Improving guidelines for video abstracts: An analysis of the most popular videos abstracts in the TIB AV Portal

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Abstract
Today, more and more scientific videos are published online. One visual format that seems particularly suitable for communicating scientific content is the video abstract. This is the 3-5 minutes long moving image equivalent of a written abstract. With this format, scientists have the opportunity to explain the results and background of their concrete research work as well as the methods used, the study results, and possible implications to a potentially larger audience.
Recently, some studies have been published on this subject, in particular with a focus on content analysis for specific domains and classifications of online videos in general. This paper explores the topic of video abstracts and publishing guidelines in order to answer the following question: „Do authors follow the existing guidelines and are the guidelines sufficient for the publication of a scientific work?“. In a literature and web review we looked at the existing publishing guidelines and extracted the major rules. A database from the most viewed thirty-three video abstracts, published on the TIB AV-Portal was created. Each video was analyzed for different criteria such as link to corresponding paper and research data, length, formats etc.. Results indicate that the most common guidelines were followed by the authors, such as max. 4 minutes length, inclusion of additional relevant material such as images, animations, and lab footage as well as good audio quality. However there is still a lot of potential to get more out of video abstracts e.g. adding a title and a link to the corresponding paper and research data.
Keywords *Video Abstracts, Video Platforms, Scientific Videos, Publishing Guidelines, Video Design*

Introduction

The scientific community thrives on the exchange, communication and dissemination of research results, ideas and projects. This takes place to a large extent at conferences, meetings, symposia and workshops, without which the scientific landscape would be inconceivable. Traditionally, the results are published in the form of articles or proceedings, thus documenting the current state of research. The advent of digital media has fundamentally changed information, communication and work behavior in science and society. Communicating research results in the form of or with audiovisual media has become a modern, rapidly growing part of scientific communication (Leon & Bourk, 2020). This has a great potential to communicate scientific findings to a wide audience that would otherwise hardly learn about the valuable research results (Bucher 2020, Leon & Bourk, 2020).

State of the Art Video Abstracts

Scientific videos have gained popularity in the last decade (van Edig, 2016, Ferreira et al., 2021). There are a number of different formats of scientific videos, such as conference recordings, project documentations, video data from qualitative research, and recorded experiments. Studies on the classification of online scientific videos (Boy et al., 2020, Morcillo at al 2016) also distinguish between presentation, expert, animation, and narrative videos, while others first make a rough distinction between TV and online formats and other subgenres (Garcia-Aviles and Lara, 2020). One visual format that seems particularly suitable for communicating scientific content is the video abstract (Berkowitz 2013, Fereira et al 2021) (hereafter abbreviated: VA). This is a 3-5 minute moving image equivalent of a written abstract (Berkowitz, 2013; p.1). This format gives researchers the opportunity to explain the findings and background of their specific research, as well as the methods used, study results, and possible implications to a potentially larger audience (Plank et al 2018). VAs can be embedded in researchers' websites, institutes, or science blogs, shared on social media, and included in lectures. In this way, they develop a visibility that extends into various social and economic spheres. Science journalists, decision makers, and interested lay people can thus learn about the latest results and discussions in science. Similarly, VAs can be helpful in keeping up with the growing body of interdisciplinary research and providing an overview of research outside one's own discipline (van Norden, 2015). Another benefit of VA creation is to revisit one's research findings in a different format. To this end, Dr. Whitesides from Harvard has his students create three-minute summaries of their research findings in VA style (Whitesides, 2011). Spicer (2014) showed in a study using the New Journal of Physics (published by IOP Science) that articles accompanied by a VA are more likely to be downloaded than those without. Of the top 25 articles with the highest usage, 36% had an associated VA (Spicer, 2014; p.9). A VA can thus be a useful tool for converting video views into downloads of online articles-especially when published in open-access journals (Watkins, 2016). Moreover, VAs positively influence the citation rates of scientific articles, as Zong et al. (2019) explain in their study - also based on the "New Journal of Physics".

Publication and Guidelines

The whole idea behind a video abstract is to publish it online and directly link it with a scientific paper that has been accepted and published in a scientific journal. On the one hand, numerous commercial platforms are available for the publication, such as YouTube or Vimeo. Cell Press[1] was one of the first publishers to recognize the potential of VA and set up its own YouTube Channel as early as 2009. Renowned scientific publishers such as Copernicus Publications, IOP Science, Elsevier, Wiley, and Taylor & Francis have also started to offer the possibility to submit VAs and link them to the respective reference article. The popular transdisciplinary repositories Figshare [2]and Zenodo [3]support the publication of videos as research output. Videos receive a Digital Object Identifier (DOI), descriptive metadata, and author information are available. The open US platform WeShareScience (http://wesharescience.com) also provides a place to link, share and discuss VAs. The TIB AV-Portal (https://av.tib.eu/) is a reliable, sustainable infrastructure for publishing scientific videos, for example in cooperation with open access publishers such as Copernicus Publications.

Many publishers have published guidelines to help scientists produce their videos abstracts (Plank et al 2017). As an example, the Design Rules of the Institute of Physics (IOP)[4] include the following hints in terms of production:

- A video abstract should not last longer than 4 minutes.
- Inclusion of additional relevant material such as images, animations, and lab footage is strongly encouraged.
- A video abstract must include a soundtrack providing a clear verbal narration of the visual content.

[1] http://www.cell.com/video
[2] https://figshare.com
[3] https://zenodo.org
[4] https://iopscience.iop.org/journal/1538-3873/page/video-abstract-guidelines

Other publishers like Tayler & Francis also give general design recommendations[5] including: make it short, avoid overload, be natural, be clear and to the point, use images, make sure your audio is clear. Theory Culture & Society[6] and BMJ[7] give similar advice. Sage after all complements that a link to the article should be added in the caption[8]. WeShareScience is offering different templates to create a video abstract[9].

Wiley uses step-by-step guides to explain how to produce and publish video abstracts and makes suggestions where and how to share the video abstracts[10]:

- Share it on your social media channels (and ask your department or institution to share it on theirs)
- Include it on your personal website and Kudos publication details
- Include it in a SlideShare about your article
- Use it in conference presentations
- Email it to colleagues and peers
- Send it to your local press office
- Link to it from future grant applications

However in all of these guidelines formal criteria are missing. These should include mention of the authors, the title, a link to the corresponding paper and research data, bibliographical references, licence information and if possible a digital object identifier (DOI).

One portal which is science compliant because the upload process requires formal metadata as well as a licence agreement is the TIB AV-Portal[11]. Additionally, all videos receive a digital object identifier from DataCite. The aim of the portal is the professional hosting and semantic indexing of scientific videos for research purposes. The portal currently provides more than 36,000 (as of October 2021) quality-checked scientific videos, primarily from technology and the natural sciences, under open access, predominantly Creative Commons licenses. These include computer visualizations, learning videos, simulations, experiments, interviews, lecture and conference recordings, and video abstracts - systematically published, for example, as part of a cooperation with Copernicus Publications. In order to ensure the long-term availability as well as the second-by-second referencing of the videos, they are digitally preserved and receive a Digital Object Identifier (DOI) as well as Media Fragment Identifiers (MFID). In addition, various automated analysis procedures are used in the AV-Portal, through which the videos are indexed on a fine-granular and time-based basis: Temporal Segmentation; Keyframe-based Text Recognition (Video OCR); Speech Recognition for the creation of audio transcripts; Annotation with predefined visual concepts; as well as the semantic analysis and differentiated tagging of the video content with subject-specific keywords. With the help of these analysis methods, information and content can be precisely localized using semantic and explorative search functionalities ("facet search"), videos can be searched for content, and relevant video sections can be retrieved with segment precision. Furthermore, the videos in the portal can be searched across languages via a cross-lingual mapping (German-English) of the semantic knowledge base. The metadata is also available as standard CC0-licensed RDF data for subsequent use.

[5] https://authorservices.taylorandfrancis.com/research-impact/creating-a-video-abstract-for-your-research/
[6] https://www.theoryculturesociety.org/video-abstract-guidelines
[7] https://authors.bmj.com/writing-and-formatting/video-abstracts/
[8] https://us.sagepub.com/sites/default/files/sage_video_abstract-external_guidelines.pdf
[9] https://wesharescience.com/Create-Video-Abstract
[10] https://authorservices.wiley.com/author-resources/Journal-Authors/Promotion/video-abstracts.html
[11] tib.av.eu

As mentioned, the portal provides standardized metadata for video abstracts, a license statement, and a DOI. However, it does not ensure that scientists cite their paper and research data directly in the VA. Together with following the guidelines, it is up to the scientists to get the most out of their video abstract.

Study and Method

In our study[12] we wanted to find out whether the most popular video abstracts on the TIB AV portal follow the common design and publishing rules or not. Our study provides a characterization of video abstracts published on our portal in the areas of Science and Technology. We identified video abstracts based on the number of views. A database of the highest ranked thirty-three videos, from four publishers was created. Each video was manually analyzed for different parameters. Based on a literature review (Ferreira M. et al. 2021, Morcillo et al. 2016) including design rules[13]. We examined some production factors like video length, genre, format and audio - said to have a great impact on the popularity and added some more production and general factors. For example, was the corresponding paper named in the video and linked permanently with a DOI and was the research data visualized in the video?

Formal metrics for each video:

a) Subjects
b) License information (Licence Type e.g. CC BY, CC BY ND)
c) Title / Intro (yes/no)
d) Credit Paper (yes/no)
e) Credit Research Data (yes/no)
f) DOI (yes/no)

Metrics for Design and Production:

g) Visualized research data included (yes/no)
h) Length (1-4 minutes, 4-5 minutes, >5 minutes)
i) Genre (Documentary Style, Animation, Dynamic Presentation, Monologue/Interview, Simple presentation)
j) Additional Elements (Text, Graphics, Animation, Presenters, Interviews, experiment / lab footage, documentary / real life footage)
k) Sound Quality (good, medium, bad, no sound)

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[12] Data see: https://doi.org/10.17026/dans-xh6-fama
[13] https://iopscience.iop.org/journal/1538-3873/page/video-abstract-guidelines

Results

Formal Criteria

Subjects

Our subset included nineteen videos from Physics, nine from Earth Science and one each from Informatics, Biology, Information Science, Engineering, Environmental Science.

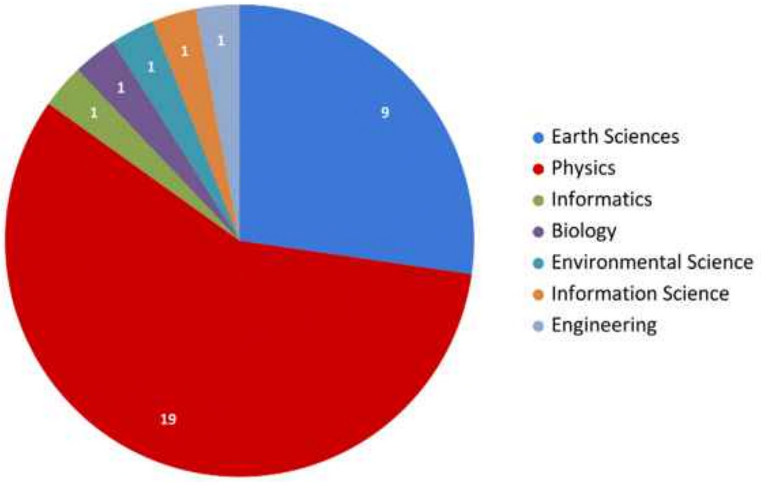

Fig. 1: Subjects (Sample:33)

Licenses

All videos have clear licence information. Nineteen videos were published under CC BY 3.0 DE, twelve under CC BY 3.0 unported, one by CC NC, one CC ND and one CC NC/ND.

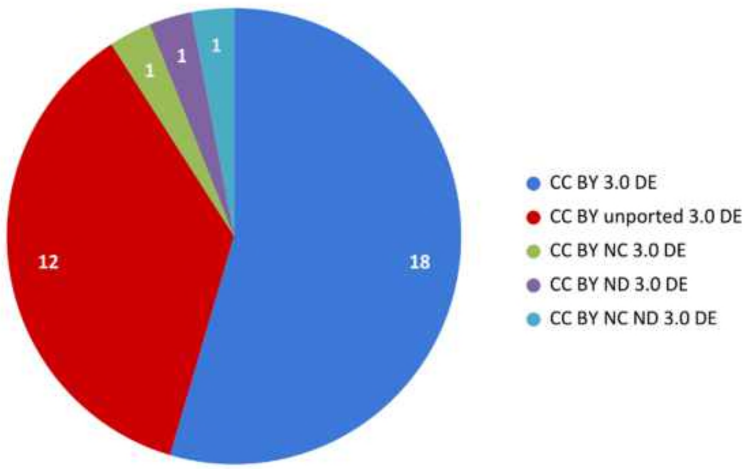

Fig. 2: Licenses (Sample:33)

Intro or Title

Thirty video abstracts had an intro or at least a clear title, three did not.

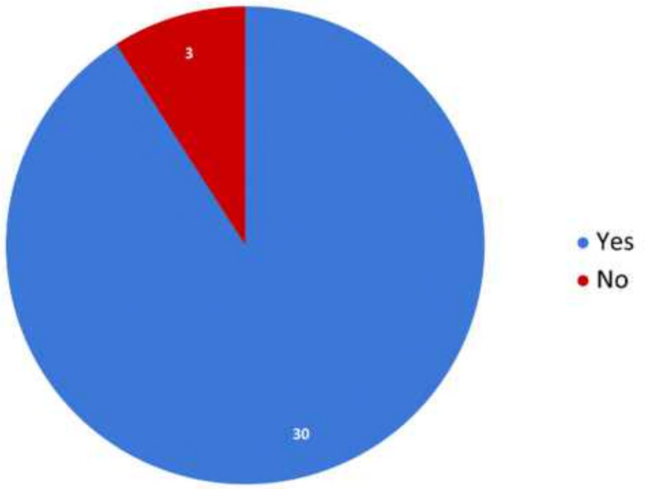

Fig. 3: Intro or Title (Sample:33)

Credit / Paper / Research Data

Only eighteen videos included credits for the paper (either in form of the title or DOI), ten did not have any information or a link to the corresponding paper or article. None of the VA added a link to the underlying research data.

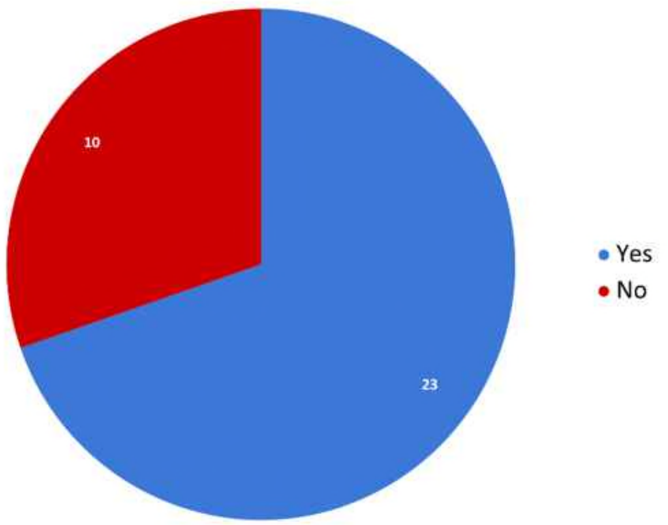

Fig. 4: Credit Paper (Sample:33)

Design Features and Production

Have the authors used scientific data visualizations?

Twenty-five video abstracts included a visualization of their scientific data in the form of models, graphs etc. eight did not make their data visible in their video abstracts.

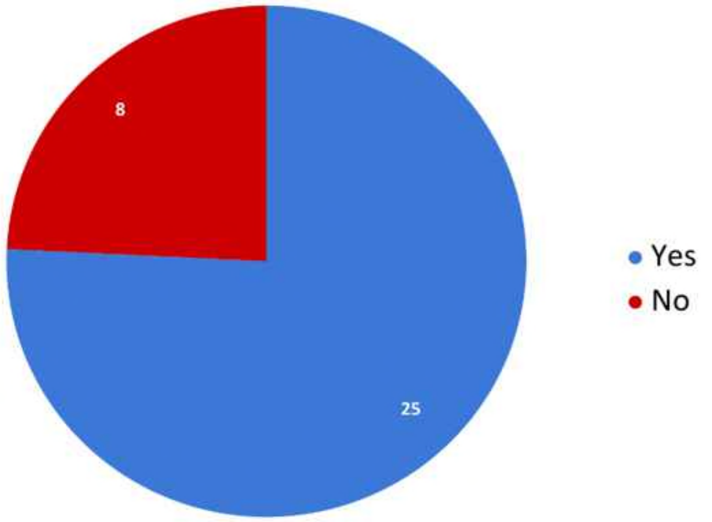

Fig. 5: Scientific Data (Sample:33)

Length

The average length of the video abstracts was 4 minutes.

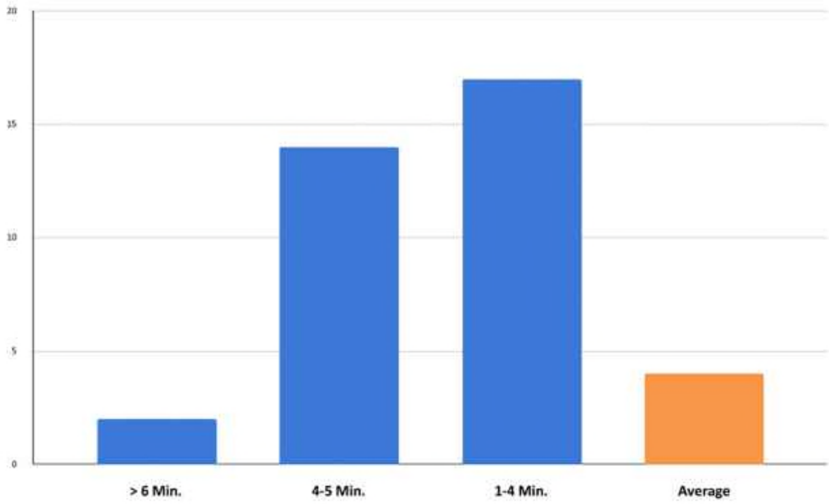

Fig. 6: Length and Average (Sample:33)

Format / Genre

Sixteen VAs used a simple presentation (scenes featuring the authors of the scientific article, category includes all kinds of author(s)'appearance on screen, author(s) talking to the camera, interviews)

Eight used a documentary style (scenes recorded with normal camera, showing the subject of the research acting, footage, reconstruction of experiments, footage demonstrating lab and/or fieldwork

Four used a dynamic presentation. As the name suggests, the focus is on a dynamic style. The authors used several different materials (animation, experiment/observation, documentary/real life, etc.) and made greater use of driving background music. Two videos of that type are under 2:30 min long.

Three used animations (scenes generated with non-linear or analog animation techniques, category includes whiteboard-, stop motion-, 3D-, timelapse animations, as well as screen recordings).

One video abstract was designed in the form of a conversation or interview. The author is interviewed and tells about her research work. In between, scenes of the computer monitor with the open document, the paper, can be seen. The computer monitor was filmed by the camera.

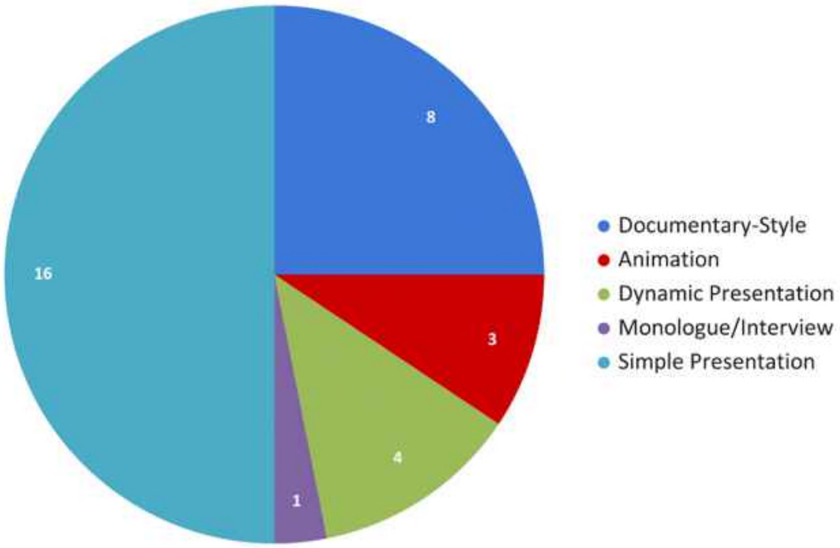

Fig. 7: Format/Genre (Sample:33)

Additional Elements

Additional elements include text (25), graphics / still Images (27), animations (11), scenes featuring authors / presenters (16), interviews / talking heads (16), scenes featuring experiments (8) and documentaries / real life scenes (12).

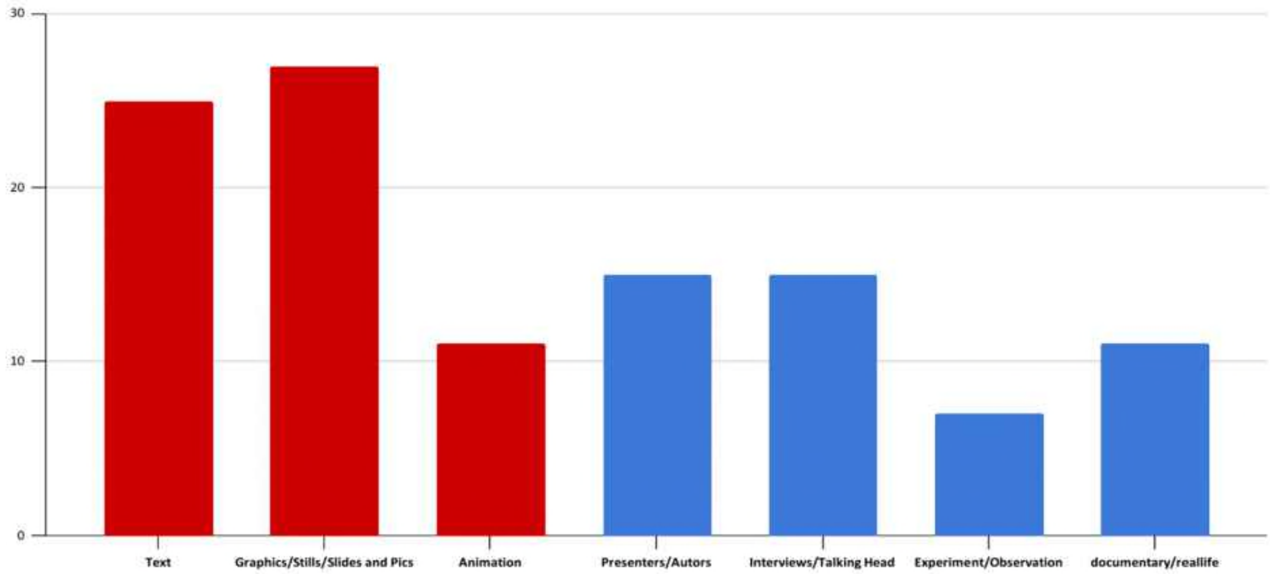

Fig. 8: Additional Elements (Sample:33)

Audio-Quality

Seventeen video abstracts had a good audio quality for the verbal narration, ten a medium, three a bad. Three VA did only use music and not a narration.

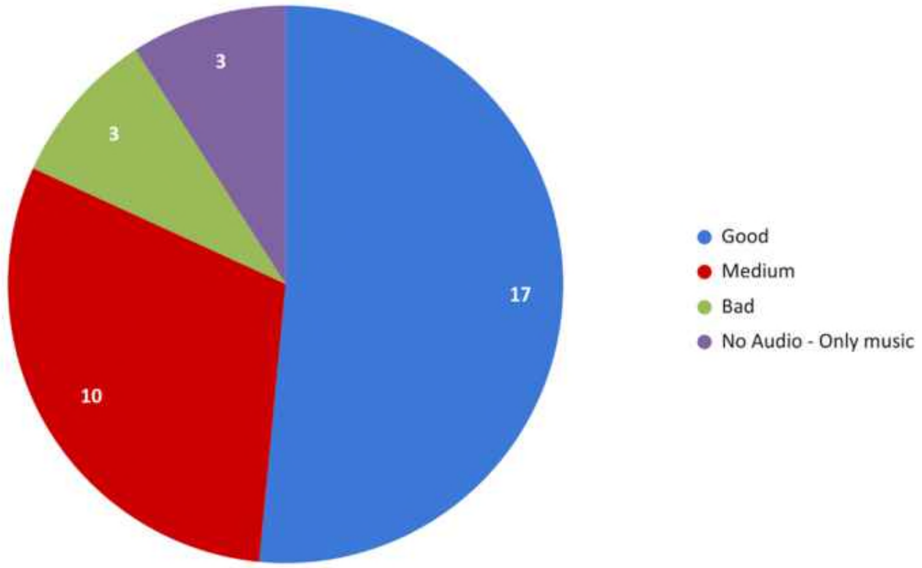

Fig. 9: Audio-Quality (Sample:33)

Conclusion

Since all VAs were published in the science compliant TIB AV portal, all had a DOI, license information, author information, title, publication year, and clear subject attribution in form of metadata.

On average, the videos from our analysis were not longer than 4 minutes (3:55 min.). Most VA did include additional relevant material such as images, animations, and lab or real footage. The majority of the VA entries had medium to good sound quality (82%) and were thus acoustically acceptable. Three videos had no title visible in the video. Most video abstracts used just one presenter/speaker who gave a "classic" simple short-presentation. In these VAs the author is shown on the screen, talking to the camera or giving an interview. Documentary style VAs were the second most common style. These types added animation, experiment/observation, documentary/real life footage and/or background music. Only half of the authors linked to their papers and only three quarters included a visualization of their research data. None of them linked to the underlying research data.

In principle the three major points, which occur in most of the guidelines are followed by the authors. These are:

- A video abstract should not last longer than 4 minutes.
- Inclusion of additional relevant material such as images, animations, and lab footage is strongly encouraged.
- A video abstract must include a soundtrack providing a clear verbal narration of the visual content.

However the results of the study show that there is still a lot of potential in improving video abstracts, especially with regard to formal criteria (e.g. visible title) as well as linking with the according papers and the underlying research data. Strictly speaking video abstracts that do not have a recognizable reference to a scientific article (Credit Paper) cannot be assigned to this genre. Here it would have to be checked whether the video abstract is related to a paper at all.

This data, combined with future quantitative and qualitative research, will hopefully provide new insights into the global study of audio-visual communication of science and help the authors to get more out of their video abstracts. Since we have seen many videos that still have a lot of potential for improvement, we would like to give the following advice to the authors and hope that in the future these will also be taken into account in the guidelines.

- Make sure your VA has a DOI, so that it is sustainably citable
- Make sure your VA has information on the licence for reuse (e.g. Creative Commons[14])
- Make sure your VA includes credits for your paper, best link it via DOI
- Make sure you link to the underlying research data
- Make sure your VA has an Intro and an Outro,
- Make sure you mention all of the authors
- Make sure you share your video on at least one science compliant portal (e.g. TIB AV-Portal), so that it is citable, digitally preserved and connected to research data and paper.

Sample (Research Data)

Full list of video abstracts

Nr.	Title	DOI (Video)
1	Soil lacquer peel DIY: simply capturing beauty	10.5446/40805
2	A system's wave function is uniquely determined by its underlying physical state	10.5446/21893
3	Overview on the open research knowledge graph	10.5446/52261
4	Dynamics of salt intrusion in the Mekong Delta	10.5446/53547
5	TROPOMI measurements and WRF CO modelling to understand extreme air pollution events in India	10.5446/50921
6	Communicating climate change in a 'post-factual' society: Lessons learned from the Pole to Paris campaign	10.5281/zenodo.2662144
7	SPHY-MMF, Coupled Hydrology-Soil Erosion Model	10.5446/37585
8	Transition from electromagnetically induced transparency to Autler–Townes splitting in cold cesium atoms	10.5446/38882
9	A "mental models" approach to the communication of subsurface hydrology and hazards	10.5446/21332
10	Scientific Audiovisual Materials and Linked Open Data	10.5446/17789
11	Magnetically guided multi-coordinate positioning system	10.5446/39650

[14] https://creativecommons.org/

12	Exciton effective mass enhancement in coupled quantum wells in electric and magnetic fields	10.5446/38806
13	Coulomb blockade model of permeation and selectivity in biological ion channels	10.5446/38744
14	Efficiency of the SQUID ratchet driven by external current	10.5446/38751
15	Anderson localization of composite excitations in disordered optomechanical arrays	10.5446/21891
16	Groundwater fluctuations during a debris flow event in Western Norway – triggered by rain and snowmelt	10.5446/53450
17	Spatiotemporal Variability in the Oxidative Potential of Ambient Fine Particulate Matter in Midwestern United States	10.5446/54718
18	Noncommutative correction to the entropy of BTZ black hole based on Lorentzian mass distribution with GUP	10.5446/49798
19	An integrated observation dataset of the hydrological-thermal deformation in permafrost slopes and engineering infrastructure in the Qinghai-Tibet Engineering Corridor	10.5446/53800
20	First Principle of the electronic and optical properties of transition metal dicalcogenide (tmd)	10.5446/49800
21	Feed conversion efficiency in aquaculture: do we measure it correctly?	10.5446/39356
22	On the relative intensity of Poisson's spot	10.5446/38422
23	Voice-Sensitive Regions in the Dog and Human Brain Are Revealed by Comparative fMRI	10.5446/32194
24	Cyclotron and Synchrotron: some applications	10.5446/50119
25	Exploring dispersal barriers using landscape genetic resistance modelling in scarlet macaws of the Peruvian Amazon	10.5446/32196
26	EPR-based ghost imaging using a single-photon-sensitive camera	10.5446/39018
27	The role of edible mushrooms in the green synthesis of CdS quantum dots	10.5446/49858
28	Obtaining the Feynman path integral through the brownian motion description	10.5446/49804
29	Conceptual design of the beam source for the DEMO Neutral Beam Injectors	10.5446/21890
30	Assessing ExxonMobil's climate change communications (1977–2014)	10.5446/39391

31	The search for Bose–Einstein condensation of excitons in Cu2O: exciton-Auger recombination versus biexciton formation	10.5446/38742
32	Structural analysis and phase transition study of the compound Pb(x) Cd(1-x)TiO3: by X-ray diffraction and Raman spectroscopy	10.5446/50261
33	Development of the RFI monitoring application for the BINGO radio telescop site	10.5446/50109

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