The benefit of “Youtube” in teaching Oral- and Maxillofacial Surgery in dental students

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Abstract

Background

Digital media has become an important part of learning and teaching of dentistry. However, open source video platforms as youtube.com provide information without peer review. This study aims to evaluate if Youtube videos on dental education are feasible to improve learning of dental students and if they should be implemented in the curriculum.

Methods

Data collection addressed six typical topics of oral and maxillofacial surgery. Ten Youtube videos for each topic were reviewed by the authors. A link to the video was shared with a class of dental students one week prior to the corresponding lecture. Questionnaires addressing cooperation and experience with teaching videos, satisfaction with the current video, and wish for adding videos to the curriculum were distributed among the students.

Results

In total, 134 questionnaires were fullfiled. 79.4% of the students watched the youtube videos voluntarily. Majority of the students showed experience with dental teaching videos from open source platforms (Youtube, Instagram). 52.2% were exposed to professional teaching videos during their studies. The majority of students (62.7%) wish for the implementation of video material to the curriculum. They felt better prepared for the lectures (73.9%) and showed an improved understanding of the contents of the lectures (70.9%).

Conclusion

Summarizing our findings, we believe that open source videos can be implemented to the curriculum after careful evaluation of their contents. Students subjectively profit from the availability of video teaching material.

Background

Teaching approaches and instructional methodologies to deliver knowledge to students have changed significantly in the last few decades. Books and lectures became less important, whereas computers, ebooks, smart devices, digital media and internet content rapidly become the most popular sources for the gathering and distribution of knowledge. [1, 2] Several educational concepts have been developed utilizing various digital media to improve teaching in dentistry and general medicine. [3] Several blended learning concepts were established and have shown superior results in comparison to conventional

teaching methods. [4–6] Correspondingly, teaching videos, for example, were used not only as supplementary material during a lecture, but also as major source for instructional methods for home learning. In this context, Pilieca et al. reported the utilization of structured video formats for the improvement of demonstrating sterile scrubbing. [7] However, beside teaching, internet and digital media have also become an important part of (self-) education. Especially for practical subjects, such as dentistry, not only theoretical information is important, but also the visual instruction is helpful for the correct conduction of distinct (dental) work. The overall synesthetic experience delivered by educational videos is desirable, as it provides multiple visual, textual, kinesthetic and auditory activities to enhance student learning. Likewise, in surgical subjects, the visualization of surgical procedures using a variety of media helps to understand individual surgical steps and augments the intraoperative learning. [8]

Overall, not every medical or dental school provides professional teaching videos or similar well-structured alternative teaching modalities for their students; thus, it seems to be a likeable option for medical and dental students to search online for teaching and tutorial videos. The most popular provider of videos in the world wide web is Youtube.com (YouTube, Google LLC; San Bruno, USA). The potential to upload and to watch clips, films and movies for free mak it a widely used platform also for teaching and sharing of educational contents.

However, the opportunity to upload videos on the open access platform leads to the presence of a plethora of online videos which lacked proper reviewing or proofreading process. Thus, the substance of the videos might contain wrong statements or focus on irrelevant aspects for certain topics, especially in complex medical or dental issues and procedures which require up-to-date knowledge review and technical expertise. El Karmi et al. described Youtube as being not suitable for patient education for explaining early childhood caries. [9] Likewise, other authors claim Youtube as a not ideal recourse for education of patients wanting to know more about colorectal cancer, endodontic treatment, or tonsillectomy. [10–12] The educational value of Youtube-videos and tutorials in dental teaching and education has been insufficiently evaluated in literature, especially when comparing it to the conventional teaching methods through lecturers.

The aim of this study is to evaluate whether Youtube tutorials on certain topics in Oral and Maxillofacial Surgery represent a promising option to improve teaching of dental students. A special focus was spent on students' experience with tutorial videos, satisfaction with the current tutorial videos, and the wishes for adding more tutorial videos to the existing OMFS curriculum.

Methods

Study design and collection of data

Six relevant subjects of Oral and Maxillofacial surgery were selected (Table 1). The topics were searched on the Youtube.com platform. The ten most popular videos (according to their number of views) were independently reviewed and evaluated by two authors (A.P., A.B.) according to the quality and the

correctness of the scientific contents. Peer-reviewed publications and medical books were used as a reference for comparison of the content. If videos showed scientifically not clear or misleading information, they were excluded. The two authors discussed for the best video to take for education. In case they did not agree on the same video, a third authors opinion (B.L.) was taken for decision-making.

Table 1
Overview of the selected tutorial videos including the subject, the Youtube link and the video length.

Subject	Youtube video (link)	Length (minutes)
(1) Neck dissection	https://www.youtube.com/watch?v=ufQzvPuMedo	12:45
(2) Orthognathic Surgery	https://www.youtube.com/watch?v=R6rw24p_nAA	14:00
(3) Basic Life Support (BLS)	https://www.youtube.com/watch?v=XTNHcP4v1UY	10:16
(4) Dental focus	https://www.youtube.com/watch?v=HJEsvWJ0KHs&t=61s	08:18
(5) Maxillary sinus	https://www.youtube.com/watch?v=nsw0MHWd2Kg	04:32
(6) Cleft lips and palate	https://youtu.be/TTZI7x_IQq8	02:55
Average		08:48

The video-link was converted to a QR-code and given to a class of dental students. The dental students were between third and fifth year of dental education. Gender and age were determined. The dental students were explicitly told that is voluntarily to participate in the study to with our attempt to improve their education and elaborate of the potential use of Youtube tutorial videos for teaching and training in dentistry. The lecture in Oral and Maxillofacial Surgery, which was addressed by the video, took place seven days after the delivery of the QR-code.

After the corresponding lecture, questionnaires were given to the students for evaluation of the outcome. The questions were listed in three groups: cooperation and experience with tutorial videos, satisfaction with the current tutorial video, and wish for adding tutorial videos to the curriculum (Tables 3–5). They had to rate the questions from 0 (not satisfactory) to 10 (excellent/totally agree) or with answering yes/no.

Table 3
Overview about the questions concerning collaboration and experience with public video platforms in learning.

Did you watch the video (yes/no)	**Yes: 106 (79.1%), no = 27 (20.1%), missing = 1 (0.7%)**
Did you watch further videos on Youtube addressing this topic? (yes/no)	Yes: 26 (19.4%), no = 99 (73.9%), missing = 9 (6.7%)
If you did so, how many?	2.4 (average)
Did you generally watch further videos addressing this topic? (yes/no)	Yes: 30 (22.4%), no = 97 (72.4%), missing = 7 (5.2%)
If you did so, how many?	2
On which platform	Youtube: n = 28 Instagram: n = 7
Do you have experience with teaching videos at dental school? (yes/no)* *only students present in the first lecture were asked	Yes: 12 (52.2%), no = 11 (47.8%)

Table 5
Overview about the questions concerning the wish for adding videos to the curriculum.

Could the video substitute a lecture? (yes/no)	**Yes: 8 (6%), no = 109 (83.3%), missing = 17 (12.7%)**
Should the video be implemented in the curriculum? (yes/no)	Yes: 84 (62.7%), no = 30 (22.4%), missing = 18 (13.4%)
How much would you like to implement this video in the curriculum? (0 = very poor – 10 excellent)	8.22 (± 1.95)
How important do you consider videos in general for teaching? (0 = very poor – 10 excellent)	7.57 (± 2)
Do you use teaching videos for the preparation of exams? (yes/no)* *only students present in the first lecture were asked	Yes: 17 (73.9%), no = 6 (26.1%), missing = 0
If you do so, on which platforms do you watch them? * And how frequent?* *only students present in the first lecture were asked	Youtube, Instagram, Amboss 6.35

Statistical Analysis

Statistical analysis was performed using SPSS software (version 24.0). Descriptive statistics were used.

Results

Six videos with an average length of 08:48 minutes were presented to the dental students. 134 questionnaires were completed and answered (Table 1). The gender distribution was 75 : 59 (female : male) and the average age was 22.99 (+/- 5.26) years (Table 2). The response was quite positive. 79.1% (n = 106) of the students watched the videos voluntarily. However, only 22.4% (n = 30) watched further videos addressing this topic on any platform. Youtube was the most favourable platform for teaching videos. 52.2% (n = 28) of the students were experienced with teaching videos provided by dental school so far (Table 3).

Table 2
Overview of the students' characteristics including gender, number and mean age.

Gender	Number	Percentage (%)	Age (years)
Male	59	44	24.58 (+/- 3.51)
Female	75	56	22.88 (+/- 2.00)
Total	134	100	22.99 (+/- 5.26)

The rating of the quality of the video was satisfactory (7.12 (± 1.3) out of 10). Although the teaching effect was rated only with 6.61 (± 1.7) out of 10. Students were rating the videos satisfactory for the improvement of the understanding of the surgical procedure (7.12 (± 2) out of 10). Furthermore, 73.9% (n = 99) stated it as a helpful preparation for the lecture and 70.9% (n = 95) said it improved their understanding the content of the lecture (Table 4). Students agreed that the presented videos cannot substitute a lecture (83.3%; n = 109), but they would strongly like to implement the videos in the curriculum (8.22 (± 1.95) out of 10). They also believe that videos are important for teaching (7.57 (± 2) out of 10) and use videos in 73.9% (n = 17) already in the preparation for exams. Most commonly, Youtube, Instagram, and Amboss were used as a platform so far. However, only Amboss is a certified provider of teaching information.

Table 4
Overview about the questions concerning the satisfaction with the current video.

How do you rate the quality of this video? (0 = very poor – 10 excellent)	**7.12 (± 1.3)**
How do you rate the teaching effect of this video? (0 = very poor – 10 excellent)	6.61 (± 1.7)
Did the video improve your idea of the surgical procedure? (0 = very poor – 10 excellent)	7.12 (± 2)
Did the video motivate you for further research on this topic? (0 = very poor – 10 excellent)	6.01 (± 2)
Did the video motivate you for further research on similar topics? (0 = very poor – 10 excellent)	5.71 (± 2.1)
Was the video a helpful preparation for the lecture? (yes/no)	Yes: 99 (73.9%), no = 16 (11.9%), missing = 19 (14.2%)
Did the video improve your understanding of the contents of the lecture? (yes/no)	Yes: 95 (70.9%), no = 21 (15.7%), missing = 18 (13.4%)
Was the lecture helpful to understand the video? (yes/no)	Yes: 92 (68.7%), no = 23 (17.2%), missing = 20 (14.9%)
Would you prefer to watch the video after the lecture instead of watching it in advance? (yes/no)	Yes: 33 (24.6%), no = 75 (56.5%), missing = 25 (18.7%)

Discussion

The utilization of visual and auditory digital media has become important in preparation for university exams. Publicly available open source online digital libraries, such as wikipedia, serve as an information service for students, patients and professionals throughout the world. [13, 14] However, for practical subjects, such as dentistry or Oral and Maxillofacial Surgery, the solely written information might not be enough for students to imagine certain techniques, such as complex surgical procedures. This ultimately leads the students to the search for videos of practical procedures in the internet to enhance their learning and acquision of knowledge. Youtube is a public open source platform which provides videos without any peer-reviewing process. In the presented study cohort, we could confirm, that 73.9% of the students already watch videos in the internet in preparation of their exams. Most commonly, Youtube and Instagram platforms were used for this purpose. Although there are many benefits in the visualization of theoretical contents, the major drawback of above-mentioned platforms is a lack of review process addressing the accuracy and correctness of the video contents after the upload. Thereby, potentially misleading or unclear information may confuse or even misinform students.

The use of Youtube as a source for the information of patients about dental and maxillofacial procedures is described for the subjects of orthodontics, wisdom teeth removal, tooth pain, impacted canine and cleft palate procedures, and others. [15–19] However, the contradictory results were critically discussed. Kilinc

et al. complain the lack of a peer review with the potential of misinformation of the public. [15] Likewise, Ozdal Zincir et al. rated the majority (70%) of Youtube videos for patient education of wisdom teeth removal as “not useful”. [16] Kovalski et al. appeal to professionals and students “to correct (the) deficit” of high quality and evidence-based Youtube videos (addressing oral leucoplakia) [20]. Although students are usually better informed than patients, above mentioned dangers of misinformation do exist also for dental students. Nonetheless, it could be shown that videos, if chosen correctly, can be equally effective in teaching practical skills as live demonstrations. [7, 21, 22]

Nevertheless, the presented data suggest that Youtube tutorial videos can inform dental students and improve the understanding of the lecture, and help the students with the imagination of surgical procedures. They showed an overall satisfaction with the provided links and corresponding videos. The majority of the dental students judged the videos as helpful in the preparation for the lecture (73.9%) and supported that tutorial videos should become a part of the curriculum (62.7%). However, the majority stated the videos would not be a sufficient substitute for an entire lecture (83.3%). It might be attributed to the short duration of the videos in comparison to the lectures. Currently, only 5% of all Youtube videos addressing dental education are provided by universities and the source of the video does not correlate with the number of views. [18, 23] Considering the existing high demand for teaching videos of high quality as supplementary materials to the conventional teaching methods, and the fact that students already do search for videos, teachers should provide accessible and guidance to reach the proper video materials. With doing so, educators may decrease the chance of receiving inappropriate content or misinformation about certain topic. The costs for implementing several videos from open source platforms are considerably low in comparison to self-developed teaching videos, since only the internet-address needs be shared after evaluation of the video by instructor. However, the educational yield from self-developed videos by the instructor might be higher, because self-developed videos can potentially be tailored and fit better into the existing curriculum of the universities. A comparison between open source and self-developed videos might be a reasonable next step to evaluate. Although the amounts of false information throughout the reviewed videos were low, a careful elaboration of the videos should be performed. As a possible limitation of this study and due to the study design, only tutorial videos in English language were selected, whereas the students were not native English speakers, which might have presented a bias in the study.

Conclusions

Youtube tutorial videos might have the potential to be implemented into the theoretical and practical training of dental students. There are currently a wide range tutorial videos with differing quality of the educational content. It seems to be relevant that tutorial videos be critically reviewed by the responsible lecturers prior to use. Next, the lecturers have to have an insight to the respective training level of the students with strict definition of the objective to be achieved with each corresponding lecture. As a suitable alternative to Youtube tutorial videos, self-produced tutorial videos to various theoretical and practical topics might become more and more relevant. Overall, dental students subjectively profit from the availability and the use of tutorial videos.

Declarations

Ethics approval and consent to participate

This study was approved by the local Ethic Committee of Leipzig University. This report followed the Declaration of Helsinki on medical protocol and ethics. All participants agreed to participate in the study by completing the questionnaire.

Competing interests

The authors declare that they have no conflicts of interest. No funding was obtained for this study.

Consent for publication

All authors consent for publication.

Availability of data and material

All data can be shared

Authors contributions

All authors have reviewed the paper and contributed to the manuscript. A. Bartella, B. Lethaus and F. Hölzle conducted the primary data acquisition. M. Kamal, R. Werkmeister and A. Pabst conducted the primary study design and draft preparation. All authors have read and approved the manuscript.

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