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Assessing Impact of Computer Assisted Learning (CAL) on Cognitive Perception - A Study In Medical College Students.

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ABSTRACT

With the change in teaching learning methods and specific ethical requirements,Computer Assisted Learning (CAL) has been utilized in teaching of Pharmacology. Present study aimed at finding out the cognitive impact of this method in medical students and its comparison with standard methodology. Consenting medical students from second year were recruited.They were taught basics of ECG and interpretation of it in health and sickness by CAL and blackboard teaching. The cognitive impact was analysed by assessing the difference in pre and post test results. It was observed that in the group undergoing CAL had significant improvement in their post test score ,indicating strong cognitive impact. However it was noteworthy that the traditional method also showed a significant improvement in pre-test scores. This indicated utility of traditional methods. Multiple studies have pointed usefulness of CAL in medical teaching. Some teachers still prefer blackboard teaching beacause of its inherent advantages. Our study proved that the blackboard teaching has still utility in teaching and producing impact on cognitive perception of the topic. However the CAL produced significantly higher impact due to its flexibility, visual impact, ability of repeated exposure etc.
Keywords: CAL, cognitive perception, medical teaching

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INTRODUCTION

CAL is an individual or a group learning technique usually offline or online involving interaction of the student with programmed instructional materials or through it with teacher. It is a method of reinforcing concepts and topics first introduced to students through the textbook and discussion in the classroom. Computer assisted learning applications generally require the student to follow the content without immediate or direct supervision from the tutor [1].

As per the recent guidelines computer simulated experiments are encouraged by CPCSEA, UGC and MCI. The use of CAL in a medical undergraduate curriculum is increasing [2]. CAL can be used in a variety of settings to increase curriculum flexibility [3]. CAL covers a range of computer-based packages, which aim to provide interactive instruction usually in a specific subject area. CAL is run either straight from a CD or over a local network so the constraint of the internet - slow download times for multimedia materials may not apply. CAL programmers can provide student ways to learn the topic through animated experiments & graphics, which can make topic more interesting.

The advantages of CAL can be outlined as providing motivation and autonomy for learner, compatible and time flexible learning, immediate and detailed feedback. The disadvantages of CAL are less handy equipment, high cost of education, lack of trained teachers and of CAL programs of perfect quality. CAL is considered by many as a possible way to improve the quality of education. One study has proved that computers have the potential to both directly improve learning and indirectly increase attendance by making learning more attractive [4].

Aim and Objectives

- To study effectiveness of CAL on cognitive perception of students
- To compare between CAL and traditional blackboard method of teaching.

Method

Students from 2nd MBBS from Bharati Vidyapeeth Medical College, Sangli, Maharashtra were recruited in the study. After appropriate Ethical Committee approval , this study was undertaken. The students consenting to participate were divided into 2 groups of 100 students randomly. Demonstration and explanation with interpretation in health and sickness of ECG was the exercise chosen for this study. Pre-test & post-test was held which consisted of 15 MCQs carrying one mark each with no negative marking(5). The answer sheets were coded and the scores documented. The ECG exercise was explained to the students in the first group on the blackboard .The ECG exercise was explained to the students belonging to second group on CAL. The outcome was measured by assessing the performance in post-test. Results were compared between the two groups and among the group.

Based upon the results finally a series of classes were taken to complete the training of students , who either did not participate or were assigned to the other group.

Statistical analysis

Mean, SD was obtained to compare score of pre test and post test. To compare score of pre-test and post-test in Group 1 and Group 2, Z test was applied. To compare scores of post-test of Group 1 and Group 2, Z test was applied. P value <0.05 was considered as significant.

RESULTS

Results showed highly significant difference between pre-test and post-test in both the groups of students.(P<0.05). Post-test evaluation between the two groups showed significant difference (P<0.05). Students from Group 2 (CAL) showed higher scoring in the evaluation of MCQs than the students from Group 1 (Blackboard).

Table 1: Pre and Post test scores in group 1 (Blackboard teaching)

Group -1 (blackboard)	Mean	S.D	P Value
Pre-Test	5.387	2.092	
Post-Test	9.323	2.212	0.000

Graph 1: Pre and Post test scores in group 1 (Blackboard teaching)
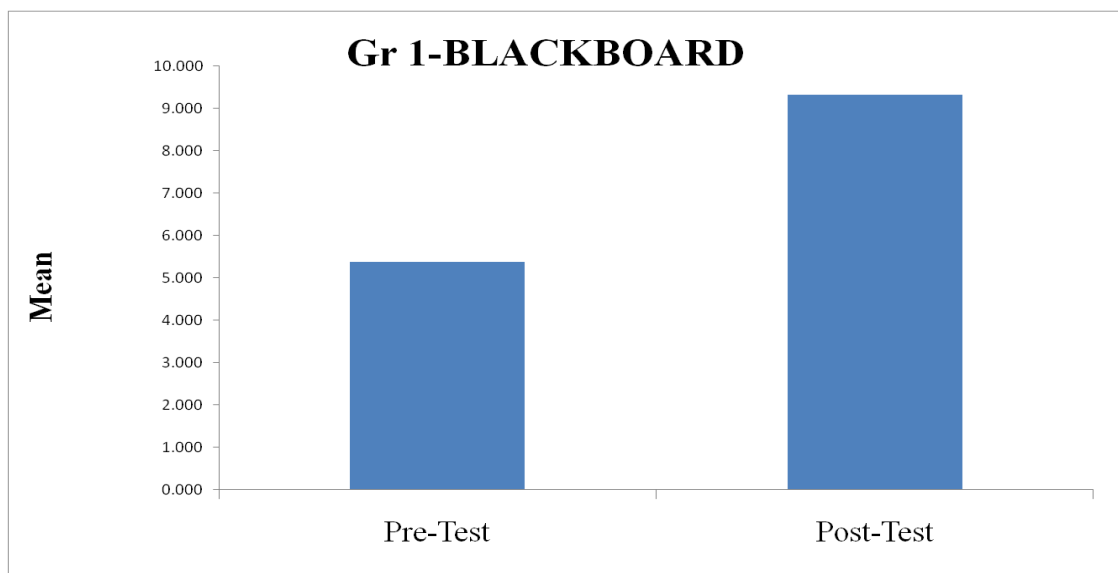
Table 2: Pre and Post test scores in group 2 (CAL teaching)

Group 2 (CAL)	Mean	S.D	P Value
Pre-Test	6.216	1.635	
Post-Test	10.622	2.772	0.000

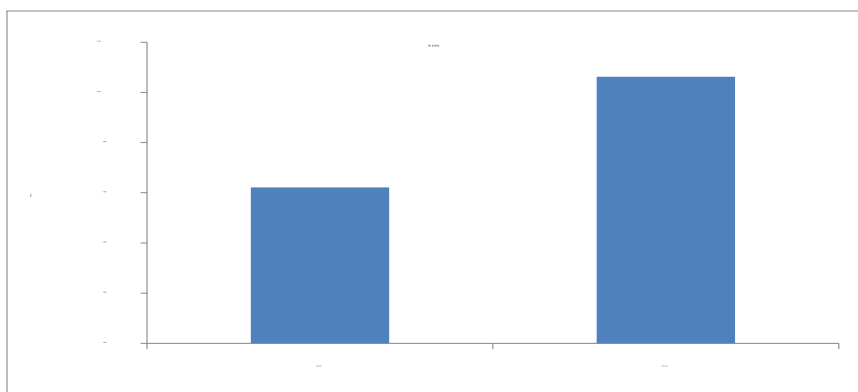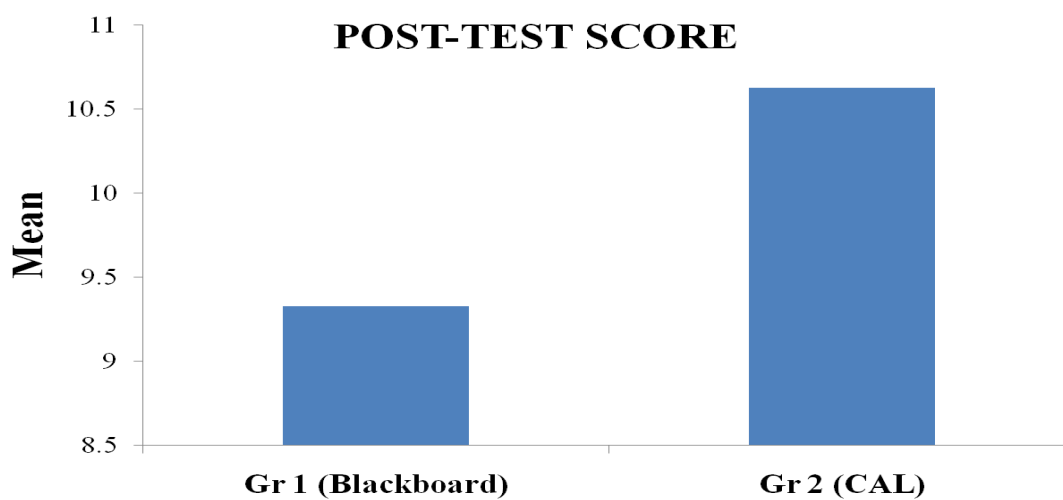**Graph 2: Pre and Post test scores in group 2 (CAL teaching)**

Table 3: Post test scores in group 1 (Blackboard teaching) and group 2 (CAL teaching)

Post-Test	Group-1 (Blackboard)	Group-2 (CAL)	z Value	P Value
Mean	9.323	10.622	2.106	0.039
S.D	2.212	2.772		

Graph 3: Post test scores in group 1 (Blackboard teaching) and group 2 (CAL teaching)

DISCUSSION

Use of CAL in experimental Pharmacology is preferred by the students owing to its advantage like ease of operations and specific ethical issues involved [6].

CAL also known as Computer assisted instruction (CAI) , was found to be as effective as live demonstration and more effective than textbook instruction, particularly in facilitating psychomotor skill acquisition and retention. CAI is an effective and efficient mode of instructional delivery for use in physical therapist education that can be delivered anytime, anywhere. Many benefits of CAI have been proposed, including self-paced learning, instructional accessibility, individualized instruction and decreased faculty instruction time by earlier studies [7].

Computerized clinical cases ["virtual patient" (VP)] provide a useful teaching and assessment tool for clinical knowledge and skills. Student acceptance of this web-based modality was high: in centers of advanced facilities as reported by the researchers [8]. Apparently it benefitted the students. Computer-assisted-learning increases motivation by providing a context for the learner that is challenging and stimulates curiosity. Activities that are intrinsically motivating also carry other significant advantages such as personal satisfaction, challenge, relevance, and promotion of a positive perspective on lifelong learning.

Providing students with choice over their own learning provides learner-controlled instruction, which contributes to motivation. Increased motivation in turn will increase student learning. Also, CAL may produce some problems in providing challenge before learner by requiring the learner to study all of the given subject matter rather than studying one section at a time [9]. Hence we feel that a judicious discretion is needed in deciding which topics are better suited for CAL and when to expose the students to it.

CONCLUSION

From the present study it is concluded that CAL is an effective method of teaching when compared to traditional method. However a significant rise in group 1 post test score is indicative of the fact that the traditional method of blackboard teaching also has a place in modern day medical teaching if used in combination or judiciously.

REFERENCES

[1]   Trisha Greenhalgh. BMJ 2001 6;322:40-4.
[2]   Khadra MH, Guinea AI, Hill DA. Aust N Z J Surg 1995;65:610-2.
[3]   Miedzybrodzka Z, Hamilton NM, GregoryH, Milner B, Frade I, Sinclai T, Mollison J,Haites N. Eur J Hum Genet 2001;9:953-6.
[4]   Leigh Linden, Banerjee A, Esther D. Computer- Assisted Learning: Evidence from A Randomized Experiment. Poverty Action Lab Paper No. 5, October 2, 2003.
[5]   http://web.uct.ac.za/projects/cbe/mcqman/mcqcont.html
[6]   Ghaisas MM, Limaye RP, Mandre VV, Rane PM and Deshpande AD. Indian J Pharma Edu Res 2006 ;40:273 – 5.
[7]   Ford, Gregory S, Mazzone, Margaret A, Taylor, Keith. Int J Pedagog Learn 2009;5(2).
[8]   Oliven A, Nave R, Hasson D R, Baruch A. Harefuah 2013;152(5):257-61.
[9]   Trayner, Patrick L. J Instruct Psychol 30(2).