

# Perception of medical students toward teaching aids during physiology lectures: a cross-sectional study

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## Abstract

**Background:** The students' learning depends on three forms of sensory modalities, that is, visual, aural, and kinesthetic collectively known as VAK. In view of this, the teacher should adapt the teaching style that fits with each student's learning style.

**Objective:** To assess students' perception toward didactic lecture using chalk and board and PowerPoint (PPT) during physiology lectures and to assess students' preference of teaching aid for didactic lecture.

**Materials and Methods:** The study was conducted among 100 medical students of first-year MBBS of 2014 batch in Physiology Lecture Hall, Belgavi Institute of Medical Sciences, Belgavi, Karnataka, India. Five physiology didactic lectures were taught by using chalk and board and five lectures were taught with the help of powerpoint (PPT). Students' feedback was collected by administering prestructured and pretested questionnaire. The students were asked to rank each item of questionnaire on a five-point Likert scale. The students were also asked about their preference of teaching aid. Students' responses were analyzed by using nonparametric test, the Wilcoxon signed-rank test and student's 't' test.

**Result:** Wilcoxon signed-rank test was used to compare different parameters between powerpoint (PPT) and blackboard (BB). The total score was assessed by Student's 't' test. Students felt and preferred didactic lecture using blackboard over powerpoint. A total of 46.73% students preferred BB teaching over PPT whereas 32.60% students preferred BB aided with PPT.

**Conclusion:** In this study, students opined that didactic lecture using chalk and board was better compared with PPT in the parameters such as stimulating interest, taking down notes or diagrams, flow of thought, recalling tough points, facilitation of interaction between student and teacher, and overall effectiveness of presentations; the difference being statistically significant. The students preferred BB teaching over PPT.

**KEY WORDS:** Audiovisual aid, chalk and board, medical education, medical students

## Introduction

Learning physiology is a building block for medical students. The most common mode of teaching in our medical college is by didactic lecture as students attending medical college are too large. Didactic lecture is passive in nature compared with other student-centered teaching methods.<sup>[1]</sup> But still it

has an advantage of imparting knowledge to large number of students at a time. The lectures can be delivered by using different teaching aids such as blackboard (BB), OHP, or PowerPoint (PPT) presentation. While delivering didactic lecture, the teacher should understand their students' learning attitude and learning style preferences. The students' learning depends on three forms of sensory modalities, that is, visual, aural, and kinesthetic, collectively known as VAK.<sup>[2]</sup> In view of this, the teacher should adapt the teaching style that fits with each student's learning style<sup>[3]</sup> rather than reinforcing their own preference.

Various studies have been conducted to assess the effectiveness of lectures using different teaching aids.<sup>[4-7]</sup> There is a mixture of views based on the studies and it is not clear whether a particular lecture delivery method is superior to other. Hence, this study is undertaken to know students' perception and their preference of didactic lecture using chalk

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and board and with PPT using Meyer's principle. By knowing students' preference of teaching aid, the same can be incorporated for undergraduate teaching. So this study was undertaken to assess students' perception toward didactic lecture using chalk and board and PPT during physiology lectures and to know students' preference of teaching aid for didactic lecture.

## Materials and Methods

After obtaining institutional ethical clearance, the study was conducted among 100 medical students of first-year MBBS of 2014 batch in Physiology Lecture Hall, Belgavi Institute of Medical Sciences, Belgavi, Karnataka, India. Five physiology lectures were taught by using chalk and board and five lectures were taught with the help of PPT using Meyer's principle.<sup>[6]</sup> Lectures selected were of the same topic and more or less of the same difficulty level. Students' feedback was collected by administering prestructured and pretested questionnaire.<sup>[1,4,6]</sup> For each of the two methods, the students were asked to rank each item of the questionnaire on a five-point Likert scale: strongly agree (1), agree (2), no opinion (3), disagree (4), or strongly disagree (5). The students were also asked to opine regarding their preference of teaching aid.

The questionnaire had following 18 parameters to assess students' perception toward teaching aid:

1. The lectures were well organized
2. The lectures were well audible
3. The board work or audiovisual aids were clear
4. The lectures were clear and understandable
5. The lectures stimulated my interest
6. The lectures advanced my understanding
7. The lecture delivery was interesting
8. Able to take notes/diagrams
9. The lecture contents were well informative
10. Stress on important points
11. Problem solving better
12. Flow of thought better
13. Better summarization
14. Best mode to recall tough points
15. Covers more subject per lecture
16. Demonstrations of clinical conditions better
17. Facilitated interaction between student and teacher
18. Overall effectiveness of presentation

## Result

### Statistical Software

The statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1, Systat 12.0, and R environment ver.2.11.1 were used for the analysis of the data and Microsoft Word and Excel were used to generate tables.

Wilcoxon signed-rank test was used to find the significance of questions 1–18 between PPT and BB. The total score was

assessed by Student's *t* test as it is a summative score following normal distribution.

Students felt didactic lectures by BB was better than PPT for parameters such as well audible, clear and understandable, able to take notes/diagrams, flow of thought, recall tough points, covers more subjects per lecture, demonstration of clinical conditions better, facilitated interaction, and overall effectiveness; and they were statistically significant.

When asked about their preference of teaching aid for didactic lecture, 46.73% students preferred BB teaching over PPT whereas 32.60% students preferred BB aided with PPT only for diagrams, videos, and explaining clinical conditions.

## Discussion

BB teaching engages learners actively to what teacher is discussing, writing, and explaining on board. As topic unfolds slowly, it stimulates interest. It enables teacher–student interaction. Students are able to take down notes as well as diagram as teacher writes/draws on the BB during lecture, whereas lectures with PPT makes the teacher less spontaneous. Structuring of PPT cannot be changed on the spot. Too much information may result in decreased communication between teacher and student. The student may concentrate on animation and font color used rather than course content or class–room discussion.<sup>[4]</sup> The diagram displayed on a slide in PPT do not give much time for students to copy. Moreover, in PPT, teachers tend to show complex diagrams, whereas in the BB, teacher chooses a simplified diagram enabling the student to follow the tracing. These may be the reasons for students' preference of chalk and board teaching over PPT.

In one of the study, the students opined that in all the parameters studied, that is, conceptual understanding, memorization, and reproducibility of text information as well as diagrams in theory examination and viva, the C&B is more helpful than the PPT, the difference being statistically significant. Majority of the students expressed that the C&B is more interesting than PPT. When they were asked about their preference for the teaching method, more than two-third of them selected C&B.<sup>[7]</sup> In another study conducted, according to the students, the attributes such as clarity of words, stress on important points, and summarizations were best dealt with PPT whereas chalk and board-based lectures gave better clarity of concepts, learning to draw diagrams, better understanding of the subject, and easier note taking. In this study, the preferred method for delivering lectures was BB (51%).<sup>[4]</sup> Study done in the Pharmacology Department showed that students who attended the classes where teacher used chalk and board obtained significantly higher score in multiple choice question test compared with those who attended the same content-based lecture using PPT. The chalk and board lectures were preferred by 67.5% of the students. This study showed that the chalk and board teaching has the advantage of a better recall.<sup>[9]</sup>

Age in years	PowerPoint	Blackboard	Z score	P-value
1. Well organized	2.14 ± 0.87	2.12 ± 1.06	-0.194	0.846
2. Well audible	2.69 ± 1.1	2.4 ± 1.11	-2.735	0.006**
3. The board work or audiovisual aids were clear	2.56 ± 1.08	2.33 ± 1.13	-1.580	0.114
4. Clear and understandable	2.63 ± 1.08	2.34 ± 1.04	-2.605	0.009**
5. Stimulated interest	2.72 ± 1.16	2.4 ± 1.14	-2.517	0.012*
6. Advanced understanding	2.53 ± 1.04	2.33 ± 1.07	-1.720	0.085***
7. Delivery interesting	2.66 ± 1.09	2.49 ± 1.23	-1.403	0.161
8. Able to take notes/diagrams	3.02 ± 1.24	2.31 ± 1.19	-3.640	<0.001**
9. Contents well informative	2.32 ± 0.97	2.27 ± 1.05	-0.506	0.613
10. Stress on important points	2.17 ± 1	2.1 ± 0.9	-0.507	0.612
11. Problem solving	2.73 ± 1.05	2.52 ± 1.08	-1.799	0.072***
12. Flow of thought	2.7 ± 1.05	2.3 ± 1.1	-3.007	0.003**
13. Summarization	2.53 ± 1.11	2.42 ± 1.1	-0.627	0.530
14. Recall tough points	3.03 ± 1.05	2.47 ± 1.1	-3.796	<0.001**
15. Covers more subject per lecture	2.31 ± 1.07	2.67 ± 1.11	-2.752	0.006**
16. Demonstrations of clinical conditions better	2.58 ± 1.09	2.86 ± 1.2	-2.186	0.029*
17. Facilitated interaction	2.48 ± 1.12	1.97 ± 0.94	-3.553	<0.001**
18. Overall effectiveness	2.63 ± 0.99	2.24 ± 0.96	-2.706	0.007**
Total score	46.44 ± 12.92	42.54 ± 14.85	2.567	0.012*

\*Moderately significant ( $P$ -value:  $0.01 < P \leq 0.05$ ), \*\*strongly significant ( $P$ -value:  $P \leq 0.01$ ), \*\*\*suggestive significance ( $P$ -value:  $0.05 < P < 0.10$ ).

In another study, majority of students opined that PPT presentations should be the sole method of teaching. Students opined that the traditional teaching fulfilled the need of understanding the subject and reproducing diagrams whereas supplementation with power point enhanced understanding because of visualization of three-dimensional diagrams and real pictures of various clinical conditions.<sup>[5]</sup> In another study conducted, the dental students did not prefer PPT mainly because the PPT presentations contained too much material and the lectures were delivered too fast. The majority of medical students preferred PPT presentations, mainly because PPT presentations avoided the issue of poor handwriting and dirty BBs. The main reasons for liking BB teaching by dental students were that the student–teacher interaction is better and it encourages taking down the notes and diagrams. The disadvantages of PPT presentation were that power failure interrupts the lecture and some teachers go too fast and then students find it difficult to take down the notes and diagrams.<sup>[6]</sup>

One more study was conducted to compare the traditional and conventional chalk and board method with PPT presentation. Majority of students preferred use of PPT presentations over conventional chalk and board method for delivering lectures while teaching gross anatomy. According to students, with PPT the lectures were well-organized, clearer with respect to new terminology, spellings, pronunciation, clarity of diagrams, better visibility, and have the continuity of lecture contents.<sup>[10]</sup>

Some other study done revealed that the majority of students favored the mix of aids during the lecture classes

as the inherent deficiency of one aid can be compensated by the other.<sup>[11]</sup>

Any teaching aid has its own advantages and disadvantages. Use of teaching aid depends on teacher's choice and topic of discussion. Traditional chalk and board should not be completely replaced by PPT as students like slow pace of teaching using BB. Let it be any teaching aid, students' participation should be encouraged during lecture. Combined use of teaching aid will be more effective wherein BB is used for conceptual understanding and PPT is used to show clinical conditions.

## Conclusion

In this study, students opined that didactic lecture using chalk and board was better compared with PPT in the parameters such as stimulating interest, taking down notes or diagrams, flow of thought, recalling tough points, facilitation of interaction between student and teacher, and overall effectiveness of presentations; the difference being statistically significant. The students preferred BB teaching over PPT.

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