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Application of Distance Mode of Learning for Regular On-campus Students in the Teaching of Pharmacology

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This is the second article on medical education in this issue. Our interest in this brief presentation lies partly in the contrast it shows when read together with the first article and partly in the message it carries. The contrast highlights the immense flexibility which the philosophy as well as the methodology of distance education has placed at our disposal — we can innovate educational programmes to cater to the needs of the society and the specific clientele that has remained ignored so far, mobilise resources for different places and countries to provide quality education and/or working within the conventional boundaries we can improve upon the existing educational inputs for better results. And the message we refer to is that the methodology of distance education need not be taken as a 'stand alone' dogma; instead, it should be seen and used as an emancipative educational transaction — in the face-to-face teaching situations it allows more time to the teacher for creative and productive work, and it facilitates autonomy among students as it trains them how to be learners in the real sense of the word, which is the only way of developing a 'learning society'.

As there is no taboo against incorporating face-to-face interaction in the system of distance education, there should be no taboo against incorporating distance education methodology in conventional face-to-face teaching system either.

1. INTRODUCTION

Medical education in India has long been criticised as being unresponsive to learner needs. Not only that, it is unresponsive to national health needs too as the entire system, based on the British model, has not evolved to keep pace with Indian needs and challenges. The end result is that usually the medical graduates, who learn to be entirely dependent on the teacher, are not motivated to value continuing education and are unable to meet the expectations of the society when they enter it as professionals.

We, at the Christian Medical College, Ludhiana, have been concerned about this phenomenon. Various attempts are being made to introduce innovations so that medical education in India becomes suitable for our needs. The present communication describes an innovative attempt to apply distance mode of learning for regular on campus students in the teaching of pharmacology.

The first step of this experiment was to discover the lacunae in the traditional system, as perceived by the students. A standardised pre-tested questionnaire was administered to the students to seek their opinion on various aspects of learning and teaching. This included teaching methodology, depth of the subject matter, autonomy enjoyed by the students, their awareness of their own progress and the evaluation system. The detailed results of this survey have already been reported (Zachariah et al 1993), and the main points are being enumerated here:

a. passive role imposed on the students
b. no learner-autonomy in terms of time and content
c. no provision for providing feedback to the students except during the term-end-examinations
d. no indication to the students regarding the depth of the subject matter to be covered
e. evaluation based mainly on recall, giving little opportunity to the students to use their cognitive skills.

Based on these observations, a different instructional system, developed on the concepts of distance learning, was evolved. For our purpose, distance learning was viewed in a wider perspective viz., any non-traditional instructional system, which does not rely on face-to-face teaching as the primary mode (Keegan 1986). The new system had to operate within the constraints of traditional university regulations in relation to time frame and course content. This has been referred to here as Small Group Learning by Objectives (SGLO).

The new system draws heavily on the ideologies of Wedemeyer (1977) and Moore (1973). Though the system had to operate within the above mentioned constraints, every attempt was made to make it least distant in terms of Moore's variables of 'dialogue' and 'structure'. Further inputs were provided in the form of teaching of study skills to the students by one of the authors (TS) and counselling activities by another author (MVN).

2. DESCRIPTION OF THE METHOD

The topic is first introduced by means of a brief talk, highlighting its social, community, scientific and clinical importance, the historical development and the present status of the drug therapy in that field.

After the introduction, the learner objectives for the topic are discussed with the students, giving necessary explanations as and where required, with recommendations for reference material. A brief introduction, learner objectives and some relevant information is distributed in the form of handouts. A sample of one such handout showing learning objectives for 'Chemotherapy and Antibiotics-Chloramphenicol' is given as follows:

Chemotherapy and Antibiotics : Chloramphenicol (Chloromycetin)

Learner Objectives

At the end of the course work the learner should be able to:

1. *express in his or her own words the development and therapeutic status of chloramphenicol.*
2. *draw the structure of chloramphenicol and indicate the nitro-group which can be replaced by sulphonothyl group to drive Thiamphenicol.*
3. *briefly describe the antibacterial activity, spectrum and resistance development to chloramphenicol.*
4. *describe briefly the clinically significant pharmacokinetic properties of chloramphenicol.*
5. *mention the therapeutic uses of chloramphenicol and the commonly used preparations and dosage.*
6. *briefly describe the adverse effects of chloramphenicol.*
7. *compare the tetracyclines and chloramphenicol on the basis of the following points:*
   - *whether or not broad-spectrum*
   - *whether or not bacteriostatic*
   - *whether more effective on Gram +ve or Gram -ve organisms*
   - *whether or not effective against E. histolytica*
   - *does or does not cross blood-brain barrier*
   - *nature of therapeutic use — common or restricted*
   - *whether for superinfection + or superinfection +++*

During the subsequent week, all the students concerned read, prepare and learn the topic according to the stated objectives and then small group discussions are held in the presence of facilitator teachers. Each group has 8 to 10 members; and turn by turn each member functions as the group leader to organise the group discussion. The role of the facilitator teacher is mainly to facilitate the total group activity.

As a matter of principle, students are encouraged to attend the sessions even though they may not be prepared to do so.

The batch of 1990 admissions was one which had the opportunity of being taught by both the methods for a duration of 9 months each; and it was this batch which evaluated the new instructional method vis-a-vis the traditional didactic lectures.

3. EVALUATION OF THE METHOD

The method was evaluated in 2 parts. Part one assessed students' attitudes towards the new method. This was done by administering a standardised pre-tested (r=0.87) Likert Scale to the students. The responses were analysed by dividing the students into 3 equi-sized groups of Higher Ability (HAG), Middle Ability (MAG) and Lower Ability (LAG) students. The significance of difference in responses was calculated by standard techniques.

The second part of the evaluation consisted in calculating the Motivating Potential Score (MPS) (Hackman and Oldham, 1975), which was calculated by the formula:

MPS= Task x Autonomy x knowledge of results.

Since the 'task', i.e. to grasp the subject matter was constant for both the traditional and the new methods, it was given a constant rating of 4. The other two variables were graded on a 5 point scale for both the methods and a mean MPS was calculated as given above. The maximum score which either method could get was 100=(5x5x4). Mean scores were calculated for both the methods and results were statistically analysed to find the significance of differences between the scores.

Results

The statements were grouped according to the 6 basic themes (see table 1) and pooled responses were used to analyse the results. Facility value (FV) for each group was calculated and the results were statistically analysed. The results have been presented in tables 1 and 2 below:

Table 1: Students' Rating for SGLO

Theme	HAG(n=12)	MAG(n=12)	LAG(n=12)	TOTAL (n=36)
1. Promotes learning and retention of information better	100.00	58.3	50.0	63.8
2. Promotes study skills better	91.6	41.6	16.6	50.0
3. Requires extra time and effort	33.3	75.0	41.6	50.0
4. Takes care of weak students	33.3	41.6	66.6	47.2
5. Promotes group interaction	83.3	83.3	75.0	80.5
6. Provides greater freedom of study	75.0	58.3	66.6	66.6

Table 2: Mean Motivating Potential Score (MPS) for the two methods:

	HAG(n=12)	MAG(n=12)	LAG(n=12)
Lecture method	20.0	25.6	24.4
SGLO	76.8	54.0	65.6
P*	0.01	0.05	0.01

*P = percent occurrence of the observed behaviour

Discussion

The results present certain interesting points. Let us first discuss the attitudes of students towards SGLO. More than half of the students felt that SGLO promotes learning better and helps retention better than the traditional method. The results show a variation when comparison between the groups is made. While 100% of the HAG felt so, for LAG, this figure was 58%. This difference is statistically significant. Almost similar results have been obtained for'promotes study skills better.'

Reaction to 'requires extra time and effort' shows another interesting pattern. About only 40% students in HAG and LAG felt that way, however, almost 75% of the students in MAG felt that extra effort is needed. This may be due to the fact that many MAG students depend on prepared class notes and had to spend extra time to prepare such notes themselves. It is difficult to explain the response of LAG in this case.

All the three groups felt that this method 'promotes interpersonal relationship', not only amongst students but also among students and the tutor. The responses are identical and the differences are not significant. The same is true of 'greater autonomy in study', in terms of books, material, time and method used. The FV is more in HAG as compared to LAG (75.0 v/s 66.6). The difference is statistically significant.

Even more interesting is the response to, 'takes care of weak students'. Only 1/3 of the students in HAG felt that weak students are adequately cared for; on the contrary 2/3 of the LAG felt that they are not placed at a disadvantage. The difference is statistically significant. Even more important than statistical significance is the fact that students in the LAG themselves felt that SGLO takes care of them.

The MPS rating reveals that SGLO was rated much higher than conventional lecture method by almost all the students. The rating for either lecture method or SGLO does not show any significant intergroup difference; but between the two methods it is highly significant.

The results of the present study strongly justify our conviction that principles of distance learning are equally relevant to on-campus learners. In view of the problems encountered in the traditional system of education, it would be worthwhile to give more trial to distance learning techniques in regular colleges and universities. Not only will it provide more freedom to teachers to engage in academic and research work but also help the students to be self sufficient life long learners.

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