



APPLICATION OF INNOVATIVE APPROACH IN FORENSIC MEDICINE TEACHING: VIDEO INTEGRATION- AN INTERVENTIONAL STUDY

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ABSTRACT Forensic medicine has evolved in many ways by using various scientific innovative methods as it is used to give justice for the society by conducting investigations for the crime like doing Medicolegal autopsies, weapon examination, toxicological analytical examination to get the clues in relation to the crime. As a result, forensic medicine is one of the most interesting subjects for students to pursue. Teaching this subject, on the other hand, has various interesting and innovative integration making it a systematic teaching modality. CSI, FBI Files, and CID are just a few of the TV shows and various movies that have influenced students undergoing medical education around the world. As a result, a teacher's ability to satisfy students questions solely through traditional teaching pedagogies becomes difficult. A promising teaching-learning module for forensic medicine uses context-cinema and video clips. This module has been shown to have a long-term impact on students. The study proved to be beneficial and effective in terms of student's reflection and professional attitude. It's a unique way of attracting student's attention. Film clips "capture the imagination" and aid in the long-term memory of facts. It also aids medical students in their preparation for ethical and moral dilemmas that they will face throughout their careers. Our study's main focus is on how this newer technique of integrated module will help the students of MBBS second and third professional year to regain the knowledge in the subject of forensic medicine.

KEYWORDS : 2nd and 3rd year MBBS Students, cinema, teaching-learning module, Forensic medicine, knowledge etc

Introduction

In the field of medical education, digital technology is becoming an integrated part for distant learning. Teaching modules integrated with the use of multimedia, videos, animations, simulated environment can help the students to improve the cognitive and psychomotor skill [1]. This digital module can incorporate asynchronous interactions between students and tutors in order to engage students. They are used by educators to improve a number of aspects of the teaching process in the online form. Such interactions were thought to open up room for reflective and critical thinking [2]. Moreover, digital learning is a fantastic way to increase learner engagement. On that basis, video integration has become a relevant option for many educationists by integrating YouTube videos for learning. Video is not only a helpful tool for learners but can also be used to make courses more interesting as well as interactive [3]. Using video as an integrated module as compared to conventional teaching in the subject of forensic medicine, this newer innovative approach helps the students to understand the subject in a better way. This technique can be used in multiple ways which develops an interest for critical thinking in the learners [4]. Students may benefit from new and creative teaching-learning techniques to increase their knowledge, critical and creative thinking abilities, and logical research skills, all of which are required for a thorough understanding of the subject. Although forensic medicine in India is sound and developing, traditional lecture-based teaching and learning is more prevalent in classrooms, where students are not sufficiently involved and it is more of a teacher centric education. It can be challenging for students to fully understand certain topics when traditional didactic teaching which eventually becomes monotonous and boring. The classroom, however, won't become repetitive or boring if various active teaching and learning techniques are introduced like flipped classroom, and students will learn challenging material more effectively and engagingly [5,6]. Video podcast (Vodcast) technique used along with interactive teaching in flipped classroom improves the better understanding of the content in educational programs. The blended programmes in teaching modalities if used is of great help to the students [7]. To take advantage of this technology, many educational institutions have incorporated a blended learning methodology into their syllabus [8]. Integrated video teaching helps for the better outcome of the learners [9]. Flipped classroom if integrated with video teaching can help to learn new concepts and can be viewed multiple times to get the master and for the retention of knowledge [10]. A teacher should always focus on the affective domain of students when teaching forensic medicine. The

reflective process of students is critical in refining attitudes and ethics. Ethics used to be taught to us by our grandparents through storytelling. A form of audio-visual storytelling is cinema. Many movies are based on real events, and they can be useful teaching resources for forensic medicine [11]. The first medical educational films and video clips appeared in 1890. Movie clips offer a brief and straightforward teaching scenario in which important issues and feelings are emphasized through particular scenes. This teaching module may be more effective due to its brief sessions, rapidity, and higher emotional intensity [12-13]. This innovative strategy can also help students think, which can have a significant positive impact on their emotional and cognitive development. In this study, film clips are used to teach subjects such as ethics, legal process, mental illness, communication skills, and human values. This innovative strategy can also help students think, which can have a significant positive impact on their emotional and cognitive development. In this study, film clips are used to teach subjects such as ethics, legal process, mental illness, communication skills, and human values. The current study was taken with an aim to know the benefits of integrating video along with the pedagogy so that it can be incorporated into the curriculum.

Background of Video Integration into the Forensic Medicine Classroom:

Video is a powerful way to engage learners and give them a multisensory experience of concepts and ideas. It can be used to show real-life examples, such as examination of victims of Sexual assault, dissection, post-mortem videos. With video, medical teacher can engage their students by using visuals, audio, and movement to illustrate concepts and make course as well as content more interesting [13]. Video is not only a helpful tool for learners but can also be used to make forensic medicine teaching more interesting as well as interactive and can also be used in flipped classroom [14]. Video integration can also be used for psychomotor skills while performing autopsy dissection [15]. Case based scenario or problem based learning can be done using video into the forensic medicine classroom as an innovative approach to teach the subject [16]. The use of videos along with multimedia tools helps for bridging the gap in the provision of unrestricted access to quality education and helps to further improve learner's performance [17]. The present study was aimed to know the importance of video/multimedia integration in the conventional teaching modality. The findings of the study will help the educators who want to improve their course design and make the most with their

video content. Digital video integration is a dynamic teaching tool that can be used to enhance the learning experience by providing visual examples of concepts and ideas. This study will discuss how educators can use video to improve their teaching practices, reach students in different ways, and help them learn more effectively. It will also present strategies for integrating video into course curriculum.

Aim

The present study was undertaken to evaluate the importance of video integrated teaching module.

Objectives

1. To understand the knowledge gain by using video integrated teaching.
2. To compare the efficacy of knowledge gained by using innovative teaching modality with conventional method.

Inclusion Criteria

1. Students of 2nd professional year MBBS.
2. Students willing for the feedback.

Exclusion Criteria

1. Students not willing to give the feedback.
2. Student absent in lectures.

Materials & Methods

It was an Interventional study undertaken in the Department of Forensic Medicine of Datta Meghe Medical College, Wanadongri, Hingna, Nagpur. Before initiation of the study peer review and validated feedback form was given to students. For the second-year M.B.B.S. students at Datta Meghe Medical College in Nagpur, a lecture series with a total of eight lectures lasting an hour was held. The following topics were covered in each lecture in turn: Legal procedure, Identification, Somniferous Poisons, Agricultural Poisons, Medico-legal Autopsy, Forensic Psychiatry, Medical Negligence and Sexual Jurisprudence.

A total of 128 students were included in the study and 2 groups each of 64 students were formed. Group (A)- The lectures on above topics were taken by conventional way in ppt format (60 minutes) Group (B)-The lectures were integrated with specific relevant clips (from YouTube/social media/academic videos) of duration ranging from 5min to 7 mins on above topics followed by conventional teaching (50 minutes). Students in Groups "A" and "B" received a brief introduction to this teaching module prior to the application of this lecture series.

Table 1: Lecture series displayed with the cinema or a video clip

Lecture No.	Topic	Cinema/ Video Clip	Language	Details
1	Court Procedures	Cinema	Hindi	Jolly LLB Part 1 and 2 (Movie)
2	Identification	Cinema	Hindi	Gajni (Movie)
3	Somniferous Poisons	Cinema	Hindi	Udta Punjab, Dev D (Movie)
4	Agricultural Poisons	Video Clip	Hindi/English	Relevant Youtube Videos
5	Medico-legal Autopsy	Video Clip	Hindi/English	Dissection videos from online resources
6	Forensic Psychiatry	Cinema/Video clips	Hindi	Nail Polish (Movie)
7	Medical Negligence	Cinema/Video clips	Hindi	Ankur Arora Murder case (Movie)
8	Sexual Jurisprudence	Cinema/Video clips	Hindi	Pink (Movie)

At the end of the lecture series of all 8 lectures (Table 1), feedback was obtained from students using the structured questionnaire on a Likert

scale. Complete feedback was received from a total of willing 128 students. Data was collected, tabulated, compiled and observations & results were obtained. Students were divided into two groups based on the exposure of teaching modality and were grouped as Group A and Group B as shown in table 2 and 3 respectively. The chi square and p value was calculated using statistical analysis comparing group A and group B to know the significance of the study.

Observations

Table 2:(Group A- Conventional Teaching modality)

	Teaching Module Utility	Totally Disagree	Partly Disagree	Agree	Strongly Agree
1	Increase in concentration during lectures.	6(9.37%)	12 (18.75%)	35 (54.68%)	11 (17.18%)
2	Increase in Memory retention	21(32.81%)	10 (15.62%)	21 (32.81%)	12 (18.75%)
3	Increase knowledge about topic.	6(9.37%)	11 (17.18%)	30 (46.87%)	17 (26.56%)
4	Change in attitude towards Patients/practical approach	14(21.87%)	12 (18.75%)	25 (39.06%)	13 (20.31%)
5	Increase in practical skills (automation and efficiency)	22(34.37%)	14 (21.87%)	20 (31.25%)	8 (12.5%)

Table 3: (Group B- Innovative video integrated teaching modality)

Sr. No.	Teaching Module Utility	Totally Disagree	Partly Disagree	Agree	Strongly Agree
1	Increase in concentration during lectures.	0(0%)	3 (4.68%)	26 (40.62%)	35 (54.68%)
2	Increase in Memory retention	0(0%)	5 (7.81%)	25 (34.06%)	34 (53.12%)
3	Increase knowledge about topic	0(0%)	5 (7.81%)	32 (50%)	27 (42.18%)
4	Change in attitude towards Patients/practical approach	2(3.12%)	6 (9.37%)	23 (35.93%)	33 (51.56%)
5	Increase in practical skills (automation and efficiency)	0(0%)	3 (4.68%)	21 (32.81%)	40 (62.5%)

Table 4 (Chisquare and p Value)

	Teaching Module Utility	k ₂ -value	p-value
1	Increase in concentration during lectures.	27.23	0.0001,S
2	Increase in Memory retention	33.54	0.0001,S
3	Increase knowledge about topic.	10.59	0.014,S
4	Change in attitude towards Patients/practical approach.	19.78	0.0008,S
5	Increase in practical skills (automation and efficiency)	50.48	0.0001,S

This study shows that there is an increase in concentration of students in lecture as evident from table 4 where k₂-value is 27.23 and p value is 0.0001, increase in memory retention where k₂-value is 33.54 and p value is 0.0001, increase in knowledge about topic taught where k₂-value is 10.59 and p value is 0.014, change in attitude towards patients/practical approach where k₂-value is 19.78 and p value is 0.0008, increase in practical skills (automation and efficiency) where k₂-value is 50.48 and p value is 0.0001. The study was highly significant as the p value is less than 0.05.

Discussion

Videos can play a vital role in medical education and can be incorporated in the conventional teaching. Videos can make lectures more engaging and may have a positive impact on learners. However, there is no alternative for effective pedagogical methods, therefore it's important to avoid going overboard and including multimedia like cartoons and video vignettes just for their amusement value [18]. Video integration in the forensic medicine classroom has many benefits for students, such as: It provides a visual representation of abstract concepts, it helps to clarify complex ideas, it is useful for students who learn better through visual cues, it may be useful for students who have different learning styles, it may be useful for students who struggle to focus or pay attention in class, it allows students to review the course material again at a later time [19]. The use of video films in medicine has gained popularity in recent years. Gross anatomy was taught to first-year medical students using video and digital images, according to Ernst et al. [20] Video films are now being used by the Royal Colleges of General Practitioners to assess student skill and doctor-patient interactions. Medical faculty can educate and teach students in some of the problem oriented medical situations that could be challenging by using conventional teaching approach which can be taught by showing video clips of well-known films. Teachers should carefully select the films they use, watch them carefully and deliberately to identify the scenes that are most pertinent to the educational objectives that are planned while taking into account the students' prior knowledge, and use assessment methods that are appropriate for the academic activity [21]. The present study shows that video integrated teaching modality improves the concentration of the student and it is highly significant which tallies with the study of Lim EC et al [18]. In fact, using movie/video clips in the classroom encourages reflection, fosters empathy, enlarges professional ideas, and aids in the development of well-rounded traits [22]. As per Blasco PG et al, the use of film in medical education can be universally embraced. Its popularity does not seem to be limited to homogeneous audiences, individuals from the supposedly more sensitive cultures, or younger, techno-savvy audiences [23]. As per Issa N et al, incorporating multimedia design concepts into conventional medical teaching has a positive impact on measures of learner understanding (i.e. long-term transfer and long-term retention) and it also highlights the importance of integrating multimedia as a teaching tool for teaching learning in medical education [24].

Conclusions

The conventional method of teaching medical education via didactic lectures if integrated with video/multimedia clips shows that it improves the concentration, memory, knowledge, attitude, and skills as evident from the feedback and statistical significance of the present study. The take home message of the study is if video clips are shown to the students, it increases the active participation of the learners also it increases the orientation and awareness of the students about the course content taught in the lecture. The authors also believe that student can access more effectively to the course content if it is supplemented with relevant scenes/video clips from the relevant movie from the social media. Use of lecture videos can definitely enhance the capability of the students in all aspects like concentration, memory retention, application of practical skills.

REFERENCES

1. Robin BR, McNeil SG, Cook DA, et al.: Preparing for the changing role of instructional technologies in medical education. *Academic Medicine*. 2011, 86(4):435-439. 10.1097/ACM.0b013e31820dbee4
2. Kahn P, Everington L, Kelm K, et al.: Understanding student engagement in online learning environments: the role of reflexivity. *Education Tech Research Dev*. 2017, 65:203-218. 10.1007/s11423-016-9484-z
3. Almurashi WA: The effective use of YouTube videos for teaching English language in classrooms as supplementary material at Taibah University in Alula. *International Journal of English Language and Linguistics Research*. 2016, Apr;4(3):32-47.
4. Shukla RK: A new systematic approach of teaching and learning of forensic science for interdisciplinary students: A step towards renovating the forensic education system. *Forensic Science International: Synergy*. 2021, Jan 1;3:100146. 10.1016/j.fsisy.2021.100146
5. Bishop J, Verleger MA: The Flipped Classroom: A Survey of the Research Paper presented at 2013. ASEE Annual Conference and Exposition, Atlanta, Georgia. 2013, June 23:pp (23-1200). 10.18260/1-2--22585
6. Balslev T, De Grave, Muijtjens A, et al.: Comparison of text and video cases in a postgraduate problem-based learning format. *Med Educ*. 2005, 39:1086-92. 10.1111/j.1365-2929.2005.02314.x
7. Pierce R, Fox J: Vodcasts and active-learning exercises in a "flipped classroom" model of a renal pharmacotherapy module. *Am J Pharm Educ*. 2012, Dec 12:76(10) 196. 10.5688/ajpe7610196
8. Evans KH, Thompson AC, O'Brien C, et al.: An innovative blended preclinical curriculum in clinical epidemiology and biostatistics: impact on student satisfaction and performance. *Acad Med*. 2016, 91:696-700. 10.1097/ACM.0000000000001085
9. Tang B, Coret A, Qureshi A, et al.: Online lectures in undergraduate medical education: scoping review. *J Med Internet Res*. 2018, 4:1-14. 10.2196/mededu.9091

10. Prober CG, Khan S: Medical education reimaged: A call to action. *Academic Medicine*. 2013, Oct 1;88(10):1407-10. 10.1097/ACM.0b013e3182a368bd
11. Blasco PG, Moreto G, Blasco MG, et al.: Education through Movies: Improving Teaching Skills and Fostering Reflection among Students and Teachers. *Journal for Learning through the Art*. 2015, 11(1):n(1). 10.21977/D911122357
12. Welsh CJ: OD's and DT's: using movies to teach intoxication and withdrawal syndromes to medical students. *Acad Psychiatry*. 2003, 27(3):182-186. 10.1176/appi.ap.27.3.182
13. Blasco PG, Moreto G, Roncoletta AF, et al.: Using movie clips to foster learners' reflection: improving education in the affective domain. *Fam Med*. 2006, 38:94-96.
14. Hurtubise L, Hall E, Sheridan L, Han H: The Flipped Classroom in Medical Education: Engaging Students to Build Competency. *Journal of Medical Education and Curricular Development*. January. 2015, Jan;2:JMECD-S23895. 10.4137/JMECD.S23895
15. Ghosh S. K.: Human cadaveric dissection: a historical account from ancient Greece to the modern era.. *Anatomy & cell biology*. 2015, Sep 22;48(3)::153-169. 10.5115/acb.2015.48.3.153
16. Sharma, A. & Shahina, & Dikshit, P.C.: Case scenario based teaching in forensic medicine to improve student learning. *Indian Journal of Forensic Medicine and Pathology*. 2017, 10:67-72. 10.21088/ijfmp.0974.3383.10217.2
17. Abdulrahman MD, Faruk N, Oloyede AA, et al.: Multimedia tools in the teaching and learning processes: A systematic review. *eCollection 2020 Nov*. 2020, Nov 2;6(11):p.e05312. 10.1016/j.heliyon.2020.e05312
18. Lim EC, Ong BK, Wilder-Smith EP, Seet RC: Sustaining interest during lectures with the use of multimedia. *Med Educ Online*. 2006, online:1-4.
19. Parekh U, Gupta S: LIVE FM (lecture improvised with video elements in forensic medicine): does a video worth a thousand pictures? A comparative study in medical education. *Journal of Visual Communication in Medicine*. 2021, Apr 3;44(2):44-51. 10.1080/17453054.2021.1901057
20. Ernst RD, Sarai P, Nishino T, Collins T, Oto A, Hernandez A, Walser EM, Chaljub G. Transition from film to electronic media in the first-year medical school gross anatomy lab. *J Digit Imaging*. 2003 Dec;16(4):337-40. doi: 10.1007/s10278-003-1700-9. Epub 2004 Jan 30. PMID: 14749968; PMCID: PMC3044075.
21. Baños, J. E., Bosch, F. (2015). Using feature films as a teaching tool in medical schools. *Educación médica*, 16(4), 206-211. 10.1016/j.edumed.2015.09.001
22. Blasco PG, Garcia DS, de Benedetto MA, et al.: Cinema for educating global doctors: from emotions to reflection, approaching the complexity of the Human Being. *Primary Care*. 2010, 10:45-47.
23. Blasco PG, Mónaco CF, De Benedetto MA, et al.: Teaching through movies in a multicultural scenario: overcoming cultural barriers through emotions and reflection.. *Fam Med*. 2010, Jan 1;42(1):22-24.
24. Issa N, Mayer RE, Schuller M, Wang E, Shapiro MB, DaRosa DA. Teaching for understanding in medical classrooms using multimedia design principles. *Med Educ*. 2013 Apr;47(4):388-96. doi: 10.1111/medu.12127