



IMPACT OF DIGITAL LEARNING IN UNDERGRADUATE MEDICAL CURRICULUM IN PHARMACOLOGY: A TEACHER-STUDENT PERSPECTIVE

Dr. Diwanshu Sharma^{*1}, Dr. Pavan Malhotra², Adam³ and Apoorva Malhotra⁴

¹Senior Resident, Department of Pharmacology Ascoms, Sidhra, Jammu.

²Professor & Head, Department of Pharmacology Ascoms, Sidhra, Jammu.

³Final Year MBBS, Department of Pharmacology Ascoms, Sidhra, Jammu.

⁴Prefinal Year MBBS, Department of Pharmacology Ascoms, Sidhra, Jammu.

*Corresponding Author: Dr. Diwanshu Sharma

Senior Resident, Department of Pharmacology Ascoms, Sidhra, Jammu.

Article Received on 03/06/2017

Article Revised on 18/06/2017

Article Accepted on 03/07/2017

ABSTRACT

Background: There are many innovations and trends in medical education that have been undertaken globally which include self-directed learning, problem-based learning, integrated teaching (IT) and community orientation. In addition to this there is multimedia learning. . Using multimedia in learning can help promote deeper learning and has positive impact in creating a learner-centred teaching environment. We feel a teaching method can be successful and will be able to draw students' attention when it is not only interesting, informative and clinically oriented but also able to fetch better marks for the students in the examinations and assessment tests. **Aims and objectives:** To assess the efficacy of digital learning as a new methodology for teaching and to compare this digital learning in the classroom to that of teacher centered method. **Methodology:** A questionnaire was prepared containing ten questions and 100 MBBS students of 4th semester and 8 faculty members, were asked to answer the questionnaire. It included two systems i.e digital learning and conventional animal experiments. Two sessions were conducted during the study with each group. These sessions were conducted one week apart. In the first session the students were taught through traditional teacher centered method and in the second session the target group was exposed to digital learning teaching module. 100 students and eight faculty members included as subjects with sub grouping of 25 students and 2 teachers in each subgroup. **Findings:** It was observed that 98% medical undergraduates favoured the use of digital learning in comparison to teacher centered theory classes. All the medical undergraduates found digital learning much easier compared to teacher-centered classroom method. When feedback was taken from faculty members they believed that teacher centered classroom was better than digital learning in nearly all perspectives unlike in certain aspects like students were more focussed when taught through digital method. **Conclusion:** Digital learning is a better source of teaching and help medical students give better results during examination as well as when they enter the clinical field as their concepts will be more clear.

KEYWORDS: Medical undergraduates, digital learning, teacher centered method, questionnaire.

BACKGROUND

There are many innovations and trends in medical education that have been undertaken globally which include self-directed learning, problem-based learning, integrated teaching (IT) and community orientation.^[1] In addition to this there is multimedia learning. Using multimedia in learning can help promote deeper learning and has positive impact in creating a learner-centred teaching environment. Multimedia learning is able to gain better attention from learners, achieve higher retention rate and also encourage better participation rate among learners.^[2-4] Multimedia learning is said to be effective in the transformation process from traditional teaching approach to blended learning and also to online

learning.^[5-7] Having the technology in education and also the use of multimedia learning, this would help bridge the transition gap of moving towards learner-centred teaching.^[8] We feel a teaching method can be successful and will be able to draw students' attention when it is not only interesting, informative and clinically oriented but also able to fetch better marks for the students in the examinations and assessment tests.^[9]

The incorporation of computer in the form of powerpoint presentation in the theory classes in the student's curricula reduces the instructor's teaching time, increasing the time available to monitor individual students' performance and improves the student's attitude toward the course.^[10] The study of digital

learning application and the acquisition of psychomotor skills among students and the relationship to teaching methodologies is a relatively new area of research in medical education. Use of power point presentation in theory classes as an adjunct to teaching health sciences in medical schools is increasing. However, work in the area of digital learning remained largely under-searched. This study is designed to investigate the outcome of computer assisted learning in pharmacology curriculum in theory classes.

AIM AND OBJECTIVES

Aim

To assess the efficacy of digital learning as a new methodology for teaching.

Objectives

1. To supplement classroom teaching by creating virtual experience using a computer.
2. To compare this digital learning in the classroom to that of teacher centered classroom.

MATERIAL AND METHODS

In continuation to my previous study where a questionnaire based comparison was done between CAL (Computer Assisted Learning) and practical animal experiments for medical undergraduates. It was observed that unlike traditional animal experiments CAL was much better in every aspect as far as the undergraduate teaching is concerned. In the present questionnaire based qualitative study conducted at Department of Pharmacology and Therapeutics, Acharya Shri Chander College of Medical Sciences and Hospital, Sidhra, Jammu involving consenting medical undergraduate students of 4th semester and faculty members in the Department of Pharmacology, a questionnaire was prepared for faculty members & students & the impact of digital learning in the theory classes was assessed for a period of 3 months. The study was conducted after taking clearance from Institutional Ethics committee (IEC). Initially the students were exposed to teaching of intergroup of 25 students per day and subsequently in the next week the same group was exposed to computer aided teaching module in theory class. The questionnaire was distributed to evaluate the impact of this learning tool for students and teachers. The questionnaire was designed from previous studies published in indexed journals comprising of ten questions.

Three sessions were conducted during the study with each group. The sessions were conducted one week apart. In the first session the students were taught through traditional teacher centered method and in the second session the target group was exposed to digital learning teaching module. 100 students in the age group of 19-21 years and eight faculty members from the Department of Pharmacology were included as subjects with a sub grouping of 25 students and two teachers in each subgroup. The questionnaire was prepared to

evaluate the impact of digital learning in theory classes apart from practical classes.

First session

It spread over 4 weeks. One subgroup was exposed to teacher-centered classroom for one week thereby four subgroups completed the exercise in four weeks. So, the first session ended by fourth week.

Second session

It also spread over 4 weeks. One subgroup was exposed to digital learning module as a part of digital teaching through power point presentation for one week thereby four subgroups completed the same exercise in four weeks, so the second session ended by eighth week.

Third session

It was of 1 week duration. A pre-structured Likert scale based questionnaire was introduced to both the target groups of students as well as teachers and a qualitative assessment was done. Subsequently, the results were compiled and report submitted by the end of 10th week. At the end results were tabulated as percentages.

Observations

It was observed that 98% medical undergraduates favoured the use of digital learning in comparison to teacher centered theory classes. All the medical undergraduates found digital learning much easier compared to teacher-centered classroom method. It was observed that digital learning was considered better as 83% students considered that it had more visual impact unlike teacher centered theory classes. Students found digital learning less time consuming, 93 % medical undergraduates found it more interesting and were more confident about exercises with digital learning as quick repetition with same exercise was possible. Another advantage of digital learning was that 87 % students experienced their retention was more when they studied through digital method unlike teacher centered theory classes where only 13 % medical undergraduates believed that retention rate was more with this method. It was observed that even teachers believed that digital learning was much better than teacher centered theory classes as far as concentration of students was concerned. 59% faculty members observed that students were found more fascinated and interested when taught with powerpoint presentation unlike 41% teachers believed that chalk and board method is better. 99% of students felt that teacher centered classroom was boring and was time consuming. But there were few disadvantages related to use of technology in theory classes like technical errors. Sometimes there were cut offs that interrupted the class the class and error in computer functioning that was more inconvenient to the teacher.

When feedback was taken from faculty members they believed that teacher centered classroom was better than digital learning in nearly all perspectives unlike in

certain aspects like students were more focussed when taught through digital method.

Since teacher centered method was more time consuming therefore teachers got less time to get feedback from the students. 24% teacher believed that they were just able to finish their course and hardly get anytime to ask questions from students. 94 % Medical undergraduates also agreed that with digital learning they got ample time to interact with the teacher whereas only 6% believed that feedback with teacher centered method was possible. At one time where both teacher and students agreed was

that digital learning promoted critical thinking more compared to teacher centered method.

RESULTS

Results show that students consider digital learning better than teacher centered classroom where as teacher believe the vice versa

Table 1: Results given in response to questionnaire by faculty and medical undergraduates.

S.No	Questions	Digital learning(theory classes)		Teacher centred Theory classes	
		Faculty members (%)	Medical UGs (%)	Faculty members (%)	Medical UGs (%)
1.	Among the two which do you think has more visual impact?	32	83	68	17
2.	Which of the two is easy?	4	100	96	0
3.	Between the two, which is time consuming?	20	0	80	100
4.	Which is boring?	86	8	14	92
5.	Where there is lack of feedback?	24	6	76	94
6.	Where repetition is possible?	61	59	39	41
7.	With which method retention rate is more?	51	87	49	13
8.	Which between the two is interesting?	42	93	58	7
9.	Where concentration is more?	59	88	41	22
10.	Among the two, what promotes critical thinking skill?	90	96	10	4

DISCUSSION

The main goal of medical education in this era is to bring new perspectives on content, process, extent and evaluation of the medical curriculum so that there is improvement in teaching –learning process.

Here a questionnaire based comparison was done between digital learning and teacher centered method used in theory classes of pharmacology, for medical undergraduates. It was observed that unlike traditional teacher centered method, digital learning is much better in every aspect as far as the undergraduate teaching is concerned. Various advantages and disadvantages were observed during the course of study. Digital learning offers a stimulus-variation from the routine teaching methodologies. Attempts have been made by many teachers of pharmacology to improve teaching methods. The result of the present study emphasizes the value of digital learning in promoting critical thinking and understanding of theoretical concepts.

In our study, 98% medical undergraduates favoured the use of digital learning in comparison to teacher centered theory classes Results from this study demonstrate 100% of medial undergraduate are of opinion that digital learning is easy, more interesting, better retention rate,

more visual impact, promote critical thinking and can help in a better way for self-assessment unlike the medical faculty who still believe that teacher centered method is better. The result of our study are more or less have same conclusions as drawn from a Pakistan study conducted by Atif Mahmood where it was observed that power point presentation was the most preferred aid with white board being the least favourite.^[11] These findings were different from the findings of the study conducted by Lalit Mohan et al which found that both the methods were almost equally preferred thought mix of aids were the most preferred.^[12] Whereas, Some reports have shown that students' inactivity in traditional teacher-centered classes would make them bored and exhausted that consequently would decrease their concentration and learning and finally would result in their absence from the classroom.^[13] Therefore introducing technology into medical education through various modes like power point presentation is the need of the hour and faculty as well as medical students find digital learning better way to learn and give better results in the medical field.

CONCLUSION

It is concluded that digital learning is a better source of teaching for the various reasons discussed.

REFERENCES

1. Smith SR. Toward an integrated medical curriculum. *Med Health R I*, 2005; 88: 258-61.
2. P. Shank. The Value of Multimedia in Learning, Adobe Systems Incorporated. [Online]. Available, 2005.
http://www.adobe.com/designcenter/thinktank/value-media/The_Valu_e_of_Multimedia.pdf
3. K. Kiili, "Participatory multimedia learning: Engaging learners," *Australasian Journal of Educational Technology*, 2005; 21: 303-322.
4. S. Oncu and H. Cakir, "Research in online learning environments: Priorities and methodologies," *Computers & Education*, 2011; 57: 1098–1108.
5. L. Y. Low, L. T. Low, and V. C. Koo, "Multimedia learning systems: a future interactive educational tool," *Internet and Higher Education*, 2003; 6: 25–40.
6. T. P. Mackey and J. Ho, "Exploring the relationships between Web usability and students' perceived learning in Web-based multimedia (WBMM) tutorials," *Computers and Education*, 2008; 50: 386–409.
7. V. Demirer and I. Sahin, "Development, implementation and evaluation of an online multimedia learning environment for blended learning," *AWERProcedia Information Technology & Computer Science*, 2012; 1: 980-985.
8. M. Weimer, *Learner-Centered Teaching: Five Key Changes to Practice*, San Francisco, CA: Jossey-Bass, 2002.
9. Hussain G, Farooque I. Evaluation of effectiveness of CAL to improve the clinical examination skills of First year Medical Undergraduates. *Int J Intg Med Sci*, 2016; 3(8): 391-96.
10. Puri R, Bell C, Evers WD. Dietetics students' ability to choose appropriate communication and counseling methods is improved by teaching behavior change strategies in computer assisted instruction. *J Am Diet Assoc*, 2010; 110: 892-7.
11. Mohan L, Ravi Shankar P, Kamath A, Manish MS, Eesha BR. Students' Attitudes Towards The Use Of Audio Visual Aids During Didactic Lectures In Pharmacology. *Journal Of Clinical And Diagnostic Research*, 2010; 4: 3363–3368.
12. Ghosh S. Combination of didactic lectures and case-oriented problem solving tutorials towards better learning: Perceptions of students from a conventional medical curriculum. *Advances in physiology Edu*, 2007; 31: 193–197. [PubMed].
13. Schreiber EB, Fukuta J, Gordon F. Live lecture versus video podcast in undergraduate medical education: A randomised controlled trial. *BMC Medical Education*, 2010; 10:68. [PMC free article] [PubMed].