Journal of Cleaner Production 294 (2021) 126287

Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

The virtues of virtual conferences

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ARTICLE INFO

Article history:
Received 29 June 2020
Received in revised form
20 January 2021
Accepted 3 February 2021
Available online 9 February 2021

Handling editor: Dr Sandra Caeiro

ABSTRACT

In this comment, we share our experiences from organizing the ICTA2020 Virtual Conference on Low-Carbon Lifestyles and argue that virtual events have potential to become the new norm among academics. We present an overview of tools that can be used and support our arguments with results from a feedback survey that was filled out by the participants of our conference. Main challenges for virtual conferences are the facilitation of informal spaces for social interaction and the prevention of 'screen fatigue'. Advantages are that they can increase societal outreach, improve the academic quality of discussions, create new opportunities for networking, and provide an inclusive environment.

1. Introduction

The COVID-19 pandemic has created opportunities to develop new practices. Before the outbreak, we had planned to organize ICTA2020 – a scientific conference on the drivers, impacts, and policies of low-carbon lifestyle changes – as a physical event in Barcelona. While we were aware that physical meetings have a large environmental impact (Le Quéré et al., 2015; Holden et al., 2017; Sanz-Cobena et al., 2020), we could not imagine a virtual format to be successful. We were following what was normal.

Forced to cancel our plans due to the pandemic, we decided to change the format towards a virtual conference. We wanted to recreate the experience of physical conferences with their stimulating talks and workshops, discussions over cups of coffee, and opportunities to meet new people. Our experience showed us that virtual events have significant advantages beyond just environmental aspects. Online spaces can increase societal outreach, improve the academic quality of discussions, create new opportunities for networking, and provide an inclusive social environment.

In this commentary, we report on the various benefits and disadvantages of a virtual conference and describe the tools that we used. We support our arguments with the results of a feedback survey filled out by 38% of the 404 conference participants. We argue that virtual events are not only of interest in times of confinement and other social distancing measures, but that they have potential to become the new norm among academics, i.e. the 'new normal' of international academic events.

2. Overall evaluation

To begin with the overall picture: According to 99% of the survey respondents, the event was a success (slightly to very positive), with 50% among them rating it as very positive and more than 84% claiming to have a more positive opinion about virtual conferences now.

An important condition for this positive outcome was arguably the prior communication between organizers and participants. Upon realizing that an online conference would be the only option amidst the COVID-19 crisis, we contacted all speakers and applicants to ask whether this would be in their interest and what formats they would prefer. We took this feedback into account when designing the virtual event, as is also recommended by the 'Cercedilla Manifesto' on sustainable scientific meetings (Sanz-Cobena et al., 2020).

Table 1 describes the tools that we used, their purpose, as well as participants' feedback. As can be seen, all tools were evaluated as positive while the webinar-style conference rooms (Section 2) were the most popular element of the event. Table 1 further presents open-source alternatives for future organizers to consider.

Fig. 1 shows an overview of the participants' opinions regarding the advantages and disadvantages of virtual conferences. Attendance costs, the amount of time to attend, and the inclusivity of different kinds of people are rated as the three strongest

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https://doi.org/10.1016/j.jclepro.2021.126287

Table 1
Overview of the three virtual conference spaces, the tools that have been used, the participant feedback, and open-source alternatives for future conferences to consider.

Space	Purpose	Tools used	Participant feedback[1]	Open-source alternatives
Forum/Conference Venue	Private and public interactions between participants	Discord	6.13/7 Positive: 91%	Riot.im, Rocket.chat
Lecture Hall/Conference Rooms	Hosting live talks, workshops, and plenary sessions	WebinarJam	6.25/7 Positive: 96%	Big Blue Button, Jitsi
Social Areas/Virtual Bar	Mingling in a relaxed environment (e.g. at lunch breaks or in the evenings)	Zoom Breakout Rooms	5.37/7 Positive: 73%	Big Blue Button, Jitsi

Notes: [1]Average result on a 7-point Likert scale from "very negative (1) to very positive (7); "Positive" includes the response options "slightly positive", "positive" and "very positive".

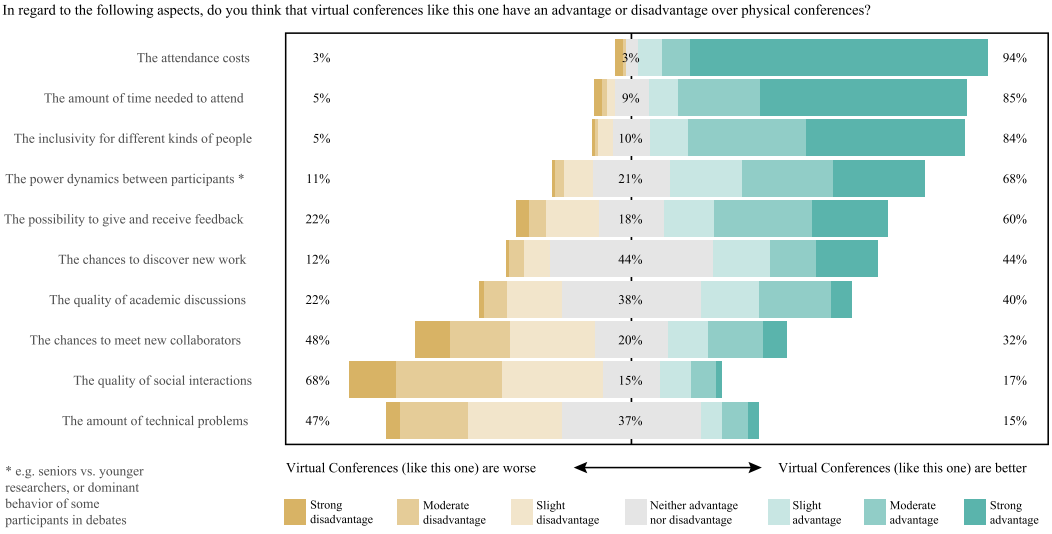

Fig. 1. Survey results regarding the difference between virtual and physical conferences.

advantages. On the contrary, the quality of social interactions, the number of technical problems, and the chances to meet new collaborators were rated as the biggest disadvantages, compared to physical conferences. These and other aspects are discussed further in the subsequent sections.

3. Communicating research

Academic conferences allow researchers to present their work, discuss latest developments in their field, and receive valuable feedback. To replicate these aspects, we designed our conference around two virtual spaces: a webinar platform that served as a 'lecture hall' for talks and plenary sessions, and an online forum that served as a virtual venue for the conference, where people could seek help, interact, and discuss between the talks.

Our experience showed that the virtual format makes it easier for researchers to get in touch with an interested audience. We had eight times more registrations for the virtual conference than for the physical one, and 49% of the survey respondents indicated that they would not have attended in person.

Another advantage is the amount of feedback, as there is no limit on how many reactions can be given in the webinar chat. Moderators can choose the most interesting questions and co-authors of the speaker can participate by responding in the chat. Instant feedback is further facilitated with live polls. On average, the participants rated the quality of academic discussions as comparable to regular physical conferences, while 60% saw an advantage in terms of possibilities to exchange feedback (see Fig. 1).

Furthermore, as talks are recorded, participants can still view and discuss them afterwards in the forum where all prior conversations of the chat are visible, and the presenters are still available for questions. Thus, people can attend sessions that they originally missed (e.g. because of parallel sessions or time zone differences). The availability of recordings after the sessions was the best-rated feature in the survey, with 94% of the respondents rating it as slightly to very positive.

Finally, the possibility to pre-record their presentations was rated as positive or very positive by 80% of the presenters who responded to the survey. This feature has three advantages. First, pre-recordings can be used as a backup presentation if there are technical problems. Second, presenters can record in a calm space and redo the recording until they are satisfied, which can improve the quality of presentations. Third, if participants choose to play their pre-recording, they can think about questions in the chat before the end of the presentation, which can give rise to better responses.

4. Networking

Another important purpose of conferences is the social interaction between participants. This is the biggest drawback of the virtual format (Reshef et al., 2020). The quality of social interactions ranked lowest among all conference elements (see Fig. 1), with 13% of the respondents seeing a strong disadvantage in comparison to physical conferences. However, our experience also shows positive aspects and points to room for improvement.

One advantage is that the forum is available before and after the conference. Participants can maintain a conversation with several people at the same time and create private groups for discussion via

text, audio, or video. Some participants mentioned to us that it was easier to start conversations with influential researchers and keynote speakers in the forum than what they were used to from physical conferences.

Another successful feature of the conference was the introduction channel (rated slightly to very positive by 83% of the survey respondents). There, participants could introduce themselves and share their own interests and work. This was helpful to get an overview of the participants and identify potential collaborators.

Creating a casual environment for informal exchanges was more difficult. We attempted to address this through video chats in smaller breakout groups to emulate a restaurant during the lunch break and a bar at the end of the conference days. This feature was appreciated, with 59% of the participants rating it as slightly to very positive and only 10% as slightly to very negative. However, in terms of quantity, only a small fraction of participants (27% of the respondents) joined at least one of the social sessions.

Another challenge that was expressed by some participants is the difficulty of staying concentrated throughout the event. This may reflect the experience of many teleworkers who are currently confined, namely that virtual communication can be more exhausting than face-to-face interaction. This is also known as 'screen fatigue', and could be improved by extending the event over a longer period of time. Such an extension could not just enable more breaks for relaxation, but also raise the inclusivity for people from other time zones.

5. Social and environmental virtues

Virtual conferences not only reproduce many characteristics of physical ones, but they also come with benefits of their own. Most notably, they have a much smaller environmental and climate impact, while they are reaching more people. A virtual conference eliminates the environmental impacts of travel and large venues, although emissions associated with IT infrastructures are not negligible (Houston and Reay, 2011). While calculating the exact emissions saved is beyond the scope of this commentary, other cases have shown that the environmental advantage of virtual events is significant (Klöwer et al., 2020; Neugebauer et al., 2020).

Furthermore, virtual events are more flexible and easier to access. Eliminating the need for travel facilitates the attendance of researchers with family or time constraints. The costs per participant of virtual events is much lower than for physical conferences (from 135€ to 5€ in our case[1]). This enables participation of interested people with lower financial means from various disciplines, including non-scientists such as journalists or practitioners. However, the necessity of a stable digital connection can also be a barrier for some.

Finally, our experience showed that virtual conferences can create a more inclusive and safe space to participate in. As can be seen in Fig. 1, 85% of respondents saw an advantage over physical conferences in terms of inclusivity, and 68% in terms of the power dynamics between participants (e.g. senior vs. junior researchers, or dominant behavior of some participants in debates). This is not to say that virtual spaces are generally free of toxic behavior, which organizers still have to be prepared for to address and mediate.

6. Conclusion

The ICTA2020 virtual conference was able to recreate the main characteristics of a physical event. Beyond that, virtual conferences can be more desirable than a physical ones in terms of accessibility, inclusivity, environmental impact, and academic quality. However, it also comes with several disadvantages, especially regarding informal interaction and screen-fatigue. The facilitation of informal spaces for social interaction remains a central challenge for future events of this kind. Still, thanks to the numerous benefits highlighted in this commentary, virtual conferences have potential to become the 'new normal' of international academic events.

[1] The avoided costs include catering and social activities, rents for spaces, travel expenses and accommodation for keynote speakers, and an originally planned subsidy for the use of environmentally friendly travel modes.

CRediT authorship contribution statement

Joël Foramitti: Writing - original draft. **Stefan Drews:** Writing - original draft. **Franziska Klein:** Writing - original draft. **Théo Konc:** Writing - original draft.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

ICTA2020 was funded by the ICTA-UAB "Maria de Maeztu" Unit of Excellence (MDM2015-0552). We further acknowledge the support by the ERC advanced-grant project EVOCLIM: Behavioral-evolutionary analysis of climate policy (grant agreement 741087), a scholarship from "la Caixa" Foundation (ID 100010434, 258 LCF/BQ/IN17/11620039), and the Catalan governmental agency AGAUR.

We further want to thank all organizers of ICTA2020: Verónica Arcas Pilz; Oriol Baeza Martinez; Jeroen van den Bergh; Rebekah Breding; Fulvia Calcagni; Esteve Corbera; Filippos Exadaktylos; Xavier Gabarrell; Alexandra García Gutiérrez; Maite Jiménez Batista; Isabel Lopera Martínez; Graham Mortyn; Nick Martin; Maica Nogales Malagón; Felipe Parada; Ivan Savin; Aljoša Slameršak; Ana Terra Maia; Patrizia Ziveri.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jclepro.2021.126287.

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