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Video as a media in distance learning: guiding principles

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Abstract: *Video has become one of the most influent and used medias nowadays, being employed in learning in various contexts and approaches. It is being used by content creators and educators in non-formal, informal and/or formal learning environments, as well as from face-to-face (traditional) courses, as a support tool for teacher in the classroom (e.g. flipped classroom), to blended and full online courses. This paper intents to present some concepts and findings related to the use of video as a media in distance learning, addressing its potentials and guidelines for using this media in learning contexts.*

Keywords: *Distance learning, guiding principles, MOOC, video.*

I. Introduction

We are living in a society constantly harassed by various types of media and technologies. These instruments are at our disposal even without thinking about them, we are used to watch television while using a computer (or other devices) for internet access, or using the actual Smart TV for that purpose. We use them when we withdraw money from a cash machine, or when we pay for goods with our smartphones. The same is occurring with video and how we learn from/with it.

Audio-visual materials have been used in learning contexts since the first decade of the XX century, first with projectors in classes and school museums, and later (second and third decades) with radio broadcasting and better film and slide quality [1], with the purpose to give teachers other tools and media in order to promote learning [2]. It was only with the advent of the television that video gained a larger audience and usage as a media in distance learning contexts (educational television), being them formal (TV education-based programs) or informal (edutainment).

Formal TV education-based programs are public or private programs specially designed to deliver formal education with the usage of television. For example, in Portugal we had the Telescola (Teleschool) program that occurred between 1965 and 2004 and that allowed more than 1 million students to finish their compulsory education [3] and that prepared the arrival of Universidade Aberta (with the first emission in 1990). More recently and due to the COVID-19 pandemic, a similar emergency program called "Estudo em Casa" (Study at Home) was delivered through public tv station for students from primary education (generally between 5 and 14 years of age) as supplementary educational resources for students without computers or internet connection.

On the other hand, Edutainment are contents that at the same time educate and entertain (edutainment = education + entertainment), and that are not part of an educational program or curriculum, such as Sesame Street, Dora the Explorer among others. These contents may be specially designed to be educative, or they can be, unintentionally educative like adult TV Shows (e.g. Cooking shows, Myth Busters, Brain Games), documentaries (e.g. Historical, Nature) or videogames (e.g. SimCity, Minesweeper).

As seen, technology, and in particular video, is being used by schools, educators and other agents/entities (for teaching and learning purposes) with recognised success for more than a century.

II. Video power and consumption

The video consumption, especially in online environments, is constantly increasing. According to Limelight Networks [4], in 2019 internet users spent almost 7 hours per week watching online videos (59% more when compared to 2016) overcoming the television for people under the age of 36, and the preferred device to consume these resources are smartphones.

Video is probably the most powerful and persuasive tool nowadays, social media apps like TikTok, Instagram or Youtube are competing with Video on Demand (VOD) systems such as Netflix, Hulu and Disney+ for which platform has a bigger share of the online consumption. Despite the higher demand for entertainment and cinema related subjects, educational content, particularly edutainment, is having a huge acceptance from the online audience. The account of Alexis Loveraz[1], in TikTok, is an example of that, this account from a young student of age 16 has more than 700 thousand followers where he teaches basic and complex Math concepts. In the same way Vsauce[2], a channel on Youtube that address scientific topics, from the educator and entertainer Michael Stevens, has almost 16 million subscribers and an exclusive web television series.

According to Google [5], 86% of viewers say they regularly use Youtube to learn new things, and 7 out of 10 use the platform to solve problems on their jobs, studies, or hobbies. In 2018 more than 1 million learning videos has been shared on Youtube every day, and the watch time for learning content increased 38% compared to the previous year [6].

Due to this awareness, Youtube Learning division launched a best practices manual in order to promote these contents on the platform. This manual includes suggestions about "Choosing what to teach to the World", from niche topics and audiences to general subjects; "What video Formats work for learning content" with pros and cons of each format like (1) Animation; (2) How-to; (3) Lecture; (4) Video essay; or (5) Homework help and how to find, engage and grow the "Audience" through different types of tools such as (1) Analytics; (2) Branding; (3) Connections as well as other Youtube tools. Helping content creators to increase the success of their educational materials.

III. From traditional (in presence) to online learning

As seen, video has been used in various contexts and modes. Regarding in presence learning, one of the innovative methodologies employed is the flipped classroom. There are various interpretations for what is flipped classroom, one of the most accepted definition is based in three main principles: (1) Video takes the place of direct instruction; (2) This allows students to get individual time with the teacher in the classroom to work on key learning activities; (3) The "lecture" is done at home through videos created by the teacher previous to the class and the "homework" is done in class (therefore the term "flipped") [7].

This instructional methodology is a mean to increase the interaction between teacher and students, giving to the later more autonomy and responsibility on their own learning, where the teacher assumes a role of guidance and tutoring. Although flipped classroom is not synonym of online courses or even online videos [7], this methodology is being used in online contexts as well, being the video made available asynchronously for student consultation, and afterwards discussed through synchronous activities (e.g. videoconferencing or chat), or asynchronously (e.g. discussion forums, assignments).

The advent of screen recording and video editing software, with low learning curve and even through free licenses of Web 2.0 platforms, as well as cheaper and accessible video digital cameras, allied to high levels of digital literacy among teachers, has allowed for a greater usage of this type of media in learning environments.

"Video allows students to view actual objects and realistic scenes, to see sequences in motion, and to listen to narration" [8] making them an excellent tool for authentic learning and for demonstrative instruction. The enrichment of the

[1] https://www.tiktok.com/@alexis_loveraz
[2] https://www.youtube.com/channel/UC6nSFpj9HTCZ5t-N3Rm3-HA

video through interactive tools/technologies such as HTML5+Javascript, allowing for markers with external content (e.g. at a time in the video the learner has access to hyperlinks, slideshows, images or other external content), has proven to have high levels of satisfaction among students [9]. The use of HTML5 and Javascript can also be used to create quizzes inside the video, allowing the students to test their knowledge before moving forward to new concepts (if a student fails the quizz he/she can be directed to another time of the video with the explanation for that concept, if the student succeeds he/she continues to watch the remaining video).

Finally, the video can also be used as a mean for formative assessment and summative evaluation in online courses. For the formative assessment through oral presentations and discussions, where in the summative evaluation it can assure exam authenticity and legitimacy through the use of proctoring software that monitors the computer desktop and webcam.

IV. Massive Open Online Courses

As told, video is being used as a support for educational content in various learning modes and contexts (in presence and in distance; in formal and informal). One example of that educational usage is Massive Open Online Courses (MOOC) that are being offered by higher education institutions (HEI) both through their own platforms (e.g. Khan Academy, Stanford Online) or through agreement platforms with various institutions (commercially such as Coursera and FutureLearn, or non-profit such as edX). MOOC are courses available for everyone to enrol, accessible through internet at no cost (they do have fees for certificates but the contents are freely available if the learner doesn't seek a diploma), where video is the main support for distribution of content.

These platforms are having a very important role in the learning in our days, especially during the COVID-19 pandemic, as an example Coursera had a growth of 644% between mid-March and mid-April of 2020 (compared to the previous year), with more than 5 million new users post COVID-19 [10]. This impact might also be related to the fact that Coursera offered free certificate courses to every university that had to close due to the pandemic, this offer continues until final of July for general public in more than one hundred courses [11].

Most of the MOOC platforms developed apps for mobile devices, increasing the autonomy of the student that, more than ever, can learn "what", "when", "where", "how", "how much" and with "who" they want, at their own pace and rhythm, and offer Multilanguage support (courses in different languages or through subtitles). Since these courses are offered by an educational provider (usually a Higher Education Institution) the contents quality is unarguable, which makes them a great option for learning at no cost (or low cost for certified courses). MOOC are also an easier and cheaper way to access Higher Education courses, and that can be seen in the geographic spectrum of learners enrolled in these courses, where most of them are from developing countries (such as Asian countries like India). Also, these platforms offer courses from different formats and models, for beginners and more experienced learners, from small modular courses (2/3 weeks) to professional specialization and full degree courses (from a few months to almost two years). Being, at the moment, a real competition to more traditional HEI (in presence or at distance).

The video material in these courses is generally asynchronous (available from the moment a student enrols the course), although some MOOC may include synchronous video (e.g. videoconferencing or webinars) that if not watched live become available asynchronously. Again, it increases the learner's time flexibility and control of learning pace.

The benefits are not exclusive to learners but also to employers, most of MOOC learners are doing these courses on their spare time and at their cost, to boost their in-job performance or for better careers. The employers are missing a chance for a reasonably economical way to invest in their employees training [12]. Big companies like Amazon and Google are now some of the big clients of these platforms that are offering industry-recognised credentials and courses.

IV. Guiding principles

As seen the potential of the video in learning environments is undoubtable, but there are

various styles for presenting video lectures and it is imperative to know the benefits and shortcomings of each one according to our audience, to the course type, to the technical resources and to the instructional design that supports the course [13]. Generally speaking we can distinguish four main styles of video:

- Traditional class capture - Filming the the teacher (and the board) similar to the context of the in-presence classroom.
- Screencast (Voice Over Presentation) - being it a slide presentation (e.g. PDF, PowerPoint) or an animation video (including the screencast of a specific software) with the direct exemplification of the actions (e.g. how-to videos showing how to code, how to edit photos/videos).
- Drawing screen - Screen capture of a whiteboard or drawing tablet, where the teacher writes/draws and the student sees the result.
- Picture in Picture – Hybrid style that simultaneously presents the teacher's image (e.g. through webcam) and the screencast (Screencast or Drawing screen).

Accordingly to Chorianopoulos & Giannakos [13] Traditional class capture is technically simple to make and to share but less usable by the learners; Drawing screen simulates private tutoring; screencast is also simple to capture and good for demonstrative instruction (but lack the teacher's presence); and the Picture in Picture mixes the advantages of the demonstrative aspects of the previous styles with a sense of presence from the teacher, allowing for transitions between the teacher explanation and the demonstration, but increasing the complexity and time consuming for post-production.

This study and others [14] demonstrated that the types of "class capture" and "picture in picture" offered better performance rates, and that "picture in picture" videos have even better performance rates than traditional classes (face-to-face) in the context of Higher Education.

Finally, there are other considerations for maximizing student learning with educational videos. We should consider three elements: (1) cognitive load; (2) student engagement and (3) active learning. Therefore, we should opt [15]:

- To eliminate (or reduce) music and complex backgrounds using audiovisual elements as a mean (to complement the content) and not an end (to replace or take the place of the learning content);
- To highlight keywords and concepts (through changes in color contrast to emphasize relationships and organization of information);
- To explain and illustrate concepts with narration in an enthusiastic and conversational way to enhance student's engagement;
- To create short videos (average of 6 minutes) and divide the lesson in various videos (each one with few concepts);
- To create interaction between the student and the content (through quizzes, buttons, additional information) giving the student the control over their learning;
- To packaging videos with questions and problems that ask students to apply the concepts learned in the video, guiding them and making video part of a larger homework assignment for a more authentic learning approach.

VII. Summary

Video may have an important and sometimes decisive role in educational contexts, particularly in distance learning where the presence of peers and teacher are less noted, and where the technologies and medias should be wisely chosen and integrated.

Regarding video, we know now that it can be used to support and to increase student's engagement in their learning, by showing real examples and explanation of content in a more authentic and demonstrative way, combined with other tools and technologies that interactively put the student in control of the materials and their learning pace.

Nevertheless, to optimize the usage and potential of these tools, teachers and instructional designers must understand the different main styles of video (class capture; screencast, drawing screen; picture in picture) and what are the best contexts and audiences to use each one of them, as well as to understand the various elements surrounding their usage (cognitive load; student engagement; and active learning) and how to effectively improve the learning experience.

There's no doubt that the video is here to stay and to support the teacher role, and to be valuable resources for learners.
Synchronous usage of video can also be an important tool in some cases, like tutoring (e.g. videoconferencing can increase the sense of presence both for the teacher and the student) and formative/summative assessment (through oral presentations and proctoring software) guaranteeing legitimacy and authenticity in the evaluation process.

XIV. References

[1] R. M. Gagne, *Instructional Technology: Foundations*. Taylor & Francis, 2013.

[2] M. G. Jones, "Defining Educational Technology for Classroom Learning," 2005.

[3] P. D. Branco, "TV.COMmunity: Arquiteturas | Avaliação | Contextos educativos," Universidade de Aveiro, 2015.

[4] Limelight Networks, "Market Research: The state of online video 2019," 2020. [Online]. Available: https://www.limelight.com/resources/white-paper/state-of-online-video-2019/.

[5] Google, "The Values of YouTube Study," 2017. https://www.thinkwithgoogle.com/advertising-channels/video/self-directed-learning-youtube/ (accessed Jun. 18, 2020).

[6] Youtbe Learning, "Your Guide to Enriching Lives, One Video at a Time," 2018. https://services.google.com/fh/files/blogs/youtube_learning_best_practices.pdf (accessed May 14, 2020).

[7] J. Bergmann, J. Overmyer, and B. Wilie, "The Flipped Class: Myths vs. Reality." .

[8] D. Zhang, L. Zhou, R. O. Briggs, and J. F. Nunamaker, "Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness," *Inf. Manag.*, vol. 43, no. 1, pp. 15–27, 2006, doi: https://doi.org/10.1016/j.im.2005.01.004.

[9] P. D. Branco and M. P. Barbas, "TV.COMmunity – evaluation of an interactive video application with students and teachers," in *10th International Technology, Education and Development Conference*, 2016, pp. 607–613.

[10] D. Shah, "Highlights from Coursera Partners Conference 2020," 2020. https://www.classcentral.com/report/coursera-conference-2020-highlights/ (accessed Jun. 25, 2020).

[11] Coursera, "Take student learning online in response to coronavirus," 2020. https://www.coursera.org/coronavirus (accessed Jun. 21, 2020).

[12] C. Impey, "Massive online open courses see exponential growth during COVID-19 pandemic," 2020. https://theconversation.com/massive-online-open-courses-see-exponential-growth-during-covid-19-pandemic-141859 (accessed Jun. 19, 2020).

[13] K. Chorianopoulos and M. N. Giannakos, "Usability Design for Video Lectures," in *Proceedings of the 11th European Conference on Interactive TV and Video*, 2013, pp. 163–164, doi: 10.1145/2465958.2465982.

[14] Z. Pi and J. Hong, "Learning process and learning outcomes of video podcasts including the instructor and PPT slides: a Chinese case," *Innov. Educ. Teach. Int.*, vol. 53, pp. 1–10, Jul. 2015, doi: 10.1080/14703297.2015.1060133.

[15] C. J. Brame, "Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content," *CBE—Life Sci. Educ.*, vol. 15, no. 4, p. es6, Dec. 2016, doi: 10.1187/cbe.16-03-0125.