

POWERPOINT PRESENTATION VS BLACKBOARD TEACHING: A COMPARATIVE STUDY AND EVALUATION IN GOVERNMENT MEDICAL COLLEGE, ANANTHAPURAMU, ANDHRA PRADESH FOR II M.B.B.S STUDENTS: A QUESTIONNAIRE BASED STUDY

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ABSTRACT

Chalk talk lecture is the oldest and most commonly used teaching technique. However, it is also common to use PowerPoint presentations after the introduction of digitalized teaching in medical colleges. This study is done to compare effectiveness of PowerPoint lecture with Conventional chalk talk lecture.

AIM

This study is designed to determine effectiveness of Chalk Talk Teaching vs. PowerPoint Teaching in medical education.

METHODS

This study was done on three successive batches of II M.B.B.S students from the year August 2013–December 2015 (Total 300 students) in Government Medical College, Ananthapuramu, Andhra Pradesh, after getting approved by Institutional Ethical committee and informed consent from the students. During regular Pharmacology Lectures, the students were divided into 2 classes. One class (150) had a chalk talk lecture, while the other class (150) had PowerPoint lecture. At the end of each lecture, a questionnaire (Containing 10 open ended Questions) is given to all the students of the class.

STATISTICS

Descriptive statistics was used to analyse data and results were expressed in terms of percentage.

RESULTS

Students of both the groups answered questions related to memory and calculations well. However, the students of PowerPoint group answered in a better way to questions related to “Understanding and memorizing.” In this study, 85% of the students preferred PowerPoint and only 15% preferred conventional chalk talk.

KEYWORDS

Chalk Talk Lecture, Digitalized Teaching, PowerPoint Presentation.

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INTRODUCTION

A number of developments appeared in medical education in the past 10 years. Most common of these developments is introduction of digitalized teaching method. Almost all medical colleges across the State are equipped with L.C.D. projectors for PowerPoint presentations. Most of the faculty are sufficiently trained to use PowerPoint. It is generally believed by some that PowerPoint is a better method of teaching than conventional chalk talk. Many times chalk talk lectures are underestimated. However, there are experienced teachers who prefer chalk talk rather than PowerPoint. Nevertheless, sometimes it is debated that PowerPoint is attractive to students and lectures are better understood.

This study is done to compare effectiveness of PowerPoint lecture with chalk talk lecture.

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MATERIALS AND METHODS

This study was done on three successive batches of II MBBS students from the year August 2013–December 2015 (Total 300 students) in Government Medical College, Ananthapuramu, Andhra Pradesh. During regular Pharmacology Lectures, the students were divided into 2 classes. One class (150) had a chalk talk lecture, while the other class (150) had PowerPoint lecture. In power-point lecture, 3 types of slides were prepared based on the type of topic.

Sl. No.	Type of Topic	Slide (Used in PowerPoint)
1.	Need to be memorized only (Eg- classification of drugs)	Mainly words and pictures (That help in memorizing)
2.	Need to be understood & Memorised (Eg- Physiologic processes)	Animations
3	Need to be memorized & analysed	Normal Sentences

The chalk talk lecture is also very well organized. At the end of each lecture, a questionnaire (Containing 10 open ended questions) is given to all the students of the class. This

study was done on various lessons from pharmacology (General pharmacology, ANS, CNS, chemotherapy). The details of Questionnaire are given below.

Sl. No.	Questions (General Pharmacology)
1.	Mention 7 routes of elimination of drug
2.	Give example of drug accumulating in hair
3.	Mention 3 drugs excreted via saliva
4.	Mention a drug excreted via tears
5.	Mention two side effects of rifampicin
6.	Explain enterohepatic circulation
7.	Explain active tubular secretion
8.	Describe passive tubular secretion
9.	What is extraction ratio?
10.	Describe I order kinetics

Sl. No.	Questions (ANS)
1.	Give 3 examples of semisynthetic derivatives of anti-muscarinic drugs
2.	Mention any 3 synthetic anti-muscarinic agents
3.	Mention 1 anti-cholinergic that does not cross blood brain barrier
4.	Mention an anticholinergic whose onset of action is less than 2 minutes.
5.	Explain competitive inhibition with reference to mechanism of action of Atropine
6.	Explain mechanism of action of pralidoxime
7.	Explain Dale's Vasomotor Phenomenon
8.	A farmer with convulsions, sweating, laboured breathing & pin point pupils with excessive salivation can be diagnosed as
9.	Limitations of Atropine injection in OP poisoning
10.	Dose of Pralidoxime in Adults & Children

Sl. No.	Details of Questions (CNS)
1	Classify NSAIDs
2	Mention any 3 uses of aspirin
3	Mention pharmacological actions of ethanol
4	What is antidote of Benzodiazepines
5	Why Ethanol is used in Methanol Poisoning
6	Mechanism of Action of Aspirin
7	Treatment of Paracetamol poisoning

8	An epileptic patient taking contraceptive pills conceived. What may be the reason?
9	What is status epilepticus? How do you treat it?
10	Safe anti-epileptic drugs for married women

Sl. No.	Details of Questions (Chemotherapy)
1	Mention 2 Antibiotic Anti-Malarials
2	Mention any 2 Sporonticides
3	Mention 4 Side Effects of Primaquine
4	Mention the drug of choice in Chloroquine resistant Malaria
5	Explain life cycle of P. Vivax
6	Explain mechanism of action of Chloroquine
7	Explain mechanism of action of INH
8	Patient taking treatment for amoebiasis attended a cocktail party and left the party early with extensive sweating, profound dizziness, headache, chest pain and metallic taste. What would be the drug he has taken?
9	A patient whose blood smear showed the presence of malarial parasite was unresponsive to chloroquine. What would be your diagnosis?
10	What is Bioavailability of Linezolid 600 mg given orally?

After 30 minutes, this questionnaire is collected; then in the subsequent classes chalk talk group was lectured with power-point and power-point group was lectured with chalk talk and their preference of teaching method was asked.

RESULTS

In this study, we have seen that students of both chalk talk lectures as well as from power-point lectures answered well. Both the scores are almost similar. But, it was seen that students of power-point lecture answered in a better way for "Questions that are to be memorized and understood" (78% in chalk talk vs. 88% in PowerPoint). The students of chalk talk lecture were not clear in answering such questions, though every care was taken to highlight important points in lecture by drawing flow charts, diagrams, etc. PowerPoint teaching is helpful in aiding to remember "Questions that are to be memorized." The details of questionnaire is given below.

The details of this study are tabulated below.

Sl. No.	Details of Questions (General Pharmacology)	% Students Answered (Chalk-Talk Group)	% Students Answered (Power-Point Group)
I	Questions Related to Topics that Need to be Memorized Only		
	1) Mention 7 routes of elimination of drug	20% mentioned all 7 routes	44% mentioned 7 routes
	2) Give example of drug accumulating in hair	100%	100%
	3) Mention 3 drugs excreted via saliva	94% mentioned 3 drugs	96% mentioned 3 drugs
	4) Mention a drug excreted via tears	100%	100%
	5) Mention two side effects of rifampicin	100%	100%
II	Questions Related to Topics that need to be Understood and Memorized		
	1) Explain enterohepatic circulation	80% answered satisfactorily	90% answered satisfactorily

	2) Explain active tubular secretion	76% answered satisfactorily	88% answered satisfactorily
	3) Describe passive tubular secretion	90% answered satisfactorily	92% answered satisfactorily
III	Questions that need to be Memorized and Analysed		
	1) What is extraction ratio?	100% answered satisfactorily	100% answered satisfactorily
	2) Describe I order kinetics	90% answered satisfactorily	90% answered satisfactorily
	3) Describe zero order kinetics	94% answered satisfactorily	96% answered satisfactorily

Sl. No.	Details of Questions (CNS)	% Students Answered (Chalk-Talk Group)	% Students Answered (Power-Point Group)
I	Questions Related to Topics that need to be Memorized only		
	1) Classify NSAIDs	50%	55%
	2) Mention any 3 uses of aspirin	92%	100%
	3) Mention pharmacological actions of ethanol	86%	90%
	4) What is antidote of Benzodiazepines	100%	100%
II	Questions Related to Topics that need to be Understood and Memorized		
	1) Why Ethanol is used in Methanol Poisoning	66%	83%
	2) Mechanism of Action of Aspirin	75%	82%
	3) Treatment of Paracetamol poisoning	81%	90%
III	Questions that Need to be Memorized and Analysed		
	1) An epileptic patient taking contraceptive pills conceived. What may be the reason?	70%	90%
	2) What is the reason to develop status epilepticus? How do you treat it?	75%	80%
	3) Safe anti-epileptic drugs for married women	80%	82%

Sl. No.	Details of Questions (Chemotherapy)	% Students Answered (Chalk-Talk Group)	% Students Answered (Power-Point Group)
I	Questions Related to Topics that need to be Memorized only		
	1) Mention 2 antibiotic antimalarials	80%	82%
	2) Mention any 2 Sporonticides	60%	65%
	3) Mention 4 side effects of primaquine	90%	92%
	4) Mention the drug of choice in Chloroquine Resistant malaria	75%	78%
II	Questions Related to Topics that need to be Understood and Memorized		
	1) Explain life cycle of P. Vivax	69%	87%
	2) Explain mechanism of action of chloroquine	88%	90%
III	Questions that need to be Memorized and Analysed		
	1) Patient taking treatment for amoebiasis attended a cocktail party and left the party early with extensive sweating, profound dizziness, headache, chest pain & metallic taste. What would be the drug he has taken?	70%	83%
	2) A patient whose blood smear showed the presence of malarial parasite was unresponsive to chloroquine. What would be your diagnosis?	79%	85%
	3) What is Bioavailability of Linezolid 600 mg given orally	65%	67%

Sl. No.	Details of Questions (ANS)	% Students Answered (Chalk-Talk Group)	% Students Answered (Power-Point Group)
I	Questions Related to Topics that need to be Memorized Only		
	1) Give 3 examples of semi-synthetic derivatives of anti-muscarinic drugs	86%	88%
	2) Mention any 3 synthetic anti-muscarinic agents	93%	98%
	3) Mention 1 anti-cholinergic that does not cross blood brain barrier	96%	97%
	4) Mention an anticholinergic whose onset of action is less than 2 minutes	100%	100%
II	Questions Related to Topics that need to be Understood and Memorized		
	1) Explain competitive inhibition with reference to mechanism of action of Atropine	86%	93%

	2) Explain mechanism of action of pralidoxime	66%	93%
	3) Explain Dale's Vasomotor Phenomenon	80%	88%
III	Questions that need to be Memorized and Analysed		
	1) A Farmer with convulsions, sweating, laboured breathing & pin point pupils with excessive salivation can be diagnosed as	60%	80%
	2) Limitations of Atropine injection in OP Poisoning	87%	90%
	3) Calculate dose of Pralidoxime in 50 yrs. Adult male & 6 yrs. old Child	70%	73%

	Questions Related to Topics that need to be Memorized only	Questions Related to Topics that need to be understood and Memorized	Questions that need to be Memorized and Analysed
Average (Chalk-Talk)	83%	78%	78%
Average (Power-Point)	86%	88%	84%

	Chalk-Talk Group (Out of 150)	Power-Point Group (Out of 150)
Preferred Power-Point	120	135
Preferred Chalk-Talk	30	15

DISCUSSION

Chalk talk teaching is the oldest method of teaching. Even though Power-Point Teaching has replaced chalk talk teaching in many teaching institutes, some teachers still prefer chalk talk teaching.^[1] Chalk talk or PowerPoint? This has been the question arising in the minds of budding medical teachers. Most of the junior faculty presumes that PowerPoint is the better way of teaching medical students. However, it is common to see students under the mentorship of senior faculty who rarely use PowerPoint getting outstanding results. In this study, 85% of the students preferred PowerPoint and only 15% preferred conventional chalk talk. In a similar study,^[2] students opined that PowerPoint containing animations was interesting rather than that containing only notes.

In this study it was seen that when students were asked to mention 7 routes of drug elimination, only 20% in chalk talk mentioned all 7 routes, while 44% in PowerPoint group mentioned all 7 routes. This is because in PowerPoint lecture certain images are used that helped students to remember well. However, for other types of questions both chalk talk and PowerPoint methods were equally useful. So this indicates that PowerPoints are useful in teaching certain topics where elaborate understanding and memory are required. Such topics in pharmacology are many in number. (eg- enterohepatic circulation in this study, mechanism of action of drugs, metabolism of drugs, physiology, etc.). But for other topics where simple memory and analysis is required, chalk talk lectures are as efficient as PowerPoint lectures as per this study. On contrary in a similar study,^[3] by Sunita B. deSa and Mukundraj S. Keny, it was seen that higher number of students of chalk talk class answered well to MCQs when compared to PowerPoint lectures and most students preferred chalk talk method over PowerPoint method.

Each teaching technique has its own advantage and disadvantage.

Advantages of Chalk Talk Lecture

1. Most of the times, Chalk talk lectures comprise up-to-date knowledge, that is collected by teacher.
2. No interruption of class even in power cut.

3. There is better eye to eye contact with students. Consequently, there will be better interaction with the students.
4. Students can easily take down notes.

Disadvantages of Chalk Talk Lecture

1. Cannot illustrate accurate images and 3-D structures when necessary.
2. Very much time consuming.
3. Students of last bench may not be able to see.
4. May not be attractive to students as there will not be any pictures, videos, etc. Teacher has to make all attempts to see that class is active.

Advantages of PowerPoint lecture

1. A number of pictures, videos, etc. can be illustrated to make the lecture attractive. In a study,^[4] by Sekhri K, it was seen that most of the students preferred lectures using LCD.
2. Customized animations to illustrate mechanism of action of drugs, metabolic processes, etc. can be made.
3. Once a lecture is prepared, it can be saved for many years and can be edited when necessary. This saves time and is very convenient to teacher.
4. 3D illustrations whenever necessary can be shown.

Disadvantages of PowerPoint Lecture

1. Power cuts, LED problems interrupt the lectures.
2. Only teachers with proper knowledge of MS Office can prepare a good presentation.
3. Interaction with students may be somewhat poor if presentation lacks interesting pictures, videos, etc. because students focus on slides rather than on teacher.
4. Writing notes will be somewhat difficult if teacher changes slides quickly.

Which Teaching Technique is Better?

There are different opinions regarding these teaching methods by different teachers.

It can be seen that each teaching technique has its own merits and demerits. Any teaching technique employed should fulfil these criteria.

1. Students' preference: The preference of majority of students should be considered. This may vary from one group of students to other.^[5] by Vikaseth et al. it was seen that most medical students preferred PowerPoint, while most dental students preferred chalk talk lecture. Anatomy students of Pune preferred Chalk talk teaching.^[6] and

Anatomy students of Jammu preferred Power-Point teaching.^[7]

2. The teaching technique that keeps the class interactive.
3. Create interest on subject.
4. Teachers' capability and preference (Few teachers explain better in chalk talk and others in PowerPoints).
5. With any teaching techniques, these objectives must be achieved. Whenever necessary, combination of teaching techniques should be used instead of depending on single method.^{[8],[9],[10]}

CONCLUSION

Both Chalk Talk and PowerPoint Methods of teaching are almost equally efficient. But few topics may be better understood using PowerPoint. Each method has its own advantages and disadvantages. Whatever be the method, every care should be taken to make the students understand the concept of lesson. Whenever necessary, combination of teaching techniques must be used.

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