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Extending Media Literacy Education: The Popular Science Video Workshop

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Abstract:

This article discusses the current relevance of videos for communicating science and presents the state of the art of Media Literacy Education programs for scientists in this area. Some initiatives of these programs are supported by university libraries and specialised libraries, and others by universities and research centres themselves. We introduce a program which is designed to provide scientists with specific training for creating and publishing video abstracts. The participants learn how to write a script for a video and acquire the basic skills they need to record audio and video, and edit footage together into a complete unit. This combines both scientific communication and creativity. The aim of this article is to show how scientists can effectively record video abstracts for their papers on their own, how libraries can support them in this issue, and how important it is to extend Media Literacy Education by programs for scientists.

Keywords: Media Literacy, video abstracts, science communication, trends in publishing, popular science video workshops

Introduction

Sharing scientific results via audiovisual media has become an important part of scientific communication. Videos such as recordings of conferences, workshops, lectures, experiments and projects all have the potential to make the knowledge gained from scientific communication more useful, by providing a deeper understanding of the experiential aspects of the corresponding contributions published as text.

Video abstracts are a new genre in science communication. However, they are not just an audiovisual representation of a traditional text abstract, but a representation of the study as a whole. In three to five minutes, the viewer should be provided with an accurate overview of the background and methods of the study. A video abstract is directly linked with a single scientific paper that has been accepted and published in a scientific journal. Publishers that accept video abstracts include Cell Press, Elsevier, Wiley, IOP Science, IEEE Xplore and the American Chemical Society.

In most cases, video abstracts are produced on a low budget and in a relatively short period of time by the scientists themselves. However, scientists need to be trained in the creation of video abstracts. The one-day "Popular Science Video Workshop" was designed to provide scientists with the skills and tools to portray their research results. The workshop, developed by filmmakers, librarians and scientists, was conducted and evaluated in Berlin, Hannover and Budapest. The workshop has successfully proven that in the age of smartphones, scientists can become filmmakers in the course of a single day.

This paper provides a tour of the workshop program, introducing tools and techniques for the visualization of research results, explaining how academics and publishers can benefit from Media Literacy programs and speculating on what the future holds for scientific publishing. The structure of this paper is as follows: the first section describes audiovisual media in science, defines video abstracts and gives an overview of publishers that currently work with these materials in publications. The second section examines the concept of Media Literacy and how it has been applied in the sciences, describing current programs and library initiatives. The third section presents the development of the Popular Science Video Workshop.[1] The fourth section discusses the role of libraries in scientific Media Literacy. The fifth section concludes the paper and considers the possibilities of future projects.

Audiovisual media in science

Advances in digital media technologies and the use of the internet as a social network has increased the popularity of non-textual information such as audiovisual media, pictures and graphics. As of July 2015, more than 400 hours of video content were uploaded to YouTube every minute, and more than 1 billion hours of content are consumed on the platform every single day as of March 2017.[2] Among general YouTube videos, Science and Technology is the second-most relevant topic worldwide, having a stable number of viewers (Erviti and León, 2014). Institutes like CERN, with 76,000 subscribers on YouTube, and NASA.gov, with 112,000 subscribers, have long recognised that sharing scientific results via audiovisual media is a low-barrier opportunity for researchers to communicate their research more effectively.

[1] http://filmjungle.eu/popsci

[2] https://www.statista.com/topics/2019/youtube/

Until recently, scientific knowledge has been primarily communicated in the form of written texts accompanied by images and static graphics. Videos were considered inappropriate for academic purposes, and were usually regarded as popular science rather than as 'proper' scientific publications (Löwgren, 2011); as recently as 2012, only 1% of academic articles had video citations (Kousha et al. 2012). Nevertheless, Young (2008:1) pointed out, "Web video opens a new form of public intellectualism to scholars looking to participate in an increasingly visual culture." Moreover, Löwgren (2011) has even noted that a video forum has the potential to make the knowledge gained from scientific communication more useful and richer than before, by giving viewers a deeper understanding of the experiential aspects of the published contributions.

Considering the impact videos have on society, the scientific community has begun to use videos as part of their publications and to cite videos as trustable knowledge sources, particularly in natural sciences and technology. Cell Press was among the first publishers to recognise the potential of video abstracts and launched a YouTube channel back in 2009 to share scientific videos. These days there are more and more academic publishers that accept videos as article supplements; these are usually published on commercial platforms like YouTube (see Table 1).

Publisher	**Knowledge areas**	**Video platform**
Copernicus Publications	All (main scope: Geosciences, Biological Sciences and Physical Sciences)	TIB AV-Portal
IOP Science (e.g. *The New Journal of Physics, Methods and Applications in Fluorescence*)	Physics and Mathematics	Publisher video platform and YouTube
Elsevier (e.g. *Journal of Number Theory*)	All	YouTube
Cell Press	Biological Sciences and Medicine	YouTube
ACS Publications (e.g. *Journal of the American Chemical Society*)	Chemistry, Biological Sciences and Geological Science	Publisher video platform
NRC Research Press	Natural Sciences	YouTube
Wiley	All	YouTube
Dove Press	Medical research	YouTube
Emerald Group Publishing	All	Publisher video platform
IEEE Explore	Computer Science	Downloadable file

Table 1: List of selected scientific publishers that accept videos as article supplements.

Video abstracts represent a new genre in science communication. A video abstract is the motion picture equivalent of a written abstract and can be defined as "peer-to-peer video summaries, three to five minute long versions of academic papers" (Berkowitz, 2013) that "describe dynamic phenomena which are simply too complicated, too complex, too unusual, too full of information to do in words and two-dimensional pictures" (Whitesides, 2011). Video abstracts can also help to communicate "the background of a study, methods used, study results and potential implications through the use of images, audio, video clips, and texts" (Spicer, 2014). In most cases, video abstracts are produced on a low budget and in a relatively short period of time by the scientists themselves. Video abstract creators can nevertheless choose from a wide variety of options: from simple whiteboard drawings to screen recordings, slide shows and "talking heads". The list is practically endless.

In the scientific community, the use and significance of video abstracts is continually increasing. This also has an impact on the usage of an article. Spicer (2014) showed (in a study performed using the *New Journal of Physics,* published by IOP Science) that articles with a video were more likely to be downloaded than those which do not. "Of the top 25 articles with the highest usage, 36% had a corresponding video abstract" (Spicer, 2014: 9). The *New Journal of Physics* was one of the first journals to accept video abstracts. Since 2011, IOP Publishing has published more than 700 papers with a video abstract. As of 2017, the number of journals published by IOP science that accept video abstracts is 20. Looking at the download figures of all IOP Publishing journals published between 2011 and 2016, it is possible to observe the following:

- *New Journal of Physics* papers with video abstracts are downloaded twice as often as those without;
- *Environmental Research Letters* papers with video abstracts are downloaded 2.5 times more often than papers without;
- Among all journals, papers with accompanying videos (as an abstract or as a supplement) are downloaded 3.5 more often than papers without. This excludes five outliers with less than 80,000 individual downloads, according to Elena Belsole, Executive Director of the *New Journal of Physics.*[3]

For researchers looking to attract more attention to their work, a video abstract may be a useful tool to convert video views into online article downloads – especially if they are published in open access journals, according to Ryan Watkins (2016), responsible for *We Share Science,* a website that helps users share video abstracts. However, a number of scientists are still reluctant to use new media when communicating their results. The perception that new media might not be accurate enough to show scientific results or that they lack sufficient resources and skills might be reasons that discourage scholars from using videos to share science.

The next section focuses on the importance of Media Literacy Education for scientists. Scientists need to be media literate if they want to create media messages that reach their audiences. As Kereiva (2010) points out, they must be trained in communication outreach so that their messages stand out and that viewers understand and remember them.

[3] Personal communication, February 2017.

What is Media Literacy?

Media Literacy is an umbrella concept characterised by a diversity of perspectives and a huge variety of definitions. The Center for Media Literacy (CML) defines it as "a framework to access, analyze, evaluate and create messages in a variety of forms – from print to video to the Internet." According to UNESCO (2008), "media and information literacy lies at the core of freedom of expression and information – since it empowers people to understand the functions of media and other information providers, to critically evaluate their content, and to make informed decisions as users and producer [sic] of information and media content." UNESCO (2008) further defines Media Literacy as the ability to "interpret and make informed judgments as users of information and media, as well as to become skilful creators and producers of information and media messages in their own right." The concept is also closely linked to digital literacy, which, according to the EU Commission, "involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet" (Commission of the European Communities (2006)).

We agree with Aviva Silver, the former Head of Unit "MEDIA Programme and Media Literacy", DG Information Society and Media of the European Commission, who stated that Media Literacy could be defined as the ability to access the media, to understand and critically evaluate their contents and to create communications in a variety of contexts. It is built on the following main elements:

- the ability to access media and media content;
- the ability to approach media critically, i.e. the ability to decipher media messages;
- an awareness of how the media work;
- creativity, communication and production skills (Silver, 2009: 12).

As mentioned earlier, the most significant change in the twenty-first century has been caused by the ability to create, produce and share low-cost user-generated multimedia content. Traditionally, Media Literacy Education has been more focused on the critical consumption and analysis of mass media, rather than the development or creation of self-made content. Easy access to production technologies for audiovisual and multimedia content on the one hand and the evolution of social media networks on the other have been the main triggers for this shift. In this setting, Web 2.0 has allowed theorists to propose multimedia creation as a basic principle of digital literacy (Gutiérrez & Hottmann 2002: 80).

Nowadays, scientists need to be able to effectively access, organise, analyse, evaluate and create a wide range of texts, images and videos. However, to become skilful creators and producers of video abstracts, they first need to be trained in such media technologies. Cooper (2011) has even suggested Media Literacy as a key strategy to improve public acceptance of climate change science. She claims that a more effective strategy for scientists and science educators should not only include discourse approaches that enable trust, with an emphasis on empowerment through reasoning skills, but also approaches that embrace the maturing discipline of Media Literacy Education (Cooper 2011).

The most common arena for teaching Media Literacy skills for the production of video abstracts is in informal online programmes by public initiatives, academia and libraries. Most training sessions include scriptwriting skills, filming skills, audio and voice recording skills, and the basics of copyright rules. The following are some examples of these programmes:

- The Popular Science Video Workshop was started in 2015 based on a concept by brain scientist Attila Andics, PhD and natural history filmmaker Attila Dávid Molnár, a co-author of this paper. The core idea has been further developed by librarians and science communicators (for details please see next section).
- Impact story[4] is a website that helps researchers go beyond citation rates to measure the impact of their contribution. It offers a five-step process and several examples for creating effective research videos.
- Karen McKee, also known as "The Science Videographer",[5] is a retired botanist and oceanographer who has a blog and several tutorials on sharing scientific research through video. She has even put together a how-to e-book on the subject.
- Liz Haswell and Eric Hamilton, biology professors at the University of Washington in St. Louis, have posted information on their website offering guidance on how to make a low-cost whiteboard video about scientific research.[6]
- We Share Science[7] by Ryan Watkins is a video portal to share, search and discuss today's research, which also offers tutorials on video production.
- The Science Out of the Box[8] series by Johns Hopkins University gives some great examples on explaining academic principles in accessible lay terms.
- The Technical University of Denmark offers a workshop for its researchers to encourage them to produce video abstracts and increase the visibility of their publications.[9]
- The Technische Informationsbibliothek (TIB) – German National Library for Science and Technology in association with CERN and ZLB Berlin organised a workshop entitled "Videos in Digital Libraries: What's in it for Libraries, Publishers and Scientists". Theory and Practice of Digital Libraries (TPDL 2016).[10]
- The Observatory for Scientific Communication of the University Pompeu Fabra (Spain), teaming up with the Spanish Foundation for Science and Technology, published a guide[11] on how to produce scientific videos. The guide is directed toward researchers desiring to share their knowledge in a visual way.
- The Centre for Science Communication and the UNESCO Chair for Multimedia in Education[12] (Eötvös Loránd University of Sciences, Budapest, Hungary) offers a one-semester course specifically dedicated to teaching science communicators how to make scientific video abstracts.

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[4] http://blog.impactstory.org/impact-challenge-video-abstract/

[5] http://thescientistvideographer.com/wordpress/

[6] https://pages.wustl.edu/haswell/articles/13992

[7] https://wesharescience.com/Create-Video-Abstract

[8] http://www.hopkinsmedicine.org/research/advancements-in-research/out-of-the-box.html

[9] http://www.bibliotek.dtu.dk/english/nyheder/2016/10/videoabstracts?id=4325fe2c-0b5a-48be-af6f-e8b33967636d

[10] http://blogs.tib.eu/wp/videos-in-digital-libraries/

[11] http://asecic.org/wp-content/uploads/2013/09/video-cientifico1.pdf (Spanish)

[12] http://ttk.elte.hu/Faculty_of_Science

Journals themselves have also begun to work with video abstracts and now encourage their authors to produce video abstracts.

- *Physics Education* from IOP Science[13] gives their authors tips and suggestions for the production of videos abstracts, with a focus on how to improve visual and audio quality as well as avoiding copyright problems.
- Wiley[14] uses step-by-step guides to explain how to produce and publish video abstracts using SlideShare, Audacity and YouTube.
- Sage Publishing[15] also invites their authors to prepare and submit a video abstract and gives some technical guidance and best practices.
- Cogenta OA, an imprint of Taylor & Francis, provides an author toolkit, including some video tutorials.[16]
- BMJ (British Medical Association), has an extremely comprehensive tutorial on video production. It covers everything from technical specifications to filming with a smartphone and solutions for different budgets.[17]

As Cooper (2011) states, Media Literacy Education is about inquiry and critical thinking, guided by questions related to the audience, authorship, the message and meaning, and concepts of representation and reality. Therefore, giving tips and best practices for the production of video abstracts to scientists is good but not enough. We suggest that in addition to teaching technical and filming skills, it is also necessary to teach critical thinking about the messages we receive and create; this is a core principle of Media Literacy Education, according to the National Association of Media Literacy Education (NAMLE, 2007). Furthermore, the production of video abstracts is an excellent training itself for developing scientific reasoning skills, as the next chapter shows.

The "Popular Science Video Workshop" as a guide for Media Literacy Education

The aim of this section is to explain the principles and practice of the Popular Science Video Workshop, a project developed as a model of Media Literacy Education for scientists. Our project is based on the following needs:

- To increase the presence of Media Literacy Education for scientists
- to implement an innovative approach focused on video abstract creation, production and publishing
- To teach Media Literacy in order to develop scientific reasoning skills
- To investigate the potential of video abstracts in the context of science communication

The objective of the workshop is to provide scientists with the knowledge and tools required to create and publish a video abstract about their own research within a limited period of time and to critically reflect on this process. In the workshop, teams of three to four participants

[13] http://iopscience.iop.org/journal/0031-9120/page/How%20to%20make%20a%20good%20video%20abstract

[14] http://onlinelibrary.wiley.com

[15] http://insights.sagepub.com/author_resources.php?folder_id=243&sub_menu_id=245

[16] http://explore.cogentoa.com/author-tool-kit/video-abstracts-a-guide-for-authors

[17] http://authors.bmj.com/promote-your-paper/video-abstracts/

are creating short scientific video by using basic filmmaking techniques, such as holding interviews; recording voiceovers and music; captioning; using time-lapse and stop-motion techniques; and animations. Training places an emphasis on easy, free and simple-to-use applications along with a laptop and/or smartphone.

One of the instructors has a background in natural sciences and the other has extensive experience in documentary filmmaking; this combination gives participants the support necessary to help them familiarise themselves with basic filmmaking tools and techniques. In addition, library personnel from the Technische Informationsbibliothek (TIB) – German National Library of Science and Technology contribute their expertise in e-publishing to the workshop.

Motivation and beginning

Producing a video abstract for a 2014 scientific paper[18] was a considerable challenge for one of the instructors, Attila Andics, PhD. He sought help among professional filmmakers, and so a video abstract[19] was made within three days and uploaded onto Cell Press's own platform,[20] as well as onto YouTube.[21] The video published by Cell Press generated more than 27,000 views and it quickly made its way into the ten most viewed videos of the video channel dedicated to video abstracts. The success of the video inspired the authors to reconstruct the steps of the production. It was based on their findings that the training method of the Popular Science Video Workshop was developed. This training method in turn has led to more video abstracts being produced, achieving more significant viewer figures. One video, featuring the results of a study published in Science[22], received more than 350,000 views on YouTube.[23]

Basic elements of video abstracts

To determine preferred filming techniques applied in popular scientific video abstracts, the training team analysed the ten most viewed videos of Cell Press's Video Abstract YouTube Channel. Screening of the individual videos showed that the visual information in these videos can be easily divided into four main categories based on which techniques were applied by the creators of the video abstract:

I. ON CAMERA: scenes featuring the authors of the scientific article. This category includes all kinds of author(s)' appearance on screen, author(s) talking to the camera, interviews.
II. ANIMATIONS: scenes generated with nonlinear or analog animation techniques. This category includes whiteboard, stop-motion, 3D, and time-lapse animations, as well as screen recordings.
III. DOCUMENTARY: scenes recorded with a normal camera. These show the subject of the research acting, wildlife footage, animal and plant behaviour, a reconstruction of experiments, or footage demonstrating lab work or fieldwork.

[18] Andics, A. et al. (2014) *Voice-Sensitive Regions in the Dog and Human Brain Are Revealed by Comparative fMRI*, Current Biology, 24, 5, 574-57.

[19] https://www.youtube.com/watch?v=StUkD_ACt60

[20] http://www.cell.com/current-biology/abstract/S0960-9822(14)00123-7

[21] https://www.youtube.com/user/cellvideoabstracts/videos?view=0&sort=p&flow=grid

[22] http://science.sciencemag.org/content/early/2016/08/26/science.aaf3777

[23] https://www.youtube.com/watch?v=N9QQxa6eLPc

IV. STILL IMAGES: This category consists of the application of still images, including slides, graphs, diagrams, and photos.

After establishing the four categories, the workshop team determined the duration and frequency that each of these techniques is used in the ten Cell Press videos.[24] This was done by using a non-linear video editor with an accuracy of one second (Figure 1) to determine duration and frequency of the four categories of visual techniques. The audio content of these videos was not analysed.

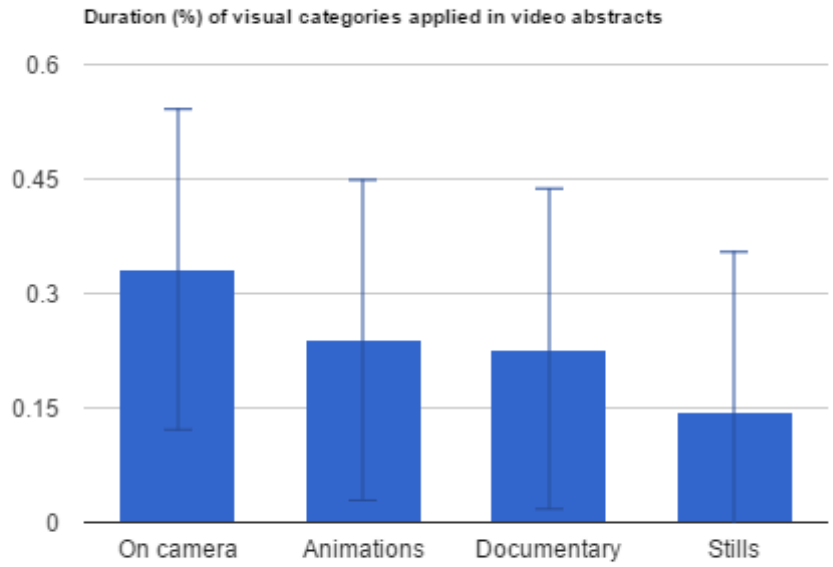

Figure 1: *Duration of visual techniques applied in video abstracts*, (analysis of the ten "most popular" videos selected on Cell Press's public YouTube channel, based on view counts, as of August 2016, in order of duration on a per-second basis, with visual information divided into four categories: ON CAMERA, ANIMATIONS, DOCUMENTARY, STILL IMAGES).

Results showed that *on-camera* appearance and *animations* were the most popular ways for authors to present the results of their research to the viewer. *Documentary*-style scenes were the third most popular way of storytelling, while the most conventional way of illustrating a study, *still images*, was less popular. These findings are in accordance with the structure of our reference video, which features mostly on-camera appearances (2 mins.); re-enactments from the lab (2 mins.); and finally animations such as on-screen recordings (1 min.).

After setting up the list of the most popular filmmaking techniques applied in video abstracts, we checked the technical preconditions of the production process. As for filming devices, we found that not only video cameras, but also smartphones met the requirements set up by publishers for video and audio content alike.[25] Checking the availability of recording and

[24] https://www.youtube.com/user/cellvideoabstracts/videos?view=0&sort=p&flow=grid
[25] http://www.cell.com/video-abstract-guidelines

editing software for each of these visual categories referred to in Figure 1 revealed that sufficient applications are available and come with easy-to-understand tutorials not only in the desktop environment, but also for mobile devices. These findings led to the conclusion that the video abstracts would not necessarily require professional filmmaking equipment and could be created with simple tools such as a smartphone, laptop and/or tablet. We compiled a list of applications necessary for the creation of video abstracts, and worked out training methods focusing on the four visual categories shown in Figure 1.

To reconstruct the steps of the production of a video abstract, we used one we made ourselves for reference.[26] We developed four consecutive sessions (writing, filming, editing, sharing), each 1.5 hours long, each consisting of a demonstration phase, followed by individual/teamwork, and concluded by a discussion/feedback round in the whole group. The four sessions were then shaped into a one-day intensive workshop schedule.

Workshop description

The workshop begins with a general introduction to video abstracts and its significance for the communication of scientific work. Small teams are formed and over the course of the workshop the participants are introduced to the most popular visual techniques applied in video abstracts as well as to scripting, editing and sharing/publishing a video.

- The first session is on writing a video script. Examples are shown and discussed. This is followed by a hands-on session, during which the participants develop a text or a script that a video can be built on.
- The second session concerns recording a video. The participants become familiar with basic recording techniques, creating graphics, audio and video content that will be edited in the next session.
- The third session is on editing the raw footage into a video and how the raw material can be structured according to the script. The result is a rough director's cut of the video abstract.
- The fourth session is on sharing. This part includes creating fine cuts and sharing the final version with colleagues and the world, including dealing with CC licences and copyright.

Each session is designed to build on the previous sessions and cultivates increasing knowledge of and skill in creating video abstracts. Hands-on group activities alternate with discussion of the interim results in order to critically reflect on each other's work.

Results

A total of 47 academics took part in the training session, called the Popular Science Video Workshop, which took place in 2015 and 2016 at three different locations (Berlin[27], Hannover and Budapest[28]).

[26] https://www.youtube.com/watch?v=StUkD_ACt60

[27] http://www.izw-berlin.de/welcome.html

[28] https://www.elte.hu/karok/ttk

The workshop results confirmed the assumption that proper supervision enables scientists and PhD students to acquire all skills necessary to create a short science video – regardless of the topic or the author's experience in filmmaking – within a single day. The 47 participants of this study were divided into 18 working groups, 15 of which were successful in uploading their self-made video by the end of the workshop (Figure 2).

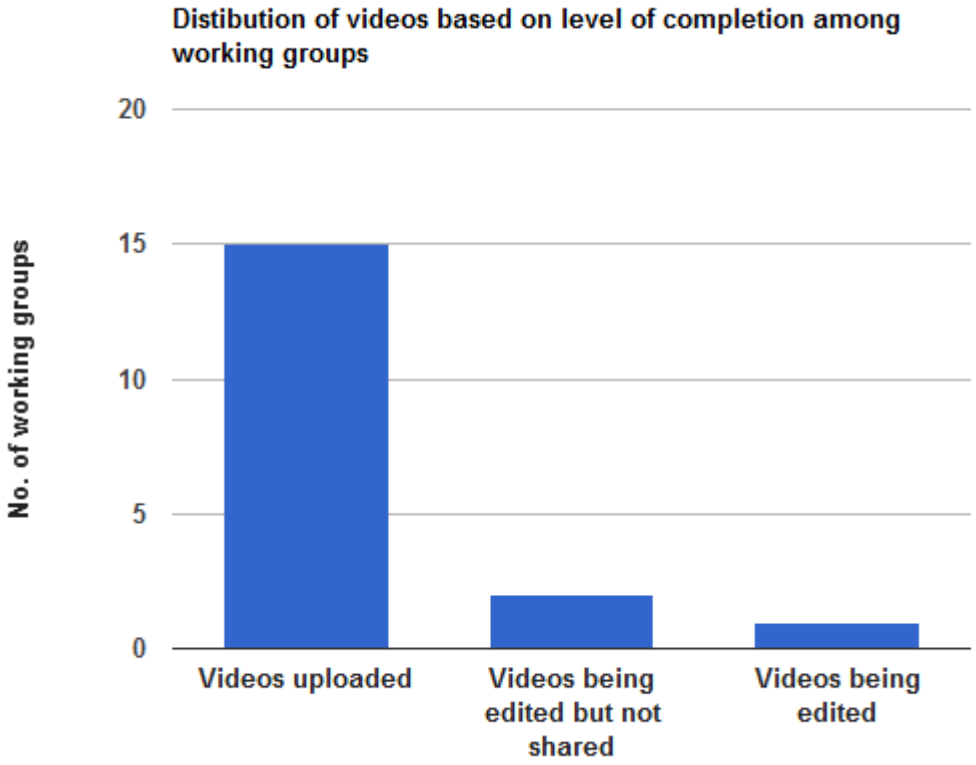

Figure 2: *Distribution of videos based on level of completion among working groups* (analysis of videos by the end of the workshop; number of working groups (18), videos uploaded (15), videos being edited (3))

Since most video abstracts are considered experimental work, which are not based on facts or real scientific work, their authors only allowed us to publish extracts of these self-made videos.[29,30,31] How many of the participants were later successful in producing and publishing video abstracts for their own work has yet to be confirmed. Nevertheless, we found the effectiveness and inventive approach of the participants to be very impressive. Scientists and PhD students were confident in working with new applications, were free to ask the supervisors questions when necessary, applied trial-and-error and imitation as effective ways of learning, and found the teamwork satisfying. As a result, we:

- identified some of the most popular visual techniques applied in present-time video abstracts;

[29] https://www.youtube.com/watch?v=N-VebEarx80
[30] https://www.youtube.com/watch?v=UG-mUCotHL0
[31] https://www.youtube.com/watch?v=YhokEAKWXuM

- produced a reference video abstract;
- described the steps of the production process and worked out a training method accordingly; and
- tested the training method on scientists and PhD students actively involved in publishing their work.

We conclude that scientists' writing and publishing skills form a very good basis for making video abstracts. Nevertheless, to meet the standards and requirements of a publisher, or to target a wider audience, it is more than advisable to involve a certain amount of external support. We found that scientists do not necessarily need to utilise professional filmmakers. Enrolling in a proper training programme can provide the skills and knowledge authors need to then be able to produce a video abstract themselves.

Conclusion and future work

Video abstracts add value to an article and facilitate the comprehension and communication of the research. They also attract more readers and increase the research impact. However, scientists still have to overcome many obstacles when producing a video abstract and therefore need some assistance. The advantage of the Popular Science Video Workshop is that the participants receive immediate feedback on their output: they have the opportunity to work in an inspiring atmosphere and obtain individual coaching by experts. Personal interaction makes the workshop very similar to actual filmmaking, leading to outstanding results within a few hours. Some of these results are summarised on the Popular Science Video Workshop YouTube channel,[32] where participants are encouraged to upload their videos.

As shown in this paper, more than 80% of the participants completed a video abstract during the workshop and were willing to upload it. In conclusion, Media Literacy Education for scientists is effective in developing skills in producing and creating video abstracts. This relatively small study provides strong causal evidence for the effectiveness of the methods used in the Popular Science Video Workshop. The practical approach taught by filmmakers, scientists and librarians positively affected researchers' filming skills. The study underlines the fact that investment in hands-on Media Literacy Education and training is an important component of building effective Media Literacy instruction for scientists.

The purpose of this paper was also to emphasise the importance for libraries to address the issue of Media Literacy in the internet age. Libraries must claim a key expert role in the field of Media Literacy. The library can function as a platform not only for providing access to videos but also for teaching how to produce media content and critically reflect on it. Library management should develop policies on Media Literacy, including the production of video abstracts, and personnel should be trained in teaching essential Media Literacy skills such as e-publishing, including copyright and Creative Commons Licences.

Libraries can also provide advice on alternative ways to measure the impact of a publication in order to make video abstracts relevant for scientific career recognition. This paper mentioned several publishers that publish videos on commercial platforms like YouTube or Vimeo, while others implement their own video platform or combine both. One important

[32] https://www.youtube.com/channel/UCePiaOy96Q1zsfIdZSeJjFw

fact that makes video abstracts relevant for scientific career recognition is the possibility to cite them as an independent resource. Therefore, it is crucial to identify video abstracts as supplements with a unique identifier such as a digital object identifier (DOI), as is currently done by publishers such as Cell Press, or on scientific video portals like the AV-Portal of the Technische Informationsbibliothek (TIB) – German National Library of Science and Technology.[33] The AV-Portal provides a reliable infrastructure for scientific videos and video abstracts and ensures that scientific videos are permanently locatable and accessible (Plank, 2016). Each video is assigned a Digital Object Identifier, a unique and persistent identifier that remains valid even if the URL of the respective object changes. The DOI creates a permanent link between the video abstract and the corresponding article. By combining the DOI with a "media fragment identifier" (MFID), the AV-Portal even offers the possibility to cite a video down to the second. It is of great importance that libraries and publishers work together in this field, as TIB did with Copernicus Publications (van Edig, 2016). From our experience, scientists have greater motivation to produce videos and video abstracts when the latter are considered proper scientific resources and can be cited accordingly.

Collaboration and knowledge sharing with filmmaking experts can be very fruitful, as in the example of TIB teaming up with professional filmmakers and scientists to conduct the Popular Science Video Workshop. This approach to Media Literacy Education in libraries was much appreciated by the participants involved. Creating and conducting Media Literacy programmes in the library encourages participants to engage in critical media behaviour and media empowerment. It also strengthens the education and information function of the library and thus has a positive effect on the image of libraries.

[33] https://av.tib.eu/

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