



# Dental Student's Satisfaction with the Video-assisted Educational Approach in Teaching Oral and Maxillofacial Surgery Principles

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#### Abstract

BACKGROUND: Educating dental students in practical skills are a difficult task that has become increasingly demanding since the outbreak of COVID-19. Today, the use of digital media plays an essential role in teaching practical skills

AIM: This study investigated the effect of educational videos on oral and maxillofacial surgery basics on dental student's satisfaction.

METHODS: Six subjects were chosen from the principles of oral and maxillofacial surgery, and according to the necessary standards, educational videos were made based on the needs assessment of students. Fellow attending evaluated and approved each video. Students were shown videos in six 2-h sessions. Students were given a researcher-created questionnaire with proven validity and reliability. Students filled out questionnaires to evaluate the impact of educational videos as well as the structure of educational videos.

RESULTS: Two hundred and three students participated in this study in their 4th-6th years. In this study, 203 students in their 4<sup>th</sup> to the 6<sup>th</sup> year participated. Most students were satisfied with the structure of educational videos (73.9%); in general, 84.7% of students expressed their satisfaction with this method. Half of the students preferred video training over face-to-face training in oral and maxillofacial surgery (50.4%). Many students suggested that these videos be included in the curriculum (80.7%)

CONCLUSION: Students' overall satisfaction with the structure and impact of educational videos indicates that educational videos made and evaluated by dental professors can help teach practical topics as a part of the curriculum.

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#### Introduction

Due to the complexity of the content of treatment processes, medical and dental students require reliable, comprehensive, and up-to-date learning resources. Teaching practical tips and skills is just as crucial for dentists as teaching theoretical aspects [1]. Most dental schools require students to spend several hours observing the clinical process presented by the attendings according to the educational curriculum to learn and improve practical skills. Due to time constraints, treatment space, the ratio of students to attendings, the small size of the oral cavity, and the complexity of most dental procedures, having a clear view and mastering the details of the process in progress during live demonstrations are often challenging. As a result, insufficient attention will be paid, and details of the demonstrated procedure will be missed [2], [3].

Since the start of the 2019 pandemic (COVID19), which was first reported in Wuhan, China, in December 2019, more than 990 million learners at various stages of their education have been impacted. Meanwhile, due to the aerosols produced during dental treatments, this profession is classified as a high-risk occupation [4], so the training in the clinical department of dentistry has become increasingly complex [5]. Studies have shown that technological advancements in recent decades have influenced the development of various educational approaches [6], [7]. In particular, instructional videos teach practical skills effectively [8], [9]. After studying the theoretical subjects, learners can watch the film in the desired environment and be prepared better to perform a clinical procedure [10]. These videos are accessible at any time and allow self-education [1]. By watching them as many times as desired, learning and efficiency increase, and in a short period, a large amount of data is transmitted [11]. Students can study complex parts of the procedure with the ability to stop, play, and playback the film, ensuring that their knowledge is sound [12].

Furthermore, by picturing the process from various perspectives, the procedure can be seen in great detail [2], improving the teaching process and developing practical skills in students. Watching a wellstructured instructional video draws Student's attention to the subject, deepens the instruction, and promotes the motivation to study more. In addition, the instructional video makes the concepts with the same and integrated content available to all students. It eliminates the need for numerous groups of students to repeat the process. As a result, the attendings will be less tired, and the data transmitted will be more accurate [12].

Students often use popular internet platforms such as YouTube to access well-structured instructional videos. However, educational videos available on the internet may not be well-structured or give students incorrect, outdated, or misleading information due to a lack of content approval and review process [13]. Studies show that only 5% of the videos on YouTube are made or evaluated by universities. Many dental students demand to watch a valid educational video offered by an experienced attending whose information is up to date and adheres to the most recent editions of dental references and oral and maxillofacial surgery [1]. Therefore, preparing credible educational videos in the oral and maxillofacial surgery department will meet the need of students and solve that the challenges highlighted. This study aims to discuss student's satisfaction and effectiveness of the original videos provided in the Oral and Maxillofacial Surgery Department of Shahid Beheshti University of Medical Sciences, as there have been no previous studies on the production of authentic educational videos and the study of their structure and impact on the student's point of view. This research will assist professors in evaluating instructional techniques and the deployment of novel methods. It will also enable assessing the impact of using instructional films in oral and maxillofacial surgery department programs.

#### Methods

The present study was performed in 2020–2021 in the School of Dentistry of Shahid Beheshti University of Medical Sciences, Tehran, Iran. Two hundred and twenty undergraduate students in their 4<sup>th</sup> to 6<sup>th</sup> years volunteered to participate in this study. A total of 203 students took part in the study to the end, with 17 dropped due to the lack of regular attendance at educational film screening sessions. Six fundamental subjects were selected according to the need assessment of dentistry school undergraduate students regarding the curriculum (Table 1).

The cognitive and student engagement elements were used to prepare this film series to attain optimal efficiency for the audience. Signaling was used for directing and producing videos about cognitive principles. These included adding short text, symbols, and pictures, Table 1: Six fundamental subjects were selected according to the need's assessment of dentistry school undergraduate students regarding the curriculum

| Title                                 | Educational content                | Time (min) |
|---------------------------------------|------------------------------------|------------|
| Local anesthesia                      | Armamentarium                      | 105        |
|                                       | Anatomical landmarks               |            |
|                                       | Maxillary injection                |            |
|                                       | Local infiltration                 |            |
|                                       | Mandibular injection               |            |
|                                       | Inferior alveolar nerve block      |            |
|                                       | Mental nerve block                 |            |
|                                       | Incisive nerve block               |            |
| Principles of suturing                | Armamentarium                      | 67         |
|                                       | Simple interrupted suture          |            |
|                                       | Continuous locking suture          |            |
|                                       | Continuous nonlocking suture       |            |
|                                       | Vertical mattress suture           |            |
|                                       | Horizontal mattress suture         |            |
|                                       | Remove suture                      |            |
| Principles of exodontia               | Armamentarium                      | 85         |
|                                       | Tooth extraction                   |            |
|                                       | Postextraction tooth socket care   |            |
| Principles of management of impacted  | Mandibular third molar impaction   | 82         |
| third molar teeth                     | Maxillary third molar impaction    |            |
|                                       | Flap design                        |            |
| Principles of managemant and          | Remove the source of the infection | 73         |
| prevention of odontogenic infection   | Surgical incision and drainage     |            |
|                                       | Antibiotic therapy                 |            |
| Principles of oroantral communication | Oroantral communication treatment  | 42         |
| treatment                             |                                    |            |

highlighting important content and keywords, and using shapes to attract Student's attention. To do weeding, a background was picked after studying the audience of these videos, and all disturbing factors, such as extra sounds, were removed as much as possible. The two visual and audio channels were used simultaneously with images and descriptions to match the modality with the content. Each video was separated into numerous portions to divide and draw the audience's attention, and each part contained subtitles for more instruction. In addition, a conversational style was employed rather than the official language, and speaking was done as quickly and enthusiastically as possible to increase student participation. Figure 1 depicts portions of the videos [14].

Theoretical knowledge was presented using Microsoft PowerPoint 2019 and combined with practical content utilizing Tech Smith Camtasia version 20.20.013 software. Clinical photos from dental, oral, and maxillofacial references were included in the films to improve the understanding of the issue. The prepared videos were peer-reviewed by five surgery department faculties for content validation. Two expert students in the field of film production and editing and one expert student in the field of medical education used the Adobe premiere pro software to direct, edit, and peer-review corrections for 6 months with the guidance of two faculty members from the department of oral and maxillofacial surgery using the latest oral and maxillofacial surgery references. The final videos were represented in six 2-h sessions for the volunteers. Dental students studied in years 4 to 6 and the age and sex of participants were recorded. All students were advised to participate in this study willingly and might leave at any time. After the presentation of the films in 6 weeks, a questionnaire was given to the students to evaluate the results. Because no standard or thorough questionnaire for



Figure 1: Surgical education video series. (a) Local anesthesia (b) Principles of suturing (c) Principles of exodontia (d) Principles of management of impacted third molar teeth (e) principles of managemant and prevention of odontogenic infection (f) Principles of oroantral communication treatment

assessing dental student's satisfaction with educational videos had been found in prior studies, a questionnaire was designed using the Likert scale with five options (between 1 = strongly disagree and 5 = strongly agree). By examining previous papers, the questions of this questionnaire were constructed to assess student's satisfaction with the structure of educational videos and their influence on the student's practical abilities. Then, its validity and reliability were assessed (Figure 2).

The validity of the questionnaire was assessed in both quantitative and qualitative aspects. Eighteen initial questions were supplied to examine the quantitative part, each expressing these five indicators explicitly, along with classification and scoring instructions. For all questions, ten attendings were asked to rate each indicator. Questions with CVI larger than 0.79, CVR greater than 0.62, and impact scores more excellent than 1.5 had acceptable mean scores, while those with mean scores below these values were deleted. The complexity of the questions, inconsistency, ambiguity of the sentences, and deficiency in the meanings of words were all examined by faculties to determine the quality of face validity (Table 2).

The Cronbach's coefficient was used to determine the reliability, and the internal consistency connected to the homogeneity of the questionnaire once the content was determined to be desirable. Ultimately, 203 students of the School of Dentistry of Shahid Beheshti University of Medical Sciences completed the final form of the questionnaire.

The Cronbach coefficient for the entire instrument was reported to be 0.858 when testing the questionnaire's internal consistency. Cronbach's -coefficients were 0.7 and 0.830 in subscales 1 and 2 (1: questions 1 to 8 and 2: questions 9 to 15), respectively. The Cronbach's coefficient does not significantly increase when any of the items in this questionnaire are removed, indicating that all questions must be included.

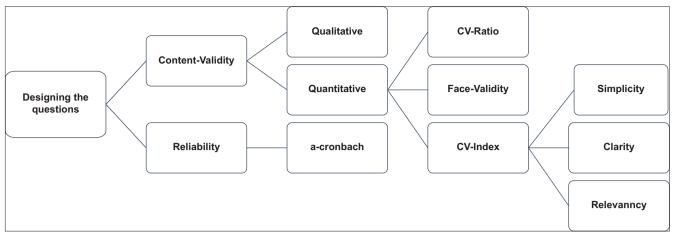


Figure 2: Developing a valid and reliable questionnaire

Data analysis was performed using SPSS software (version 19.0). The validity indicators of the questionnaire included face validity, content validity ratio, and content validity index, which included three sections: relevancy, clarity, and simplicity. Cronbach's  $\alpha$  coefficient was used to evaluate internal consistency.

| Year of study/   | Female       | Male         |
|--|--------------|--------------|
| Age  |              |              |
| 4 <sup>th</sup> year<br>5 <sup>th</sup> year<br>6 <sup>th</sup> year | 52           | 34           |
| 5 <sup>th</sup> year   | 53           | 43           |
| 6 <sup>th</sup> year   | 14           | 7            |
| Total  | 119          | 84           |
| Age (years)  | 21.82 ± 2.29 | 21.65 ± 2.61 |

#### Results

Students were shown six educational videos that lasted an average of 75:36 min, and the students completed a total of 203 questionnaires. The female-to-male participant ratio was 119 to 81, with men and women averaging  $21.82 \pm 2.29$  and  $21.65 \pm 2.61$  years, respectively. Demographic information of the participants by school year is presented in Table 3.

| Table 3: TI | ne average | validity of | of the tool |
|-------------|------------|-------------|-------------|
|-------------|------------|-------------|-------------|

| CVI                          | Score |
|------------------------------|-------|
| Relevancy                    | 2.79  |
| Clarity                      | 2.64  |
| Simplicity                   | 2.75  |
| Content validity ratio       | 2.72  |
| Face validity (impact score) | 4.70  |

Students were generally satisfied with the structure of educational videos (n = 150, 9.73%). Order of taught content (n = 158, 8.77%), order of teaching from simple to complex (n = 172.84/4.4%), sound and image quality (n = 178, 7.87%), visibility of details of the practical demonstration (n = 184, 6.90%), time allocated to each article (n = 147, 4.72%), relevance to previous information (n = 144, 0.71%), and comprehensiveness and content up-to-dateness (n = 166, 8.81%) were satisfying. One hundred and seventy-two students were

generally satisfied with the effect of educational videos in a study of student satisfaction with this educational method (7.84%). One hundred and eighty-four students agreed to use this educational method in other departments (6.90%). There was also high satisfaction from the perspectives of 144 students on the impact of these films on knowledge promotion (0.71%), 162 students on the impact on the promotion of surgical principles and practical skills (8.79%), and 138 students who expressed interest and motivation to learn more (9.67%). One hundred and sixty-four students agreed to introduce educational videos into the curriculum and made it mandatory to watch them (7.80%). One hundred and four students preferred this educational method to traditional education (4.50%), while 40 were against it (7.19%) (Figure 3).

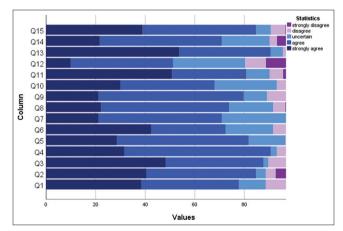


Figure 3: Results of dental students' satisfaction with the videoassisted educational

#### Discussion

Transferring practical skills to dental students are one of the particular teaching challenges in this profession. Due to the educational environment and curriculum defined in dental schools, various methods are used to achieve this objective. Based on the input of dental students at Shahid Beheshti University of Medical Sciences, this study intends to assess the impact of educational videos in teaching the fundamentals of oral and maxillofacial surgery. Mastery in surgical principles, including local anesthesia injections, tooth extraction, suturing, impacted wisdom tooth surgery, odontogenic treatments, and oral sinus communication, is required for general practitioners. Written resources alone appear insufficient to understand sophisticated dentistry and oral and maxillofacial surgery techniques. The previous studies have shown that mastering basic practical skills reduce patient injury risks [12], [15], [16], [17], [18], [19], [20], [21], [22], [23]. The previous studies have discussed educational videos on local anesthesia and examined them [12], a comparison of educational videos and traditional training on SST [10], and the use of integrated models in teaching oral and maxillofacial surgery [6]. However, according to the writers of this article, no study has been done to evaluate the videos used to educate dentistry students on surgical principles.

In the present study, the educational videos were approved in terms of content, quality, comprehensiveness, up-to-dateness, and acceptability by students. According to the Student's feedback, the sound and image quality was satisfactory, and each step's nuances were discernible. Instructional videos greatly benefit the teaching process by displaying a high-quality image and a close-up view of every tiny detail. Students will receive more quality and quantity of practical skills tips, allowing them to see the various therapy steps in-depth and as often as they want [12].

The findings of a 2019 study in Australia by Wong *et al.* on the benefits of employing instructional videos based on student input were similar to those of the present study [12]. An educational video with a wellstructured and approved structure can be as effective as a live demonstration experiment [1], [24], [25]. According to the student's feedback, watching these educational videos pique their interest and increase their desire to learn. Aragon *et al.* (2008) in Canada and Teasdale *et al.* (2006) in the United States conducted studies on educational videos and found that watching educational videos improve dental knowledge [26], [27].

Moreover, according to a 2008 study by Aragon *et al.* in London and Pan *et al.* (2014) in the United States, these educational videos improve practical and general knowledge about surgery principles [26], [28]. The questionnaire results show that most students suggest that educational videos be included in the department of oral and maxillofacial surgery curriculum. In a research published in 2020 by Bartella *et al.* in Kuwait, 62.7% of respondents proposed including educational videos in the curriculum. As a result, the advantages of instructional videos should be considered [1].

Although the importance of instructional videos in teaching practical skills has been proven,

several studies have expressed reservations about the prospect of instructional videos replacing faceto-face instruction. In the present study, 50.4% of the participants prefer videos to the conventional teaching method. However, a 2016 study by Seals et al., Texas, expressed that a complete replacement of these two methods is impossible [3]. In addition, a 2015 study in Saudi Arabia by Algahtani et al. found that while students are satisfied with video-based learning, it is not seeking to replace traditional methods [24]. Because the effects of traditional teaching methods and educational videos have been researched in various studies, these two methods are considered equal in terms of efficacy, and the combination will produce the best results [10], [20]. Finally, the students found this method satisfactory, and its implementation as part of the dentistry school instruction curriculum is recommended in every department. Students exhibited a higher level of selfconfidence in executing treatments in a 2016 study by Seals et al. in Texas, and the findings were similar [3].

# Conclusion

Students' overall satisfaction with the structure and impact of instructional videos in this study showed that instructional videos made and evaluated by dental professors could help teach students practical topics and are part of the Student's practical teaching curriculum. Traditional teaching methods and educational videos have advantages and disadvantages, and choosing one over the other requires further consideration. However, combining the two can be helpful.

# **Data Availability Statement**

This published article includes all the data generated or analyzed during this study.

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