75 students to the undergraduate medical (MBBS) course every November. The first batch was admitted in November 2008. The college also admits 8 students on full tuition scholarship. Both self-financing and scholarship students are admitted on the basis of performance in entrance examinations. The six basic science subjects (Anatomy, Physiology, Biochemistry, Pathology, Microbiology and Pharmacology) are taught in an integrated manner during the first two years. Students spend time in the hospital wards every week learning history taking skills. The students are examined in an integrated manner at the end of the first and the second year (Tribhuvan University, 2009).

Most students were from Kathmandu valley and urban areas of Nepal. Brahmins, Chhetris and Newars accounted for the majority. These groups are dominant economically and politically and account for a large number of the educated

Table III: Median total score of participants according to selected demographic characteristics

Characteristic	Median total score	Statistic used & statistic value	P value
Gender			
Male	93	Mann-Whitney U,	0.022
Female	98	statistic = - 410	
Native place			
Kathmandu valley	94	Kruskal Wallis,	
Non remote area	97	Statistic = 1.032	0.597
Remote area	83		
Caste			
Brahmin	98	Kruskal Wallis	
Chettri	99	Statistic =3.371	0.498
Newar	97		
Janajati	89		
Others	101		
Financing of education		Mann-Whitney U,	
Scholarship	**96.5**	statistic = - 211	0.356
Self-financing	100		
Location of school			
Kathmandu valley	99	Kruskal Wallis,	
Nonremote area	101.5	Statistic = 2.561	0.278
Remote area	96		
Type of school		Mann-Whitney U,	
Government school	88	statistic =– 229.5	0.326
Private school	96		

elite in Nepal. Majority of students were educated in private schools. This could have been because their families are economically strong. Also government schools provide education in the Nepalese language. These days there is increased emphasis on schooling in the English language. English medium schools teach all subjects in English and Nepali is only taught as a language.

During 'Review-preview' a student briefly summarizes what had been covered in the previous class and mentions what will be covered in the coming lecture. The students do 'Review-preview' in rotation using the overhead projector. The activity helps students revise what has been covered previously and link it to what will be covered in the present session. A summary of the major points of the previous lecture and

indication of the major themes and learning objectives for the current session will provide the teacher and students with a relatively easy start (Cantillon, 2003). Having students or participants do it helps in increasing their engagement with the learning process. 'Review-preview' by participants is widely used in workshops.

After the 'Review-preview' the teacher states the learning objectives for the particular session. The teacher prepares detailed lesson plans for each session which are discussed with departmental colleagues who offer constructive criticism and suggestions. Formulating learning objectives is part of the planning process and is a clear statement of what is expected of the teaching program and helps in planning assessments (Hogerzeil, 2001). They help the student understand what is
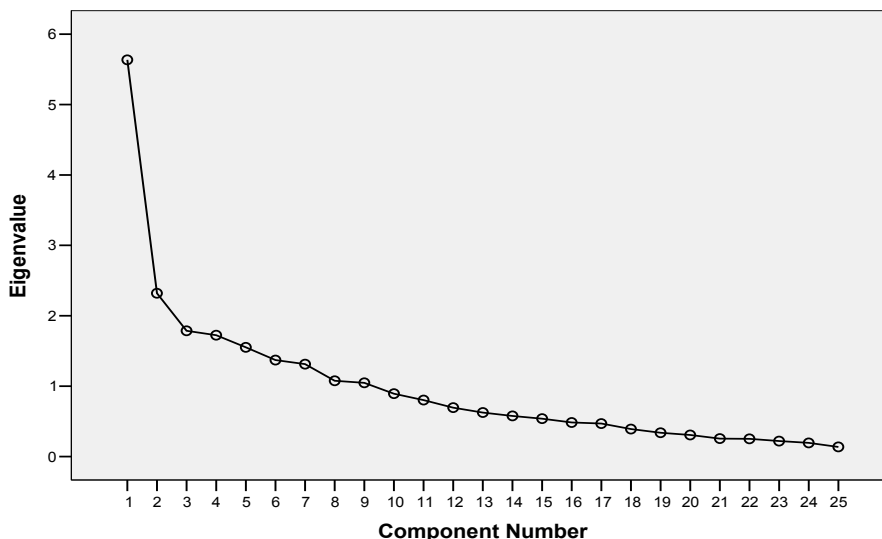
Scree Plot

Figure 1: Scree plot of the data

expected of him/her and helps prepare for the expected level of competency (Rege & Bhatt, 2002).

'Quick thinks' are questions used to decrease the monotony of the lecture and engage students in critical thinking (Johnston and Cooper). Select the best response, correct the error, complete the sentence starter, compare and contrast can be carried out. It is recommended to use a quick think every 15 to 20 mins. to maintain student attention and interest. In a medical school in Turkey, while conducting interactive lectures in Physiology, the authors used a task requiring

interaction approximately every 15 minutes (Gulpinar and Yegen, 2005). The students in the present study were ambivalent about the exercises and questions chosen for 'Quick think'. We are confident that with increasing experience we will frame better, more interesting and relevant questions. The student however, enjoyed the activities. A uniform power point slide format is used for all lectures. The format has been carefully designed to improve contrast and visibility. The department uses a maximum of six lines per slide and a maximum of 14 slides per class.

Table IV Rotated Component Matrix.

Item	Component		
	1 (Logistics/ preparation)	2(Planning/ organization)	3 (Wrap up/ feedback)
Seven (Learning sessions interactive)	**.717**		
Twenty-five (Venue expectations)	**.628**		
Eleven (Duration of sessions)	**.617**		
Seventeen (Teachers & stimulating environment)[*]	**.536**	.453	
Six (OHP in review/preview)	**.493**		
Twenty-four (New concepts during sessions) [*]	**.490**		.466
Eight (Quick think useful)	**.479**		
Eighteen (Principles taught useful during future practice)	**.474**		
Ten (Power point slides good quality)+			
Twenty-two (Pharmacology difficult subject) +			
Twenty (Built up on previous knowledge)		**.756**	
Twenty-one (Organized framework to facilitate learning)		**.741**	
Three (I have done a review/preview)		**.602**	
Nineteen (Number/quality of teachers' questions) [*]	.428	**.571**	
One (Sessions interesting & informative) [*]	.466	**.489**	
Five (Starting with learning objectives) [*]	.406	**.443**	
Two (Review/preview revision & preview)+			
Twenty-three (Not interested in similar future sessions)[Δ]			**-.737**
Thirteen (One minute paper useful feedback to teacher)			**.665**
Sixteen (Regular student feedback useful in improving sessions)			**.661**
Twelve (One minute paper helps self-reflection)			**.636**
Fifteen (Obtaining student feedback good idea)			**.527**
Fourteen (Summarizing by teacher not useful) [Δ]			**-.459**
Nine (Exercises for quick think not interesting & informative) +			
Four (Review-preview improves presenter's understanding)+			

* Double loading items greater than 0.4 means that they have dual representation
D Negative loadings means they are negatively correlated with the dimension.
+ These items did not show significant factor loadings (>= 0.4) on the extracted three dimensions.

Studies have shown that the students' interest and attention in the traditional lecture diminishes significantly after 20 minutes (Stuart and Rutherford, 1978; Frederick, 1986). Energy shifts or changes of pace are necessary to hold and focus student attention (Steinert and Snell, 1999). Interactive lectures can be helpful. While conducting a structured large group Pharmacology session around 5 minutes are spent on review- preview. Outlining learning objectives occupies 2 minutes. After about 25 minutes of lecturing a 'Quick think' question is asked. The teacher summarizes the topic in about three minutes towards the end. Students answer a 'One minute' paper or provide feedback on the lecture and the lecturer during the last 2 minutes. Students may find the use of a one-minute paper useful to identify impressions and concepts that need further clarification (Cantillon, 2003). We use student responses to obtain information on which part of the lecture they understood and which parts need further explanation and clarification. Asking the students to complete an evaluation questionnaire is a method to obtain feedback. Evaluation by students can provide teachers with the most useful information on the quality of their teaching (Hogerzeil, 2001). Written evaluation done using a brief questionnaire has been recommended. The students in our study agreed with the usefulness of obtaining feedback and opined that it will be helpful in making sessions more relevant, interesting and informative. A student in a British medical school had stressed on the importance of feedback at the end of each session and ensuring anonymity of the respondents (Rushforth, 2004).

The students felt principles of Pharmacology taught would be useful during future practice. In a study in a Nigerian medical school, students wanted inclusion of clinically relevant material (Oshikoya et al., 2007). They wanted seminars and group discussions to be included and special topics in Clinical Pharmacology to be taught both in lectures and practical. Teachers should ask questions both to check comprehension and promote discussion (Cantillon, 2003). The teacher should wait to allow students to answer questions and resist the tendency to answer them himself. Questions can stimulate interest, arouse attention, serve as an ice breaker and provide valuable feedback to both students and the teacher. Interactive teaching values students' prior ideas and knowledge and aims at empowering them to be independent learners. Before planning a lecture, the teacher should know about students' knowledge of the subject. Prior knowledge is important in meaningful learning and the process of learning builds on previously acquired knowledge (Gulpinar and Yegen, 2005; McLaughlin and Mandin, 2001). However, students still felt that pharmacology is a difficult subject to learn and understand and were neutral about attending similar sessions in future.

The median total score was higher among females, students from nonremote areas and educated in private schools. Students in private schools educated in English and may find it easier to follow lectures delivered in English, the medium of instruction in medical schools.

The exploratory factor analysis revealed that three dimensions of large group sessions could be extracted from the tool explaining 39% of variance among them. There were few items that were not represented by these dimensions and these should be retained in the future studies with larger samples to rule out their role in the large group session at KISTMC. Thus, further longitudinal study is required to confirm these findings.

The study had limitations. It was conducted only among one group of students. Being a new medical school only one batch had been admitted. Student opinion was obtained using a questionnaire. The responses were not compared with those obtained by other methods like semi-structured interviews and focus group discussions. The questionnaire was only shown to two students for comprehension and readability. The sample size for factor analysis was low. Detailed pretesting of the questionnaire was not carried out.

Conclusions:

Student feedback on interactive large group teaching in pharmacology was positive. Modifications in large group teaching are important as these continue to be the major teaching modality. We plan to continue and further develop large group teaching strategies especially in Pharmacology. Student feedback is planned to be obtained at frequent intervals.

Acknowledgements:

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