

Research Article

EVALUATION AND COMPARISON OF CHALKBOARD TEACHING, POWER POINT TEACHING AND COMBINATION OF CHALKBOARD-POWER POINT TEACHING IN PHARMACOLOGY SUBJECT FOR SECOND YEAR MBBS STUDENTS IN MEDICAL COLLEGE

^{1*} DR. KALE RANJANASUSHIL, ² DR. SHRIVASTAVATRIPTI, ³ DR. CHAKRABORTI DIPANKAR, ⁴ DR. BAHEKAR SATISH EKNATH

¹MD (Pharmacology), Professor, MGIMS, Sewagram, Wardha, Maharashtra. ² MD (Physiology), HOD, department of Medical Education, DMIMS SawangiMeghe, Wardha Maharashtra. ³ MD (Pharmacology), Resident, MGIMS, Sewagram, Wardha, Maharashtra. ⁴MD (Pharmacology), Assistant Professor, Govt. Medical College, Aurangabad, Maharashtra

Email: brahmane@mgims.ac.in

ABSTRACT

Context: Various teaching methodologies are routinely utilized in medical education on daily basis. In the view of new teaching aids in medical education, it is necessary to evaluate and compare the conventional method with these newer ones for necessary corrections and practical implementation. **Objectives:** The study was aimed to explore knowledge and perception of different techniques of pharmacology teaching in students of second MBBS. **Methods:** This was an interventional cross-over study was conducted in the department of pharmacology in second MBBS students. Predesigned and prevalidated questionnaire was initially used as pre-test and students were exposed to different teaching techniques and then same was used as post-test. After this, questionnaire for perception were filled by students containing various questions.

Results: The analysis was performed using Statistical Package for Social Sciences (SPSS) version 10.0 programmes for Windows. One-way analysis of variance (ANOVA) and post-hoc test for multiple comparisons was applied.

On statistical comparison of pre and post test square it was evident that students performance was best in chalkboard and power point combination group when compared chalkboard and power point technique group in terms of scores. Analysis of perception question also revelled same results in favour of combination technique. **Conclusions:** In medical college for undergraduate students, instead of individual chalkboard or power point technique, the combination of these two techniques is more suitable tool of teaching and learning.

Keywords: Teaching- learning, perception, power point technique, chalkboard technique.

INTRODUCTION

Teaching is a specific art in the academic life of teachers. Since ancient times, various teaching and learning methods are being introduced, modified and adopted by individual teachers and academic institutes. Among these, chalkboard (CB) teaching is the oldest and most effective way of teaching and learning. Although it has its own advantages and disadvantages, in present era this method has its own place.

In the present era of computer technology, use of computers had replaced many older ways of teaching. Among these, one of the most common, teaching by power point technique (PPT) presentation is commonest and effective medium for teaching and learning. But, it also has its own pros and cons.

In the context of medical education curriculum, Pharmacology is one of the most important subjects in undergraduate education. Conventionally, the subject is being taught to second MBBS phase. The main aim of teaching in Pharmacology is to make students understand various drug effects in such a way that they find the subject interesting and help them in actual application of this knowledge in their clinical practice.

There are mixed viewpoints regarding the power point teaching technique. Common is one that using PPT improves learning or comprehension whereas other states that this technique is equally good as other techniques such as overhead presentation and chalk board teaching. While, some studies have revealed that PPT actually impairs learning.[1] It has also been postulated that the applications of computer technology enhances the ability to process the ever-increasing volume of medical knowledge. [2]

However, it is not as simple as having only text on a colored screen, it is accompanied by few complexities like multiple tables, pictures, graphs, sound effects, visual effects, video clips etc. There are some other factors that can affect the effectiveness of these types of presentations like irrelevant sounds, extraneous texts, and irrelevant pictures. [3-5]

To continue in this aspect, most important point regarding PPT is the complexity of the presentation that may affect the effectiveness of this technique. As it has been reportedly postulated that learning is relatively permanent change in the behavior of the learner. [6-7] To promote meaningful learning, there is strong need to choose between various presentation formats. [8]

There are many previous studies conducted in medical education before, these types of studies are continuously needed to be carried out to support the evidences and compare different teaching techniques for further exploration of this matter. Therefore, the present study was planned to compare the impact of the PPT and chalkboard teaching and the combination of both in Pharmacology subject teaching by assessing the knowledge based on the performance and comparing student preferences for these techniques.

MATERIALS & METHODS

An interventional cross-over study was conducted in the department of Pharmacology in second MBBS students. Total 65 students were enrolled in this study. Approval was taken from institutional Ethical Committee before start of the study. Individual consents of the students were taken before each planned session. Predesigned and prevalidated questionnaires targeting the aims and objectives were delivered to students.

Test items were selected from a large bank of questions developed by departmental faculty members. The specific items were selected by study coordinator according to a blueprint designed to match the expected knowledge of the undergraduate medical students for the given topics for the confirmation of validity and reliability of the results.

Students were divided into three groups, 20 students in each group. To start with, predesigned questionnaire of the topic containing 10 multiple choice questions was distributed and asked them to fill it and collected back within 10 minutes. After this, all the groups were exposed to interventions as described below.

First group was delivered 3 lectures with chalkboard technique. Second group was delivered 3 lectures with PPT technique. Third group was delivered 3 lectures with combination of chalkboard and power point technique. The topic was same for all the groups, but the teaching techniques were different only. Thus, total 9 lectures have been conducted, out of which 3 with chalkboard technique, 3 with PPT technique and 3 with combination of chalkboard and PPT technique. All the groups attended all the technique sessions. After completion of respective sessions, post test questionnaire (same as pre-test) were distributed and asked them to fill the same within same time limit as above.

After the students were exposed to all the sessions, questionnaire for perception was distributed. Time given was 20 minutes, so that they can read all questions and understand them. Questionnaire containing 10 questions of 5 marks each of 5 point rating scale from poor to excellent was distributed to get assessment for their perception.

RESULTS AND DISCUSSION

STATISTICAL ANALYSIS

All the data were collected and analyzed. The sample was described by using mean±SEM for quantitative variables. The analysis was

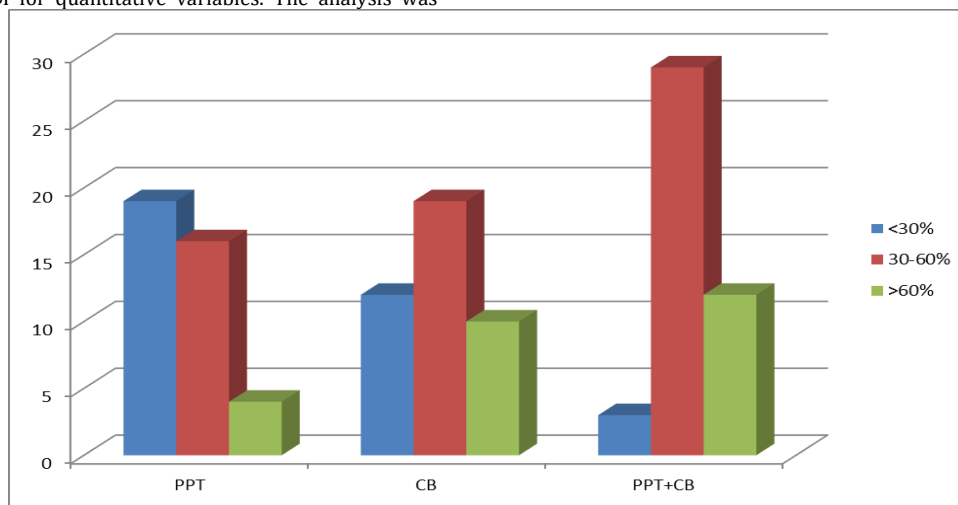
performed using Statistical Package for Social Sciences (SPSS) version 10.0 programme for Windows. Statistical analysis was conducted using one-way analysis of variance (ANOVA) and post-hoc test for multiple comparisons was applied. P value of less than 0.05 was considered statistically significant. Then the perceptions of the students were analyzed by the percentage calculation of different questions used.

RESULTS

Total no. of students enrolled was 65. Among these 39 students were present for PPT session and when pre-test was compared with post-test showed highly significant ($p<0.001$) difference. 41 students were present for Chalkboard (CB) session, this also showed highly significant difference ($p<0.001$). 44 students were present for PPT+CB session again showed highly significant difference ($p<0.001$). From the statistical inference obtained by **Table 1 & Graph 1**, it is clear that 19 students have less than 30% marks followed by 12 for chalk-board technique group and only 3 by combination of chalk-board and power point technique group. Most of the students lie between 30-60% grade and 12 students in >60% grade of combination technique and only 4 in power point technique group. Individual analysis of perception question also revealed same results going in favour of combination of chalk-board and power point technique.

Table 1: Comparison of percentage of difference in marks in number of students among PPT, Chalkboard and PPT+Chalkboard.

% of difference	PPT	CB	PPT+CB	% of difference
<30%	19	12	3	<30%
30-60%	16	19	29	30-60%
>60%	4	10	12	>60%



Graph 1

Above Table 1 and Graph 1 show that 19 students have less than 30% marks followed by 12 for CB marks of students and only 3 by PPT+CB. Most of the students lie between 30-60% grade and 12 students in >60% grade of PPT+CB and only 4 in PPT.)

DISCUSSION

It is obvious that learning and teaching are interdependable things. These should be considered in integrated manner. From this, we can achieve deep cognitive processing which will elicit ethical and intellectual development.[9] All teachers have the responsibility to facilitate learning, encourage thinking and increase practical applicability of any subject. Teacher can emphasize significance of the knowledge for future practical life to make students eager to know and learn. The student must be given an opportunity to apply acquired knowledge in analysis, synthesis, evaluation and problem-solving.

Powerpoint teaching technique provide numbers of options like personalizing slides, having choices of font, colour scheme, display options, sound, and graphics which provide an opportunity to enhance a presentation in different ways. But simultaneously, inappropriate use of this technique can also degrade the quality of a presentation.[10]

Results of present study regarding teaching learning are similar to the study conducted by sultan et al. who pointed out that in PPT improves the educative value of the subject by integrating text, pictures, and images is of great advantage. [11-12] Many authors have argued that PPT presentations encourage an active learning environment, increase the effectiveness of lectures, and lend clarity to the subject. [13-15] But in contrast to this, our study results

propose that PPT presentation doesn't stimulate interest as compared to CB and CB+PPT. As far as effectiveness of lectures are concerned PPT+CB was best than only CB or PPT when used singly (Table 1 & Graph 1). Long term retention of memory was good by CB and PPT+CB as compared to PPT. But in another study, it was observed that the short term retention of facts was less with PPT and hence students in PPT group obtained lower scores. [16]

In another study in USA, medical students rated both types of techniques equally and displayed no differences in short or long-term retention of material. [17] One more study conducted on 5th semester medical students in Gujarat showed equal liking by students for both techniques. [18] Recent studies conducted in India also reported that combination of teaching aids is the best method of teaching. [19-20] Our results are also in favour of CB+PPT which when used properly becomes the best method for teaching and learning.

However, our study also had some limitations. This study has been specifically conducted to evaluate the use of teaching aids in Pharmacology only. The findings obtained may not be true for all subjects in medical curriculum. The preference of students for these two teaching aids may vary from subject to subject and also influenced by the commonest mode of teaching aid used in that method.

CONCLUSION

The results of the present study suggest that both the tools of teaching (chalkboard or power point) have some strengths and limitations. Therefore, combination (CB & PPT) method of teaching is more suitable tool of teaching and learning at undergraduate medical schools than chalkboard or power point alone. The results of the present study suggest that chalkboard has the advantage of a better recall and interest stimulating besides being the most preferred aid among medical students. There is a need to discuss as to why a traditional method has more preference over a new method. This study should be considered as a guide by all streams of medicine to improve the use of PPT and to consider it as supplement to the chalkboard teaching.

CONFLICT OF INTEREST

There are no conflict of interest declared

REFERENCES

- Kosslyn SM et al. PowerPoint(®) Presentation Flaws and Failures: A Psychological Analysis. *Front Psychol.* 2012;3:230. (doi:10.3389/fpsyg.2012.00230)
- Fotheringham MJ et al. Interactive health communication in preventive medicine: internet-based strategies in teaching and research. *Am J Prev Med.* 2000;19(2):113-120. (doi:10.1016/s0749-3797(00)00188-4)
- Moreno et al. A Coherence Effect in Multimedia Learning: The Case for Minimizing Irrelevant Sounds in the Design of Multimedia Instructional Messages. *Journal of Educational Psychology.* 2000;92. 117-125.
- Schraw G. Promoting general metacognitive awareness. *InstrSci* 1998; 26(1-2):113-25.
- Mayer, R. (2009). *Multimedia Learning.* Cambridge: Cambridge University Press. (doi:10.1017/CBO9780511811678)
- 6SabithaVadakedath et al. Assessment of Conventional Teaching Technique in the Era of Medical Education Technology: A Study of Biochemistry Learning Process among First Year Medical Students Using Traditional Chalk and Board Teaching. *American Journal of Educational Research* 2018; 6(8):1137-1140.
- Chadwick SM et al. Teaching and learning: an update for the orthodontist. *J Orthodont* 2002; 29:162-7.
- Mayer RE, Moreno R. A split-attention effect in multimedia learning: Evidence for dual processing systems in working memory. *Journal of Educational Psychology* 1998;90:312-20.
- Meo SA. Power of the PowerPoint and role of chalkboard. *Med Teach* 2008;30:640-1.
- Collins J. Education techniques for lifelong learning: making a PowerPoint presentation. *Radiographics* 2004; 24:1177-83.
- Meo SA et al. Comparison of the Impact of PowerPoint and Chalkboard in Undergraduate Medical Teaching: An Evidence Based Study. *J Coll Physicians Surg Pak.* 2013;23(1):47-50.
- Mayer RE et al. The instructive animation: Helping students build connections between words and pictures in multimedia learning. *J Educ Psych.* 1992;84:444-52.
- Hunt N. Enhancing lectures the modern way. *The New Academic.* 1998:3-9.
- Seth V et al. Impact of various lecture delivery methods in pharmacology. *EXCLI J.* 2010;9:96-101.
- Rossen S et al. "Enhancing your lecture with presentation software – Setting instructional goals". <http://www.oid.ucla.edu/Fnmc/classtep.htm> & <http://www.oid.ucla.edu/Fnmc/goals.htm>. (Last assessed on 30 June 2020)
- deSaSB et al. PowerPoint versus Chalkboard Based Lectures in Pharmacology: Evaluation of Their Impact on Medical Student's Knowledge and Their Preferences. *Int J Adv Health Sci* 2014; 1(5): 10-14..
- Ricer RE et al. Does a high tech (computerized, animated, PowerPoint) presentation increase retention of material compared to a low tech (black on clear overheads) presentation? *Teach Learn Med.* 2005;17(2):107-11.
- Baxi SN et al. Parmar D, Tripathi CB. Student's perception of different teaching aids in a medical college. *Afr J Health Prof Educ.* 2009;1(1):15-6.
- Kumar A et al. Student's views on audio visual aids used during didactic lectures in a medical college. *Asian J Med Sci.* 2013;4(2):36-40.
- Mohan L et al. Students' attitudes towards the use of audio-visual aids during didactic lecture in pharmacology. *J ClinDiagn Res.* 2010; 4(6):3363-8.