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Research Article

ROLE OF INTERACTIVE TEACHING IN MEDICAL EDUCATION

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ABSTRACT
Interactive teaching involves interchange of ideas between teachers, students and the lecture content. It refers to increased discussion among the participants and their active involvement. This article describes the various techniques and their importance to promote interactivity during medical teaching. The aim of this study was to obtain feedback from undergraduate MBBS students on their perception of the existing interactive techniques and methods used dur ing lecture in preclinical classes. A questionnaire study was conducted in the Department of Physiology at Sri Guru Ram Dass Institute of Medical Sciences Vallah,Amritsar ,Punjab, India, The subjects wereundergraduate MBBS students. The summary of the consolidated observation and suggestions for improvements were taken into consideration and discussed. Further Interpretation of the feedback reflected that the learners still prefer to be taught in an individualized care-based environment with different interactive teaching techniques.

Key Words*: Interactive Lecture, Learner, Interactive Techniques*

INTRODUCTION

Interactive teaching involves interchange of ideas between teachers, students and the lecture content. It refers to increased discussion among the participants and their active involvement. This article describes the various techniques and their importance to promote interactivity during medical teaching. The purpose of teaching is to facilitate learning and encourage the learners to learn more effectively. nteractive teaching involves a two-way interaction between the presenter and the participants. It encourages and expect learners to participate. It valves student's prior ideas and aims at empowering students to be independent learners. The vision of a teacher using an interactive approach is to develop classrooms where students are helped to make sense and reflect on their experiences, evaluate their work and set future learning goals. In such classrooms students are encouraged to articulate how they learn, they should be able to express what the problem is they working on, what questions and prior ideas they have what their plans are to solve the problem. For the purpose of this discussion, the term 'lecture' will refer to any large group presentation at any level of the educational system when done effectively, the lecture can transmit new information in an efficient way, explain or clarify difficult notions, organize concepts and thinking, challenge beliefs, model problem solving, and a motivation for learning. (Gage & Berliner, 1991, Foley & Smilansky 1980) Frederick 1986, Saroyan &Snell, 1997] (White G. 2011) A lecture is an oral presentation intended to present information or teach people about a particular subject. Lecturers were, and still are accustomed to simply reading their own notes from the lecture for exactly that purpose Nevertheless, modern lectures generally incorporate additional activities, e.g. writing on a chalk-board, exercises, class questions and discussions, or student presentations. The classroom lecture is a special form of communication in which voice, gesture, movement facial expression, and eye contact can either complement or detract from the content. No matter what your topic, your delivery and manner of speaking immeasurably influence students' attentiveness and learning. While lecturing tends to be the easiest form of instruction, studies show that students absorb the least amount of information that way . Interactive teaching values student's prior ideas and aims at empowering students to be independent learners. Interactive teaching is the term given to a strategy/style of teaching For teachers it offers an opportunity to lear n along with the students and to use their interactive skills to listen carefully and

challenge misconceptions where possible. The teacher's own knowledge will always be an important factor. There are likely as many teaching methods and techniques as there are teachers, but some stand out due to their effectiveness. Both teachers and students will enjoy class more when it includes methods that encourage students to take responsibility for their own learning and a more active role in and out of the classroom. The various interactive techniques used:

Technique Description (Mc Leish 1976), (Mc Laughlin K *et al.* 2001), (Kumar 2003)

Questions Asking or inviting questions of the audience which can be rhetorical or allow participants to respond by a show of hands or an audience response system

Brainstorming Inviting the audience to think creatively and share ideas with the group

"Think-pair-share" sessions Thinking independently and then sharing ideas with a neighbor

Small group activity Breaking the audience up into small groups, asking each group to share ideas

Demonstrating Using visual examples (e.g., a live patient), with the audience asking questions

Role playing Asking a member of the audience to play a patient or doctor (similar to a demonstration)

Problem-solving Asking the audience to seek clinical information on a case and justify the request

Case-based examples Presenting history and radiologic images in sequential order, asking the audience to think about the next logical step at each sequence

Directed listening Directing the audience to signal (eg, through a raise of hands) each time a specified word or phrase is used or image is shown

Pre- or post-testing Presenting test questions before, during, or at the end of the presentation that the audience can answer silently, on paper, or through an audience response

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, questionnaire was developed with the scope of giving individual opinion on content of the lecture 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.

MATERIALS AND METHODS

The undergraduate MBBS students who had completed few months of the curriculum were selected for the study. A total of 300 students were selected. . The questionnaire devised for the present study was divided into two sections. The first 1-5 questions were one word answer and 6-10 questions were yes or no type. In the questionnaire we asked their Name, Age, Sex, Medium of Education in school and their permanent address. The questions asked were:

1. Which Interactive technique is reliable type?
2. Which tecnique develops the ability to understand the topic better?
3. I prefer… …
4. Which technique provides good learning experience?
5. Which is more interesting and interactive technique?

(These questions were: yes or no basis).

6. Should seminars be conducted along with other mode of teaching?
7. Should BB teaching be integrated with OHP teaching?
8. Should computer assisted LCD projector teaching in future be included along with other mode of teaching?
9. Do you feel Brainstorming necessary in medical education
10. Should the handouts or photo state material of topic be provided

RESULTS

The responses obtained under section A, of questionnaire were statistically treated to calculate Satisfaction Indices for each item. A majority of the responses from the teaching questionnaire and specific comments and suggestions of students were noted and found that 85% of the students found Computer Aided teaching as most reliable technique, 90% foundAudiovisual aids develops the ability to understand the topic better,70%considered Group Teaching to be good learning experience,90% found Role plays and simulation more interesting and interactive technique and Computer aided teaching is the most preferred technique by the students which involves various simulation methods. In yes or no options most of the answers (90%-100%) were given with yes option.

Comments/Suggestions(Selected)

1. The approach to teaching is very nice
2. This encouraged us a lot to do more study
3. Dividing in groups makes us very energetic to study more
4. Questions are entertained and students' participation encouraged, and the help of a teacher makes it more interesting
5. We think Audiovisual aids is very effective technique.
6. New method of teaching in physiology is really very helpful and encouraging
7. It has helped the students to do regular studies.

DISCUSSION

The interactive teaching promotes the following characteristics of effective learning.

Active Involvement

Students who are actively involved in the learning activity will learn more than students who are passive recipients of knowledge (Butler 1992; Feden 1994). The students who do not talk in class are often stimulated by questions asked in class.

Increased attention and motivation

Increased attention and motivation enhance memory. Increased arousal and motivation are the essential ingredients for learning. Attention span in the traditional lecture diminishes significantly after 20 minutes (Frederick 1986, Foley and Smilansky 1980). Energy shifts are essential if student attention is to remain focused.

Higher Level of thinking

Interactive teaching promotes higher level of thinking which includes analysis and synthesis of material, application to other situations and evaluation of the material presented.

Feedback to learning

Interactive teaching allows teachers to receive feedback at a number of levels. On student needs , on how the information has been assimilated and on future learning directions. Students, on the other hand can get feed back on their own performance.

Brain Storming

More the questioning by the teacher more the stimulation of student's brain. This will cause arousal of attention in the student.

Hesitations In Giving Interactive Lectures

Many teachers report a fear of losing control over students. Fear of not covering whole of the lecture. Many believe that the basic medical sciences cannot be taught interactively and that it is easier to teach clinical sciences.

To achieve the goal of increasing student participation , attention and motivation in the lecture process various techniques are used.

Various Techniques

Putting questions to the audience: Questions can stimulate interest, arouse attention in students Questions asked should be simple and to the point. The teacher's way should be non-threating,. He or she should wait for a response of the student .

***Small Group Teaching*:** Class can be divided into small groups of two and four students sitting in the neighbourhood and then asked to discuss one topic in a few minutes. This technique gives teacher an additional way of assessing student. This is powerful and affective method but noise produced during discussion is its drawback.

Brain Storming: Brain storming refers to that process whereby students generate a list of issues – in response to a specific question or topic. In the beginning of a lecture it is an invitation to everyone in a group to participate, In the middle it can be helpful to change the pace, to regain students attention and at the end it allows the students to summarize the information discussed. (Newble & Cannon, 1994 Schwenk & Whiteman, 1987; Geuna S, 2002)

***Quizzes and Short Answers*:** Quizzes or short answers can he used at the beginning or end of a class to provide a "check-up" on learning to summarize the information.

Computer Aided Teaching: Inter active teaching in a large group can be done with the help of computers. An alternative approach is the use of flash cards. (Kennewell S et al 2007)

Clinical Case Discussion: This is the second most common method (after questioning) used by medical teachers. This increases interest and promotes problem solving. This makes the learning of medicine 'real'.

Handouts: Handouts are written material helpful to the teacher as well as students. Handouts of slides (Amato & Quirt, 1990) , (Maureen Tam etal 1993) allow students to participate more in thinking about the concepts rather than writing down every word of the lecture. The literature on handouts give higher scores in test.

Audio Visual Aids: Overhead projectors allow the presenter to maintain eye contact with the students. Flip charts and white boards allow for the creation of diagram which is very helpful in medical science. Multimedia and computer assisted learning also promotes interaction.

Using Simulations and Role Plays: Simulations and role plays allows students to try out a real life situation in a 'safe setting' and to receive feedback. (Handfield-Jones et al, 1993, Steinert, 1993 a), imulation can be helpful in involving students at a number of levels in the lecture format. (Botezatu et al 2010), (Okuda Y et al 2009) Medical simulators are increasingly being developed and deployed to teach therapeutic and diagnostic procedures as well as medical concepts and decision making to personnel in the health professions. Many medical simulators involve a computer connected to a plastic simulation of the relevant anatomy. Sophisticated simulators of this type employ a life size mannequin that responds to injected drugs and can be programmed to create simulations of life-threatening emergencies. Medical simulations of this sort will often use 3D CT or MRI scans of patient data to enhance realism. Some medical simulations are developed to be widely distributed (such as web-enabled simulations that can be viewed via standard web and can be interacted with using standard computer interfaces, such as the keyboard and mouse. Active models that attempt to reproduce living anatomy or physiology are recent developments. The famous "Harvey" mannequin was developed at the University of Miami and is able to

recreate many of the physical findings of the cardiology examination, including palpation, auscultation, and electrocardiography.(Copper et al. 2008).

Interactive models: More recently, interactive models have been developed that respond to actions taken by a student or physician. Until recently, these simulations were two dimensional computer programs that acted more like a textbook than a patient. Computer simulations have the advantage of allowing a student to make judgements, and also to make errors. The process of interative learning through assessment, evaluation, decision making, and error correction creates a much stronger learning environment than passive instruction.

Virtual patients: Virtual Patient definitions include a broader range of techniques for medical educational pur-poses:

(1) Artificial Patients or animal models (computer simulations designed to teach biochemical or physiological principles without conducting experi-ments on humans or animals)

(2) Human Patient Simulators (mannequins or life-like models reflecting human appearance, pathol-ogy and physiology)

(3) Simulated Patient (patient information recre-ated by humans using fictional data and stored in a database for student use)

(4) e-Patients (use of real patient data with differ-ent name to maintain anonymity, e.g. electronichealth record information)

(5) Virtual World Patient (patient is a computer generated character - an avatar - living in a virtual world environment).

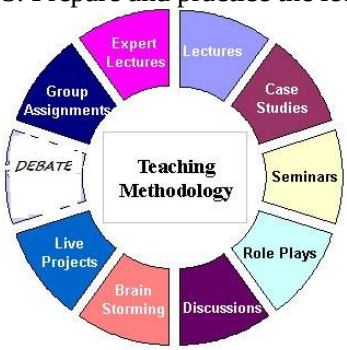
Artificial patient software and patient simulators are becoming increasingly commonplace i medi-cal schools all over the world. Simulated patient databases however take considerable time, effortand resources to establish and are often createdmore than 90 percent of medical schools in the United States have eliminated animal laboratories from their curricula. The majority of medical schools in the U.S., including Harvard, Stanford, and Yale, have replaced their use of live animals in physiology, pharmacology, and/or surgical-training exercises with humane and effective non-animal teaching methods, including observation of actual human cardiac bypass surgery, patient simulators, cadavers, sophisticated computer programs, and more. An increasing number of veterinary schools have been able to employ similar humane educational alternatives, thereby saving the lives of countless animals who in the past would have been killed for the purposes of dissection or suffered through unnecessary surgeries. In addition to being more humane, non-animal teaching tools such as computer simulations, multimedia CD-ROMs, and models are also more economical than traditional animal-based teaching exercises.(Balcome J2000) Whereas the "traditional" approach involves the acquisition and disposal of animals on an ongoing basis, purchasing a set of CD-ROMs represents a one-time expenditure for a product that can be used repeatedly for many years. Schools can save tens of thousands of dollars each year by implementing reusable replacements for animal "specimens. Advances in medical simulation technology and computer-based interactive learning, increased awareness of ethical concerns, and progressive curriculum reform recognizing the need for human-based learning are a few of the many factors that have contributed to the replacement of live animals in medical education.

Teleconferencing: Teleconferencing makes it possible to connect the resource persons at one end and the learners/participants gathered at dispersed centers, and to engage them in dialogue, discussions and doing activities with effective learning outcomes. The medium brings in interactivity as is possible in a face-to-face group situation.

Debates, Seminars and Guest Lectures: Debates can be .conducted and the student on either side can be asked to support two different sides of the issue. (Frederick, 1986, 1987) similarly, seminars and guest lectures should be conducted after completion of one topic. All these will help in arousing attention in students and thus increasing inter activity.

Teacher should follow the following strategies

1. Identify his or her fears, be willing to take risk.
2. Maintain your sense of humour.
3. Prepare and practice the lecture.



4. Set rules at the beginning of the lecture and prepare students for role play.
5. Never over do and be flexible

In our study we got the feedback which was very statisfying suggesting importance of application of various interactive techniques in Physiology lecture classes increasing student participation , attention and motivation in the lecture process

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