Final Report - Governing Question

How do online platforms such as YouTube efficiently can be used to convey complex medical information in a simpler language to improve patients' and a general audience life quality?

Critical and Creative Thinking MA

Paula Andrea Ávila Jiménez

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University of Massachusetts Boston

Instructor: Peter Taylor

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Background:

For many years, I worked as a TV producer. I had the opportunity to work with commercial or entertainment television, as well as public or educational television. In terms of commercial or entertainment television I mean, reality shows, soap operas, game shows, or any other TV formats that aims to make profit entertaining the audience. On the other hand, public or educational television is any type of TV format that aims to deliver information that might educate and/or entertain the audience. Moving from the bottom in the TV production scale to the top of it, I have learned about team work, budget management, and video technology. However, working for a reality TV show for a public TV channel made me question the purpose of TV, film, or video in our society.

"La Lleva" – in English named "Tag" as the children's game- was a reality show produced by SeñalColombia the national public TV channel in Colombia. In "La Llleva" participants were authentically in charge of cultural sharing and exchanging their lifestyle, passions, and visions. It had the purpose to facilitate the beginning of a chain of cultural exchange were kids have to play the role of a host. Thus, they had to demonstrate to their guest whatever connects them the with their city, school, and family. At the end of each episode, the host received a letter with a surprise. Since this reality show emulates the game tag, now the visitor tags the host to travel somewhere. As a result of working in this project, I started to reflect about my ethics and my responsibilities or duties as a TV producer. Also, I spent time thinking and talking with other coworkers about how aware producers, directors, and investors are of the power of mass media mediums, and how audiovisual contents can affect audience's behavior.

After a few years of reflection on myself, my passions, and my jobs, I moved from a philosophical and ethical approach to a more practical approach. Therefore, I decided to find ways to use my experiences as audiovisual producer to improve audiences' lives. In fall 2016, I started to work at Dana Farber Cancer Institute (DFCI) as assistant research. I was in charge to create educational suite of

videos and booklets in Spanish and English for Latinos' cancer patients. The purpose of DFCI research instrument is to improve patients understanding of chemotherapy purposes when colorectal and pancreatic cancers are in advance stage (Grantome, 2017). During the following two years, the suite of educational material is using to test its effectiveness in a Randomized Controlled Trial study (RCT's) run it by DFCI and other cancer institutes around the U.S.

Working at DFCI was a meaningful experience that made me realize the value of using video as educational tool. Thus, my career was shifted and since then my profession focus is to find ways to improve science communications using video as a tool Thereby, the question to answer in this research project sketch is: How do online platforms such as YouTube efficiently can be used to convey complex medical information in a much simpler language to improve patients' and a general audience life quality?

Introduction

Globalization and technology offer many opportunities to remove educational boundaries using new technologies such as internet. More than ever, it is easy for those who are interested in learning to find formal or informal educational options. Changing the way that people communicate and learn, the internet facilitates people's education process because it is easy to share, participate, and collaborate. For instance, online courses lectures and podcast have been used for academic purposes in schools, universities, and community college (Bell, Lewenstein, Shouse, & Feder, 2009). Moreover, the internet offers other venues where people appeal to search for educational support. For instance, I follow YouTube channels relate with English grammar, academic writing in English, among others since I was ESL student.

More so, I used YouTube with academic purposes during my master's degree too. Thereby, I found myself many times searching for concepts and theories explanations that were more appealing to

me or use simpler language that textbooks or academic papers. During my masters' first year, I remember struggling to understand statistical concepts such as odds ratios or confounders in my epidemiology thinking class, and YouTube videos were helpful to understand and digest those concepts and moved forward. Based on these experiences, I questioned the uses of video-sharing websites such as YouTube and its potential benefits in educational settings.

During my first months working at DFCI, I researched about educational videos that were more appealing for patients to understand complex and complicate medical information. The research led me to search on YouTube again. Thus, I search for channels owned by cancer institutes, hospitals, or public television services such as Frontline. Focusing on palliative care, I found that those YouTube channels with videos that use patients' experiences to explain medical information had more views that those that only had doctors (Bärtl, 2018). As a result, patients may learn and engage better if they hear from other patients who share similar experiences. Therefore, I focused DFCI videos in patients' experiences and guiding interviews with questions that help them to explain with their own words complex and complicated medical information relate with advanced cancer.

Based on my experience with DFCI, I found that advanced cancer patients can explain complex and complicated medical information using their experiences, routines, or feelings. Besides, while patients participated in video-interviews, they coped and rethought about the meaning of their life and legacy opening a private space to talk and share. Therefore, while receiving information from the doctor is valuable to patients, patients learn more from listening to other patients' experiences. Furthermore, video-sharing websites are the best venue to share medical information because they provide free access, at any time, in any place to patients. Ultimately, online platforms such as YouTube can be an excellent resource to engage patients or the general public who are interested in increasing medical literacy using more straightforward and appealing language. engage with

Education and technology

Technology has been integrated into the educational setting long time ago. As example, technologies such as radio and TV were use before in the classroom (D. A. Muller, 2008). However, its introduction did not make any significant contribution to education evolution; although it has been several predictions about this through the past century. Today, students learn mostly in the same way that they did a century ago. By in large, students are still educated in groups by a single teacher. Thereby, that is not the idea of what a revolution looks like.

Moreover, educational theorists have been introducing the term "Education 3.0" to describe different approaches to introduction new technologies in learning process and education (Frau-Meigs & Lee, 2016). It is understood that Education 3.0 integrates a variety of disciplines such as neuroscience, cognitive psychology, and pedagogy looking to help students to learn efficiently. Thus, Education 3.0 looks to create a holistic environment where students could potentialize skills and knowledge to move forward in a digitalize and globalize word. Also, the term is a metaphor of how education should be moving forward.

In detail, Education 1.0 is understood as essentialist and behaviorist education where students follow the three Rs: *Receiving* information by listening a teacher, *Responding* by note taking and studying in textbook, *Regurgitating* by taking the same test that other students to evaluate the amount of knowledge memorized (Hiremath & Kenchakkanavar, 2016). Thus, the education1.0 is a one-way learning process where students are only a recipient for knowledge in the same way that web 1.0 was only used to disseminate information (Keats, D., & Schmidt, 2007)

Moreover, Education 2.0 is understood as andragogical, and constructivist because it permits the interaction between information and users as well as users themselves (Gülsoy, V. G. B., Taylan, B. D, and Yakın, 2014). Therefore, Education 2.0 has a progressive and humanistic approach where

different bearings of students and the classroom itself are relevant in the learning process. Thus, Education 2.0 is comparable with Web 2.0 because both follow the three Cs: *Communicating, Contributing, and Collaborating* (Gülsoy, V. G. B., Taylan, B. D, and Yakın, 2014).

Furthermore, Education 3.0 is a personalized, self- determined education where students are self-determined using interest-based learning to problem-solving, innovation, and creativity. Thus, Education 3.0 is a heutagogical and connecting teaching and learning process where students oversee the learning process and apply what is learned to create. Education 3.0 can be compared with the Web 3.0 because both affording to users – students and teacher – free and available content that is personalized based in individuals' interest and trends.

Similarly, I think patients learning process can be seen using the approaches described above – Web 1.0, 2.0, and 3.0 and Education 1.0, 2.0, and 3.0, Therefore, Education 1.0 occurs in a medical environment when a doctor diagnoses a patient and give the medical information needed to help the patient to understand the disease, its prognosis, and treatment. Thus, Education 2.0 happens when patients get involved in the medical learning process asking their providers for more information, using available medical support services, and sharing experiences with other patients. Finally, Education 3.0 will occur when patients search for medical information created by other patients, doctors, and medical communicators who are using simpler and appealing language to engage patients, caregiver, and the general public.

Effective educational videos to teach science

The Internet changed our idea of the world. 30 years ago, the world was so big, and communications were slower than today. Internet not only broke boundaries, short distances, and change our time-perception of contact making it faster. Thus today, we can go on the internet and find information almost about everything. Formal educational use tools like online libraries or search

engineers, and informal educational use tools such us social media and sharing-video websites (Bell et al., 2009). Also, internet allows interaction between people all over the globe that share similar ideas, beliefs, and curiosity by opening a dialogue and creating online-communities. Therefore, the internet is a medium that can contribute to increase medical literacy in general public because has both the tools and the audience.

Although the internet has the resources, it may not improve medical literacy in general public if medical communicators do not engage patients' learning process. Therefore, medical communicators should be asking about the best online-mediums and forms to deliver complex and complicated medical information. To point out, Dr. Derek Muller who "is an Australian-born, Canadian science communicator, filmmaker, and television personality, who is best known for creating the YouTube channel Veritasium" (D. Muller, 2010) did his PhD dissertation about effective ways to teach science using video as a tool. In his doctoral dissertation, "Designing Effective Multimedia for Physics Education" Dr. Muller suggests that the question should be around how do we make a film/video that effectively teach someone about science? instead of asking questions about the uses of technology in education.

In his research, Dr. Muller runs an experiment with a group of 364 first year physics students at University of Sydney. Thus, students were randomly assigned to watch one of the four videos on Newton's First and Second Law of Motion. Made by Dr. Muller and his research team, the first video is a regular lecture-style presentation or *"Exposition"* as its name in his paper. The second video is the same *Exposition* improved with additional information or *"Extended Exposition"*. The third video is the *Exposition* with common misconception that are stated clear as well as refuted in a social dialogue between two people or *"Refutation".* The last video is a student-tutor discussion about the same material presented in the *Refutation* or *"Dialogue"*.

In addition, students were tested with a twenty-six online multichoice questions about Law of Motions before and after watch the video. After collected the data and analyzed it, the results show that the third and fourth videos – *Refutation* and *Dialogue* – were more effective producing the highest learning acquisition in participants. Thereby, the result of Dr. Muller work suggest that the effectiveness of an educational video can be importantly improve if it includes and discusses general misconceptions regardless audiences' levels of education and experiences.

To sum up, The RCT's run by DFCI wants to test the effectiveness of video and booklets to engage Latinos to understand the purpose of chemotherapy in advanced stage – palliative care. Base on Dr. Muller findings, medical educational videos can be improved by including and discussing general misconceptions that had been identified in patients. Therefore, the videos and booklets might need to start explaining the patient's misconception that chemotherapy is only for cancer cure.

Science channels on YouTube

By early this month, YouTube had 1.9 billion users who watched almost 1 billion hours of videos and generate billions of views and comments. Also, YouTube has launched a local version in more than 91 countries and can be navigated in a total of 80 different languages, as well as more than 70% of watch-time come from mobile devices (youtube.com, 2017). These statistics show the high impact on the subscriber, as well as the opportunity to reach more people in a short period optimizing tech-sources - mobile devices. Therefore, YouTube same to be an excellent venue to disseminate complex, complicated medical information to improve science communication within the general public.

In 2015, The journal Public Understanding of Science (PUS) published an article "Science communication on YouTube: Factors that affect channel and video popularity". In the article, the authors Welbourne, Dustin J and Grant, Will J report the first overview of science communication on YouTube. It is important to know that one of main evaluation items in the overview was to separate

Professionally-Generated Content (PGC - National Geographic, Discovery Channel) from Use-Generated Content (UGC - YouTubers).

Researchers conducted a content analysis from 39 Science communication YouTube channels and watched 385 science videos that were randomly sampler for each channel and reviewed for inclusion (Welbourne & Grant, 2016). As a result, they identified three different factors that might contribute to increase popularity in sciences YouTube videos. The first, it is that UGC videos were superior in popularity although the PGC videos were higher in number. Second, the presence of a regular communicator to deliver content increase the amount of view by a large. And third, despite to be a UGC or PGC short videos had more views that Long-slow videos.

The results of this overview are starting points for the future researcher who are interested in science communication improvement using new technologies such as video-sharing websites like YouTube. Also, the factors to improve popularity in science YouTube channels are useful to current science communicator to increase views in future videos, as well as they are helpful to AV producers like me who are searching for new professional opportunities. After all, videos like I produced at DFCI and that include and discuss patients' misconceptions and experiences could be upload in a YouTube channel to reach more worldwide cancer patients in the future.

Follow up

As a result of this research work, I want to focus on science communication improvement, mainly, to increase medical literacy in the general public. After my experience at DFCI producing videos for Latinos cancer patients, I decided to shift my career as an AV producer to a more educational approach. Besides, I found that video-sharing websites such as YouTube are an excellent venue to showcase videos at a low cost. Moving forward, I am looking to explore more in deep YouTube Creators

Academy an online-courses offer by YouTube to help new creators to create their own YouTube

Channels.

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