Tips for Using YouTube in Medical Education

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Abstract

The role of online social networks in our everyday life has become crucial and undeniable. YouTube is a mainstay in online social networks. Created in 2005, YouTube is the third most visited Web site on the internet. Its educational value has been exemplified by the establishment of YouTube Education. Given the relative easiness of producing and uploading videos on YouTube and its free content, it has become a pool of a huge quantity of educational videos in different specialties uploaded by students and teachers. This paper aims to provide hints on effective usage of YouTube in medical education by evaluating an already existing video in order to recommend it to your students and by highlighting how to create and optimize your educational videos.

Introduction

Videos play an important role in supporting classroom teaching, self-directed learning, revision, and continuous medical education. The role of multimedia including videos in medical education has long been documented and has been reported to be more efficient in reducing classroom time and improving examination performance in many instances [1-5]. Students show interest in the subject and their learning is increased when instruction is integrated with multimedia tools [6-7].

Internet resources have become an integral part of everyday life, and undoubtedly, the media influences the way students learn and teachers teach [8]. The future generation of medical professionals who grew up in an environment sophisticated with information technology has been called 'digital natives' [9].

This 'Net Generation' has aptitudes, attitudes, expectations, and learning styles reflecting the environment in which they were raised [10-11]. This environment is decidedly different from that which existed when faculty were growing up. Thus, medical educators must find ways of engaging students more critically and creatively. The more recent use of web applications facilitates sharing through social networks like YouTube (YouTube, LLC., San Bruno, CA), Facebook© (Facebook. Palo Alto, CA), and Twitter™ (Twitter, Inc., San Francisco, CA).

The use of social networks in an educationally relevant context can change the way students learn and communicate, as well as improve interactions between faculty and students [12-13].

The growth of such online resources and the advances in Web 2.0 technology are changing the information landscape and impacting teaching and learning.

It has been shown that social networking creates a blended, social constructive learning environment that encourages collaboration, conversation and sharing. Many social networks offer platforms that can be tailored by the individual learner [14-17].

YouTube popularity and educational potential

YouTube is a mainstay in online social networks. Created in 2005, now owned by Google, YouTube is the third most visited Web site on the internet behind Google and Facebook [18]. YouTube is a video-sharing website on which users can upload, share, and view videos. It provides an easy to use interface and the largest collection of a wide range of user-generated video content including videos with educational value. Each month, there are more than 1 billion unique users who visit YouTube and over 4 billion hours watched. Every minute, 72 hours of video are uploaded to YouTube with 70% of YouTube traffic coming from outside the United States. With the boom in the usage of intelligent hand held devices in the past couple of years, users, including medical professionals and students have instantaneous access to the growing collection of video content; thus, traffic from mobile devices tripled in 2011. Today, 25% of global YouTube views come from mobile devices [19].

In the Arab world, according to a survey published in June 2012, YouTube playbacks doubled in one year putting the region the number two spot in the world behind the United States. Saudi Arabia has scored the highest number of YouTube views in the world per Internet user. In the Arab region, Saudi Arabia is followed by Egypt, Morocco and United Arab Emirates. Whereas no statistics were provided on YouTube for Iraq, its Facebook and Twitter statistics are not among the leading in the region [20].

Technologies that were designed for purposes other than education, such as YouTube, are now frequently used in education. The educational value of YouTube has been exemplified by the establishment in 2009 of YouTube EDU, which became a home to high quality educational content from around the world. It aims to provide a global platform where anyone, anywhere can learn or teach. In the higher education category, channels from top educational institutions, including colleges and universities around the world have already subscribed. Several video categories are broadcasted including medical videos [21].

The use of YouTube in education is a present day topic. Little research exists in the literature about the recent use of YouTube in educating medical students and health professionals [22-28]. Considering its popularity and ease of access, the author considered YouTube an important platform for anatomy education. For that purpose, Human Anatomy Education channel was established on YouTube in early 2011 [29]. A survey in May 2012 on second year MBBS students at the University of Sharjah showed that among ten other social networks, YouTube channel ownership (52%) is the second after Facebook account ownership (86%) (unpublished observations). However the percentage of YouTube channel owners is almost double the percentage of an earlier survey in May 2011 (29%). In the latter survey, 98% of students indicated that they use YouTube for acquiring medical knowledge although with different frequencies [23].

Aims

This article aims to provide hints on effective usage of YouTube in medical education by evaluating an already existing video in order to recommend it to your students and by highlighting how to create and optimize your educational videos.

How to evaluate an educational YouTube video?

Given the relative easiness of producing and uploading videos on YouTube and its free content, it has become a pool of a huge quantity of educational videos in different specialties uploaded by students and teachers. However, the quality of such videos is not scrutinized. In addition the unregulated nature of the information contained within user generated wiki sites is potentially dangerous to those seeking online information; YouTube is not an exception in this respect. This mixture of variable content quality videos creates a burden on

students who search for an authentic source of information.

The ways search engines and/or Web 2.0 applications exploit social signals are usually not disclosed; however, social features are promising to improve the retrieval performance [30]. YouTube is the world's second largest search engine; however, unlike many professionally oriented databases, such as those used for peer-reviewed publications, the search engine utilized by YouTube allows for only a limited degree of search control since it is not best calibrated for searching educational content. Thus, some videos with high-standard educational quality content might not appear on the top of the list [26,31].

Given the lack of regulation of such videos, it is likely that a proportion of online resources are still of poor quality with substantial educational flaws. The student should be observant to quality and not be misled by low-standard educational content videos. Educators can help the student by recommending a short list of relevant videos to the topic under discussion. However, this process, while time-saving to the student is cumbersome to the teacher [23].

Educators should set criteria for rapid selection of a short list of relevant videos by using objective and subjective parameters. For objectivity, you may use video information metrics which include the page number on which the video was located in the search results (each page contains 20 videos), duration, date the video was uploaded, number of views, video category, and engagement parameters extracted from video statistics including likes, dislikes, comments and favourites.

Other objective information includes those related to the channel on which the video is uploaded. Channel information includes number of subscribers, channel views, number of uploaded videos on the channel, and whether the channel is dedicated for educational videos or not.

The page number indicates the relevance of the video to the search keywords and thus those found on the first page are more likely to be seen than those on lower pages. Number of video views provides an indication of the popularity of the video. The date the video was uploaded can give an idea about the number of views/day because recently uploaded videos will have lower total views than older videos and this might not serve as a comparative criterion to reflect popularity and usefulness. The engagement criteria are an indication of the concern of the viewer who might reflect on the video by liking, commenting, or adding to his favourites. It has been shown that for every 'dislike,' we get 10 'likes'- people like to tell other people about the stuff they love [19]. Camm et al., 2013 used a "like/dislike" ratio of 0.9 as a cut off for rating videos. This ratio is calculated by the number of likes divided by the total number of likes/dislikes [26]. The number of comments per se might not be a reliable indicator of a positive feedback because some comments might reflect a negative impact.

A brief analysis of the channel to which the video belongs provides a better insight on the video owner. Institutions and some educators may have established dedicated channels for teaching. On the other hand, some students have established such channels for their colleagues. Others might have mixed educational and non-educational content, this reflects non-dedication to education.

The number of uploaded videos, channel views, and subscribers are a good indicator of the owner's work in general. Some channel owners are sporadic producers who have produced the videos once and never added to them. The number of channel views is a collective figure of the views of all videos on the channel. It can be considered as a good reflection of the quality of the channel videos even though the particular video has not by itself attained high level indicators. The number of channel views is another reliable indicator of the quality of the owner's videos in general. However, in non-dedicated channels the above-mentioned channel indicators are not reliable in reflecting video or channel quality since the number of channel views or subscribers might have been

skyrocketed for the reason of presence of videos of another category like music or social videos.

In addition to YouTube metrics, the educator can set own subjective quality assessment criteria including appropriateness of content to the educational level of your students, authenticity, fulfilment learning objectives, communication skills of the presenter, and audio-visual quality of the produced video. This is in view that some authors have indicated that YouTube indices of preference (views, likes, dislikes, or search page) are not crucial in determining the value of educational video content [26,32]. Therefore, teaching institutions or professional societies should endeavour to identify and highlight good online teaching resources.

Reports of dissociation of YouTube provided video usage statistics and community engagement statistics with the relevance of the retrieved videos were published before YouTube launched "watch time". In October 2012, YouTube updated its suggested videos algorithm in order to focus on 'watch time." Thus the new algorithm for suggesting videos includes prioritizing videos that lead to a longer overall viewing session over those that receive more clicks [33]. By this way it can better surface the videos that viewers actually watch, over those that they click on and then abandon [34]. Previous to this, smart video producers had noticed that YouTube would reward clicks more than actual views. Watch Time should thus become an important metric to promote videos on YouTube because it is a sensitive metric of those people who are watching well beyond the first click. However, this new metric has not yet been researched in relation to educational videos.

How to create your educational video?

In every minute, 72 hours of video are uploaded to YouTube worldwide [19]; however, in the Arab region, which is number two spot in the world in YouTube video viewing, only one hour of YouTube video is uploaded per minute [20]. This is an indicator of the consumer tendency in the Arab region. It is at the same time an appeal to begin producing videos from own teaching material.

YouTube's slogan "Broadcast Yourself" can be easily met by consulting free self-learning resources. The creator hub on YouTube site provides a lot of information about how to get started and create a video. More refined information about creating videos with educational content are provided in YouTube EDU Playbook Guide which can be downloaded for free. It also provides information about how to apply for and become part of YouTube EDU [35].

Video capturing and editing methods that are suitable for producing educational videos are in many instances ubiquitous and user-friendly. Educational videos can fail if they go too high tech and if they go too low tech. Videos can be captured by video cameras or by using Camtasia Studio software (Techsmith Corporation, Michigan, USA), which is a computer screen capturing program in which it is also possible to record audio. In this way on-screen PowerPoint presentations can be captured as video. If a drawing pad with a stylus is also used, then writing, drawing illustrations or tracing certain features can be captured at the same time. As for mobile devices, Reflector (Squirrels LLC, USA) can airplay mirror the iPad, iphone screen on a computer which can then be captured and produced using Camtasia Studio.

The captured videos can be edited by using simple software such as Windows Live Movie Maker (Microsoft Corporation, Redmond, WA), Camtasia Studio, and the editing tool of YouTube itself.

These simple methods of capturing and editing are in many places comparable to those that are used by Khan Academy in producing educational videos. Khan Academy is a not-for-profit educational organization started by Salman Khan in 2008. Its mission is to provide a free, world-class education to anyone, anywhere. It all started when, in 2004, Khan began remotely tutoring his cousin who had difficulties in math. Eventually, word got around and his videos were hosted on YouTube. Now, with a library of over

4,100 videos on everything from arithmetic to physics, finance, medicine and history, the organization is receiving significant donations and grants [36].

How to optimize your educational video?

In a traditional classroom setting, no instructor would like to find his lecture hall empty or his students dozing in their chairs. In the virtual world, methods to engage the viewers could be different from face-to-face instruction since the instructor is not accomplishing visual contact with the attendants.

Education content video creators need to employ certain strategies to optimize their videos for the education category and build up more audience. The educator can use supplemental or full lessons. The contents could be single or in series. In anatomy education, for example, a course-based channel is recommended in which it is important to utilize annotations, metadata, and playlists to help the viewer navigate through the videos in a system oriented or region oriented sequence.

Because anatomy is a morphological subject then it is of the utmost essential to use three dimensional materials such as cadaver, prosections, and models to support learning. The use of multiple approaches within the same video or in a series of videos is important for understanding the multiple aspects of anatomy including gross, cross sectional, applied and surface anatomy.

The metadata (and description in particular) is a great way to communicate and outline your channel content for the viewer. It will help your audience find the right videos as they search. It is also important to give an outline of the objectives of each video session so viewers know what to expect. If the videos are course-based, it should be clear as to how this video session fits into the series or playlist. If such an outline is not provided within the video itself, it can be given in the "about" information tab. Also include links to related videos and the sequence they must be watched with both in the "about" information tab and as annotations on the video itself. For

the latter purpose, you may use the annotation tab from the edit screen. Hints to the sequence can be included in the video title. These tips can help not only create but also repurpose existing educational materials for YouTube.

The use of supplemental subtitles is recommended to engage the viewer. It can also serve to learn difficult medical terminology. Subtitles can be also used to pose questions during the video session which may effectively engage the viewer.

Lecture-based videos can often be long. For these videos to become more consumable and accessible for the audience they need to be shortened. If not possible, then an abridged version of the video may guide interested viewers who can then commit to the full length version. However, viewers often find shorter videos more intelligible. As an example, Stanford University uploaded two versions of the 2005 Steve Jobs commencement speech - a full version included an introduction by the president, and the other video was edited to just feature the speech. The edited version has over 16.5 million views, whereas the full version has 1.5 million [35]. Long videos can be cut into shorter ones each addressing an objective or a group of objectives then the whole series is included in a playlist. Education channels can use the 'start and end time' features, allowing you to create playlists that feature specific time frames from videos within the playlist. Let's take the heart anatomy as an example; if you create a video on the gross anatomy of the heart and another on the surface anatomy of the thorax then you can select the part related to surface anatomy of the heart instead of the whole video to include it in a playlist of heart anatomy together with the gross anatomy video.

Annotations can be extremely useful to build an interactive, curriculum experience for your viewers and to help them navigate to the previous and next videos in the lesson.

Create an interactive lesson for your viewers by annotating to specific time codes of video so that users can jump to a particular section. Annotations can be used for another way of

interactivity by posing self-assessment questions for which answers and explanations are provided by hovering the pointer over a highlighted area using the spotlight annotation.

Evaluation and feedback

The use of YouTube can encourage learners to reflect on the material in an environment in which they are accustomed to. YouTube Analytics lets the channel owner monitor the performance of the channel and videos with up-to-date metrics and reports. It is a powerful evaluation tool that provides continuous feedback in which the channel owner can filter the reports by content, geography and date.

Concluding remarks

YouTube popularity should encourage educators to use it as a platform in teaching the Net Generation. The design and creation of videos requires extra time and effort by the faculty; however, capturing and editing tools are cheap and user-friendly. Educators need not worry that they might be superseded by YouTube videos with their interactive potentials because technological tools cannot completely replace classroom interactive teaching. Videos can release educators by reducing lecturing load and improving the quality of instruction. Establishing a YouTube Channel can offer a new forum for scholars to communicate and additional opportunities for educational research.

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