



Original Research Article

## Effectiveness of Audio-Visual Aids in Medical Education: A Students' Perspective

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### ABSTRACT

**Background:** The advancement of various audio-visual (AV) aids in the present era has led to progressive changes in education. Uses of AV aids play a key role in medical education to learn and understand a particular topic. As the subject of anatomy involves more of illustrations and demonstrations, AV aids become essential in conveying the necessary information. Therefore the present study aims to assess the students' perspective about the use of AV aids in teaching anatomy.

**Material and methods:** The present cross sectional study was carried out involving 189 first year MBBS students. The students were asked to put forth their preferences for the different AV tools that would help them to understand the subject better. A questionnaire was therefore constructed accordingly and was distributed to the students at the end of the academic year 2013-14. The responses ranged from strongly disagree to strongly agree with a score of 1-5. The results were expressed in percentages and were tabulated.

**Results and conclusion:** The most common AV aid preferred was PowerPoint but the combination of aids was also suggested that would make an impact in effective learning. The present study not only assesses the effectiveness of the AV aids used in teaching Anatomy but also highlights the students' valuable opinions and ideas which could be implemented in future for active learning.

**Keywords:** Audiovisual aids, Anatomy, PowerPoint, Blackboard, Learning

### INTRODUCTION

Lectures have been a part and parcel of teaching and learning since ancient times.

<sup>[1]</sup> Although there are different alternative methods of teaching like group discussions and small group teaching which appear to be successful methods of attaining higher-level intellectual learning, in India it is almost inevitable for a medical student to attend lectures, as the number of students attending

medical schools is too large in comparison to the teaching staff available. <sup>[2]</sup> Hence, the lecture classes are obligatory and therefore it is immensely important to make them as effective as possible. <sup>[3]</sup>

Students have different domains of learning which include visual, auditory, read/write and kinaesthetic modes. <sup>[4]</sup> Teachers have to bear these different domains in mind while choosing different

teaching methods to enhance learning and to make it more interesting and impact bearing.

A chalkboard or a blackboard is uniquely effective as a medium of classroom instruction and has been used commonly in the lectures, while the use of transparencies with an overhead projector (OHP) is also popular. [5] Recently, the use of electronic presentations is now common in medical colleges, as in other colleges and universities. Microsoft PowerPoint (PPT) is the most popular package used out of all electronic presentations. [6]

The advancement of various audio-visual (AV) aids in the present era has led to progressive changes in education.

Uses of AV aids play a key role in medical education to learn and understand a particular topic. As the subject of anatomy involves more of illustrations and demonstrations, AV aids become essential in conveying the necessary information. Therefore the present qualitative study was aimed to assess the students' perspective about the use of AV aids in teaching anatomy.

## **MATERIALS & METHODS**

### ***Teaching methodologies practiced for the present curriculum:***

The first year of MBBS course involves learning the basic sciences such as Anatomy, Physiology and Biochemistry. Anatomy curriculum includes gross anatomy, histology, embryology, neuroanatomy and genetics. The main teaching methodology includes lecturing which is followed by live demonstration using the dissected specimens, histology slides and embryology models. The AV aids like blackboard, OHP, PPT, animations and videos are used in the lecture classes for the better transfer of information.

### ***Study design:***

The present cross sectional study was carried out involving 189 first year

MBBS students. The ethical clearance was obtained from the Institutional Ethical Review Board. An informed consent was taken from the students before participating in the study. A questionnaire was therefore constructed accordingly and was distributed to the students at the end of the academic year 2013-14. Likert scale with responses ranging from strongly disagrees to strongly agree with a score of 1-5 was used in the questionnaire. The questionnaire assessed multiple aspects such as most preferred AV aid, usefulness of combination of AV aids, the use of animations and videos the details of which is shown in table 1. The students were asked to put forth their preferences for the different AV tools that would help them to understand the subject better. The results were expressed in percentages and were tabulated.

## **RESULTS**

The study questionnaire was distributed to 189 first year MBBS students in which 95 were males and 94 females of age group of 18-20 years. The questionnaire evaluated the effectiveness of various AV aids used in their curriculum. 60.2% of students chose PPT as the preferred AV aid, which helped them understand the topic better. 19.89% of them preferred blackboard over PPT. the graph 1 shows the frequency distribution of students according to their opinions in the use of PPT as a preferred AV aid.

69.09% of the students affirmed that the diagrams and flow charts were better perceived with PPT which also made notes taking easier (41.1%). 53.32% of students agreed that the PPT presentations evoked interest in them to go back and study.

Combined use of AV aids was appreciated by 87% of students as shown in graph 2. They suggested that the PPT and the blackboard can be combined and used accordingly. Animations in PPT is an

interesting feature which was acknowledged by 88.26% of students who found it supplementary to the content while 3.93% of them found it as distraction in learning.

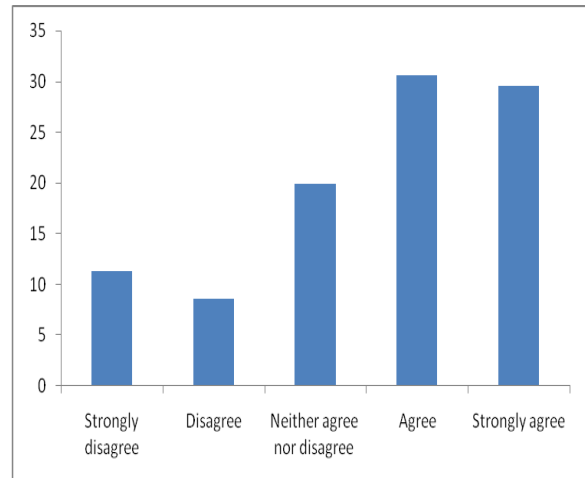
Need for an online database of all PPT presentations of lectures which could be made available after the lecture classes was welcome by 87% of students as shown in graph 3. The students agreed that they can easily access the PPT presentations of lecture classes anytime outside the classrooms. 7.81% however failed to respond.

Students described PPT as an illustrative, time saving, well oriented and creative AV aid which helps to create a mind map which enhances learning. The use of blackboard was also appreciated as a simple tool where the diagrams can be drawn sequentially and schematically by the teacher. This could help them to understand and easily reproduce the same in a better manner and would also create healthy interaction between a teacher and students.

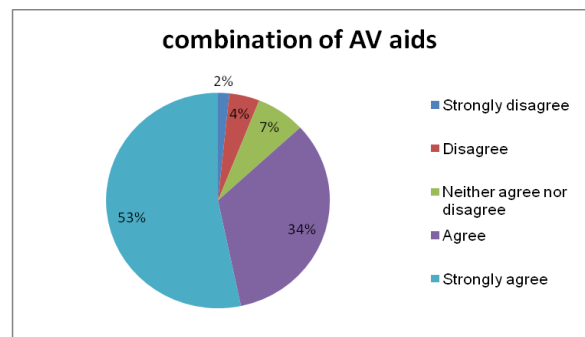
The students were also asked about the other AV aids commonly used. 32.72% of students were aware about the other AV aids such as Prezi, word maze, flash cards and online videos. 36.35% of them were not aware about these while 30.9% of them did not respond for the same.

Table 1: The questionnaire assessing the various aspects of AV aids used in teaching Anatomy

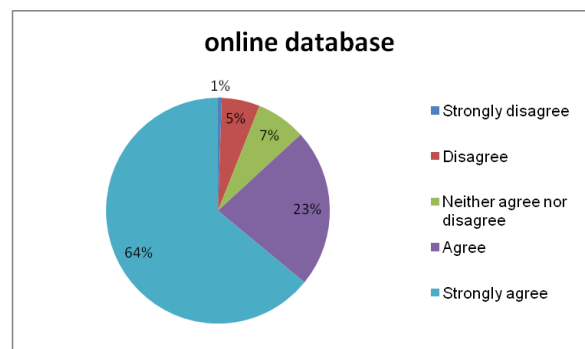
|    |   |
|----|---|
| 1  | I prefer PPT over blackboard/OHP for the lecture classes                                |
| 2  | PPT helps me to understand the lectures better  |
| 3  | Diagrams and flow charts are better perceived using PPT                                 |
| 4  | Combined use of audio-visual aids (PPT and Black board) is more helpful                 |
| 5  | I take notes from PPT during classes  |
| 6  | Animations and videos are supplementary in the PPT to understand anatomy subject better |
| 7  | Animations and videos are distractors in the lecture classes                            |
| 8  | The PPTs used in lectures provoke interest in learning the subject during self-study    |
| 9  | I am aware of audiovisual aids other than PPT   |
| 10 | An online database of PPTs of all classes for the access of students will be useful     |



Graph 1: Frequency distribution of students' opinions for the use of PPT as a preferred AV aid. Majority of the students preferred PPT over blackboard and OHP.



Graph 2: Students' perspective on use of combination of AV aids in lecture classes.



Graph 3: Students' perspective about the need for an online database of PPTs of Anatomy lecture classes

## DISCUSSION

At the undergraduate level, Anatomy is mainly taught to first year medical students in India and the subject is horizontally integrated with other basic science subjects like physiology and

biochemistry. The training program in Anatomy uses a prudent mixture of didactic lectures with audio visual aids and small group demonstrations of dissected specimens.

Questionnaires are being used commonly as a tool to evaluate the various aspects of teaching and learning among the students. In the present study, a questionnaire was distributed to obtain the students' opinion on the AV aids used during didactic lectures.

The student feedback in the present study revealed that the use of AV aids in lecture classes stimulated the students and stated that the concept was well illuminated which further inspired them for in-depth reading.

Didactic lectures have their own limitations. Here the listener passively receives the material which induces boredom and sleep. There are different methods to make a lecture effective. The most popular among them is the use of visual aids which should be clear and understandable. [7] AV aids are of different types and the ones most commonly used in educational institutions include black board (BB), OHPs and Microsoft Power Point Presentations (PPT).

In black board/ white board-teaching, the students are active participants and are able to follow the teacher as it involves natural breaks and pauses making it easier for them to note down the important points.

It motivates an interest in learning. Diagrams and flow charts can be drawn sequentially and schematically by the teacher. This could help the students to understand and easily reproduce the same in a better manner and would also create healthy interaction between a teacher and students. The other benefits include its easy availability in most of the lecture rooms, easy utility, free from technical errors and

effective development of the concept in sequences. BB teaching however have its own limitations, i.e., eye to eye contact is lost while writing, the written material cannot be stored and reused, bad handwriting etc. [8]

The versatility of the OHP has made it a powerful teaching tool and has replaced the BB in classrooms. In this case the teaching material (including illustrations) can be prepared well in advance. The teacher faces the class all the time and eye to eye contact too is not lost. The prepared transparencies can be preserved for future use. Although OHP is a useful tool when it comes to taking notes, when a large volume of information is presented in this manner, it gets overloaded and useful note taking becomes difficult. The students may continue to take down notes and may fail to follow and understand the explanation provided. This could be one of the why the students do not prefer the use of an OHP during lectures. Additionally, a good illumination is needed for proper visualization. The use of different colours on the plastic transparency sheet and depiction of the main points with good hand writing is beneficial in understanding the topic under discussion the failure of which may not be successful in meeting the students' needs. [9] However in the present study the use of OHP failed to receive positive response from the students.

The majority of medical students prefer PPT presentations, mainly because they avoid the issue of poor handwriting and dirty blackboards. [10] PPT has the ability to integrate text and images which is a great advantage and improves the educative value of the subject. [11] Authors have even stated that PPT presentations encourage an active learning environment, increase the effectiveness of lectures, and lend clarity to the subject. [12,13]

One disadvantage of PPT may be that the student becomes a passive observer rather than an active participant. [14]

It is suggested that although PPT has some positive effects, it does reduce the interactive discussion between teacher and students. [15] Some previous studies have found that the students preferred PPT. [16-18] while in others the students preferred traditional blackboard teaching to OHP and PPT. [19] One extensive study has suggested that the efficacy of PPT is case specific rather than universal. [20]

The present study revealed that the understanding of topics is best possible when combinations of AV aids are used, preferably BB and PPT. This was in general agreement with a study by Lalit and his co-workers. [21]

It is also found that the effectiveness of the lecture depends upon the teacher, regardless of the teaching aid used, and in this context one study points out that what is fundamentally important in university teaching is not the quality of the technology but the quality of the teacher. [22]

The authors were unable to correlate the assessment results obtained at the end of the academic year with the practice of AV aids.

## CONCLUSION

The most common AV aid preferred was PPT but the combination of AV aids, preferably BB and OHP was also suggested that would make an impact in effective learning. The present study not only assesses the effectiveness of the AV aids used in teaching Anatomy but also highlights the students' valuable opinions and ideas which could be implemented in future for active learning. The present study also suggests that the use of AV aids can be beneficial and accrued by the students only in the presence of an effective teacher who

would act as a facilitator catering to the needs of the students.

## Lessons for Practice

- As the diagrams and flow charts are better perceived using PPT, it was considered as the most acceptable AV aid in learning Anatomy.
- A combination of AV aids would help the students understand the particular topic better.
- Appropriate use of animations and videos during lecture classes would help the students to increase the perception, evoke interest and also break the monotony.
- Establishment of an online database of all PPTs would be essential for the access of PPTs outside the classrooms during self-study by the students.

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**Contribution by Authors:** All the authors were involved in the study process and have contributed to the same.

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