



Point of View

Freeing didactic lectures from monotony with a brief mid-lecture presentation on innovations in biomedical technology unrelated to the original lecture

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The traditional lecture is used for transferring information to large groups of students. Lately, South Asian medical schools have attempted changes to teaching and learning strategies by incorporating self-directed learning, problem-based learning and other active learning methods [1]. However, for practical reasons, didactic lectures remain an optimal approach to instruction [2]. In lectures where students are only listening, they have difficulty concentrating beyond the initial 20–25 minutes. This is mainly because of monotony and lack of active student participation [3] and due to the number of lectures students often are required to attend at a stretch. Beitz [4] recommends that instructors use brainstorming sessions, problem-solving activities, case studies, games and discussions to facilitate student participation. Educationists encourage instructors to consider the motivational context for learning. The premise is that students learn best when they understand that there is a need to learn.

Recently, the concept of facilitating ‘technology literacy’ in bioscience students has gained prominence. The term ‘technology literacy’ has been used to refer to acquisition of knowledge and skills thought essential for functioning in a society dominated by innovations in technology and its impact on society [5]. In the long run, technology literacy is likely to enable students to value knowledge and the ability to conduct inquiry, evaluate and make wise decisions about technology in

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different areas of science such as medical, physical, or environmental science, within a larger social context [6]. In the present study, we tried a new method to break the monotony typical of didactic lectures.

The research reported here was carried out among the first year undergraduate medical students studying for the award of the Bachelor of Medicine and Bachelor of Surgery degree at the Melaka Manipal Medical College (Manipal campus) in India. The first year of the preclinical phase consists of 4 blocks where Biochemistry is studied along with Anatomy and Physiology. Teaching-learning methods include didactic lecture classes of 1 hour each (for large classes of about 125 students) and small group methods including problem-based learning (PBL), self-directed learning (SDL), cadaveric dissection sessions and other practical classes. Didactic lectures are delivered using a combination of PowerPoint slides as well as the black board. The intervention described below was tried in biochemistry lectures in the first and third blocks of the preclinical phase of the MBBS programme.

The intervention was a mid-lecture 2-3 min detour from the original lecture in which the lecturer presented a recent interesting advance in biomedical technology that had no relationship with the original lecture topic and chosen randomly, with a few PowerPoint slides. The presentation also included some photographs related to the topic. Examples of topics included capsule endoscopy, telerobotic surgery, robotic prosthetic arm, stem cell research, synthesis of urinary bladder in the laboratory, use of nanotechnology to clear atherosclerotic plaques, diagnosis of cancer using sniffer dogs, commercial cloning of pet dogs. URL links to content and images used for presenting some of these topics are provided below.

Capsule Endoscopy:

http://en.wikipedia.org/wiki/Capsule_endoscopy

<http://springfield.news-leader.com/specialreports/progress2004/>

Bionic arm

<http://www.washingtonpost.com/wp-dyn/content/article/2006/09/13/AR2006091302271.html>

<http://www.thaimedicalnews.com/wp-content/uploads/bionic-human-arm-robot.gif>

<http://news.bbc.co.uk/2/hi/health/5348458.stm>

Telerobotic Surgery

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1356984>

Usually the *mid-lecture break presentation* was at the end of one subtopic in the original lecture and before the beginning of the next subtopic. Only one technological advance was discussed per lecture. A concise description was provided by the lecturer as to how this technology is or could be applied. Following this, the original lecture resumed and continued for the next 20-25 minutes. Care was taken not to distract the students mind from the ongoing lecture; queries arising from topics used in breaks were either discussed after the class or students were asked to find out more about those topics by themselves.

Common to topics chosen was that they were thought to be cutting edge technological advances unlikely to be elaborated in textbooks students typically used for their studies. It is thought that technology literacy has the potential to facilitate meaningful learning, creative and critical thinking, and life-long learning [7]. The main idea was to promote students awareness of some technological advances in medicine (called Technology Literacy) and at the same time break the monotony of didactic lectures. After 10 such lectures, students were asked to complete a questionnaire (their responses are indicated in **Table 1 below**). Free text comments were invited and some of them are shown in **Table 2 (next page)**.

Table 1 – Student Feedback on the Mid-Lecture Break Presentations (n = 125)

1 - Strongly agree; 2 - agree; 3 - uncertain; 4 - disagree; 5 - strongly disagree

Questionnaire Item	1	2	3	4	5
It helped break the monotony of the lecture.	88	32	5	0	0
Topics chosen were inspiring.	66	47	12	0	0
Overall, it motivated me to study in general.	29	57	35	4	0
It distracted me from the lecture topic.	1	6	11	58	49
Time was just sufficient to give me the break during the lecture.	27	62	28	6	2
I was able concentrate on the lecture class after the monotony breaking session.	37	63	20	2	3
I prefer a method of this sort for breaking the monotony during the lecture.	77	43	5	0	0
It cheered me up during the lecture.	83	30	11	1	0

Table 2: Selected Students Comments on the Mid-Lecture Presentation on Technological Innovations. Each comment below is that of a different student.

- *It let me know more of the outside world and new technological inventions. Thanks sir*
- *By far, a very interesting and useful method as it keeps us updated.*
- *I love this method. Technological information was very interesting and related to the medical field*
- *Use short video clips.*
- *The information is really interesting.*
- *Its good - besides studies, we can know new inventions*
- *It's the best method so far.*
- *It is very good and you should keep it up*
- *I think all lecturers should break the monotony of lectures by using your method*
- *It is interesting, knowledgeable, updated (advanced)*
- *It was a cool method - knowledge*
- *It is effective for breaking the monotony (of lectures)*
- *This method of breaking the monotony should be followed in other lecture classes as well*

It can be seen from students' feedback that they liked this approach to breaking the monotony of lecture; further, a majority believed it motivated them to study better, in general. We believe new technologies presented during the break may have opened students' minds to the existence of varied approaches to diagnosis and treatment of diseases. The expectation of getting introduced to cutting edge technology in class and further exploring them on their own may have contributed to enhancing and or maintaining students' attention, particularly in large classes where the impersonal situation makes students typically feel less involved. We believe technology literacy has the potential to motivate learners engage critically with content taught in didactic lectures and assume greater control over their learning; using them in the fashion described also allows to partially relieve the monotony inherent in didactic lectures.

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R.R.Barkur et al. Freeing didactic lectures from monotony with a mid-lecture presentation unrelated to the original lecture. *Medical Physiology Online* 2010; available from <http://www.medicalphysiologyonline.org>

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