ACADEMIC CONFERENCES IN A COVID-19 ERA: A PATH TOWARDS REINVENTION

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Abstract - The challenges raised by the COVID-19 outbreak in 2020 were by far among the most challenging and uncertain times with a substantial impact on many industries. One such domain was related to academic conferences, where in-person events used to be the standard organizing form. Faced with the impossibility to organize in-person meetings anymore, topped by the interdiction related to across-borders traveling, this industry had to turn to technology to keep on existing. Based on a content analysis approach, the current paper aims to evaluate how academic conferences have changed since the beginning of 2020 and learn from this shift. Significant results show a focus on the new challenges for organizing virtual conferences, significant individual challenges that academics have been going through since the COVID-19 outbreak, and the future of academic conferences that are likely to be focused onorganizing a perfectly balanced hybrid scientific events.All these results point to an industry that,even though it was almost entirely focused on the face-to-face format before the pandemic (mostly because participants valued the most social interaction), found internal resources to shift very fast to and 100% virtual format.

Keywords - Academic Conferences, COVID-19, Reinvention

I. INTRODUCTION

The COVID-19 outbreak in 2020 has completely changed our lives in every aspect of it. The uncertainty it brought about in our own lives caused a new level of stress and anxiety,which was felt across all industries. The academic environment was not spared of such an impact. In an environment where we praise collaboration and quick sharing of ideas, the COVID-19 outbreak seems to have a global impoverishment of science and higher education [1]. It was one of the most affected areas with major shifts that needed to be implemented very fast. One of those significant shifts relates to how academics managed to stay involved in research projects, write articles, attend academic conferences, and expand their scientific impact. This paper aims to discover how academic conferences have shifted to adapt to the new challenging times. After a short overview of the literature review, a content analysis approach will uncover these changes.

II. CHANGES IN THE ACADEMIC CONFERENCE LANDSCAPE

Working in a fast-changing environment while experiencing a high level of uncertainty had adverse outcomes for most academic staff. In a study conducted by Gewin [2], she discovered that 70% of the academic staff declared that they were stressed in 2020 (as opposed to only 32% in 2019). As a report by De Gruyter [3] mentions, between May and December, 2020 academics have been through more pressure and not less, as the challenges have intensified towards the end of 2020. It seems like daily challenges related to various topics: logistical, spatial, physical, emotional, intellectual,can accumulate over time to produce noticeableeffects on a scholar's work that can amplify a much more considerable divergence among individuals on various levels [4]. As a general principle, the teachers in a work-from-home format (WFH) had to master very fast the digital learning technology while keeping the same teaching quality and targets [5].Like students, academics may experience adverse psychological effects generated by feelings of isolation, anxiety, stress, insomnia, confusion, boredom, and anger [6]. This increased level of stress and pressure into changing the day-to-day work patterns (moving to forced e-learning, for example) might instead provide many negative experiences with digital formats,thus creating barriers for their furtherdevelopment across academia[7].On top of the significant changes in managing the teaching tasks, scholars worldwide had to adapt to attending virtual academic conferences instead offace-to-face conferences. We define it as a digital format for academic conferences, including video-streaming, online facilitation tools, and web-based event tools (e.g., Sched)[8].

Before the COVID-19 outbreak, there were concerns about the shortcomings of face-to-face conferences, including the lack ofequity and inclusivity of participants and speakers in termsof sex, ethnicity, geographical setting, physical ability,health, and career stage[9]. Also, long before the pandemic, growing questions about resource waste and scholars' rising carbon footprint prompted demands for more sustainable ways of intellectual exchange [8]. For example, 12.5 percent (one eighth) of academics are responsible for half of all flight-related CO2 emissions resulting from conference (or other academic event) attendance, demonstrating the environmental impact of face-to-face conferences, which is much more of a concern because the environmental impact is not offset by increased academic performance ('above a certain academic level there was no correlation between the number of flight miles and the academic performance of the individuals')[10]. So, even though

before 2020, there was skepticism about bringing these activities online, believing that the importance of conferences could not be established online [11], it looks like a crisis was all we needed to make academic conferences also work in the virtual environment.

The upside of virtual and digital formats includes improving information sharing inclusivity, minimizing time and costs of coordinating academic exchanges, and allowing more diverse workspaces with regional and temporal versatility [8]. Also, since at academic conferences, knowledge sharing, especially in reviews and remarks, is highly valued, this information sharing performs just as well, if not better, in interactive conferences than it does in actual conferences[8].Other advantages of virtual conferencing include increased mobility for those who would otherwise be unable to attend due to financial or personal reasons. [11]. When referring to the advantages of online conferences for organizers, we could mention fewer challenges with travel, lodging, food, and beverages, together with a diminished conference's carbon footprint [12]. To these elements, we can also add the ability to make content available for replay easily and include speakers who might not traditionally be spotlighted at physical meetings(due to either travel limitations or the relative lack of emphasis on trainee work), significantly reduced(if not eliminated) costs of attendance[13]. So, decarbonization, cost-saving, contribution to amplifying social learning, and leveraging technologies for expanding learning chances are just a few benefits to consider when choosing a virtual conference [14].

A few months into this format (online conferencing), and scholars argue that they dislike online conferences since they are skeptical of online formats' potential to replicate the interactive, networking, and collaborative elements of face-to-face conferencing [3,11]. The same idea is also issued by Schwartz et al. [8]. They mention that virtual conferences fail to replicate social experiences like casual chats, pose new data protection questions, and increase tension levels due to the blurring between work and personal spaces [8]. On the conference's organizing part, organizers mention that hosting an online conference is especially challenging for creating a socializing context for participants, especially for those who live in different time zones [12].

As a result, attendance is declining, particularly among academics who have limited time[3]. In an attempt to make virtual conferences more appealing to participants, a solution might relate to system designers bringing features that help participants create a sense of social presence (encouraging involvement, participant-centered growth, and engaging conference atmosphere [15]), groupcohesion, and group efficacy virtual conferences and thus facilitatinghigher academic performance even though they may not have face-to-face interaction in the offline world[16].For example, live broadcasting, interactivity (e.g., raise a hand, text/voice chatting), and productivity (screen sharing, annotation, coediting) are just a few tools that can increase the level of human contact significantly in a virtual setup [15].

We cannot ignore the fact that despitetechnological barriers to online participation, especially for low- and middle-income countries, hosting conferences online is an essential move toward equalizing access and inclusion in science and professional fields[11]. Even more than that, online conferencing might be a powerful tool of bringing balance between genders: those with caring responsibilities (especially women) tend to have smaller mobility and therefore have a narrower range of opportunities to make their voices heard in the research industry [2]. Therefore, online conferencing seems to tackle issues related to the geographical remoteness of research actors and organizationsthat up until now used tohave limitedmobilityopportunities [17].All in all, virtual conferences proved to bemore economical, more environmentally friendly, and more inclusivewhen compared to real-life events[18].Solutions like virtualization, face-to-face national sub-conference, or involving ECR (early career researchers) for organizing and session chairing might prove very valuable in this context [19]. By balancing the benefits of both formats, maybe a mixed balance betweenvirtual and in-personconferences might be the bestway forward[18]. As a result, holding international conferences online, or at least providing an online component as part of a 'hybrid' model, improves the ability of conferences to fulfill the moral imperatives of the environmental community by tackling the climate crisis and some of the field's structural injustices[11].In the post-COVID era, hybrid conferences may wellbecome the new reality, striving for full, active, and complementaryparticipation of attendees and speakers both on-site and at a distance[9].

III. RESEARCH: METHODOLOGY AND RESULTS

A. Methodology

A content analysis was developed to uncover the most critical growing trends relating to academic conferences' transition to the virtual format due to the COVID-19 outbreak. The same articlesexamined for the current state of the literature were also examined for this purpose. The following criteria were used to determine if a paper could be included in the examined corpus: publishing dates in 2020 or 2021, availability in scholarly databases such as ScienceDirect, Scopus, and Elsevier, and the paper's subject should be linked to one of the following keywords: "virtual," "academic," "conference," and "COVID-19." This method yielded a corpus of 19 articles with a total word count of 79928.The AntConc software (developed by Laurence Anthony, AntConc is a

corpus analysis toolkit for concordance and text analysis) was used to analyze the resulting corpus. The significant results are presented in the following section.

B. Results

When looking at the most popular words in this corpus, aside from connectors, we discover that the two most popular concepts are related to 'learning' and 'online' (in this order). Therefore, we can argue that no matter the platform's format, academic conferences are learning moments for participants, thus arguing for the need for making this growing space available for teachers across theworld as a way to keep on investing in the quality of our present and future teachers.

When looking at the significant challenges when tackling the area of a conference in the middle of the COVID-19 outbreak, we discover that 'organizers', 'attendance', 'formats', and 'funding' are among the most popular (as it can be seen in Fig. 1). Based on these elements, we can argue that this new format might have brought more challenges on the organizers' part than on the participants' part. Participants likely had an easier transition towards an online format for academic conferences since this transition was already set in motion for the teaching side of their career.

The focus on the perks of the virtual setup, as well as various mentions of tools aimed at tackling the shortcomings of a virtual world (as it can be seen in Fig. 2), might also point to the increased focus laid on the difficult times that conference organizers have had since transitioning to an online setup for their event. In this context, a new term arises in the form of 'virtual co-presence': 'Cultivating good virtual co-presence pushes us to think about how the good life lived-at-a-distance can be facilitated for the many, and not just the few' [17], such an outline offers a glimpse on the optimistic view of the positive outcomes of the pandemic outbreak.

Fig. 3 shows various ways of focusing on 'outcomes' in this corpus. Based on these results, we discovered a preoccupation for the mental and psychological outcome and effect on the teachers, usually acting as both participants

Total No. of Cluster Types 240 Total No. of Cluster Tokens 389

Rank	Freq	Range	Cluster
1	24	6	conference on
2	11	5	conference and
3	10	3	conference was
4	8	3	conference is
5	8	4	conference organizers
6	7	3	conference attendance
7	6	3	conference online
8	6	1	conference stage
9	6	3	conference. the
10	5	1	conference series
11	4	1	conference formats
12	4	3	conference funding
13	4	3	conference in
14	4	1	conference survey
15	4	1	conference to

Fig. 1: Most common clusters, including the word 'health' (Source: Corpus analysis using AntConc)

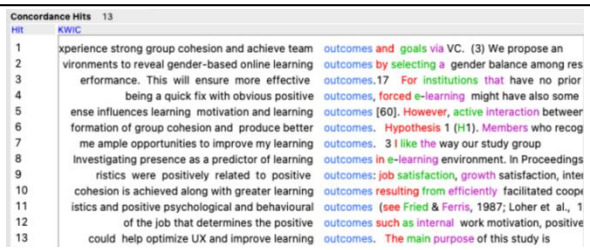
Concordance Hits 238

Hit	KWIC
1	ors and Psychological States in a Virtual Academic Conference Author(s): Jiun-Yu Wu,
2	rules for creating a brand-new virtual academic meeting (even amid a pandemic). P
3	le rules for creating a brand-new virtual academic meeting (even amid a pandemic) 2,3
4	le rules" for creating a brand-new virtual academic meeting serving as a useful blueprint
5	a blueprint for the design of new virtual academic meetings, especially in the absence of
6	ss of jurisdiction, and facilitating virtual access to conference and networking opportunities
7	ohesion, and performance vary in virtual and face-to-face teams. In Proceedings
8	José, M.; Ferreira, C.M.; Serpa, S. Virtual and Face-To-Face Academic Conferences: Comparison
9	ue. Aiming for a balance between virtual and in-person conferences might be the
10	o online learning situations using virtual applications in various fields and disciplines. I
11	OVID-19 scientific conferences: virtual becomes the new reality When the World
12	ition. 4.4. Task In this study, the virtual class was conducted as an online class
13	lace. Online platforms provided virtual classrooms as well as media for innovative
14	e first prospect—cultivating good virtual co-presence in a less mobile world—
15	3.1. Prospect 1: Cultivating Good Virtual Co-Presence in a Less Mobile Era 3.1.1.
16	to think about how the nature of virtual co-presence in the workplace might be
17	s regarding possibilities for good virtual co-presence. Moreover, I highlight those issues
18	e virtual sphere. Cultivating good virtual co-presence pushes us to think about
19	Engelbeck, G. Requirements for a virtual collocation environment. In Proceedings of the in
20	'normalising" the extended use of virtual communication going forward—will require some tho
21	e of material foundations, such as virtual communication systems in sustaining "long distan
22	r mobility, and the importance of virtual communication systems in sustaining networks are
23	ka, L.; Lord, G. Social presence in virtual communities of foreign language (FL) teachers. Sy
24	G. Enhancing Group Cohesion in Virtual Communities of Practice. In Proceedings of the 20
25	able to attend in person, thus the virtual concept gains a lot of value. Aiming
26	earned organizing the PAM 2020 virtual conference. ACM SIGCOMM Computer Communication Re

Fig. 2: Collocations using the word 'virtual' (Source: Corpus analysis using AntConc)

and organizers for academic conferences. Therefore, we discover that even when evaluating the world of scientific conferences, there is still a focus on health issues, a focus specially generated by increased awareness of the need to protect and take good care of our health during a worldwide health crisis.When taking into account the fact that there is a valid 'relationship between job characteristics and positive psychological and behavioural outcomes' [7], we can argue that this is yet another proof of the need for clarity, certainty, and predictability in the professional life of a teacher in order for that teacher to thrive and deliver educational experiences for their students at its best. Nonetheless, individual characteristics of teachers might be predictors of their success or lack of success in findings ways to tackle uncertainty and mastering the digital skills for this new virtual environment [7].Moreover, the new skills need on the part of teachers are not limited only to digital skills, but they also related to digital social skills that seem to not improve in time, as DeGrutyer shows [3]. Besides needing to gain new digital skills, source-poor academics are still facing challenges of joining world-class virtual events due to high fees and lack of IT&C infrastructure [17]. Based on these elements, it becomes more and more important to remember to build academic conferences that will fit into teachers' schedules and attempt to diminish the stress-inducing variety of online, novel tools. Sticking to digital tools that are among the friendliest to use and offering support in any format (1-on-1 communication, video tutorials, instructions) for participants to enjoy the academic conference are relevant and salient elements to consider as conference organizers.

The challenges are not limited only to teachers in their role as participants in virtual conferences. When organizing a virtual conference, new challenges occur, like building a program that will help participants across more time zones attend a reasonable hour [14]. But while new challenges occur, old ones become obsolete in the virtual setup: the issue of time necessary to schedule and organize an event is



Concordance Hits 13

Hit	KWIC	
1	xperience strong group cohesion and achieve team	outcomes and goals via VC. (3) We propose an
2	vironments to reveal gender-based online learning	outcomes by selecting a gender balance among res
3	erformance. This will ensure more effective	outcomes.17 For institutions that have no prior
4	being a quick fix with obvious positive	outcomes, forced e-learning might have also some
5	ense influences learning motivation and learning	outcomes [60]. However, active interaction betweer
6	formation of group cohesion and produce better	outcomes. Hypothesis 1 (H1). Members who recog
7	me ample opportunities to improve my learning	outcomes. 3 I like the way our study group
8	Investigating presence as a predictor of learning	outcomes in e-learning environment. In Proceedings
9	ristics were positively related to positive	outcomes: job satisfaction, growth satisfaction, inte
10	cohesion is achieved along with greater learning	outcomes resulting from efficiently facilitated coop
11	istics and positive psychological and behavioural	outcomes (see Fried & Ferris, 1987; Loher et al., 1
12	of the job that determines the positive	outcomes such as internal work motivation, positive
13	could help optimize UX and improve learning	outcomes. The main purpose of this study is

Fig. 3: Collocations using the word 'outcomes' (Source: Corpus analysis using AntConc)

seriously diminished together with the cost of such events [13]. In order to thrive as conference organizers in such a setup, there is a need to pass along these changed elements by lowering fees, bringing more flexibility in the logistics of the event, and improving communication and support given to participants. While there is also undeniable value to the emphasis put on the local research communities that have been in the spotlight during the COVID-19 outbreak[17], we need to remember the great importance of the worldwide scientific community and how it grows by interacting with each other, exchanging ideas, and being exposed to different opinions and views.

All in all, this brief analysis has shown us how the world of academic conferences has changed and what conference organizers can learn from these lessons. We argue for an increased focus on bringing more support to teachers who face the pressure of adapting to the new virtual world for their teaching tasks and their research-related tasks. At the same time, we need to admit that the old-fashioned way of organizing scientific events might have been outdated and need reinvention, with new objectives of becoming a more sustainable industry with less resource waste. In the post-COVID-19 era, we need to find the balance between reducing the environmental impact of academic conferences while still creating contexts of growth and learning for teachers and organizers.

IV. CONCLUSION

It is very likely that in the aftermath of the COVID-19 outbreak, we will happily discover that we will have had the experience of full-virtual academic events and experience that we will have the chance to leverage in order to move towards a more sustainable approach to this industry. The lessons that we learn from these experiences will be a reminder for us that we can adapt to new circumstances (even though most of the time we will seem reluctant to change), we can find ways to dedicate time and energy to advancing scientific discoveries, and with some help, we can also find a way to bring mental and psychological balance while having a teacher's career. As we slowly move towards a post-COVID-19 world, conference organizers need to remember that a new challenge is rising ahead: finding ideal solutions for organizing hybrid academic conferences.

The current approach of a corpus analysis could be expanded to tackle the shortcomings of a corpus analysis: the narrow criteria of including specific papers in the corpus that was later on analyzed, the available papers on this topic of virtual academic conferences, and the general approach of academic conferences without taking into account various specific features of such event in various areas.As such, developing a research project in order to discover the views of both conference organizers and participants would be a great path towards discovering the underlying beliefs, perceptions, and experiences with virtual conference and then turning that knowledge into guidelines to follow as an organizer whenever planning a virtual conference (including also the challenge index that might appear along the way).

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