

Use of audio-visual aids in medical education for effective learning

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Abstract

Background: Educators are in constant search for more efficient and effective ways to advance student learning. Medical teachers have previously conveniently used blackboard and slide projectors to educate the students. Now a day's various combinations of audio visual aids such as power point, videos, have been used to enhance the quality of teaching. This study was done to know the students opinion regarding the various audio visual aids used during the lecture classes.

Materials and methods: A total no of 397 students from first year to final year medical and first year dental students from Sri Siddhartha Medical and Dental College were invited to participate in a questionnaire based study. Their responses were analyzed. **Results:** In the present study three hundred and ninety seven students were participated. Out of 397 majorities were from Indian origin and 44.1% were from Karnataka. Majority were studied in private school and in English medium. In most of the schools the black board was the teaching method used. In the present study most of the students (46.3%) preferred combination of audio visual aids during didactic lecture classes. Students preferred power point as a best media for better understanding of subject, flow chart and diagrams. **Conclusion:** As the Chinese proverb "A picture paints a thousand words", simply providing content, the information presented can be enhanced and thus hopefully made easier to assimilate by the use of visual aids. From the point of view of the educator the logical conclusion is from passive reading to active media is truly interactive. In the present study the lectures delivered by using a combination of audiovisual aids are more appreciated and accepted by the students.

Key Word: effective learning.

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INTRODUCTION

Educational environment is one of the most important determinants of an effective curriculum.³ Medical teachers have conveniently been using different teaching methods to educate the students previously dominated by blackboard and slide projectors.² Now a day's computers are increasingly used in medical education. Teaching and learning medicine particularly has gone under profound changes due to computer technologies.⁸ Electronic

learning (e learning) is moving from text books in electronic format to a truly interactive medium that can be delivered to meet the educational needs of students and post graduate learners.⁵ Lectures are the most traditional, old fashioned and didactic method of teaching but usually they are a one way delivery of information. A well organized lecture remains one of the most effective ways to integrate and organize information from multiple sources on complex topics. Lectures are the powerful techniques for getting across a large amount of theoretical information. They are the useful method for large number of students, must be thought at one time. The maximum benefit of visual aids obtained only in conjunction with a well structured lecture. Comparison of the recall of visually and verbally presented lecture information has shown a clear superiority of visual information over verbal information for both immediate and long-term recall.¹ The Present study was undertaken to know the students opinion regarding audio-visual teaching aids used in the medical college.

MATERIALS AND METHOD

A cross sectional study was carried out among the undergraduate medical students of first year to final year and first year dental students at Sri Siddhartha Medical College and Sri Siddhartha Dental College, Tumkur from January 2014 to June 2014, after the approval of the study from the institution. All the medical students from first year to final year and first year dental students were included in the study. Students who were absent in three consecutive classes were excluded from the study. After taking the informed consent, the students were asked to complete a pretested, semi structured questionnaire. The confidentiality of students was maintained. The questionnaire consisted of two parts. The first part collected demographic and other relevant information about the students. The gender and nationality of the students were noted. The information regarding students schooling whether government or private school, medium at the school were noted. The second part of questionnaire consisted of statements regarding audio visual aids. The students were asked to answer legibly and encircle the appropriate answer wherever required. No personal identity information was obtained. The questions used in the study are shown in the appendix. Data collected was entered in the MS-excel sheet and analyzed by epi-info-7. Chi-square test was applied to test the significance. Statistical significance was accepted at $p < 0.05$.

RESULTS

In the present study three hundred and ninety seven students are participated. Out of 397, 121 were from first year, 111 were from second year, 84 were from 3rd year and 63 were from final year and 18 were from first year dental students. 57.9% were females and 42% were males. Majority of them were from Indian origin and few were from other countries.

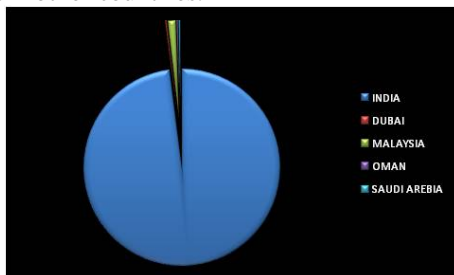


Figure 1: Shows the distribution of students from different countries

In the present study out of 397, 175(44.1%) were from Karnataka state, 63(15.9%) were from Tamilnadu, 48(12.1%) from Kerala, 33(8.3%) from Andrapradesh and 77(19.4%) were from other states. 95.1% of students had studied in private school and 97.7% had studied in English medium. The teaching method used in the school was black board in 50.2% and combination of aids was used in 36.6%. In the present study most of the students (46.3%) preferred combination of audio visual aids during didactic lecture classes. The reasons given by students favoring black board were, it is easy to understand, they can concentrate more, it is easy to take diagrams and notes. And reasons favoring the power point were, interesting to lesson, clear visibility, can correlate with clinical videos, accumulate more knowledge in less time, Students can pay more attention. Visual aids can be better remembered. In the present study most of the students preferred power point (36.8%) for better understanding of diagrams and second preferred media was combination of aids (26.5%). Students preferred power point as better media for flow chart (46.3%). Majority of students were of the opinion that understanding of the topic was best with combination of aids (43.5%) and the second preferred media was black board (33.5%). For understanding of histology majority of the students preferred blackboard as best media (46.9%) and the second preferred media was power point. The reasons given by the students were black board was useful to learn each cell structure, to write diagrams. Power point was helpful to view a large diagrams and colourful actual slide image. 82.8% of students were interested in making notes and they preferred power point as a best media to make notes. Also students preferred black board as best method for listening without making notes. 63.3% preferred to take notes during class. Most of the female students preferred to take notes than males students ($p = 0.0011$). Most of the students (55.7%) preferred student seminars. The reasons given were that they can read the subject in detail, can improve the confidence, communication skills and knowledge. The interactive discussions creates more interest to study. Students opine that listening with visual aids will stimulate further reading and in black board teaching the concentration time is more.

Table 2: Distribution of variables among males and females

Variable	Male n(%)	Female n (%)	P VALUE
1. Preference for hand outs / notes			
Hand outs	74	68	P<0.005
Taking notes	87	163	
2. Method stimulate further reading			
Only lecture	30	22	P <0.05
With visual aids	134	202	
3. For making notes			
Yes	124	204	P<0.005
No	43	25	
4. Vadl (visual aids preferred during lecture classes)			
A (black board)	29	47	P>0.005
B (ohp)	21	14	
C (power point)	46	55	
D (combination of aids)	70	133	

DISCUSSION

Computers are good at storing information. They reproduce it accurately time after time and, with appropriate connections, can transmit that knowledge to where it is needed.⁵ It is a valuable tool to add to the medical teacher's toolkit, but like all tools it must be used appropriately.⁵ With the shift in the teaching pattern from teacher-centric to student-centric teaching, wherein the teacher is now more of a facilitator in the learning process than an imposed teacher. The educational environment and the students perception about the teaching pattern, the quality of teaching, and their own assessment about their performance become imperative so as to ensure and maintain high quality educational environments and optimum teaching to the students.³ Motivation is an innate feature affected by four factors, namely situation, (surroundings and external stimuli), mood, goal and tool.⁹ Medical schools particularly in developed countries have invested heavily in ICT (Information and Communication Technology), not only to deliver education, but also to improve the quality of services provided by health care professionals. This is in striking contrast to the plight of many medical professionals in developing countries who many suffer from inadequate computer knowledge and skills to use ICT effectively. International organizations such as United Nations (UN) and World Health Organization (WHO) have acknowledged ICT as useful tool to address health care education in developing countries.⁸ There are many subjects from preclinical subjects like Anatomy to clinical subjects like Medicine taught in the medical colleges all over India. In the routine undergraduate teaching the teachers usually use blackboard and various audiovisual aids, problem based experiments. Questionnaires are being used commonly as a tool to evaluate the various aspects of teaching and learning among the students.⁴ In this study, the questionnaire was distributed to study the

students opinion on the audio visual aids used during didactic lecture in the medical college. A properly structured lectures are the probably the best teaching method in many circumstances and for many students.⁶ Lectures are effective because they exploit the spontaneous human aptitude for spoken communications and because they are real time human presence social events. Despite the lecture method being so unpopular among professional educational advisers, reformers and intellectuals generally and annual declarations that information technology will render lectures obsolete—many scientists continue to give lectures and students continue voluntarily to attend them.¹ Lectures are especially used in teaching the most quantitative and systematic sciences and for intensive professional training courses such as medicine, engineering and law. In other words lectures are a forces of teaching in exactly the situation where transmission of knowledge is most vital and in subjects where learning is most easily and validly measurable. Majority of the student's feedback revealed that attending lecture classes stimulates further reading. The major limitation of lecture is that the listener passively receives the material, feels bored & sleepy. The use of effective Audio Visual aids make them feel interesting and attentive. In our study majority of the students preferred combination of aids during didactic lectures in a medical college. Combination is always better than a single monotonous teaching. Students opine that each method of teaching has its own advantage and all are useful in its own way. Use of power point enables to play videos, pictures, clinical signs and symptoms. With the use of videos one can easily understand the actual process like in case of embryology or any disease. Such videos make students more attentive and make the subject more interesting. The study also revealed that understanding of subject was best with the combination of aids. Students also opined that power point as an effective media for understanding the flow charts,

diagrams, histology slides and for taking notes. In the Bergman investigation on the students and faculties opinions with regard to traits of successful medical teachers and effective education, in the teachers and students point of view, the indispensable characteristics were scholarship and communication skills respectively.⁷ There are many more methods to teach histology. Bauer *et al* used 35 mm projection slides in self study modals. Downing used laser disc image banking technology. Olgivie used photo micrographic image banking with bar code retrieval and digitalized photo-micrographic exhibits derived from and linked to traditional laboratory slides sets.¹⁰ In our study the students preferred black board as the best media for learning histology and second preferred media was power point. The students gave reasons such as they can learn each cell structure in the black board. Black board is best for copying of diagrams. In power point one can view the clear and magnified image of the slide exactly as seen under the microscope. The students opine that black board was best for diagrams and power point slide best for overall view of the slide. So use of both will be advantageous. Most of the students preferred student seminars. The reasons given were they can read the subject in detail, can improve the confidence, communication skills and knowledge. Creates more interest to study and more interactive. Students opine that listening with visual aids will stimulate further reading and black board teaching concentration time is more. As per the work of Richard Mayer *et al*, a set of principles regarding multimedia and modality were use full in preparing PowerPoint are:

1. Multimedia principle: Retention is improved through words and pictures rather than through words alone.
2. Special contiguity principle: students learn better when corresponding words and pictures are presented near each other than far from each other on the page or screen.
3. Temporal contiguity principle: students learn better when corresponding words and pictures are presented simultaneously rather than successively.
4. Coherence principle: students learn better when extraneous words, pictures, and sounds are excluded rather than included.
5. Modality principle: students learn better from animation and narration than from animation and on-screen text.
6. Redundancy principle: students learn better when information is not represented in more than one modality- redundancy interferes with learning
7. Individual differences principle: Design effects are higher for low- knowledge learners than for

high- knowledge learners. Individual differences principle: Design effects are higher for high- special learners than for low- special learners.

8. Direct manipulation principle: As the complexity of the materials increase, the impact of direct manipulation of the learning materials (animation, pacing) on transfer also increases. Students engaged in learning that incorporates multimodal designs, on average, outperform students who learn using traditional approaches with single modes.¹⁰

CONCLUSION

Scientists, who usually have something to teach which is worth learning, should feel more confident about the value of lecturing and the appropriateness of the method. In general lectures should be aim to be enjoyable, but should not strike to be entertaining as a major goal; because lecture should be memorable rather than diverting. In a nutshell, lectures retain a major educational role to make learning easier and effective. In general multimodal learning has been shown to be more effective than traditional unimodal learning. Adding visual to verbal (text and/or auditory) learning can result in significant gains in basic and higher-order learning. In our study students opinion about the use of audio visual aids during didactic lectures was favorable. The lecture delivered by using a combination of audio visual aids was more appreciated by the students. Instead of trying to phase out lectures, we should strive to make the better by using visual aids. The lecture should be constricted in a fashion to enable the students to gather factual information easily and in a concise manner and the students were able to make notes from combination of visual aids like black board and power point presentations. We plan to implement feasible student suggestions for further improving the use of audiovisual aids during didactic lectures in our institution.

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