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COVID-19 and the academy: It is time for going digital

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ABSTRACT

In many countries, the lock-down due to the COVID-19 pandemic triggered discussions on the use of digital interaction formats for academic exchange. The pace with which researchers adopted digital formats for conferences, lectures, and meetings revealed that currently available tools can substitute many of the physical interactions in the workplace. It also showed that academics are willing to use digital tools for scientific exchange. This article sheds light on scholars' experiences with digital formats and tools during the pandemic. We argue that digital interaction formats increase the inclusivity of knowledge exchange, reduce time and costs of organizing academic interactions, and enable more diverse workspaces with geographical and temporal flexibility. However, we also observe that digital interaction formats struggle to reproduce social interactions such as informal discussions, raise new concerns on data security, and can induce higher stress levels due to the blurring of the boundaries between work and private spaces. We argue that digital formats are not meant to substitute physical interactions entirely, but rather reshape how research communities operate and how academics socialize. We expect hybrid formats to emerge, which combine digital and physical interaction formats, and an increase in digital interactions between geographically distant working groups. We conclude that the time has come for digital interaction formats to be part of a new regime in the field of academic exchange.

It is time for going digital

The shock caused by the COVID-19 pandemic provides a window of opportunity for the integration of digital interaction formats (see Box 1) in the field of academic exchange. The pace with which academics adopted digital tools for conferences, lectures, and meetings during the lock-down revealed that currently available technologies can substitute many physical work interactions adequately. It also showed that academics are willing to use the rapidly increasing number of digital tools for scientific exchanges (see Table 1). But, even before the pandemic, growing concerns about resource waste and the increasing carbon-footprint of scholars had triggered calls for more sustainable forms of academic exchanges [1,2]. Despite these calls, academic travel behavior continued to contradict research agendas [3], and physical conferences are announced to take place after the lifting of international travel bans. However, scholars' experience with digital formats and tools during the pandemic revealed a broader range of positive and negative impacts of going digital. In the following, we reflect upon six of the most prominent ones and argue that the time for digital interaction formats has come. Throughout this article, we draw upon our experience organizing the first digital conference for the Network of Early career researchers in Sustainability Transitions (NEST) and a subsequent survey with all participants.

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Table 1
Summary of common academic interactions and related examples of digital formats.

Interaction	Main characteristics	Digital formats and tools
Lecture, course	Highly formal interaction mainly from one speaker to many attendants	Webinar (e.g., Zoom webinar, GoToWebinar), e-learning platforms (e.g., OpenedX, Udemy)
Seminar	Highly formal interaction from one or a few speakers to a few attendants	Webinar, video-streaming (e.g., Zoom, YouTube, Skype, GoToMeeting)
Interview	Formal interactions. One-to-one or small groups	Video-streaming, automated video interviews (e.g., Sonru)
Workshop	Formal interaction with inputs to and from a few participants. Diverse formats, often aimed at active engagement	Video-streaming, web-based text processors (e.g., Google Docs, Microsoft Sharepoint), online facilitation tools (e.g., IdeaFlip, Stormz)
Team meeting and group working	Formal interaction among a few participants	Video-streaming, web-based text processors, web-based project organization and communication tools (e.g., Trello, Asana, Slack, Microsoft Teams)
Conference	Highly formal and informal interaction. Combines multiple formats, typically involving tens to thousands of participants	Video-streaming, online facilitation tools, web-based event tools (e.g., Sched)
Networking	Informal interactions. One-to-one or small groups	Video-streaming

Definition: Digital interaction formats enable the exchange and collaboration between individuals and working groups that are spatially distant from each other. Digital interaction can include both real-time or pre-recorded formats. In this perspective, we focus on the interaction formats for academic exchanges that had to be adapted and transformed during the Covid-19 pandemic (see Table 1).

First, digital interaction formats can be more inclusive than physical events as they lower the barriers to participating. For example, early-career researchers often lack the financial means to join physical conferences. This is even more problematic for researchers from the Global South as most conferences are organized in Northern America and Europe, exacerbating traveling costs and time. However, while digital events lower traditional barriers, others arise. For instance, participants from distant countries might have difficulties joining live virtual sessions due to time zone differences. Another new barrier could be the access to individual computers, webcams, and a stable internet connection, although the pace with which researchers adopted digital interactions during the COVID-19 pandemic suggests that most researchers have access to the necessary IT infrastructure. It is important to acknowledge, however, that the higher inclusivity of digital conferences does not guarantee a richer diversity in digital events, particularly, if the organizing research community is geographically concentrated. Therefore, going digital can make academic exchanges more inclusive but is only the first step to enhance the diversity of the research community.

Second, digital formats lower the cost and time required to organize academic interactions and diminish food, plastic, and paper wastes. The direct cost of organizing a digital interaction is lower than a physical event because traveling, accommodation, and catering expenses disappear while the additional costs for hosting webinars are marginal. In the NEST 2020 conference, expenses decreased by more than 90% of the initial budget when moving from a physical to a digital event. In addition, organizing a digital event involves significantly fewer working hours than a physical one. For example, booking the travels and accommodation for keynote speakers, preparing the conference venue, and organizing social events are time-intensive tasks exclusive to physical conferences. Finally, when going digital, conference organizers can avoid the food, paper, and plastic wastes from catering, beverages, and printed material used during physical events.

Third, digital tools enable formal interactions among researchers but struggle to replicate more informal discussions. Knowledge exchange, particularly in the form of feedback and comments, is highly valued at academic conferences. In digital conferences, knowledge exchange works as well as during physical conferences, in some cases even better. For example, meeting chats can provide a platform to collect, store, and share questions and comments. However, social interactions during coffee breaks and conference dinners are much harder to reproduce in a virtual environment. This difficulty poses a challenge for knowledge exchange across research topics and through less established personal links between participants. Particularly for interdisciplinary communities, creating bonds between young scholars across disciplines and topics is of immense value. Ideas on how to address these issues for digital events range from random or topic-centered speed “dating” to after-conference drinks in virtual party rooms. Yet, we see a need for more innovation in digital interaction formats to improve social interaction.

Fourth, using digital tools for academic interaction can affect personal well-being, happiness, and mental health. The extreme situation during the Covid-19 pandemic required most researchers to work from home and to restrict physical social interaction. Such lock-down can induce higher stress levels and jeopardize personal well-being [4] due to increasing loneliness, blurring boundaries between work and private space [5], and a lack of in-person collaboration. Particularly for young PhDs, who often build their social lives around work or move to a new country to start their research, the mental toll of isolation might add up in such extreme situations. Therefore, academics have to be alert towards the consequences for individuals' well-being when switching fully to digital interaction.

Fifth, using digital tools for academic interaction raises new issues on data security. In particular, the recent media attention paid to the phenomenon of 'zoombombing' [6]—the intrusion of trolls into non-password-secured digital meetings—triggered concerns on the privacy and long-term functioning of digital formats and left its mark on the recent hype around video-conferencing tools.[6] While developers and users of digital tools quickly learned how to address such unanticipated risks, other data security issues might be more fundamental. For example, concerns remain about the power of the private sector and the resulting dependence of academics. Just recently, Zoom suspended the accounts of members of the Hong Kong freedom movement, bowing to pressure from the Chinese government [7]. Such engagement in ethically and morally questionable practices stands in stark contrast to scientific integrity, while new dependencies on large private companies thwart recent open-access movements of universities and scientific communities [8]. Ultimately, this points to the importance of compliance considerations when choosing digital interaction tools.

Sixth, rebound effects challenge carbon emission savings of going digital. Reducing energy use and the associated carbon (equivalent) emissions lies at the core of the appeals for replacing flying with digital interaction formats. The environmental impact of academic conferences, which stem mostly from flying [9], routinely sparks debates about ethically correct traveling behaviors of researchers. While many studies on the individual case level highlight the potential to reduce energy consumption (e.g., [10]), a recent review challenges these

[6] https://www.bloomberg.com/quote/ZM:US

findings, outlining that economy-wide energy savings are most likely modest and, depending on rebound effects, might even be negative or non-existent [11]. Uncertainties of rebound effects relate to the extent to which digital conferences cause increases in non-work travel and home energy use that may outweigh the gains from reduced work travel and office energy use. Going digital, therefore, contributes to energy savings the most if it is embedded in a broader transition to more sustainable traveling.

To summarize, a broad range of new communication tools is paving the way for academia to go digital. The COVID-19 crisis revealed that academics are willing to and capable of using them for scientific collaboration. Existing digital tools are well-suited to enable most academic interactions such as lectures and seminars. They can increase the inclusivity of academic exchanges, reduce the time and costs of organizing academic interaction, save resources, and enable more diverse workspaces with geographical and temporal flexibility. However, we also observe that digital formats struggle to reproduce social interactions such as informal talks, raise new concerns on data security, and can result in higher stress levels and reduced personal well-being. Also, the extent of carbon emissions savings from going digital is yet unclear. We conclude that digital tools are not meant to substitute physical interaction entirely in the future, but rather reshape how research communities organize their interactions. For example, instead of one annual physical conference, we expect hybrid or additional digital formats, and, instead of researchers commuting to distant places for lectures and seminars, we expect geographically separated working groups that are connected online. Ultimately, going digital provides the opportunity for more knowledge exchange, which is particularly important for young scholars, allowing them to become more confident while presenting their work, get feedback on early-stage research, position themselves within research communities, and learn from multiple perspectives. Recognizing these benefits, most NEST 2020 participants said that they would participate in more conferences a year if it did not require them to spend more time and resources on traveling.

The time for digital new interaction formats is now. Digital interaction formats have successfully substituted physical conferences during the COVID-19 pandemic and will be part of a new regime in the field of academic exchange. We expect a fundamental change in how academic communities operate and how academics socialize.

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.

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