



EXPLORING TEACHING METHODS: A COMPARATIVE CROSS-SECTIONAL STUDY ON THE EFFECTIVENESS OF CHALK AND BOARD WITH THE POWER POINT PRESENTATION AT A MEDICAL COLLEGE IN EASTERN UTTAR PRADESH, INDIA

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ABSTRACT

In this modern era, technologies have led to changes in teaching techniques among medical students, transitioning from traditional chalk and board methods to power point presentations. This study aims to assess medical student's perceptions on the different teaching methods. A comparative study was conducted with 100 medical students divided into two groups of fifty each. One group received lectures using power point presentations, while the other group received lectures using chalk and board. Students' perceptions were recorded using a questionnaire, and knowledge gained was assessed using single-best multiple-choice questions (MCQs). The group attending power point presentations scored significantly higher in MCQs compared to the chalk and board group. The majority of students rated power point presentations higher than chalk and board. Second-year medical students preferred power point presentations over chalk and board. However, no lecture delivery method was found to be universally superior, highlighting the importance of formal training in teaching technologies to enhance presentation skills and student motivation.

KEYWORDS : Medical students, teaching methodology, chalk and talk, MCQs, lecture, teaching and learning.

INTRODUCTION

India is a developing country that is going through many changes in different aspects, one of them being education¹. Lecture have been the most common form of teaching and learning since ancient times². However, there are a growing number of educators who advocate for replacing chalk and board methods with power point presentation that include an increased use of technology and group activities³. The most accepted criterion for measuring good teaching technique, however, is the amount of student learning. During a lecture, both the visual and auditory senses are used to absorb information and here assistance in the form of the visual aid is useful⁴. Designing and selecting teaching methods for this purpose is one area on which researchers in education should focus⁵.

A chalkboard is uniquely effective as a medium of classroom instruction and has been used commonly⁶. The impact of technology has led to the increased use of computers for presenting information in many of today's classrooms. Power point presentation hailed as an easy-to-use means of creating professional presentations teachers for creating classroom presentations⁷. I have observed that educators often compromised their lectures by using new technology-based teaching methods, claiming that these methods pave the way for a better learning environment for their students⁸. A study found power point presentation to be one of the most widely used software programs in both an area educator preparation program and local public schools⁹. According to one study, traditional classes with blackboard presentation were the most favoured by students from biomedicine and medicine courses while another study observed that most students

preferred power point presentations over traditional presentations (e.g., chalk and board)¹⁰. Various studies have been conducted to assess the effectiveness of lectures using power point presentation or chalk and board. But, there is a mixture of views based on the studies and it is not clear whether a particular lecture delivery method is superior to others. Recently the use of electronic presentations has become common and power point presentation is now the most popular instructional aid.¹¹

Hence, the present study was planned in a medical college of eastern part of Uttar pradesh, India, to assess the students' perceptions of the impact of Power point presentations in lectures compared with the chalk and board method. The study analyses the preferences for teaching aids of medical students.

MATERIALS AND METHOD

A questionnaire-based survey of 2nd year medical students in a government medical college Azamgarh, Uttar Pradesh. Study was conducted after getting permission from the principal and institutional ethics committee of the college. In this college, the annual intake of medical students is 100. 100 students were selected from 2nd year MBBS student then they were divided into two different groups that is group A and group B with 50 students in each group. To group A students taught by method of chalk and board and to group B students taught by method of power point presentation and the questionnaire was circulated to all 2nd year medical student

After teaching each group students were asked to fill the structured questionnaire about their views and perception. For

each group students were asked to rank the five components on five-point scale where 1 denotes strongly disagree and 5 denotes strongly agree.

After completion of questionnaire students were asked to mark a question paper consisting of 10 objective questions.

The sum of all the students' gradings on each parameter was used to calculate the final weighted score. The overall preference of the students is estimated using the method of weighted average, for finding the weighted score of each parameter regarding the different lecture delivery method.

RESULT

Following 5 question questionnaire was made on the basis of which result was obtained.

1. Satisfaction level of students with mode of teaching.
2. Learning effectiveness with mode of teaching.
3. Confidence level after lecture.
4. Faculty interaction with students during teaching.
5. Students interaction with students during teaching.

Based on the survey results were revealed. Which were mentioned in following.

In Terms Of Satisfaction Level.

In terms of satisfaction level out of 50 students taught by chalk and board said that 12 says that they were neither satisfy nor dissatisfy 26 were satisfied with this method and 12 says that they are very satisfied with this mode of teaching whereas none of the students answer very dissatisfied and dissatisfied.

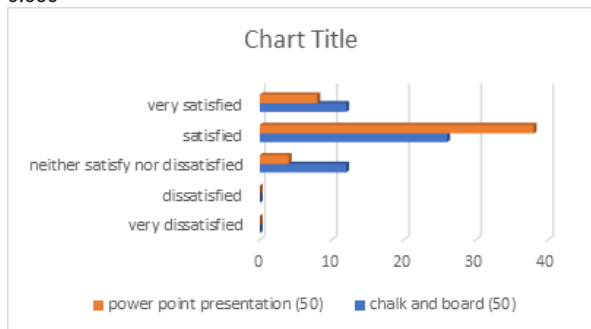
In satisfaction level out of 50 students taught by power point presentation said that 4 students are neither satisfied nor dissatisfied 38 were satisfied with this mode of teaching by this method and 8 were very satisfy whereas none of the students answered very dissatisfied and dissatisfied.

Table 1. Two-sample Wilcoxon Rank-sum (mann-whitney) Test For Satisfaction Level

chalk_ppt	obs	rank sum	expected
ppt	50	2601	2525
chalkboard	50	2449	2525
combined	100	5050	5050

p-value=0.530

$P\{\text{satisfaction level(ppt)} > \text{satisfaction level (chalkboard)}\} = 0.530$



In terms of learning effectiveness.

In terms of learning effectiveness out of 50 students taught by chalk and board 13 says its acceptable 30 responded that it is good and 7 responded that it is very good whereas none responded poor and very poor.

In learning effectiveness out of 50 students taught by power point presentation 2 says its acceptable 6 responded that it is good and 42 responded that it is very good whereas none responded poor and very poor.

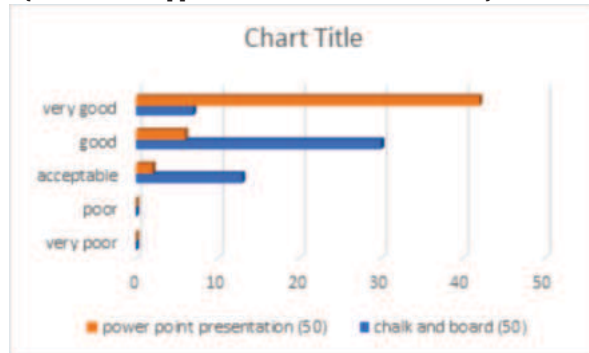
Table 2. Two-sample Wilcoxon Rank-sum (Mann-Whitney)

Test For Effectiveness

chalk_ppt	obs	rank sum	expected
ppt	50	3409	2525
chalkboard	50	1641	2525
combined	100	5050	5050

p-value=0.000

$P\{\text{effectiveness (ppt)} > \text{effectiveness (chalkboard)}\} = 0.854$



In term of confidence level.

In terms of Confidence level out of 50 students taught by chalk and board method 25 says its acceptable, 15 says it good and 10 responded that its very good whereas none of then responded poor and very poor.

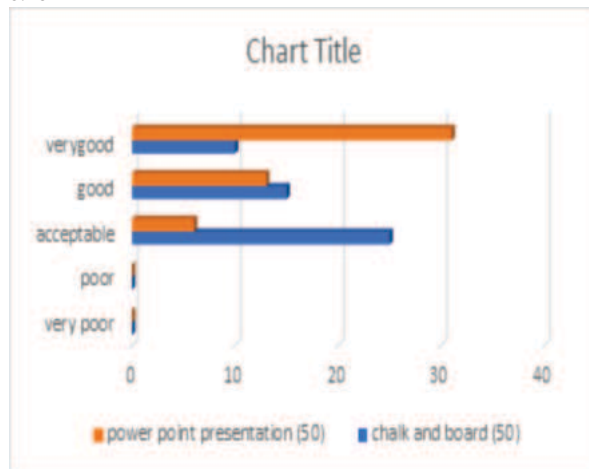
Confidence level of students out of 50 taught by power point presentation 6 says its acceptable, 13 says its good 31 says its very good whereas none of then responded poor and very poor.

Table 3. Two-sample Wilcoxon rank-sum (Mann-Whitney) Test For Confidence Level

chalk_ppt	obs	rank sum	expected
ppt	50	3167.5	2525
chalkboard	50	1882.5	2525
combined	100	5050	5050

p-value=0.000

$P\{\text{confidence level (ppt)} > \text{confidence level (chalkboard)}\} = 0.757$



In Terms Of Faculty Interaction With Students During Teaching.

Out of 50 students attended the chalk and board class 5 students were neither agree nor disagree 39 agree that interaction was good 6 students strongly agree with the interaction during class whereas none of the students mark disagree or strongly disagree.

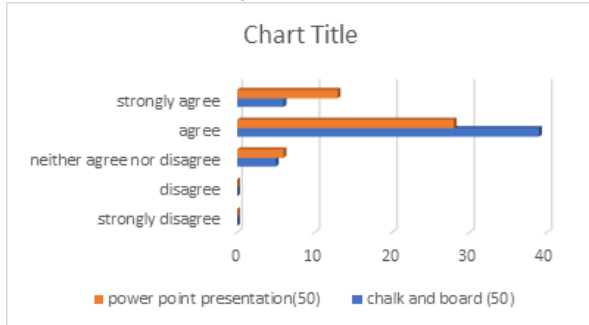
Out of 50 students attended the power point presentation class 6 students neither agree nor disagree 28 agree that interaction was good 13 students strongly agree with the interaction during class whereas none of the students mark disagree or strongly disagree.

Table 4. Two-sample Wilcoxon Rank-sum (mann-whitney) Test For Teacher-student Interaction

chalk_ppt	obs	rank sum	expected
ppt	50	2660.5	2525
chalkboard	50	2389.5	2525
combined	100	5050	5050

p-value=0.2462

$P\{\text{teacher-student interaction (ppt)} > \text{teacher-student interaction (chalkboard)}\} = 0.554$



In Terms Of Student Student Interaction During Class.

Out of 50 students taught by chalk and board method 10 students neither agree nor disagree with the interaction, 29 agree that student student interaction was their in the class, 11 strongly agree with the fact that student student interaction was their, whereas none of the students answer disagree or strongly disagree.

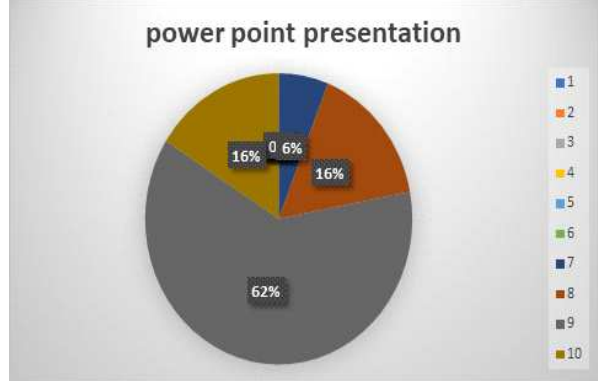
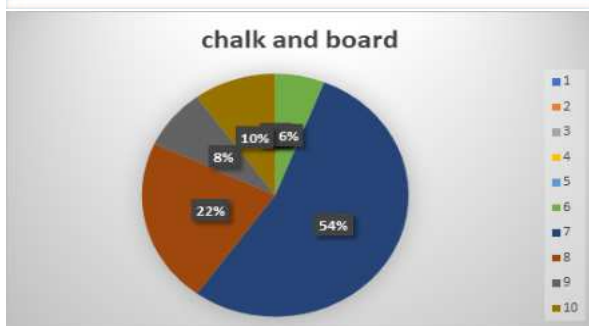
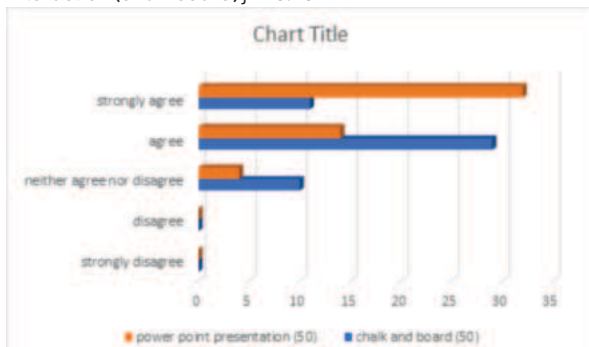
Out of 50 students taught by power point presentation 4 students neither agree nor disagree with the interaction, 14 agree that student student interaction was their 32 students strongly agree that student student interaction was their, whereas none of the students answer disagree or strongly disagree.

Table 5. Two-sample Wilcoxon Rank-sum (Mann-Whitney) Test For Student-student Interaction

chalk_ppt	obs	rank sum	expected
ppt	50	3042	2525
chalkboard	50	2008	2525
combined	100	5050	5050

p-value=0.000

$P\{\text{student-student interaction (ppt)} > \text{student-student interaction (chalkboard)}\} = 0.707$



Single-best Multiple-Choice Questions [MCQs] paper was used for assessing the knowledge gained by the group taught by chalk and board method and we found out that students taught by chalk and board 6% scored 6 marks, 54% scored 7 marks, 22% scored 8 marks, 8% scored 9 marks and 10% scored 10 marks.

Single-best Multiple-Choice Questions [MCQs] paper was used for assessing the knowledge gained by the group taught by power point presentation and we found that 6% students score 7 marks, 16% students score 8 marks, 62% students score 9 marks and 16% students score 10 marks.

Higher proportion of students were satisfied with power point presentation than chalk and board.

The majority of the second-year medical students rated PPT-based teaching higher in terms above five parameters studied as compared to the chalkboard.

Question paper consisting of 10 objective questions were used to assess the knowledge gained by the lecture and we found that students taught by power point presentation score good marks in comparison with students taught by chalk and board.

Table 6. Two Sample T-test For Marks Obtained

Group	Obs	Mean	Std. Dev.	[95% Conf. interval]
ppt	50	8.88	0.746	[8.668, 9.092]
chalkboard	50	7.66	1.042	[7.368, 7.956]
combined	100	8.27	1.090	[8.054, 8.486]

t = 6.73

degree of freedom = 98

$H_a: \text{Marks_ppt} > \text{Marks_chalkboard}$

p = 0.000

Table 7. Two Sample T-test For Combined Score

Group	Obs	Mean	Std. Dev.	[95% Conf. interval]
ppt	50	22.06	1.490	[21.636, 22.484]
chalkboard	50	19.62	1.383	[19.227, 20.013]
combined	100	20.84	1.884	[20.466, 21.214]

t = 6.73

degree of freedom = 98

$H_a: \text{scores_ppt} > \text{scores_chalkboard}$

p = 0.000

CONCLUSION

The medical students in our survey preferred the use of PPT presentations significantly over the other method. So students' preferences for a teaching method can vary greatly within the same institution given the same infrastructure and facilities. Therefore, the present study, as well as the previous studies, does not bring out the superiority of any lecture method. It appears that in the hands of a trained teacher any teaching aid would be appropriate and effective. This highlights the need for formal training in teaching technologies to develop good presentation skills and thus motivation of students.

DISCUSSION

Teaching is an art. This study highlights the fact that the favourite technique of lecture delivery for students by different faculties in the classroom can vary so much within the same college. Different technologies are available in classrooms for teaching in the present day scenario. The use of better teaching technique aid allows students to understand better. This also allows more time for interaction and further understanding. Use of technology can be a very beneficial and time-saving tool for all teachers.

An evaluation by the students can provide the teacher with the best user feedback regarding the best teaching method. It was observed that when contents such as figures and flow charts were discussed on PowerPoint and then elaborated the students were more active and got a time to ask the questions compared to chalk and board where they were more focused to note down the proper notes. PowerPoint presentation is an essential instrument of health professionals in teaching. It offers a tremendous number of options for personalizing slides. Having choices of font, color scheme, display options, sound, and graphics providing an opportunity to enhance a presentation in different ways. However, it should be kept in mind that inappropriate use of PowerPoint features can substantially degrade the quality of a presentation.¹² A common fault of PowerPoint presentations is the use of slides with too many lines per slide, too many words per line, lines that extend too far inferiorly on the slide, spelling errors, distracting animation effects, too many graphs, and poor colour scheme.¹³

Teaching with chalkboard engages the learners actively and the learners always become attentive to that what the teacher is writing and providing knowledge on the board. In this traditional method, the teacher can easily engage the learners actively because students think on each written or discussed point on the board. However, there are few limitations of this tool. The teacher may avoid writing or drawing a figure or flow chart on the board. In medical teaching support of illustrations is very important to develop a concept of that organ/structure/ system. Therefore, the students may face difficulty to understand the ideas/concept of the content on the chalkboard. Considering all these facts both the tools of teaching have some strength and weaknesses.

Some previous studies have found that students preferred PPT¹⁴⁻¹⁶ while in others the students preferred PPT. One extensive study has suggested that the efficacy of PPT is case specific rather than universal¹⁷.

In the present study, MCQs were designed to measure the knowledge of physiological facts; all the questions were relevant and related to the specific contents discussed in the lecture. The content validity was observed through expert opinion that all the questions were related to the contents of the topic and adequately reflected the key learning outcomes. However, for the face validity students were asked i.e., do the items in MCQs appear fair and appropriate according to the content of topic delivered in the class room. At the end of assessment student's comments were taken on the fairness of the assessment exercise and most of the students commented that all the items appeared fair and appropriate and they were very pleased about the entire exercise.

Regardless of the teaching aid used the impact of a lecture depends on the teacher.

In this current study 2nd year students medical students prefer to study with the help of animated power point presentation instead of chalk and board. This preference is may be probably because in this modern era students are more attractive toward the technologies. Chalk and board using

blackboard teaching is deficient in showing the three-dimensional (3-D) diagrams, animated videos and real-time sounds. However, the same can be demonstrated using a PPT. Furthermore, PPTs take less time to present the same information as compared to chalk and talk using blackboard teaching.¹⁸

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