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YouTube in Anatomy Education: Boon or Bane?

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Introduction

Anatomy is fundamental and vital field of study with broad application in medicine, nursing & various health professions with regards to physical examination, symptoms elucidation, to diagnose with sophisticated radiological images used for three-dimensional visualization and also surgical procedures[1]. To achieve this objectives anatomy facilitators aim to intensify student's learning. Integration of technology has brought quality of education to the higher level. e-learning and sharing of videos are extensively done on the YouTube, the largest site of video sharing [2]. YouTube is a valuable resource for learning & teaching anatomy, but whether it is a boon or bane depends on how it is used and the context in which it is used. Here are some considerations:

I. For teaching

A. Boon:

a) *Accessibility:* Since YouTube provides free and easily accessible educational content to a global audience; thereby it provides a global platform for teaching for the teachers.

b) *Supplementary resource*: It has been reported that well designed videos, anatomical footage of cadavers & live patients, models, radiological images & diagrams can be used to enhance understanding of 3D structures through 2D medium of videos [3]. It has also been reported that the integration had a positive effect on examination results and demonstrated that anatomy videos can successfully be utilised to supplement material taught in class in response to reduced class hours [4]. Study done on learning anatomy on YouTube at Jordanian university reported that 92.9% of these students used YouTube to learn gross anatomy, 25.8% of them used it in learning histology, 34.5% for embryology [5]. Dissection videos were the most viewed anatomy related videos on YouTube, particularly in countries where dissection is abandoned and such videos are alternate methods of learning [5-6]. Teachers can use YouTube as supplementary resource to reinforce class room learning or provide additional explanation and examples. Particularly very useful in problem-based learning (PBL).

c) *Diverse content*: Wide range of educational content can be made available on YouTube covering various topics and teaching styles, catering diverse teaching preferences.

d) *Visual & multimedia content:* Digital contents like multimedia on YouTube can enhance the understanding of complex topics thereby making it an effective tool for teaching which may not be possible in regular class rooms. According to dual coding theory, which supports the use of videos as an instructional resource to enhance learning, suggest that working memory has 2 channels of information

acquisition and processing, visual and auditory channels. Information from both channels in a complementary manner enhance the quality and level of comprehension, facilitate the integration of new information into existing cognitive structures, and improve memorization of the information [7].

B. Bane:

a) *Quality control:* Teaching faculty as well as learner has to critically evaluate the contents and to be accurate and reliable, high quality content should be included. Anatomy facilitators should adopt evidence-based criteria and standards when reviewing and selecting existing YouTube videos for learners. The quality of this content and the pedagogical soundness of the videos can be improved if educators in collaboration with knowledgeable healthcare professionals control the production of evidence based content, editing, and addition of video to YouTube channels for instructional purposes [8].

b) *Distractions:* Unrelated contents potentially divert learner's focus away from educational material and can become a distracting platform.

c) *Limited interactions & practical skill training:* YouTube is one way communication platform lacking real-time interaction and feedback that traditional classrooms or dedicated e-learning platforms offer. Human anatomy education extends beyond theoretical knowledge, requiring hands-on experiences such as cadaveric dissection and laboratory-based exploration. While YouTube provides valuable visual and conceptual support, it cannot fully substitute these essential practical components that are critical for achieving a comprehensive understanding of the subject.

d) *Privacy concern:* There are privacy issues associated with online platforms, facilitator should consider student privacy when using YouTube in the classroom.

e) *Logistic barriers:* Anatomy educator may have logistical barriers while integrating lectures with YouTube videos including availability of internet access at time of presentation, ensure audio devices to broadcast sound, or URL link sharing and its usage on time at same time. Sometimes YouTube may be a banned website in some education center and access to it would become a major concern [7].

f) *Content effectiveness:* The vastness of the available content material may sometimes prove ineffective in terms of coverage of the subject material. For example, study conducted on usefulness of YouTube in learning surface anatomy reported that all areas were not covered or some were poorly covered, thus Youtube is considered as not adequate source for surface anatomy learning [9-10].

II. For learning:

A. Boon:

a) *Visual learning*: YouTube provides access to a wide range of anatomy related videos and tutorials, which can be helpful for visual learners to understand complex anatomical concepts. YouTube has huge anatomy based content like dissection videos, recorded lectures, radiology tutorials and demonstrations on clinical case and surface anatomy.

b) *Accessibility*: It offers a convenient and accessible platform for self paced learning, allowing individuals to revisit and review content as needed.

c) *Variety of contents:* There are many reputable institutions and educational channels that provide high quality anatomy lessons and demonstrations.

B. Bane:

a) *Quality varies*: Not all content on YouTube is accurate or reliable. It is essential to critically evaluate the sources and ensure the information aligns with reputable anatomical sources. Learners should also be aware that certain parameters in YouTube like number of viewers, Likes, Dislikes, comments, share, do not provide an accurate indication of the quality or usefulness of videos [7].

b) *Lack of interactions:* YouTube is a one-way platform, so there is limited opportunity for interactions or asking questions which is important for in depth learning. The absence of structured teacher or peer guidance, coupled with the risk of misinformation and limited scope for active discussion and critical thinking, may impede the development of deeper conceptual understanding and essential professional learning skills.

c) *Over reliance:* Some learners may become overly reliant on YouTube and neglect other essential resources like textbook, cadaveric specimens or inter active courses.

Conclusion

For teaching: YouTube can be a valuable tool for teaching when used thoughtfully and in conjunction with other educational methods. It is important for facilitator to curate contents, guide students on responsible usage and balance the benefits of accessibility and visual learning with potential distractions and quality concerns.

For learning: YouTube can be a valuable supplementary resource for learning anatomy, but it should be used judiciously alongside other educational materials and with acritical eye to ensure the accuracy and quality of the content being consumed.

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