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EFFECTIVE USE OF A-V AIDS AND TECHNOLOGY WHILE TEACHING GENERAL MEDICINE TO MBBS UNDERGRADUATES .

General Medicine

Dr Deepa Sunil Banjan*

Associate Professor Department of Medicine, Rajiv Gandhi Medical College & Chatrapati Shivaji Maharaj Hospital. Kalwa *Corresponding Author

ABSTRACT

Modern medical education encourages use of technology as a part of New teaching –learning methods. Smart Boards, Case based Video recordings, Medical blogs, online lectures, online journals, Practical demonstrations on Mannequins, virtual labs simulations and Telemedicine to engage students in the learning and informative process. Using technology effectively, in various forms helps to achieve the goals faster. To create awareness about use of AV aids as well as to evaluate attitude, skills and knowledge of using the technology effectively learning, a Random combined study of Qualitative and quantitative research, was conducted over a period of 2 years in 50 students in a Medical College. Students (n=50) between 18-20 years of age were randomly subjected to a validated questionnaire and subjected to an interview for achieving the objective of the study. Results were Tabulated in percentage. The Students also preferred Chalk and board method with clear sound and structured instructions for conventional lectures. The study provides evidence that cognition was faster via A-V aids and recall was better with Live recordings. The children were aware about existing technological gadgets and internet technology but required a facilitator to guide them for using it effectively. Smartphones were most common gadgets used. Live case based recordings or cases were preferred to simulation or power point lectures. Using the technology was operator dependent and time consuming and required expertise by the teacher.

KEYWORDS

A-V AIDS, Effective use, Technology, Medical Education, research.

INTRODUCTION

Medical Education needs to be revised due to new emerging trends of diseases as well as migration of different kinds of populations [2*] Technological advances and introduction of sophisticated machines and web based communications into social, economic and educational fields. Technology has been effective in the Clinical Hospital based services so introduction of technology in medical education Medical education has become the need of the hour. Pan endemics, Data analysis, Robotics in surgery, Lasers and computers based HIMS are some aspects which have solved many Time consuming tedious problems in Medical fields. Hence it is necessary to prepare the average undergraduate student for effective use of appropriate technology and develop skills to operate technology effectively in early training years. The Competency based curriculum (CBME) and validated technological learning modules are an integral part of CBME [5*]. Publications also have become an integral part of Medical education in India. To make the undergraduate competent for use of technology, the medical teacher has needs to be an expert and learn to use technology effectively. A good lecture of medicine subject, is the result of planning, preparation, and hard work and it is essential that a medical teacher invests the necessary time.[1*] energy and effective use of Technology into identifying resources, organizing the material, developing examples, and preparing supporting documents for the students. The lecture is best appreciated when a teacher is an expert and a facilitator of content that is taught. When subject experts are not available or paucity of actual cases are not available in teaching hospitals, video recordings of lectures and cases can help in better understanding of any subject. This study shows that technology helps in process of dissipation of knowledge and also assists in faster learning.

METHODS AND MATERIALS

The study was conducted over a period of 2 years in 2 parts. The 1st. part of study involved a questionnaire. The means of communication technology used for studying medical topics, were evaluated. 2nd. part involved subjecting the students to two different forms of teaching. One by didactic manner and the other by use of A-V recordings of live cases of same subject.

The Questionnaire of survey was validated by first conducting a pilot study of random 25 students. Principal component analysis & Cronbach's Alpha was applied for Validation and to check internal consistency of the questions in the pilot study.
0.9= very significant + 3 marks
0.7-0.9= significant + 2 marks
0.5-0.7= significant + 1 mark
< 0.5= no statistical significance

The data was cleared and during pilot study. Only 12 Mcqs were selected. The questionnaire was e-mailed at authentic emails provided by the students pre-and posttest. The reminders were sent on phone numbers provided by the students. The replies were documented in Google documents electronically. The questionnaire was sent and received in extension.doc word 2004/7 format. 150 students could operate emails and fill the required questionnaire. [100%] the 1st part of the questionnaire consisted of Demographic information, consent to participate and publish and second part has 15 validated statement Mcqs. Each consisting of 5 marks. The Likert scale rating from 1 to 5 marks. Most effective was 5 and least effective was 1 mark.

4 Knowledge based questions. 5 marks each. A-V aids awarded 5 marks and didactic awarded 1 mark each. 4 skill based questions 4 attitude based questions the 2nd part of the study consisted of dividing the participants in 2 groups randomly and subjecting Group 1 to didactic lecture and other group 2 to video case based recording of same topic with teacher as a facilitator. The Participants were then divided into 2 groups. One conventional didactic lecture and the other of case based live Audio-video recording. A pretest and posttest evaluation was done by subjecting one group to didactic form of lecture with conventional chalk and board method and the other group with a case based video recording showing non-offensive content of same topic the lecture. The video was monitored by an expert while recording and relaying. Explanation regarding what to interpret was given during video play. Both groups were then subjected immediately and after 2 weeks to a common Survey for evaluation their Knowledge of, attitude and skills to operate electronic gadgets with Information technology and effective use of those audio-visual aids in Medical curriculum & recall of the video content and lecture subject. Data was analyzed using excel sheets SPSS statistical package & Chi square test. The evaluation of qualitative data was done on the basis of scores of Likert scale the analyzed questions which required detail answers were also followed by in depth Interview of participants to understand attitude towards learning via technology & audio-visual aids during lectures. The Author also evaluated the participants for their preferences of subjects in Medical sciences they would like to learn via Audio visual aids Vs live case based studies.

THE OBSERVATIONS AND CONCLUSIONS

1] All students replied to the emails and validated questionnaires.[N=50] [C & table no1] Commonest form of technology was computers to access the net 100% used computers, 96% used cellphones as a means to use communication technology for seeking information, 2% used iPad, 4 % were aware about video conferencing and web based seminars were known by 8%, .6 % did not use any means. 42% Preferred Internet to Find Something New Otherwise 58% Students Preferred Conventional live case studies. Of people who preferred technology, 60% Used Internet for Curiosity And 40% Used It for Gaining Information. 42% Had Used Internet for Gaining Medical Information. 71 % Of the Users Used Only Wikipedia As the Source of Information. 100% Of the Students Found It Informative but Not Necessarily Academically Oriented.45% Students Wanted Subject Neurology to Be Taught Via Audio-Visual Technology. Clinical case based studies recordings were preferred by 98 %. Direct Videos of signs demonstrated were preferred by 95 %. 50% Felt

Technological or Case Based Study Would Help Because Of Difficulty to Conventional Teaching Methods of Didactic Lectures which did not involve a dialogue or visual stimulation. 86% Expressed Willingness To learn The Difficult System in Alternative Way. 48% felt Technological modules were effective where no teacher was available.

TABLE 1

info tech	25	25	0.5	0.5	0	LECTURESS PREFERRED
lectures/av	25	16	0.5	0.32	0.22	METHODS DID NOT MATTER
new methods	20	25	0.4	0.5	0.1	POOR KNOWLEDGE GUIDANCE NEEDED
search engines	25	25	0.5	0.5	0	SMART PHO? AVAILABILITY
devices	25	24	0.5	0.96	0.4	CASE BASED STUDIES WITH TEACHER
ppt	10	13	0.5	0.4	0.1	PPT WAS NOT SO APPRECIATED
live learning	23	21	0.5	1 p=1		LIVE CASE RECORDINGS PREFERRED
av aid helps	22	22	0.26	0.32	0.06	AGREED THAT AV AIDS HELPED
facilitator	25	25	0.44	0.44 p=1		FASCILITATATOR NEEDED
test recall	15	23	0.42	0.42 p=1		MORE IN AV AIDS USED
condition recall	15	22	0.44	0.76	0.32	NEUROLOGY PREFERRED SYSTEM
system	21	18	0.72	0.88	0.16	
total	251	259	5.68	7	0.48	P=0.48
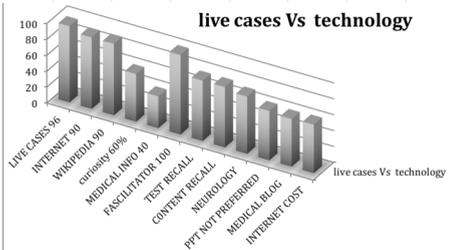
Chart 1

CHI SQ test to test significance of P value found in Didactic Vs AV aids use and facilitator.

	A	B	C	D	E	F	G	H	I	J
1	info tech		25	25	0.05	0.5		LECTURESS PREFERRED		
2	lectures/av		25	16	0.05	0.32		METHODS DID NOT MATTER		
3	new methods		20	25	0.04	0.5		POOR KNOWLEDGE GUIDANCE NEEDED		
4	search engines		25	25	0.05	0.5		SMART PHO? AVAILABILITY		
5	devices		25	24	0.05	0.96		CASE BASED STUDIES WITH TEACHER		
6	ppt		10	13	0.5	0.4		PPT WAS NOT SO APPRECIATED		
7	live learning		23	21	0.5	1		LIVE CASE RECORDINGS PREFERRED		
8	av aid helps		22	22	0.26	0.32		AGREED THAT AV AIDS HELPED		
9	facilitator		25	25	0.44	0.44		FASCILITATATOR NEEDED		
10	test recall		15	23	0.42	0.42		MORE IN AV AIDS USED		
11	condition recall		15	22	0.44	0.76		NEUROLOGY PREFERRED SYSTEM		
12	system		21	18	0.72	0.88				
13	total		251	259						
14										
15	CHI SQ TEST	value	8.011583		13.334661					
16	degree of freedom		11		11					
17	p value		0.7122659		0.272016					
18										
19	p=0.4402									
20	accept Null hypothesis									
21	Effective use of technolog with trained facilitator to explain technology, can be accepted									
22	for MBBS students.									

DISCUSSION

1] Imparting Education and clinical skills in a medical graduate to make a competent practitioner and educationist, is one of the goals the Medical teacher has to achieve in formative years of Modern medical graduate .[7*] Hence the role played by the teacher is vital. The teacher is the facilitator and guide to enable for the student to understand and inculcate the skills necessary for practice of medicine. The author gives an evidence based validation in this study for the statement. 96% of the students concurred with the statement. Faculty building hence must be stressed upon as a primary goal in future of medical curriculum. To whet curiosity and improve methods of learning, all three forms of learning must be included while teaching Medicine. Educators have determined that most adults, adolescents, and children learn best by experiencing a blend of activities that promote the three learning domains: cognitive, affective, and behavioural. Cognitive refers to knowledge or a body of subject matter, affective refers to attitudes and beliefs, and behaviour refers to practical application [*6] Use of AV aids during lectures, concur with this. All the Students in this study, were competent to Operate Audio Visual Modules used for seeking information. Only 25 % knew how to use internet for self-study so assumption about students willing to immediately accept technology over conventional means without proper training, would not be right.2] using only technological aids was not the preferred means for learning.96% students preferred live case based studies for learning. Willingness to learn only a difficult system by alternative means was preferred by students 88% wanted Neurology to be explained by simulation. Simulation & Mannequins was agreed upon by most students for practice and developing confidence in the interviews. Smartphones with internet connectivity was preferred by 50% due to availability, accessibility and interactive communication. 32% opined that AV aids helped in self-study. Students did not know how to use search engines for study purpose indicating correct facilitation of training to be introduced if effective use of technology was to be used.96 % agreed that Video Recordings of actual cases were effective in short term as well as long term recall for pictures.44% of the students agreed that AV aid was extremely effective when expert was a facilitator. 100% agreed that case based live recordings were extremely effective for long term and short-term recall.25 % expressed that power point presentations were not so effective methods of AV aids. Cost factor of internet data packages was issue brought forth in the study. The means to gain correct information did not matter. Wikipedia was the most common used for seeking information by the undergraduates Email feedback was effectively submitted by all students. It is wrong to assume that even if students are techno savvy, they would readily accept technology to learn academics. Significant statistical difference between learning by only lectures and by using AV aids, was found by Chi sq. test P= [0.7122665, 0.272016 difference =0.4402 > p=0.05 %] in this study. N=50, degree of freedom 11.

Use: Audio visual Records of cases can be kept for Teaching when cases are not available. Teaching modules can be used for recall or reinforcement of learning. Technology must be used effectively by using equipment or gadget as per effectivity.

Limitations: Study was time consuming. Assimilating same group of students was difficult due to routine curricular activities. Special time had to be dedicated. Sample size was less for greater statistical application. Using AV aids is costly and equipment needs investments. Internet connectivity, is another cost limiting factor.

APPENDIX

Validated Questionnaire by Dr Deepa Banjan.
Language English
Name: _____ Age _____ Sex: M/F/O   Email: _____
Cell Phone number: _____ Semester year. _____ Date & time: _____

Informed Consent: I the abovementioned participant, am willing to participate in the survey conducted as a part of academic research of teaching learning process. I am above 18 years of age and give my consent for using the data/ opinion expressed by me to be used for research and publication maintaining the confidentiality.
Signature:
_____

Circle the Option after reading the query.
Ask the interviewer about ambiguity of any question.
Opinion expressed should be as close to true information. There are no right or wrong answers. The survey is for understanding attitude, skills and knowledge.

A] What form of communication technology and media used in Medical lecture teaching, are you familiar with? [knowledge based] 1

1] Cell phones 2] computers 3] iPad 4] Video Conferencing 5] Webinars 6] E- learning Modules lectures 7] OHP 8] smart Boards 9] Chalk & Board 10] any other mention

2] How effective are Conventional lectures for learning? [skill based] 1

A] Extremely effective   b] Very effective c] somewhat effective d] Not so effective e] Not effective at all.

4] By What new methods would you prefer to study medicine along with didactic lectures? [student centric pedagogy attitude based] 1* Audio visual aids b] Role play and Mannequin based simulation c] Webinars d] telemedicine f] Don't know any of the methods g] live case based bedside learning.

6] What websites do you know or use to access medical information on the net? [knowledge based] for knowledge & self- study adult learning

A] Wikipedia b] Search Engines like Google scholar, Medline, PubMed, c] any other

7] What devices do you use for communication?

A] Smart phones b] Laptops/ desktops c] Interactive smart boards d] iPads e]

8] PowerPoint presentations were effective in recalling information of the condition shown
Extremely effective b] Very effective c] somewhat effective d] not effective e] not effective at all. [Skill based]

9] Which module was effective PowerPoint or Case based live recording for recalling information of condition shown?

PPT/CB Extremely effective b] PPT/CB Very effective c] PPT/CB somewhat effective d] PPT/CB not effective e] PPT/CB not effective at all. [skill based] 3**[circle either PPT or CB. PPT= PowerPoint/ CB= case based recording]

10] Using Audio Visual aids are effective in recall and understanding of lecture Topics? [attitude based] 3***

A] extremely effective b] very effective c] somewhat effective d] Not so effective. E] not effective at all. [skill based]

11] Was the explanation of video by the teacher helpful? [student centric attitude based]

a] Extremely helpful b] very helpful c] somewhat helpful d] Not helpful at all e] Video was self-explanatory. 4 **** [teacher centric skill based.]

12] What Signs were shown in video / explained in the lecture? Knowledge Recall based

13] Which poisonings is the sign seen? [Knowledge Recall based]

14] which system would you like to learn best via Audio visual aids plus a facilitator?

A] Cvs b] CNS C] RS d] Endocrine e] Gastrointestinal.   F] Hematology.

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