

## Comparative Study of Traditional Chalkboard Teaching Over Powerpoint Presentation as a Teaching Tool in Undergraduate Medical Teaching

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**Abstract:** Teaching and learning are active and continuous process. In the past decade, a number of developments appeared in medical education. With the advent of digitalized teaching methods, the most common teaching tool is PowerPoint Presentation. The present study, a cross-sectional questionnaire-based study, was conducted to evaluate the impact of chalkboard and PowerPoint teaching in 209 undergraduate medical students. This study has shown that blackboard teaching still remains the most preferred teaching aid by the students (71.77%) when compared to PPT teaching method (28.23%). However, the students preferred PowerPoint Presentation over traditional chalkboard, when parameters like understanding diagrams and charts (77.51%), demonstration of clinical conditions (89%), problem solving abilities (83.25%) and post-lecture summarization (63.16%) were considered. On the contrary, chalkboard was the medium of choice when the students were asked about perception of subject (76.55%), stressing important points (61.72%), maintaining pace with the facilitators (61.24%), student-teacher interactions (74.64%), ability of retention (55.98%), holding attention (66.03%) and flow of thought (91.87%).

**Keywords:** Chalkboard, PowerPoint Presentations (PPT)

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### I. Introduction

Teaching and learning are active and continuous processes (1). Teaching is an art of facilitating and supporting learning character in students. Learning is the cognitive process whereby an individual acquires the professional and ethical values, the biomedical, behavioral and clinical knowledge, reasoning and psychomotor skills necessary for professional competence (2). Learning ultimately leads to a permanent behavioral change in the learner (3).

Lectures have been the most common form of teaching and learning since ancient times (4). However, in the past decade, a number of developments appeared in medical education. Most common of these developments is the introduction of digitalized teaching method (5). Almost all medical colleges across the country are equipped with L.C.D. projectors for PowerPoint Presentations (PPT). It is generally believed by some that PowerPoint is a better method of teaching than conventional chalk and talk. However, there are experienced teachers who prefer chalkboard rather than PowerPoint. Nevertheless, sometimes it is debated that PowerPoint is attractive to students and lectures are better understood.

Chalkboard is inexpensive, easy to clean and reusable. It allows students to keep pace with the facilitator and is not dependent on electricity (6). PPT has the advantage of using colors, fonts, diagrams, and animation. But, it has the tendency of overloading information and is solely dependent on power supply.

There is a need to evaluate the impact of this change on the knowledge gained by the students. Therefore, the present study was conducted to evaluate the impact of traditional chalkboard and PowerPoint presentation in undergraduate medical teaching and hence, getting a structured feedback from them about these teaching-learning media.

## II. Materials And Methods

A cross-sectional questionnaire-based study was conducted at Bankura Sammilani Medical College, Bankura, West Bengal and Midnapore Medical College, Midnapore, West Bengal, India among 2<sup>nd</sup> year medical students during the period of February- March, 2019. The participation in the present study was on voluntary basis. No personal identification was disclosed in this study.

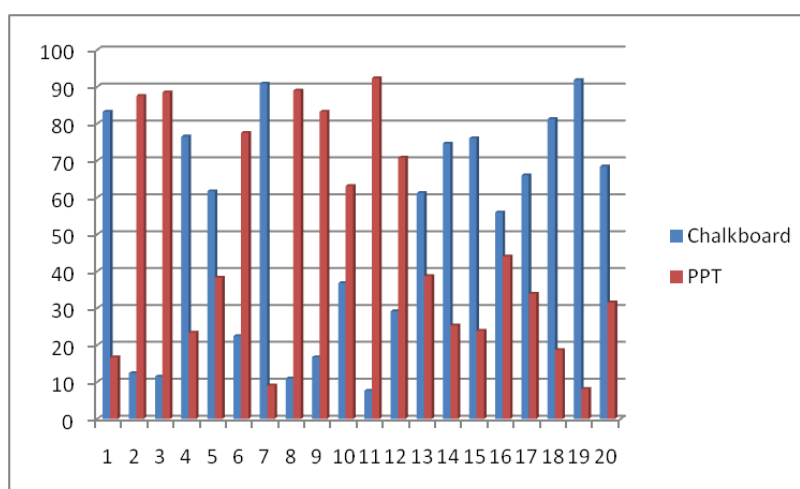
A predesigned and pretested questionnaire containing 21 questions was used to collect data. A questionnaire was designed to assess the opinion of students regarding chalkboard and PPT presentation (7). The study was conducted in 209 students who were already exposed to various teaching aids earlier. One hundred and thirty two (n<sub>1</sub>=132) medical students of Bankura Sammilani Medical College and seventy seven (n<sub>2</sub>=77) of Midnapore Medical College, who are in 2<sup>nd</sup> Professional M.B.B.S course, participated in the study. Students were summarized about the objectives of the present study and assured confidentiality and also instructed to mark appropriate teaching aids for each question in the questionnaire form and give their overall opinion regarding the best teaching aid they preferred. All the students attended the questionnaire. Data were entered and analyzed in Microsoft Excel for Windows 10.

## III. Results

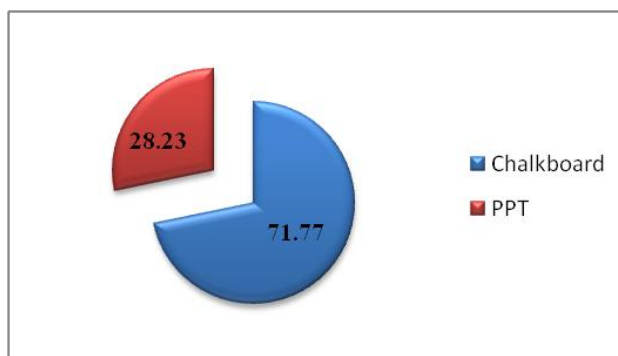
In the present study, 21 parameters were studied taking students' opinion between chalkboard and PowerPoint teaching methods [Table 1 and Fig. 1]. Of the total 209 students in our study, 71.77% of students preferred chalkboard over PowerPoint presentation (28.23%), as depicted in Fig. 2.

**Table 1** Students' opinion for chalkboard and PowerPoint teaching methods

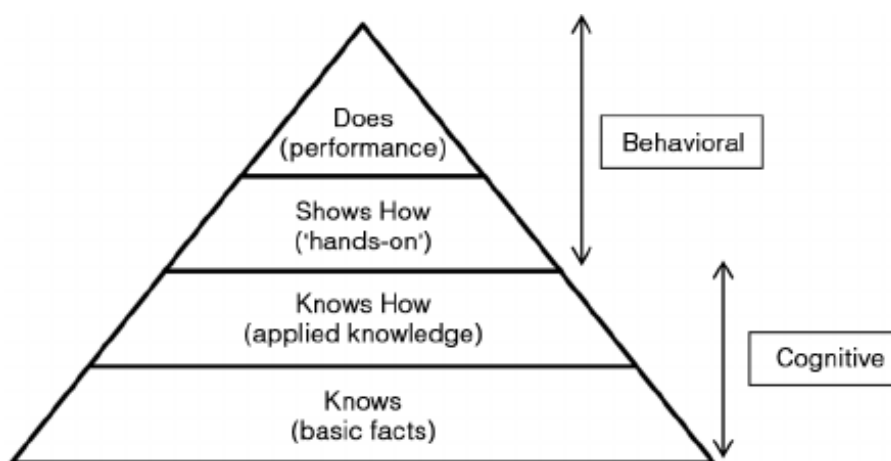
Sl. No.	Parameters	Chalkboard		PowerPoint Presentation	
		Number	Percentage	Number	Percentage
1.	Addressing cognitive domain (Knows of Miller's pyramid)	174	83.25	35	16.75
2.	Addressing cognitive domain (Knows how of Miller's pyramid)	26	12.44	183	87.56
3.	Addressing affective domain	24	11.48	185	88.52
4.	Better perception of the subject	160	76.55	49	23.44
5.	Stressing important points	129	61.72	80	38.28
6.	Understanding diagrams and charts	47	22.49	162	77.51
7.	Copying diagrams and charts	190	90.91	19	9.09
8.	Demonstration of clinical conditions	23	11	186	89
9.	Better problem solving	35	16.75	174	83.25
10.	Better summarization	77	36.84	132	63.16
11.	Covering more topics per lecture	16	7.65	193	92.34
12.	Obtaining feedback of the topics covered	61	29.19	148	70.81
13.	Maintaining pace with the facilitator	128	61.24	81	38.75
14.	Interactive	156	74.64	53	25.36
15.	Generates interest in learners	159	76.08	50	23.92
16.	Good retention	117	55.98	92	44.02
17.	Able to concentrate	138	66.03	71	33.97
18.	Ease of eyes	170	81.33	39	18.67
19.	Better flow of thought	192	91.87	17	8.13
20.	Flexibility in teaching and learning	143	68.42	66	31.58
21.	Most preferred Teaching-learning medium	150	71.77	59	28.23



**Figure 1** Percentage distribution of parameters in chalkboard and PowerPoint teaching methods



**Figure 2** Pie-chart showing overall preference of students between chalkboard and PowerPoint teaching



**Figure 3** Miller's pyramid of competence

#### **IV. Discussion & Conclusion**

The teaching learning process in medical professional is crucial, because this is the time when students are taught about pathophysiological concepts of diseases and their management and also, they come in touch with patients in the hospitals (8). Moreover, the curriculum in medical education is changing continuously. Needs of learners are changing and role of teachers is being redefined at the same time. One has to keep pace with the ever changing needs of the learners and changing trends in education. Hence, if the needs of the learners are considered during teaching, the process of teaching and learning can be made more effective. In this study, we tried to find out the gaps, if any, by taking students' feedback, in the 2nd year medical students about their opinion about chalkboard and PowerPoint teaching methods.

In our study, it is seen, that when the students were required to answer certain questions, simply on recall basis, they preferred chalkboard (83.25%) over PPT (16.75%). This may be due to the fact that writing the names on board and pronouncing at the same time has got a long term effect on the learners. Similar results are also reflected in a study elsewhere by Sunita B Desa and Mukundraj S Keny (6). However, in questions, where application of knowledge (Fig. 3) is needed to answer questions, the results are different, with PPT (87.56%) clearly being the medium of choice among learners. This is because in PowerPoint lectures certain images and animations can be used which help the learners in better understanding of topics, like the physiology of certain organs or the pathophysiology of diseases. Almost similar results are also seen, when the facilitator addresses the affective domains like attitude, communication, empathy and ethical values. This may be due to the fact that various parameters of affective domain can be easily taught in the class in the form of some educational and real-life videos, which is quite a mammoth task while teaching with chalkboard. Both these results are identical to a study conducted in a Government Medical College in Andhra Pradesh (9).

Taking into consideration the depth of perception of subject and reinforcement of salient and must know areas, learners favor blackboard over PowerPoint Presentations, results being similar to studies in the other parts of the country (10). It is in chalkboard teaching, the students can take down notes and hence, can maintain pace with the facilitator (61.24%). Moreover, handouts are not given out in advance in blackboard teaching, so the students tend to focus more intently on the lecturer, asking questions about their muddiest points, and thus making the teaching process interactive. Hence, a good lecturer can motivate the students on a journey of discovery, exposing students to one interesting fact after another by blackboard teaching method. Students will have better retention of the subject afterward if the notes are written with the lecturer's

explanation. In chalkboard teaching, the students are active participants and are able to cope with the teaching speed of the teacher and helps in holding attention in the class (66.03%), with better flow of thought (91.87%). However, in PowerPoint teaching, if the students lose focus for even a short moment, it can be difficult to catch up with the lecturer. Also, in this mode of teaching, since the entire content is limited to the slides, the facilitator loses flexibility in making things clear and understandable in cases of doubts during the lecture. Our study result is comparable to the previous study by Novelli and Fernandes (11).

However, students in our study felt that the chalkboard is ineffective in demonstrating clinical conditions (11%) and easing out the problem solving questions (16.75%). Similarly, though understanding diagrams and charts is easier in PowerPoint teaching (77.51%) due to easier blend of colors and better reproduction, copying the same is easier in chalkboards (90.91%). The students felt that the eyes get easily strained in PowerPoint teaching due to contrasting colors, comparatively darker rooms and adapting to animations and change of slides. But, since the entire content of lecture is limited to the slides, more topics can be covered in PowerPoint teaching (92.34%) as compared to traditional chalkboard teaching (7.65%). Similarly, summarization is easier in PowerPoint teaching (63.16%) in the form of take home message. At the end of PowerPoint Presentation, certain questions may be posted for students in the form of Multiple Choice Questions or Short Answer Questions in one or two slides to obtain an immediate feedback from the learners. And the learners even felt that giving feedback to the facilitators is way easier in PowerPoint teaching (70.81%) as compared to chalkboards (29.19%). Identical results were seen in the study conducted by Baxi and Shah (12).

Present study has shown that blackboard teaching still remains the most preferred teaching aid by our students (71.77%) when compared to PPT teaching method (28.23%). Identical results were also reflected from a different study in the Department of Pharmacology by Mahalaxmi SP and Prabhakar A (8). This may be explained by the facts that PowerPoint Presentation takes longer time to set up the projection, power failure interrupts the lecture, it is difficult to take down the notes and learning concepts and finally there is less interaction of teacher with students.

Though there are a number of qualitative studies regarding the perception of medical students on various teaching-learning media, there is a definite lack of quantitative studies. So, the present study was conducted to evaluate the impact of chalkboard and PowerPoint teaching on undergraduate medical students. Though chalkboard had significant upper hand over PPT, but this study has some mixed students feedback favoring both for different reasons. So such type of study will depend on topic and subject of medical curriculum, and so, the topics with more diagrammatic presentations will favor PPTs over chalkboard. A blended method, where chalkboard, PowerPoint Presentations and other audiovisual aids can be used, may be effective for the active learning of medical students, with better interaction and improved outputs in the form of advanced and competent Indian Medical Graduates.

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### **Conflict of interest**

No conflict of interest is associated with this work.

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None declared

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