

ORIGINAL ARTICLE

CHALK AND BOARD VERSUS ANIMATION BASED LEARNING

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Background: Teaching Physiology is not a science, but is an art. Conceptual learning is gained through perception of students towards learning. The objective of this study was to compare perception of students about chalk black board learning (CBB) and animation based learning (ABL). **Methods:** This descriptive observational study was carried out in Physiology Department of Liaquat University of Medical & Health Sciences, Jamshoro. The faculty members of Anatomy and Physiology Departments, teaching the students of 2nd semester of 1st professional MBBS were interviewed. The same teachers taught the same topics with ABL and CBB. The data were collected on a specially designed proforma. The students were inquired about their attitudes towards CBB and ABL. Data were analysed using SPSS-16. **Results:** Total 107 students participated in the study, 71% students considered ABL a very boring method that diverge their interest from the topic. According to 74.8% students, they remembered topics much better by CBB. Whereas 57% students were agreed that they better analyse topics on CBB. Sixty eight (68.2%) students understood the topics more by CBB. And 71% students had sustained interest in topic by CBB learning. Interestingly 82.2% students consider CBB as self-motivated learning. However 50.5% students agreed that the sketches on animations gave better understanding. Then 50.5% students favoured better learning presentation by CBB teaching methodology. **Conclusion:** Chalk board teaching methodology, is a powerful tool for learning and teaching. Animation based teaching is a very boring method that deviate the interest from topic but it helps in understanding of sketches more than CBB.

Keywords: Animation based teaching, Chalk Blackboard Learning, Students, Teachers, Teaching methodology

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INTRODUCTION

Teaching, since long, has been believed to be a very difficult ordeal. It requires no lesser than King Solomon's wisdom, Sigmund Freud's insight, Albert Einstein's knowledge, and Florence Nightingale's dedication. Only a few teachers have the attitude and aptitude required to ace the process of teaching. With the advent of technology the process has simplified and bears the promise to bear more fruitful results. Teaching has traditionally been centred on verbal lectures, hand written and drawn notes and images. The board was friend and rescuer of every teacher and student, helping teachers better convey knowledge and aiding students in understanding the knowledge presented in lectures in greater depth.¹ However, with the passage of time, this process is failing to meet the ever increasing expectations of the students and falling short of portraying the advanced concepts that science reveals every day.²

To address these problems, many teachers are turning towards transparencies and PowerPoint (PP) slides. However these are often considered passive forms of learning and are unable to sustain interest for a longer time. To counter it educators are enthusiastically taking up alternate teaching methodologies to reinforce didactic instruction in lectures like Problem-based

Learning, Case-simulated learning, Patient-centred learning, Early clinical exposure, Multiple-format sessions,² Visual, Aural, Read/Write and Kinesthetic sensory modalities (VARK)³ and Animation-based Lectures (ABL)⁴. Animation is the act, process or result of imparting life, interest, spirit, motion, or activity.⁵ A picture can be worth a thousand words.⁶ Learning is best achieved when a lecture is coupled with an animation, because this combination provides a reference from which students can appreciate the knowledge presented in the animation.⁷

Most people commonly think of animations as Saturday morning cartoons or Disney features; however this is only a narrow aspect of the medium. An effective animation contains sequences of motion frames and presents the essential attributes of a concept in a manner that facilitates learning.⁴ These attributes make animation an excellent tool for helping students develop ideas and mental models of complex processes which organise new knowledge. Learning research has demonstrated that visualising processes in three dimensions aids learning, and animations are effective visualisation tools for novice learners and aid in long-term memory retention.⁸

The aim of this study was to compare CBB with ABL in terms of perception of students and faculty.

SUBJECTS AND METHODS

It was a descriptive observational questionnaire-based from 1st to 30th November 2011 after approval from ethical review board. Convenient samples of 107 students of 2nd semester MBBS and 20 faculty members from Departments of Anatomy and Physiology were interviewed regarding their views about CBB and ABL teaching aids. Verbal consent was taken from participants. Total 40 Credit Hours (12 Cr. H. for only Chalk and 28 Cr. H. for both chalk and multimedia) were utilised for teaching. Data were collected through interview by a self-administered questionnaire, and analysed using SPSS-16.

RESULTS

One hundred and seven students participated in the study. ABL was considered boring by 71% students and CBB as boring by 29% students. The students who remembered facts on CBB were 74.8%, and those who remembered facts on ABL were 25.2%. Fifty-seven percent students agreed that they can better do analysis of topic by CBB, and 43% could better do analysis on ABL. The topics were understood better with CBB by 68.2% students, and 31% did better with ABL.

Seventy-one percent students favoured CBB as it sustained interest during learning; ABL was favoured by 29% students. CBB helpful in learning method in 82.2% and ABL was helpful in 17.8% students. Students who understood sketches better on CBB were 49.5% while those who understood better on ABL were 50.5%. Students who liked CBB as learning presentation skill were 50.5%, and those who liked ABL were 49.5%.

Sixty-five percent teachers strongly agreed that students' learning with animations is better, while 35% opined that students interact more with animations; 30% teachers felt lecture preparation easier with ABL than board teaching. Seventy-five percent teachers were much confident with ABL than the CBB.

Table-1: Liking CBB and ABL by students (%)

Opinion	CBB	ABL
Boring	29.0	71.0
Remember facts	74.8	25.2
Better analysis	57.0	43.0
Understand topic	68.2	31.8
Sustain interest	71.0	29.0
Self-motivation learning	82.2	17.8
Understand sketches	49.5	50.5
learning presentation skills	50.5	49.5

Table-2: Frequency of teachers' attitude towards animation-based teaching (%)

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Student Learning	65	25	0	10	0
Student Interaction	35	20	50	15	10
Lecture Easily Prepared	30	35	10	25	0
More Confident	75	50	15	50	0

DISCUSSION

Teaching basic science subjects is based on conceptual adult learning of students to understand functional organization of human body with respect to all mechanisms responsible for its operation.⁷ Medical students come from diverse pre-medical backgrounds, different institutions, varied learning styles, and with different approaches towards learning.⁹ The tough curriculum can be made exciting, intrusive and relevant to desired outcome by the implementation of multiple teaching learning strategies.¹⁰ This can be made possible in view of comments by the recipients and the deliverers.

Lecture is considered to be an imperative teaching methodology and staple of medical education for large group of students.¹⁰ Lecture was used to be taken by experienced teachers with chalk and board before the advancement in computer technology. The common and greatest challenge faced by the tutor is to guarantee attentiveness of students, involvement and participation for their achievement.¹¹ Majority of the students sustained their interest with CBB. Teachers can influence the dynamics of their classrooms, build strong teacher-student relationship and maintain interest of the students by both ABL and CBB. Students in our study

retained interest with CBB compared to ABL in the same topics and the same teachers.

In a student-centred learning environment, teaching learning process enforces a great deal of expectations from the teacher, equivalent participation from students and effective classroom management.¹² The barriers to learning can be plunged if learners are motivated to learn. It is emphasised by facilitation theory that teachers should act like a facilitator, launching friendly and conducive environment to develop internal motivation towards learning.¹³ The interactive lecturing promotes active involvement, increased attention and motivation, and increases the satisfaction of both teachers and students in medical education.^{12,14} In our study students opined that CBB teaching motivated them towards self-directed learning (SDL).

It has been observed that adults learn by different styles through hearing information, visual images, and actual hands-on experience. Some people take in information through ideas and concepts and some through the feelings associated with specific examples and experiences. An educator is most effective when text is adjacent to important structures and is spoken simultaneously to reinforce the learning

process (spatial contiguity effect). The dual coding theory of Paivio contends that visual and verbal information are processed contrarily through separate channels making separate illustrations for evidence.⁷ Visual information carried by animated and static visuals can imprint grey matter with demonstration of movement and trajectory. In our study greater percentage of students preferred CBB in understanding of textual relationship. It is in contrast to Liao's meta-analysis which suggests that, as a whole, student learning is better when a multimedia learning tool is included during instruction relative to a control group without such tools.¹³

Students need to retain information from classes for interpretation and application of information with respect to importance of the content. The instructors' job is not over till they have assisted learner in retaining the information. Seventy-five percent students in our study were able to retain information with CBB compared to 25% students who benefited from ABL. Retention of topic is directly affected by the degree of original learning. Retention by the participants is important for determination of desired performance of the students. Sixty-two percent students in our study found CBB to help in related learning. The unexpected and interesting theme which emerged from our study is popularity of CBB in students in comparison to ABL which is contrary to studies by others.^{15,16}

Students consider ABL to be boring because during this type of learning they fail to interact with the facilitator. This occurs when students lose contact with the content and the teacher. The perception of faculty has to be evaluated in terms of program deficiencies, students' performance, personal learning and obstacles faced during the implementation of teaching learning strategies.

Though teaching should be done on board, at least some animations must be given through PowerPoint. Comprehension by students is better when they follow physiological responses of the educator's body movements like standing at the board, waving hands and explaining students the explicit details. New teaching strategies can, however, be selected and implemented in terms of needs and outcomes of the educational experience by feedback acquired from students and faculty members.^{9,17}

The integrated curriculum at any university is planned to acquire effective learning outcome, competencies in the required skills, and personal as well as professional development of students. New teaching and assessment methodologies have been introduced in medical education in last two decades. It is therefore important to let students understated their responsibilities as learners and accomplish given tasks. In view of student preferences this can be maximised by lecture plans that include 'chalk and talk' teaching

together with ABL to facilitate long-term memory retention.¹⁷

CONCLUSION

Students considered CBB useful for understanding structural and functional relationship. It helped in interaction with tutor, motivated them towards SDL and helped in retention of concepts. ABL helped in understanding of sketches, and with this methodology, students became familiar with presentation skills. Faculty members found preparation of lecture easier with ABL and preferred this mode of teaching.

RECOMMENDATIONS

A combination of different methods should be used for delivering an effective lecture with complex topics taught on board together with animations to facilitate learning of medical students. However, 'no one delivery style is optimal for all content and context', and the blind use of a particular presentation should not be encouraged with 'intelligent use' of PowerPoint for delivery and retention of lecture content by students. A good practice is to provide lecture handouts or upload them online, a day before the lecture to inculcate the importance of preparation for an interactive learning process.

REFERENCES

1. Brisbane MA, Chin SS, Melnyk E, Begg DA. Using web-based animations to teach histology. 2002; 269(1): 11–9.
2. Sathishkumar S, Thomas N, Tharion E, Neelakantan N, Vyas R. Attitude of medical students towards early Clinical Exposure in learning endocrine physiology. BMC Med Educ 2007;7:30.
3. Fleming ND. I'm different, not dumb. Modes of presentation (VARK) in the tertiary classroom. In: Research and Development in Higher Education. Zelmer A (Ed). Proceedings of the 1995 Annual Conference of the Higher Education and Research Development Society of Australasia 1995;18:308–13.
4. Yue C, Kim J, Ogawa R, Stark E, Kim S. Applying the cognitive theory of multimedia learning: an analysis of medical animations. Med Educ 2013;47(4):375–8.
5. The American Heritage® Dictionary of the English Language, (5th ed). Houghton Mifflin Harcourt Publishing Company. 2014.
6. Beakes, G. A picture is worth a thousand words. A personal view of using images in the teaching of the Biological Sciences. Biosci Educ 2003;1:(1):15 pp Available from <http://bio.ltsn.ac.uk/journal/vol1/beej-1-3.htm>. [accessed Dec 12, 2014]
7. Paivio A. Dual coding theory: retrospect and current status. Can J Psychol 1991;45:255–87.
8. McClean P, Johnson C, Rogers R, Daniels L, Reber J, Slator BM, *et al.* Molecular and cellular biology animations: development and impact on student learning. Cell Biol Educ 2005;4:169–79.
9. Rehman R, Razi S, Syed S. Impact of alterations in teaching methodologies on learning capabilities J Pak Med Assoc 2011;61:982–6.
10. Rehman R, Afzal K, Kamran A. Students' opinion about usefulness of interactive lectures in conventional and hybrid medical colleges. Pak J Physiol 2013;9(1):7–10.
11. Rehman R, Afzal K, Kamran A. Interactive lectures: A perspective of students and lecturers. J Postgrad Med Inst 2013;27(2):152–6.

12. Kamran A, Rehman R, Iqbal A. Importance of Clinically Oriented Problem Solving Tutorials (COPST) in teaching of Physiology. Rawal Med J 2011;36(3):232–6.
 13. Liao YKC. Effects of hypermedia on students' achievement: a meta-analysis. J Ed Multimedia Hypermedia 1999;8:255–77.
 14. Singh S, Singh S, Gautam S. Teaching styles and approaches: medical-student's perceptions of animation-based lectures as a pedagogical innovation. Pak J Physiol 2009;5(1):16–9.
 15. O'Day DH. Animated cell biology: a quick and easy method for making effective high-quality teaching animations. CBE Life Sci Educ 2006;5:255–63.
 16. Hauer J, Quill T. Educational needs assessment, development of learning objectives, and choosing a teaching approach. J Palliat Med 2011;14(4):503–8.
 17. Sternberg, Robert J. Cognitive psychology (4th ed). Thomson Wadsworth; 2006.pp. 234–36.
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