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Video abstract production guide

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Video abstracts are audio-visual representations of a scientific abstract that a researcher can use to complement an article. As a science communication tool, they stand as a novel and exciting way to present scientific discoveries, explore new formats, and reach new audiences. In this practice insight, we share the experience of creating a video abstract in Ecology, explaining and exemplifying the different stages of the process: selecting the paper, writing the script, producing the video, editing the video and promoting the film. Sharing the setbacks and wins of a video collaboration between researchers and science communicators, we hope to be a valuable contribution to all the people starting and already working in the field.

KEYWORDS

online science video, video abstract, science communication, Ecology, pollination, environmental communication, science and media, audio-visual production

Introduction

Science videos offer novel and exciting ways of communicating scientific topics (García-Avilés and de Lara, 2018). However, as researchers, we must ensure scientific rigor in these new formats, especially in an era with an excess of popular content and misinformation (Rosenthal, 2020). Video abstracts, i.e., filmed versions of the written abstract of a scientific paper (Berkowitz, 2013; Spicer, 2014), have the potential to maintain trustworthiness while connecting the researchers and the institutions with new audiences (Kippes, 2021). Having scientists promoting their work in a video can also encourage middle school students to pursue careers in science while demystifying some preconceptions about science and its stakeholders (Ruzi et al., 2021). Beyond all the workshops and courses (Plank et al., 2017; Chan, 2019; Angelone et al., 2020) that give researchers the media tools needed to produce their movies, a new body of work provides first-person testimonies about this process (Krebs et al., 2020; Smith, 2020; Brennan, 2021; Maynard, 2021).

This practice insight adds to those contributions and gives a unique team perspective on producing a video abstract. As science communicators, researchers and videographers, we are working on a project to understand the potential of video abstracts in Ecology and Environmental Sciences (Ferreira et al., 2021). During the work, along with different researchers, we produced two video abstracts, with the final goal of evaluating them from science communication and educational perspectives. Although studying their effects was important, the production process was also full of valuable lessons and should not be dismissed as an important output. So we propose the exploration of one of those videos, adapted from the paper "Spatiotemporal Variation in Pollination Deficits in an Insect-Pollinated Dioecious Crop," written by researchers from FLOWer Lab (CFE—Center for Functional Ecology, University of Coimbra) and published on 22 June 2021 in the journal Plants (Castro et al., 2021).

With this practical guide, we intend to build a helpful tool for all the researchers and communicators that want to initiate themselves in video abstract production. While sharing our experience, we list along the way the main steps to take, good practices advice and some other tips that could be considered.

Production stages

Selecting the paper

Before production starts, it is essential to select the main topic. In the specific case of a video abstract, we have to choose a scientific paper. We took into account three factors for selecting the article. The first one relies on the bonds established with the researchers. Being updated on the research unit's scientific production and aware of future works can be a challenging task. One way is to promote communication services among all research groups. So, if a researcher has some ongoing projects with an audio-visual potential, he/she will contact the communication office. Our experience tells us that researchers and groups more aware and skilled in science communication are the ones who usually accept most of these challenges. We worked with researchers from FLOWer Lab, who were used to communicating science. The second factor to consider is the paper's topic. Similarly to a press release, where we evaluate some findings to promote in the media, the video abstract also needs this kind of assessment. From our point of view, ensuring that the video is innovative, up-to-date, and has a solid visual component is important. One strategy is while reading the abstract try to visualize the concepts. We chose a paper with current and popular topics, i.e., pollination and biodiversity loss, directly linked with the UN Sustainable Development Goals (SDGs) (United Nations, 2015) and with great visual potential. The last aspect to consider is the release date. For planned dissemination, it helps a synchronous release with the corresponding paper. So our choice should preferably point to unpublished papers, already near the submission stage.

Writing the script

The traditional format for a movie script splits the action into chapters and scenes. There are some rules for writing a regular screenplay and some software that can help with that task [e.g., Celtx (Celtx Inc, 2022), Final Draft (Cast&Crew, 2022), and Trelby (Trelby Org., 2022)]. For this purpose, we followed the traditional structure of a scientific paper (Vachon, 2018): introduction, methods, results, discussion and conclusions. Accordingly, we elaborated our film with the same structure. We used the six formula question (adapted from Chan, 2019) to answer these questions about the research:

1. What is the problem?
2. Can you provide more details about the problem and why it is a problem?
3. What are you doing to solve the problem?
4. What have you found out?
5. What is the impact of the research? Why is it important?
6. What is next for your research?

This strategy uses the answers as a starting point for the script. From this stage onwards, the work is done closely with the researchers: we created an online working group to discuss the several versions of the script using a table to deconstruct the complex ideas and replace the jargon. We registered the predicted duration according to the measure of 150 spoken words per minute and added some keywords to help us ensure that the main topics were covered. Thus, two additional columns were created beside the column with the text (i.e., the answer to each question): one for the estimated length and the other for relevant keywords.

Once the script was ready, we decided what footage to get.

> "Just as a scientist has to collect data, a filmmaker has to collect film. Which can be very tedious. But it is the same basic process. If your interview says the forests are dying, you have to go find film of dying forests to show your viewers in order to get them to really grasp what is being said" (Olson, 2018).

We placed the images required to illustrate the text in a final column. In this stage, we were realistic and creative about what we could shoot and which royalty-free resources could be used. Which footage do we already have? Which footage will we have to get? Will it be necessary to obtain any license? Table 1 shows part of the grid that we applied.

From our experience, this writing stage is perfect for planning the budget and deciding what paid resources will be used. Once we had our final narration, we copied the text section to a new document and rehearsed the reading. It is necessary to balance the essential information with the desired length. The definition used for a science video implicitly considers a short-length content (Welbourne and Grant, 2016; García-Avilés and de Lara, 2018). Indeed, our previous work recommended 2–3 min as the ideal length for this kind of videos (Ferreira et al., 2021), and it was shown that short videos could strengthen long-term information retention (Slemmons et al., 2018). However, each video has its own dynamic, goals and target audience, so more studies and information are necessary to fully ascertain the most appropriate length. Having said this, we tried to produce a script for the shortest video possible without compromising all the fundamental information and rigor.

Producing the video

Our production stage comprised six key moments: narration recording, on-site film shooting (kiwi orchard in this particular case), interview recordings, film shooting in the laboratory, animation development, and online searching for images and videos free of royalties.

One of the authors, João Loureiro, was the chosen narrator. We taped the voice-over on a laptop using the external microphone KIMU Pro (Krom Gaming, 2021) and the free audio software Audacity (Audacity Team, 2021). We recorded two to three takes for each paragraph to have some backup audio files and a wider range of choices.

TABLE 1 Script grid using the six-formula question (adapted from Chan, 2019).

Question		Time	Text	Keywords	Scenes
What is the problem?	What is pollination, and why is it important?	43 s	Pollination is the simple transfer of pollen from the anthers to the stigmas, culminating in fertilization; however, this important ecosystem service is far from being simple, as plants rely on mutualistic interactions with animals to carry its pollen.	Pollination	Images of the pollination process as a simple tutorial.Interview? Animation?
			We currently know that the yield and quality of over 75% of crops worldwide is directly affected by animal pollination, and the area occupied by pollinator-dependent crops has increased over the last decades. Pollination is, therefore, an important biodiversity-dependent service supporting food provisioning.	Food production	For example – we can have images of different crops (e.g., sunflower, pear, apple, cherry, kiwi). General images of orchards, pollinators, and pollinators. Wide shots. Interview?

Before filming, we prepared our camera (Canon EOS 760D) settings. We usually selected a frame rate of 25 p and a resolution of 1,920 × 1,080 pixels to shoot in high definition. We tried for our images to have the same resolution, so the viewer does not spot differences. In the editing software, it is possible to adjust the resolution (from a higher resolution to a lower one), but it is preferable to be consistent from the start. For the web, since most screens nowadays are HD, the best advice is to shoot in a higher resolution than 1,280 × 720 pixels (Leonard and Kurniawan, 2022). Also, there is no point in uploading a 4K or 8K video to YouTube if most of the screens where it will be seen do not have that resolution (Vachon, 2018). Furthermore, much more space will be needed to store the files, and the work in the editing software will be much slower when using such high resolution (Vachon, 2018).

We scheduled two filming sessions on the kiwifruit orchard, one when the kiwifruit was flowering and the other some months later during the fruiting season. We filmed various shots (e.g., wide shots, mid shots, close-ups) and recreated some experiments and sample collection in the field with the researchers. It is important to shoot some cutaways: footage of something relevant that allows to cut between two shots that do not quite match or to provide some context (Vachon, 2018).

Our first interview (four questions) with the author Sílvia Castro occurred in the orchard. For that, we used an external microphone. If possible, one should not rely on the camera's microphone because, in many cases, the quality is not the best for such purposes. Also, one should try to collect a minute or two of the natural sound of the space where the filming is occurring. This could be important to help solve editing problems. The second interview (six questions), with the author Helena Castro, was conducted in the laboratory and was filmed by the communication team from the Communication Division of the University of Coimbra. From our perspective, in closed spaces, it is important to choose a background that tells something to the audience about the interviewee and the research. Also, look for places well-lit where it is possible to avoid noises and interruptions. We wrote a set of possible questions not shared in advance with the interviewees to keep their reaction and answers spontaneous. Only the main topics were provided in advance. While filming an interview, remember that the person in front of you is usually unfamiliar with the camera. The lens can be intimidating, so we tried to provide a relaxed environment and repeat the take as many times as needed. Usually, we shoot 3–4 takes for each question. From our understanding, the more takes we collect, the better, especially for the editing, where some problems not precepted during filming day could arise (e.g., interviewees looking directly at the camera instead of the interviewer) (Vachon, 2018).

After the interviews, we scheduled an afternoon with the authors Helena Castro, Catarina Siopa, and Hugo Gaspar to recreate on film some of the paper's laboratory methods: identifying pollinator species and measuring and weighing the kiwi fruits.

The use of motion graphics (animations) came from the need to present some concepts in a simple and comprehensive way. Graphic designer André Ferreira was in charge of producing two animated clips. After his first read of the script (Table 1), we discussed what kind of elements were most suitable to animate. We opted to illustrate two scenes, one about the pollinator's decline and its causes and the other showing the kiwi production area in Portugal and the location of the orchards used in the study. Two software were used for this task, one to illustrate, Adobe Illustrator (Adobe, 2022b), and the other to animate, Adobe After Effects (Adobe, 2022a). The latter allowed to animate the elements drawn with Adobe Illustrator. This process of asset creation and post-production animation took ∼8 h to be done. Videos that are entirely infographic might take weeks to produce.[1]

Lastly, we searched online for free stock videos to enrich our catalog. We started the search with our keywords and refined it into more specific concepts. Different stock footage providers [e.g., Pexels (Canva, 2022), Videvo (Videvo, 2022), and Videezy (Eezy Inc, 2022)] offered the ideas and concepts we could not get on camera. Also, it was necessary to select the background music. We bought the music "Colorful Dots"[2] on the website PremiumBeat (Shutterstock, 2021), but there are other free options that can be explored [e.g., YouTube Audio Library, Free Music Archive (WFMU, 2022)]. Search for the mood and genre that suits your film best and follow the suggestions of similar tracks the website provides.

1 This was a free collaboration. This kind of work normally has a cost of 30€/h.

2 The price of the standard license is 48.90€.

FIGURE 1
Screenshots from the final version of the video abstract.

Editing the video

Before editing, organize all your material so that its usage is practical, intuitive, and accessible. We present an example of our folder organization:

- PROJECT: where we kept all the versions of the projects containing our work baseline. We saved daily copies with the date (e.g., Pollination 2020-06-04 Proj) to quickly go back to previous versions if necessary.
- RUSHES: with all the images we used for editing, including interviews, cutaways, animations, and field or laboratory footage.
- SOUND: with all the audio resources like music, narration or ambient sound.
- RENDERS: with final versions of our film, which we produced by reviewing and modifying after sharing and having feedback from colleagues and friends.
- RESOURCES: with all extra material that will go into the film, such as photographs, titles, logos, animations, and other resources linked to the movie, such as licenses, notes, and scripts.

With all the data organized, it was time to review our footage and take some notes. In each sequence, we wrote what worked and what did not, what we liked best, and what could work as a transition to another shot. We suggest creating a detailed plan with the moments where the points of interest show up in each sequence. An accessible software that the person feels comfortable using is also recommended. We used Adobe Premiere Pro 2022 (Adobe, 2022c),[3] but some software with free versions have similar performance and features as paid ones [e.g., iMovie (Apple, 2022), DaVinci Resolve (Blackmagic Design, 2022) and HitFilm Express (FXhome, 2022)]. With all the assets organized, we started the post-production process. The narration and interviews were the first files to be imported into the timeline. In doing that, we create an audio structure that respects the order of the script. Once we had an audio track with the correct rhythm, we added the music and started to drag in the footage.

In this stage, we tried different approaches. Trial and error are part of the process. Also, from our practice, taking some breaks and returning to your project with a fresh look is crucial. Once we had our first version, which took 1 week to produce, we shared it with the researcher's team and started to discuss possible ways to improve it. Our movie had six versions until we were completely satisfied with the final result. From the first version to the last one, the changes were mainly in the aesthetic and number of titles and the display of some scenes. We add a new split-screen scene layout and a google earth traveling shot. Our final version (Figure 1) was 5 min and 20 s long.

3 An Adobe Student License costs 19,99 €/month in the first year and 30,74 €/month after that.

Promoting our film

The video was uploaded and launched on CFE YouTube Channel on 14 September 2021 (Ferreira, 2021). We produced a specific thumbnail for the video and titled it "Pollination deficit in kiwifruit." This shortened title delivered the message more concisely because the paper's original title was too long and not very appealing for dissemination purposes (Bell, 2020).

After an online presence of 10 months, the video achieved 1,055 views and a watch time of 35.5 h. By exploring the video analytics available in the YouTube Studio control panel, we can study audience retention, a measure that helps to see how often each moment the video is being watched as a percentage of total views (Bell, 2020). Rewinding and re-watching can result in values higher than 100%. The average view duration was 2:01 min, less than half its length, and the average percentage viewed was 37.7%. Also, 62% of the viewers are still watching at around 0:30 min, which is typical for these videos. Another available measure is the relative audience retention, which shows the video's ability to retain viewers during playback by comparing it to all YouTube videos of similar length. These data help us to understand the viewers' behavior.

YouTube was not the only social network where the video was uploaded. There was a planned dissemination strategy between the communication office and the researchers. The Instagram, Facebook, Twitter and Linkedin accounts from CFE, FLOWer Lab and the researcher's personal pages worked in unison to disseminate the video. Also, we associated the movie premiere with the celebration of the Ecology Day (14 September). We previously registered our film release as one of the activities on the official platform created to promote Ecology worldwide. Finally, the video was also uploaded on the paper's main page in the journal "Plants" (https://www.mdpi.com/2223-7747/10/7/1273).

Discussion

The low-cost and do-it-yourself paradigms (Brennan, 2021; Maynard, 2021), supported by learning tools for filmmaking (Angelone, 2019; Angelone et al., 2020), are important drivers in the academic science video universe. Although, and not forgetting the efforts of user-generated content (Erviti, 2018), our work with video abstracts showed that professional and semi-professional formats that blend different genres and styles (e.g., animation) are more popular than amateur productions (Thelwall et al., 2012; Velho and Barata, 2020; Ferreira et al., 2021). So, in the search for a more compelling video abstract in Ecology, with an informative and entertaining narrative that does not forget the rigor (Pavelle et al., 2020), researchers could join efforts with science communicators, designers, journalists and media producers, using the resources available at their institutions and universities (Smith, 2020). Our case study promoted the knowledge exchange between the different players involved: on one side, the researchers learned new tools and technics to communicate their science, and on the other side, the communicator/producer had scientific support throughout the process (e.g., to choose the most appropriate images of the study species). Planning all the presented steps—writing, producing, editing and promoting—from the start is vital. For example, to disseminate our video is not enough to upload it online (Finkler et al., 2019). It is a strategy that requires time, contacts and resources (Erviti and Stengler, 2016; Vachon, 2018).

Each stage of the production process had its own setbacks. Matching the script with the desired length, finding the ideal footage from the online providers, guiding the interviewee along the interview or editing the final video version were some of the main challenges. Also, being able to in-depth analyze the analytics of the video is one of our goals for future work. Understanding audience behavior on different social media (not only on YouTube) (Kaul et al., 2020; Pavelle et al., 2020) will allow us to explore new models and procedures.

Science video as an area of study has grown in the last decade (Rosenthal, 2020), and methodological approaches to video production are needed: in different formats, scientific areas, topics and intervenients. This work intends to be a testimony and example of creating a video abstract from scratch. Exchanging experiences between researchers who embark on the audio-visual adventure allows us to grab new pieces to this global puzzle and challenging task.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Written informed consent was obtained from the individual(s) for the publication of any identifiable images or data included in this article.

Author contributions

SC and HC provide the interviews. JL was responsible for the voiceover. SC, HC, HG, and CS recreate the experiments on the field and in the laboratory. MF was responsible for conceptualizing the film, recording the video and audio, editing it, and promoting it on social media. All authors collaborate on writing the script, preparing the filming sessions, and discussed and contributed to the final manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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