

Comparative Study Between Conventional and Module Based Forensic Odontology Classes; A Questionnaire Based Cross- Sectional Study among Students of Saveetha Dental College

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INTRODUCTION

The word Forensic is derived from the Latin word forum, which means “court of law” and Odontology denotes study of teeth. Forensic odontology as defined by FDI is that branch of dentistry which in the interest of justice deals with the proper handling and examination of dental evidence and with the proper evaluation and presentation of dental findings. Forensic odontology involves application of dental sciences in the identification of deceased individuals through comparison of ante-mortem and post-mortem records⁽¹⁾

The importance for forensic odontology in the society has increased since the last decade. The universities and colleges must be able to spread awareness and knowledge on forensic odontology by providing an effective way of conveying the knowledge for its students⁽²⁾. Usually in the old school lecture based classes, it is that the students have to sit passively in rows of chairs or tables all facing the lecturer, who usually resides at a lectern. A lecture is a “one-to-many” form of communication, involving little or no audience participation. It is authoritarian, by nature.⁽³⁾

The conventional method of lecture has been the cornerstone of the theoretical undergraduate medical education. Their efficacy however reduces due to reduced interaction and short attention span of the students. Interaction in teaching has been attempted by numerous methods. The interactive response system is one such tool which aims at improving the module based lecture. Module based classes has been a preferable alternative to conventional method of classes past this decade⁽⁴⁾

The classes conducted for forensic odontology in saveetha dental college, Chennai, aims in conveying awareness and knowledge on forensic odontology in much more interactive way rather than old school lecture based classes. The classes are module based that comprises of effective interactive learning sessions.

MATERIALS AND METHODS

A questionnaire based cross-sectional study was conducted among the students of Saveetha Dental College. 50 students from the 2013-2018 undergraduates who attended CONVENTIONAL class on forensic odontology and 50 students from the 2014-2019 undergraduates who attended MODULE based classes were subjected to a questionnaire made up of 20 questions regarding their opinion and knowledge on Forensic dentistry. Classes were conducted during the 2nd year for a duration of 6 months.

The first 10 questions were targeted to know their opinion on CONVENTIONAL and MODULE based classes. The next 10 questions (11-20) tested their knowledge on the FORENSIC ODONTOLOGY
Both the batches were subjected to the same questions.

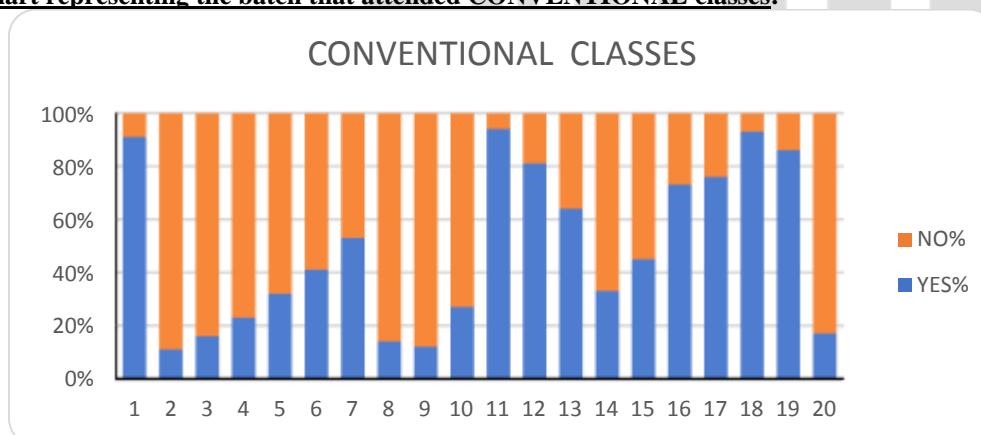
RESULTS

The statistical survey data shows that the batch that attended CONVENTIONAL classes had comparatively less knowledge on Forensic odontology and opted for CONVENTIONAL classes. The batch which attended MODULE based classes had more knowledge on Forensic odontology and opted for MODULE based class sessions. This concludes that MODULE based class sessions were more interactive and effective than the CONVENTIONAL based class sessions. It also reflected on their results as their theory examination scores were more compared to the students who attended conventional lecture classes. For an institution, the aim should be that the students must get energized and engaged in the hands-on learning process. Interactive class session is clearly an instructional medium that is compelling and generates a much greater amount of interest and intellect than the more traditional printed material.

Results on questionnaire subjected to the batch that attended CONVENTIONAL classes:

S.No	Questions	Yes %	No %
1	Do you think conventional classes in forensic odontology will be helpful in gaining more knowledge?	91	9
2	Do you think module based classes in forensic odontology will be helpful in gaining knowledge?	11	89
3	Does the knowledge attained during the module based classes, retain in the memory till the time of examination?	16	84
4	Do you think weekly tests improve the performance in examination?	23	77
5	Were you able to concentrate for a longer period of time during the classes?	32	68
6	Are you able to participate in other beneficial activities after classes?	41	59
7	Are you confident enough with knowledge on forensic odontology?	53	47
8	Do you think group based learning in module based FO classes were helpful in more understanding of the subject?	14	86
9	Interactive sessions in module based classes such as clay modelling, critical pedagogy, role playing and peer based learning were conducted. Was it useful?	12	88
10	Do you think module based classes were about applying the concepts of forensic odontology in practical sessions which helped in retaining the knowledge on the subject for a longer period of time?	27	73
11	Can teeth serve as a source of DNA?	94	6
12	Can you identify indicators of domestic violence and child abuse?	81	19
13	Can sex determination be done using Barr bodies?	64	36
14	Are you confident in handling forensic dentistry related cases?	33	67
15	Do you have knowledge about bite mark patterns of teeth?	45	55
16	Do you think you have a crucial role in identifying deceased in the incident of mass fatality?	73	27
17	Do you know the relevance of dental records in recognising the dead and accused criminal?	76	24
18	Do you know that you can present forensic dental evidence in the court as an expert witness?	93	7
19	Are you Aware that the lip prints can be presented as dental evidence?	86	14
20	Can enamel/dentin act as an aid for identification of age?	17	83

Chart representing the batch that attended CONVENTIONAL classes:



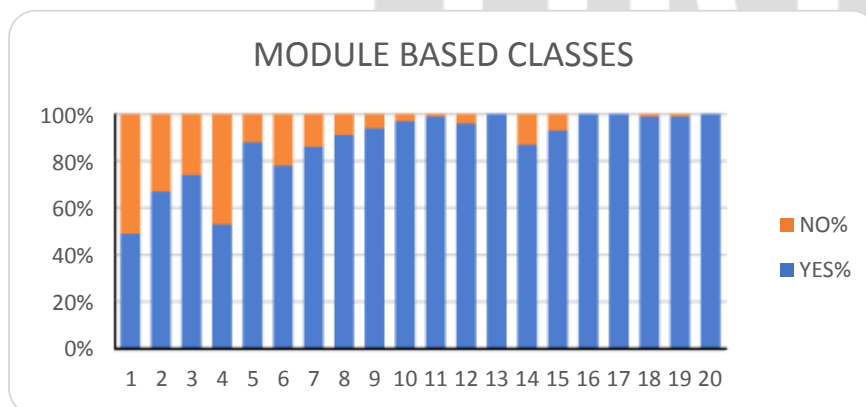
X axis: Question Number. Y axis: 'Yes' and 'No' response in percentage

Results on questionnaire subjected to the batch that attended MODULE based classes:

S.No	Questions	Yes %	No %
1	Do you think conventional classes in forensic odontology will be helpful in gaining more knowledge?	49	51
2	Do you think module based classes in forensic odontology will be helpful in gaining knowledge?	67	33
3	Does the knowledge attained during the module based classes, retain in the memory till the time of examination?	74	26
4	Do you think weekly tests improve the performance in examination?	53	47
5	Were you able to concentrate for a longer period of time during the classes?	88	12
6	Are you able to participate in other beneficial activities after classes?	78	22
7	Are you confident enough with knowledge on forensic odontology?	86	14
8	Do you think group based learning in module based FO classes were helpful in more understanding of the subject?	82	8
9	Interactive sessions in module based classes such as clay modelling, critical pedagogy, role playing and peer based learning were conducted. Was it useful?	94	6
10	Do you think module based classes were about applying the concepts of forensic odontology in practical sessions which helped in retaining the knowledge on the subject for a longer period of time?	97	3
11	Can teeth serve as a source of DNA?	99	1
12	Can you identify indicators of domestic violence and child abuse?	96	4
13	Can sex determination be done using Barr bodies?	100	0
14	Are you confident in handling forensic dentistry related cases?	87	13
15	Do you have knowledge about bite mark patterns of teeth?	93	7
16	Do you think you have a crucial role in identifying deceased in the incident of mass fatality?	100	0
17	Do you know the relevance of dental records in recognising the dead and accused criminal?	100	0
18	Do you know that you can present forensic dental evidence in the court as an expert witness?	99	1
19	Are you Aware that the lip prints can be presented as dental evidence?	99	1
20	Can enamel/dentin act as an aid for identification of age?	100	0

Chart representing the batch that attended MODULE based classes:

X axis: Question Number. Y axis: 'Yes' and 'No' response in percentage

**DISCUSSION**

Greater knowledge and awareness of forensic odontology among the dental students is required in the growing field of medicine. The practice of forensic odontology has gained importance in a number of developed countries across the world. In the developing countries such as India, it is yet to attain its significant position⁽⁵⁾

The conduct of education in this 21st century has been witnessed with a paradigm shift from face-to-face teaching environment to a more technology- based learning environment. The advancement of ICT (information and communication technology) has influenced the development of education. For example, interactive multimedia learning applications were introduced to the class rooms; blended learning and distance learning which involve web-based learning were implemented. With these new applications

and learning platform, students are exposed to a more student-centred learning experience. Reference posited “the use of computer-based technology in college education has dramatically increased to include emerging technology for visual presentation, simulation, accessing course materials and World Wide Web resources, and interactivity.”⁽⁶⁾

The use of technology in education is necessary because students are known as digital natives. Students these days are highly connected with technology in their daily lives. They use Internet to search for information to assist their learning.⁽⁷⁾ They also experience various ways of collaboration and communication with their peers and teachers through social networking tools and also chatting software. It has been a norm to see how frequent students use technology in their learning. Therefore, it is necessary to use technology in education to enhance students’ learning experiences.⁽⁸⁾

Currently, the use of computers is increasing in dental education⁽⁹⁾. In a review, medical students have stated they prefer interactive class sessions rather than traditional lecture-based classes. Advantages such as accessibility, ease of use, freedom of navigation, high quality medical images and the possibility of repeat practice are among the reasons mentioned for their preference. Interactive module based learning is an important tool in evidence-based forensic odontology because it is continually being developed and updated.⁽¹⁰⁾

CONVENTIONAL CLASSES- The classes were conducted for 1 hour once a week for a course of 6 months. The sessions were more of lectures.

MODULE BASED CLASSES- The classes were conducted for 3 consecutive days from 8 am to 3 pm for a course of 6 months. Interactive sessions such as role playing, critical pedagogy, facial reconstruction, clay modelling were conducted during those 3 days.

The questionnaire was designed in such a way that the YES% represented the likeliness towards the MODULE based class sessions whereas the NO% represented the likeliness towards the CONVENTIONAL Based class sessions.

As the first 10 questions were subjected to receive the opinion that the pupils have for both conventional based classes and module based interactive class session.

The awareness the students had on conventional and module based classes, it was that 91% opted for ‘yes’ which means the pupil had less awareness on module based classes with interactive sessions, the rest 9% opted for ‘NO’. It was clear that the students had difficulty in retaining the concepts they learn as only 16% has opted for yes which clearly shows that the attention time span is very less and retaining the knowledge is complicated in conventional lecture sessions. The students opinion on weekly test for a improvement in performance statistically showed that 23% opted for ‘yes’ which reflects their lack of interest in the subject as it already was less interactive.

The questionnaire was designed to analyse the level of knowledge the students gained in conventional sessions. A dentist must have a sound knowledge on certain basic principles and facts on forensic odontology; one such fact is that the DNA can be retrieved from the tooth which plays a crucial role in identification of an individual. Which is basic to be known in forensic odontology, 96% of the students were quite aware of this fact, which were similar to other studies (Ankita Sahni et al), it shows that the conventional classes does not have a negative effect in learning such basic concepts, but when it comes to simplifying complicated concepts module based lecture sessions were always on the upper hand.

In a study conducted by Ankita Sahni et al 95% of them were aware of the fact that teeth act as an accurate source of DNA material and only 5% were not aware about it. The main sources of DNA are pulp, dentine, cementum, and periodontal ligament fibers. Thus, teeth can be successfully used for human identification.⁽¹¹⁾

The interactive learning materials allow flexibility, support individual learning paths, and encourage active and cooperative learning. Interactive tools provides platform in which students can share and discuss the observations with their fellow students and with teachers (Rosas et al., 2012).⁽¹²⁾

The analysis on the students that attended module based lecture session showed that 67% of students preferred for module based classes; this shows that the module based classes had a positive effect in the mindset of the students. The interactive sessions comprised of activities such as clay modelling, critical pedagogy, facial reconstruction and role playing which gave an opportunity to analyse the interest and knowledge on the subject.

The level of interest shown by students towards module based classes were statistically a sum of 94%. The students were able to retain the concepts and knowledge on forensic odontology for a longer time and were clearer on the details of the complicated concepts which were put-forth to the students in a simple and interesting way. The statistical result of their knowledge on forensic odontology was more positive with a sum percentage of 99%. This data shows that the students attending module based class sessions were on the upper hand when it comes to the positive opinion and knowledge on forensic odontology.

This research represents an initial attempt to compare the effectiveness of two different pedagogies, traditional and interactive learning. Findings emanating from the study indicated that students who were taught with the interactive learning model had better

scores than those who attended traditional instruction. The test results are in agreement with other studies (Dr. M. A. Omiola 2012, 42)⁽¹³⁾, who also argued that students in the module based learning environments showed more mean results and hence we can deduce that such interactive environments have the potential to strengthen the core of teaching and learning, to provide the student with enough opportunities to learn in a fun way. This is a very important finding and the results also show that students were not only enjoying the module based environments but it also lead to critical thinking. The classroom discussions and activities encouraged in the interactive classes encouraged students to think critically and their higher order thinking questions reflected the interest developed towards the subject. The study finding is also consistent with other studies in the literature which indicated that student performance in interactive courses was equivalent or slightly superior to traditional courses (Nikolaos Vernadakis 2012, 441), (Adem Uzun 2010, 202), (Ümit YAPICI 2012, 233) and (Ibrahim Yasar Kazua 2014, 184)⁽¹⁴⁾

The approach of interactive learning as a teaching model is currently gaining more and more recognition and acceptance and thus appears as an alternative teaching approach that help students improve their performance. Overall, the findings reinforce the view that a module based interactive learning environment promotes student-centered learning and critical thinking by giving the opportunity and providing a conducive environment where students take more responsibility for their learning and increase the involvement and participation necessary for such learning⁽¹⁵⁾. Based on the results, interactive Module based learning may be used as an effective way to deliver knowledge as it gives students a technology based on ramp to student achievement and richer and more rewarding learning experiences in a fun way.

Although many studies have demonstrated that technologically advanced instructions can be as effective as traditional methods, the curriculum at most dental schools is still based on an outdated model of educational delivery⁽¹⁶⁾. It has long been suggested that didactic presentations (i.e. conventional or passive learning) are the least effective teaching methods. What is learned passively is typically not well retained and is commonly not effectively or enthusiastically applied⁽¹⁷⁾. By contrast, interactive learning is self-reinforcing and more retentive because of the learner's active participation in the educational process⁽¹⁸⁾.

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