



Towards sustainable and accessible events: an exploratory research perspective

Marta Brescia-Zapata¹

Accepted: 13 November 2023
© The Author(s) 2023

Abstract

In recent years, there has been a noticeable drive towards promoting sustainability at events. Nevertheless, sustainable events often overlook the topic of accessibility. In an effort to fill this gap and gather data towards possible solutions, two co-creation workshops were conducted that focussed on the practical elements of organising and coordinating an accessible and sustainable event that caters to people with diverse access needs. Through the use of practical examples taken from the work carried out as part of different EU projects, workshop participants gained insights into the logistics of creating an accessible event that is user-centric, collaborative, and sustainable. The workshops' main aim was to settle a discussion on how to prepare guidelines and recommendations to organise a sustainable and fully accessible event. All lessons learned during the workshops were then used to organise the Green Digital Accessibility conference, which took place on 2 December 2022 in a hybrid format in Barcelona. This paper begins by outlining existing guidelines on accessibility and sustainability, before moving on to present the methodology and findings from both workshops. Subsequently, we will delve into the guidelines that were developed during the workshop. The goal of this study is to integrate universal accessibility guidelines into the ISO 20121 standard with the ultimate aim of establishing a template that ensures academic and scientific events are accessible and sustainable from their inception. This work concludes by considering some possible research avenues that combine sustainability and accessibility in event planning.

Keywords Event organisation · Accessibility · Sustainability

1 Introduction

Sustainability and accessibility have become increasingly important topics in Europe as policymakers, businesses, and citizens seek to address environmental and social challenges [1]. The concept of sustainability was defined by the United Nations in 1987 [2] as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”. The European Green Deal has elevated the topic across Europe by establishing a regulatory and legislative framework to drive positive climate action by moving the European economy away from an economic model based on the consumption of finite resources towards a more sustainable development model that prioritises

regenerative growth [3]. The EU also acknowledges accessibility as a cornerstone in the green transition by providing inclusive environments and equal opportunities for all individuals, regardless of their abilities. The EU has implemented various policies and directives aimed at promoting accessibility, including the European Accessibility Act (2019), which aims to improve the functioning of the internal market for accessible products and services. Furthermore, the EU promotes accessibility through funding for projects that support accessible infrastructure, transportation, and information and communication technologies.

In the field of standardisation, EN301459 recommends a Universal Design approach when developing any system or product. This requirement is gaining traction as a mainstream concept, driven by the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and now carries significant political and moral weight. The ISO 20121 standard [4] establishes criteria for implementing an event sustainability management system applicable to all types of events or related activities, as well as offering guidance on

Communicated by Green Digital Accessibility.

✉ Marta Brescia-Zapata
marta.brescia@uab.cat

¹ Universitat Autònoma de Barcelona, Barcelona, Spain

adhering to such criteria. Currently, there are no guidelines or standards that combine sustainability and accessibility; therefore, there is a need to build synergies between the two fields.

One effective way to adhere to standards is by co-creating guidelines and recommendations, which can serve as a framework for decision-making and action when organising accessible and sustainable events. Co-creation, which can be defined as the active involvement of end-users in various stages of the production process [5, 6], is aligned with the European Commission's definition of social innovation as a process that mobilises each citizen to become an active part of the innovation process [7]. Co-created guidelines can also foster ownership and accountability, as they reflect the collective voice and values of participants.

In this paper, the methodology and results of two co-creation workshops carried out in Barcelona and Brussels will be presented. Participants were introduced to the concepts of sustainability and accessibility and were later asked to apply this knowledge in the context of events organisation. The section begins by giving examples of existing guidelines on sustainability and accessibility. This is followed by a discussion of the methodology and results from the workshops. The insight gained from both workshops were later applied in the organisation of the Green Digital Accessibility conference, which took place on 2 December 2022 in Barcelona. Section 4 details the conference organisation as well as participants' feedback obtained through a post-event questionnaire. Finally, Sect. 5 provides some preliminary conclusions and potential avenues for future research.

2 Background: existing sustainability and accessibility guidelines

Sustainability and accessibility both feature in the United Nations' Sustainability Development Goals. More specifically, Goals 4, 8, 10, 11, and 17 (Quality Education, Decent Work and Economic Growth, Reduced Inequality, Sustainable Cities, and Partnership for Goals, respectively) all mention sustainability and accessibility. Indeed, the UN has identified the need to ensure that the transition to net-zero is inclusive to everyone, irrespective of age, sex, disability, ethnicity, origin, religion, economic or social status [8]. Nevertheless, most of the existing guidelines on event organisation only focus on one of them, sometimes not even mentioning the other. The UN's Environment Programme defines a sustainable or 'green' event as one that is designed, organised and implemented in a way that minimises potential negative impacts and leaves a beneficial legacy for the host community and all involved. The World Wide Web Consortium (W3C) [9] recommends that event accessibility should be prioritised, as sessions that are designed to be accessible

for individuals with disabilities also foster inclusivity for diverse audiences, including those with different learning styles or language fluency. Moreover, the W3C highlights that accessible sessions offer additional benefits to both organisations and individuals, including increased participation, improved learning outcomes, a positive reputation, and legal compliance.

On the topic of sustainability, the EU has developed a range of policies and initiatives aimed at reducing the environmental impact of events and promoting sustainable practices. Some examples are the EU Ecolabel, the Circular Economy Action Plan, the Energy Efficiency Directive, and the Eco-Management and Audit Scheme (EMAS) [10]. The EMAS is a program established by the European Commission that provides a framework for companies to assess, improve, and report their environmental performance. The EMAS steering committee approved in 2018 the 'Guideline on Organising Sustainable Meetings and Events at the Commission'. This document provides a checklist organised into seven steps or topics that should be addressed to guarantee that an event is sustainable. For each step, there are two categories of actions: minimum requirements and advanced options. Although the document emphasises the importance of easy access to the venue, the term "accessibility" is noticeably absent in the text.

The EU also supports sustainable event certification schemes such as the ISO 20121 standard for sustainable event management, which covers all aspects of event planning, including sustainability. First published in 2012, the standard applies to all types of events, from small local gatherings to large international conferences. It also covers a range of areas in event management, including but not limited to, sustainable procurement, waste management, energy and water conservation, community engagement, and transport management. Although it does not explicitly mention accessibility, it addresses social responsibility and stakeholder engagement, which could encompass accessibility considerations.

Regarding accessibility, in 2010, the W3C Web Accessibility Initiative (WAI) published a checklist for accessible events, conferences, training, and presentations that are remote/virtual, in-person, or hybrid. The checklist helps presenters, participants, and organisers make events inclusive, particularly to people with disabilities. It provides links to additional resources, including tutorials, checklists, and tools for creating accessible presentations, as well as a section on how to test the accessibility of presentations. However, the topic of sustainability is not covered within this checklist.

In the absence of guidelines, many universities across the USA, such as Cornell University [11], University of Kansas [12] or Oregon State University [13], have created their own checklists to organise accessible events. Similarly, in Europe, Inclusion Europe, a European movement of people

with intellectual disabilities and their families co-funded by the EU, published a set of guidelines on accessible events [14]. Similarly, the European Disability Forum (EDF) created ‘Guide for accessible meetings for all’ [15]. Neither of these guidelines and recommendations deal with sustainability, nor do they differentiate between rules for speakers and rules for organisers. Instead, both guidelines provide speakers with information on how to prepare and deliver an accessible presentation. They also offer guidance on addressing accessibility issues before, during, and after the event.

3 Workshops

This section describes the two co-creation workshops in Brussels and Barcelona. It reports on the procedure and participants involved and discusses the ideas that emerged during the sessions. The final goal of these workshops was to apply all lessons learned in the organisation of the Green Digital Accessibility conference, which took place on 2 December 2022 in Barcelona.

3.1 Workshops outline

The first workshop, titled “Accessibility meets sustainability: How to organise a green and accessible event”, took place in Brussels as part of the first edition of The New European Bauhaus fair [16]. This event was celebrated from 9 to 12 June 2022 in a hybrid format. The main themes of the festival were beauty, sustainability, and inclusion always with a focus on the European Green Deal. It aimed to establish connections across various domains, including research, science, technology, education, civic engagement, art, culture

and architecture. The workshop attracted a total of 5 voluntary participants between the ages of 20 and 40 who were digitally savvy and expressed a keen interest in research, science, new technologies, sustainability, and accessibility matters.

The second workshop, named “Go green! Cómo organizar un evento sostenible y accesible” (“Go green! How to organise a green and accessible event”), took place in Barcelona as part of the European Science Night [17]. This public event, held annually in over 300 cities in 30 European countries, aims to bring research closer to audiences of all ages and promote research and innovation through clear and engaging means. Our workshop consisted of 4 participants, all of whom voluntarily signed up. Similar to the first workshop, the participants were aged between 20 and 40, digitally savvy, and demonstrated a strong interest in research, science, new technologies, sustainability, and accessibility matters.

3.2 Methodology

Each workshop followed a similar procedure and was divided into two parts: a theoretical one and a practical one. The first part was structured around several activities to raise awareness of sustainability and accessibility when organising and attending events. These concepts were later applied during the practical part (see Fig. 1 below). The main difference was the language in which the workshops were held (English in Brussels and Spanish in Barcelona).

Participants were first introduced to the facilitators and their backgrounds. Subsequently, the participants were prompted to respond with three words to the inquiry “What does accessibility mean to you?” using the web-based tool

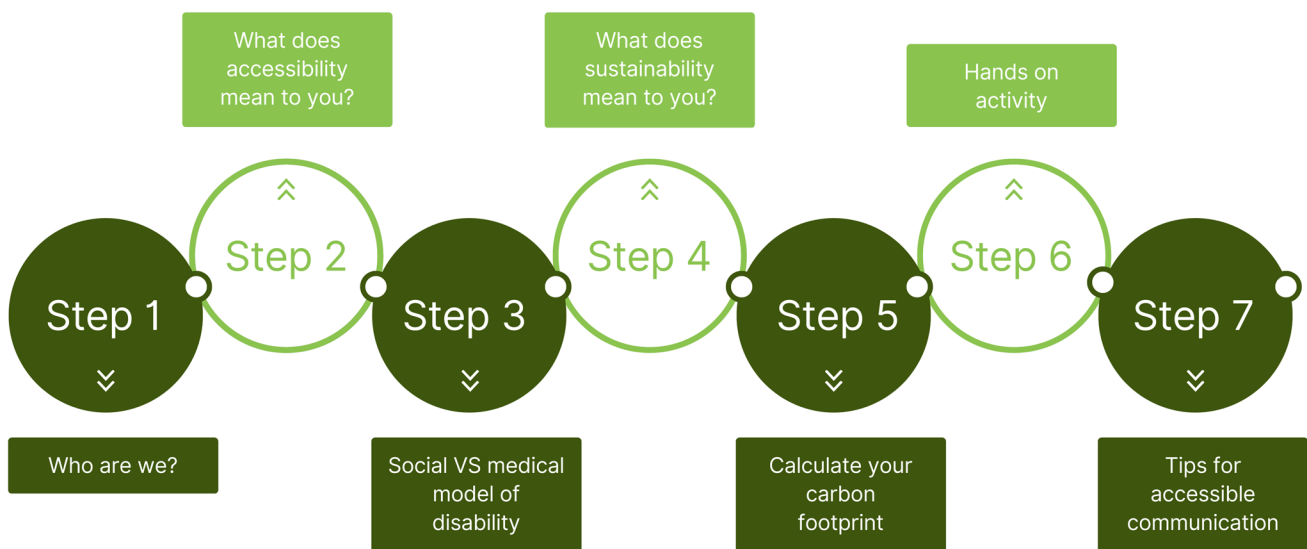


Fig. 1 Steps followed during the workshops

Mentimeter. Figure 2 (left) displays the responses provided during the workshop. The distinctions between the medical and social models were explored by leveraging the participants' responses as a foundation. Then, the subject of sustainability was introduced, and participants were asked to answer with three words to the question "What does sustainability mean to you?" via Mentimeter. The answers are shown in Fig. 2 (right). The participants' responses were discussed, and the carbon footprint calculator developed by World Wildlife Fun (WWF) [18] was presented. The objective was to foster awareness about the impact of daily activities on CO₂ emissions.

After this theory-oriented part, the participants were presented with the hands-on session. The objective of this second part of the workshop was for the participants to work together to develop a series of sustainable and accessible recommendations to take into account before, during and after an event. As a help, they were offered five categories taken from the sustainability guides mentioned in Sect. 2—namely: venue, waste, providers, catering, and communication. Accessibility was addressed as a transversal theme in all categories. After a 20-min discussion, all the ideas were

put together on a whiteboard and some new thoughts came out.

Before debriefing the session, some tips on how to communicate in an accessible way on social media platforms were shared with the participants. Specifically, the tips were tailored towards two widely used platforms for professional engagement, namely Twitter and LinkedIn. By implementing these strategies, participants can ensure that their posts reach a wider audience and contribute to a more inclusive community. The list of strategies shared with the workshop participants was inspired by the 'List of Resources on Digital Accessibility' created as part of the Erasmus + project YoungArcHers (2021–1-FR01-KA220-SCH-000034341) and by the 'Accessibility Checklist' created as part of the Erasmus + project IMPACT (2019–1-FR01-KA204-062381). To provide an overview of these tips, they are summarised in Table 1 below.

3.3 Results

After the completion of the two workshops, the ideas that arose during the hands-on session were compiled and

Fig. 2 Mentimeter results during the workshop that took place in Brussels



Table 1 What to do and what to avoid for accessible social media communication

What to do	What not to do
Skip the fancy font generator	Do not use fancy font generator
Be thoughtful about using emojis	Do not overuse emojis
Use alternative text for all images. Be descriptive yet concise describing them	Do not fill the alternative text with useless keywords
Describe images in context	Do not use automatic alternative text
Limit the use of animated GIFs	Do not use animated GIFs in signatures, presentations, or comments
Use one blank line between paragraphs	Do not omit blank lines or use a lot of them between paragraphs
Use sentence case	Do not use capital letters all time because it has no visual shape
Capitalise the first letter of each word in hashtags and usernames	Do not use all lowercase in hashtags
Check the colour contrast on your images	Do not assume an image that looks clear is accessible for everyone (e.g. Orange and white have a low colour contrast ratio)
Subtitle your videos accurately	Do not let automatic subtitling tools do all the work. Edit the result
Provide transcripts for podcasts and videos with short paragraphs and speaker ID	Do not publish transcripts with big blocks of text

compared with existing guidelines on organising sustainable or accessible events. Based on the five categories provided, participants put forward the following ideas:

- **Venue** Choose a venue that is easily accessible by public transportation or that provides adequate parking spaces for attendees. Ensure that the event is accessible for people with different needs, including accessible parking, ramps, and elevators. Moreover, it is important to consider locations that have a green certification and offer eco-friendly options for lighting and energy usage.
- **Waste** Implement a waste reduction plan that includes the use of recyclable and compostable materials, reduction in paper usage, and proper waste disposal. If the venue is not offering fountains, it would be good to provide water refill stations and minimise the use of single-use plastics.
- **Providers** Work with providers that have experience with accessible technology—such as closed captioning—and choose equipment that is energy-efficient and has a low environmental impact. It would also be interesting to consider partnering with organisations that provide disability and environmental services.
- **Catering** Offer sustainable food options, such as vegetarian and Km 0 meals, prioritising the use of ingredients and products that are produced or grown nearby, reducing transportation emissions, and supporting local farmers and producers. It would be also desirable to reduce food waste by accurately estimating the number of attendees. It would be desirable to ask attendees in advance for dietary restrictions.
- **Communication** Promote the event using eco-friendly methods—such as recycled paper and digital media—and provide accessibility information on the event website and in promotional materials.

In addition to all these ideas, participants highlighted the importance of getting feedback after the event in order to evaluate the success of the event and to identify areas of improvement. Feedback also provides an opportunity to communicate with attendees and address any concerns or issues that arose during the event. Finally, in order to summarise all these ideas, we designed a figure that illustrates the path that must be followed to organise an event accessible and sustainable (see Fig. 3).

The figure portrays a comprehensive roadmap consisting of six steps. The first step is “Attitude and legislation”, which emphasises the importance of fostering an inclusive mindset and complying with accessibility and sustainability laws and regulations. The second step, “Communication”, highlights the importance of ensuring that the event information is being disseminate in an accessible and sustainable way. Moving forward, the third step, “Accessibility and Sustainability of the venue” focuses on the need to select event venues that are accessible and eco-friendly, integrating elements such as ramps, elevators, and energy-efficient technologies. The fourth step, “Accessibility and sustainability of the content”, focuses on creating event materials, presentations, and digital content that cater to individuals with diverse abilities and align with sustainable practices. The fifth step, “Good practices exchange”, encourages sharing successful accessibility and sustainability strategies to foster continuous improvement. Lastly, the sixth step, “Audience feedback”, stresses the significance of gathering feedback from attendees to assess the effectiveness of the implemented measures and make necessary improvements for future events. Together, these steps form a framework that helps organising events that are both accessible and environmentally responsible.

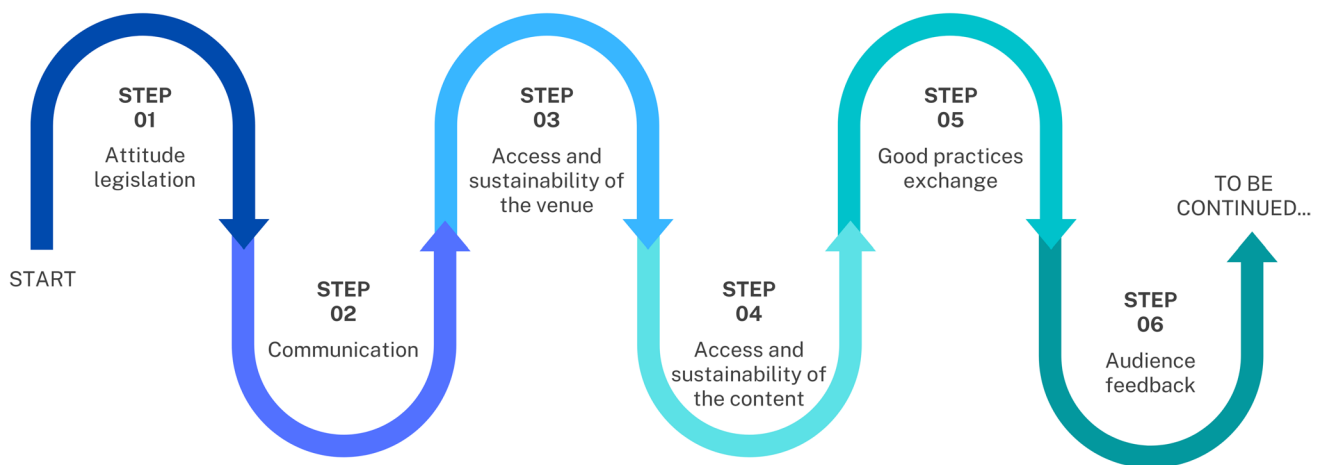


Fig. 3 Accessibility and sustainability chain

4 From theory to practice: the green digital accessibility conference

The first edition of the GDA international conference took place on 2 December 2022 in Barcelona. This conference was organised by the Transmedia Catalonia research group as part of the H2020 European project GreenSCENT (Smart Citizen Education for a green fuTure, ref. code 101,036,480), which aims at engaging people with environmental issues. Through a series of talks and discussions with experts in media, media accessibility, web design, environmental education, and tourism, the GDA conference aimed to establish new connections between sustainability and accessibility—step 1 in the accessibility and sustainability chain, see Fig. 3.

Following step 2 in the accessibility and sustainability chain (see Fig. 3), the event was promoted both online (LinkedIn, Twitter, and the Transmedia Catalonia website) and in-person (during the workshops in Brussels and Barcelona). Also, to reduce paper waste and increase accessibility, communication with potential participants was done via email. The organising committee conducted all its meetings through the online platform Microsoft Teams, thereby eliminating the need for physical travel and reducing associated carbon emissions. The minutes and other pertinent documents were then securely stored in a designated folder on Google Drive, promoting efficient and sustainable digital record-keeping practices.

In total, 31 people from different countries attended the conference. In order to increase the attendance rate whilst reducing environmental and travel costs, the conference was held in a hybrid format. Online participants joined the conference via Microsoft Teams. This choice was made due to the availability of various accessibility features, including closed captions, live transcriptions, screen reader support, and voice control. The venue chosen to celebrate the event was the Residència d'Investigadors, a place located in the city centre that is also well-connected with other neighbourhoods by metro and accessible with wheelchairs—step 3 in the accessibility and sustainability chain, see Fig. 3. In preparation for the conference, all in-person attendees received an online welcome pack document via email. This 2-page PDF outlined the steps followed by organisers to minimise the carbon footprint of the event. The document categorized the information into five key categories: conference materials, catering, waste policy, transport, and the hybrid event format.

Regarding conference materials (step 4 in the accessibility and sustainability chain, see Fig. 3), to cut down on waste, organisers created a PDF version of the conference proceedings, which can be accessed using a QR code. The QR code was printed and available in a range of different

locations throughout the building. A copy of the agenda was settled on the main door of the conference room so that those who do not use a QR code scanner could still view it. The physical welcome pack included a bag and a notepad that were made from recycled materials. These notepads were created by the local association Fundació Fupar, which supports people with disabilities. The pack also included a pencil with seeds at the top, which when planted grow into a basil plant. Participants were also asked to return their name badges after the conference so that they can be reused for future events.

Also, taking into consideration step 3 in the accessibility and sustainability chain (see Fig. 3), both the catering for the conference and conference dinner were provided by local suppliers in the Barcelona area. Lunch was supplied by a local provider who offers vegan and vegetarian options that were available in compatible packaging. Tea and coffee were available during the coffee breaks. The conference dinner took place in a local restaurant located five minutes walking distance from the conference venue. Regarding the waste policy, a series of waste and recycling bins were located in different areas of the building. The bins were colour-coordinated to help with sorting. After the conference, these bins were emptied, following proper waste disposal.

4.1 Post-event questionnaire

In order to gather feedback from participants, an online questionnaire was sent after the event via email—step 5 and 6 in the accessibility and sustainability chain, see Fig. 3. The design of this evaluation form drew inspiration from the model proposed by Inclusion Europe [14] and was implemented using Google Forms. The questionnaire consisted of 11 questions that encompassed three types: five Likert-scale questions (e.g. 'The information prior to the GDA was adequate'), five open-ended questions (e.g. 'Which topics would you like to be covered in future editions of the GDA conference?'), and one single choice questions (e.g. 'I will come back to the GDA conference next year'). The Likert-scale questions (1, 2, 3, 4, and 8) generated qualitative data as they measured on a numerical scale. The open-ended questions (5, 6, 9, 10, and 11) generated qualitative data as they allowed participants to provide descriptive responses. The single choice question (7) provided categorical data, offering a clear picture of participants' intention to attend the conference in the future.

In total, 13 participants voluntarily completed the questionnaire, contributing valuable insights from diverse perspectives. Amongst the respondents, 4 attended the event online (30.8%), whilst 9 attended in-person (69.2%). This distribution of responses reflects the hybrid nature of the conference, which enables a better evaluation of the event's success, as it accounts for both modes of engagement.

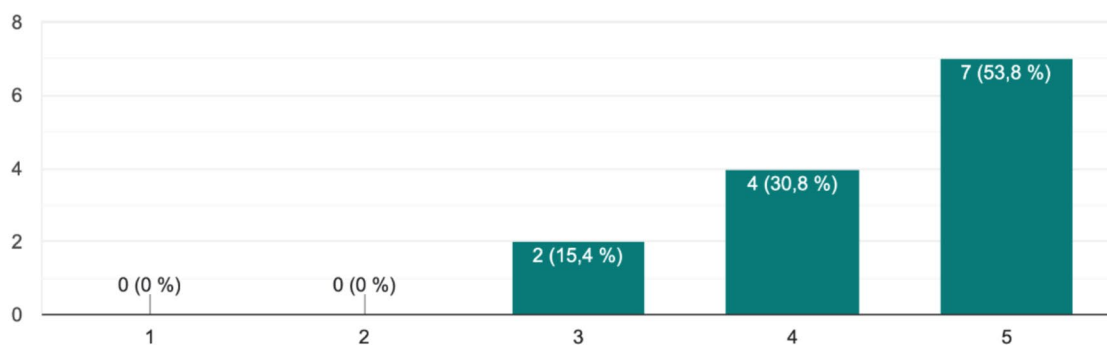
The first question, “The information prior to the GDA was adequate”, was assessed using a Likert-scale question with a 5-point scale (1 meaning “Strongly disagree” and 5 meaning “Strongly agree”). Most participants (92.3%) rated the information as completely adequate, giving it the highest score. One participant (7.7%) perceived the information as mostly adequate, giving it a score of 4 out of 5. Moving on to the second question, “The conference met my expectations,” which also used a Likert-scale question with a 5-point scale, the responses shed light on the participants’ overall satisfaction with the event. Ten participants (76.9%) expressed complete satisfaction, assigning the highest score of 5 out of 5. Two participants (15.4%) rated the conference as mostly meeting their expectations, rating it with a score of 4 out of 5. Only three participants (23.1%) considered the conference to have partially met their expectations, with a score of 3 out of 5.

Questions 3 and 4 focussed on assessing the sustainability and accessibility of the conference. In general, the responses indicated positive evaluations from participants, as depicted in Fig. 4. The event was rated as very sustainable by 7 participants (53.8%). Similarly, in terms of accessibility, 5 participants (38.5%) expressed that the conference was very accessible. Only two participants rated the conference as mostly sustainable and accessible (15.4%), a score of 3 out of 5 in both cases.

The responses to question 5, “How did this conference influence your perspective of sustainability?” and question 6, “How did this conference influence your perspective of accessibility?” showed how the conference influenced on participants’ understanding of sustainability and accessibility. Regarding sustainability, participants noted that the conference was eye-opening, highlighting the unexpected connection between accessibility and sustainability. They

3. How would you rate the sustainability of the GDA?

13 respuestas



4. How would you rate the accessibility of the GDA?

13 respuestas

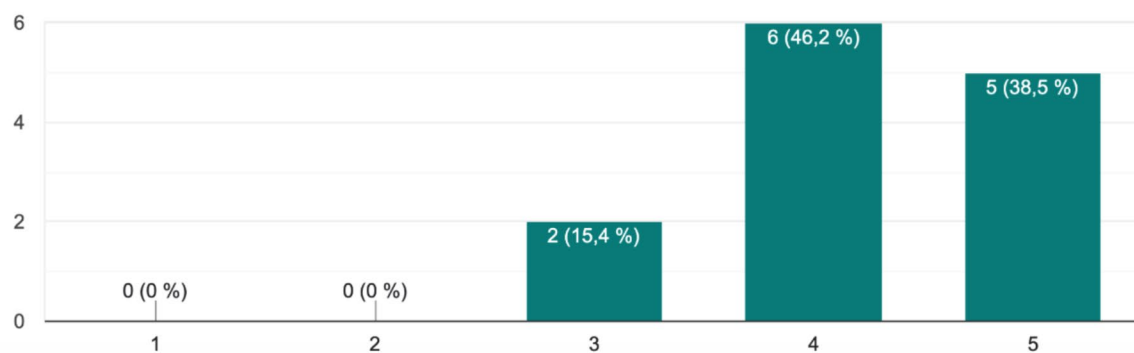


Fig. 4 Answers to questions ‘How would you rate the sustainability of the GDA?’ and ‘How would you rate the accessibility of the GDA?’ 1 means ‘not sustainable/accessible at all’ and 5 means ‘very accessible’

highlighted the importance of planning and considering sustainability in all aspects of event management, including supply chain and web design. The conference also raised interesting questions about connecting sustainability with social justice. Participants also manifested an interest in continuing the exchange of ideas at an international level. In terms of accessibility, participants realised the need to prioritise accessibility from the beginning of an event to meet attendees' needs. The conference revealed accessibility problems and solutions, challenging pre-conceived notions and highlighting the broader understanding of accessibility that may include sustainability considerations. Some participants recognised the potential cost, both in terms of financial and environmental impact, associated with accessibility.

Question 7 asked participants about their intention to attend the GDA conference next year, offering response options of 'yes', 'maybe', 'no', and 'I prefer not to answer'. The results revealed a strong interest amongst the respondents, with 10 participants (76.9%) answering 'yes' to attending the conference again. Additionally, 3 participants (23.1%) responded with a 'maybe'. Responses to question 7 align with the feedback received for question 8, which asked participants to rate their recommendation of the GDA conference to others. Amongst respondents, 11 participants (84.6%) gave a top rating of 5 out of 5. Two participants (15.4%) rated their recommendation as 4 out of 5, indicating a slightly lower but still positive endorsement.

Questions 9, 10, and 11 were open-ended questions, aiming at gathering insights and suggestions for enhancing future editions of the GDA conference. Question 9 asked participants to provide their ideas on topics they would like to see covered in future editions of the GDA conference. Some participants expressed interest in exploring the implementation of sustainability and accessibility principles, such as creating environmentally friendly videos with accessibility features. Other suggested topics included climate change, engagement with user organisations and industry, trending technologies like AI and blockchain in the context of sustainability and accessibility, real-world examples, and the ecological impact of accessibility services. Overall, the responses emphasise the need for more practical applications, industry perspectives, and emerging trends in the field.

Question 10 asked participants about their favourite aspects of the conference. Respondents commended the interesting panels, the quality of the keynote speeches, stimulating conversations, and the friendly atmosphere of the event. The sustainability-focussed organisation, including the absence of plastics and the use of sustainable lunch boxes, was also highlighted. The variety of topics covered and the feeling of being part of a community were also mentioned.

Question 11 asked about aspects of the conference that participants felt could be improved for future editions. In

line with the feedback received in question 9, it was suggested the incorporation of more workshop-style sessions. Other suggestions included improving promotion efforts and addressing challenges related to online participation, such as providing better communication between online and in-person attendees. Another issue highlighted by responders was the duration of the event, as it was a too-long day and by the afternoon attendees were too tired to follow the presentations. In terms of accessibility, some participants mentioned live captioning as a feature that can be improved. Microsoft Teams allows for this feature; however, even though it was activated during the whole event when the speaker is far from the microphone (for example in the round table session), the computer does not catch the sound and the subtitles are not generated. A possible solution to this problem could be hiring a respeaking service to provide live captioning delivered by a professional.

5 Conclusions

This study highlights the importance of organising events that are both accessible and sustainable. Whilst events can serve as examples of balance between human activity, resource utilisation, and environmental impact, it is essential to move away from practices characterised by excess and waste generation. As Jones [19] argues, there is a potent opportunity and pressing obligation for events to create a long-lasting affirmative impact, by exhibiting a trajectory towards sustainable development and empowering and inspiring those in attendance, supply chain, and local hosts to take action.

To achieve sustainability and accessibility in events, collaboration and communication among event organisers, attendees, local communities, suppliers, and politicians are crucial. Event organisers can play a vital role in advancing sustainability and accessibility by adopting eco-friendly practices and inclusive policies. Similarly, event attendees can also contribute to sustainable and accessible practices by making informed choices and taking individual actions. For instance, attendees can choose to use public transportation, bring their own reusable water bottles, and ensure that their presentations meet all the accessibility requirements (such as providing alternative text for all figures, appropriate font size, and sufficient colour contrast).

To the best of our knowledge, whilst there are existing guidelines for organising accessible or sustainable events, none of them cover both aspects simultaneously. To bridge this gap, the present paper examined various accessibility and sustainability guidelines and checklists and organised two co-creation workshops involving people interested in attending such events. The workshops resulted in the development of the accessibility and sustainability

chain (see Sect. 3.3, Fig. 3), which provides a practical framework for ensuring events are both accessible and sustainable.

As a practical application of the research findings, the GDA conference was organised following the accessibility and accessibility chain. It served as a demonstration of how to integrate sustainable practices and accessibility considerations throughout the event planning and execution. Feedback from attendees, obtained through a post-event questionnaire, revealed that this effort was positively appreciated. However, insights from the questionnaire also shed light on areas for improvement in future editions. Respondents expressed a desire for extending the duration of the event to allow for interactive sessions and workshops, as well as a better balance to prevent information overload. Additionally, suggestions were made to provide live captioning during the event for accessibility purposes and to ensure post-conference access to presentation transcripts.

Another potential avenue for improvement is the assessment of the carbon footprint associated with events using carbon calculators. These tools provide valuable insights into the emissions associated with events, including travel, energy consumption, and waste management. Thus, whilst these calculators are a useful tool for analysing the environmental impact of events, they may not provide a complete picture of the carbon cost when accessibility is also taken into account. Future efforts could focus on developing carbon calculators that incorporate accessibility-related considerations to provide a more comprehensive assessment of the carbon footprint of accessible events.

In conclusion, organising sustainable and accessible events are an ongoing commitment that requires continuous commitment and collaboration. The GDA conference, with its focus on sustainability and accessibility, represents a step forward in this direction. The implementation of the accessibility and sustainability chain proved effective in organising the conference and ensuring its alignment with these principles. However, it is important to notice that this is just the beginning of the journey. Gathering feedback from participants in future editions of the conference will be crucial to further refine the event's sustainability and accessibility. Additionally, expanding the application of the accessibility and sustainability chain to other types of events, such as fully in-person or online conferences, covering diverse topics, and accommodating larger attendee numbers, would be necessary to test its effectiveness and adaptability. By pursuing these avenues, the event industry can continue to progress and set higher standards for sustainable and accessible event practices.

Acknowledgements The author of this article is a member of TransMedia Catalonia, an SGR research group funded by the Catalan Government (Departament de Recerca i Universitats) (2021 SGR 00077). This work has been partially funded by the H2020 European project

GreenSCENT (Smart Citizen Education for a greeN fuTure, ref. code 101036480).

Author contributions MBZ is the corresponding author and the writer of the manuscript. She also reviewed the content and format.

Funding Open Access Funding provided by Universitat Autònoma de Barcelona.

Data availability Data generated or analysed during this study are included in this published article and its supplementary information files. Any additional data can be made available upon reasonable request.

Declarations

Conflict of interest The author declares that there are no conflicts of interest of financial or non-financial interest.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

1. Yunus, M., Biggeri, M., Testi, E.: Social economy and social business supporting policies for sustainable human development in a post-COVID-19 world. *Sustainability* (2021). <https://doi.org/10.3390/su132112155>
2. United Nations Brundtland commission: Report of the World Commission on environment and development: Our common future <http://www.un-documents.net/our-common-future.pdf> Accessed 31 Mar 2023
3. European Commission: The European green deal, Brussels (2019)
4. International Organisation for standardisation: Event sustainability management systems —requirements with guidance for use (ISO standard No. 20121:2012) (2012).
5. Prahalad, C.K., Ramaswamy, V.: Co-opting customer competence. *Harv. Bus. Rev.* **78**(1), 79–90 (2000)
6. Vargo, S., Lusch, R.: Evolving to a new dominant logic for marketing. *J. Mark.* **68**(1), 1–17 (2004). <https://doi.org/10.1509/jmkg.68.1.1.24036>
7. Commission, E.: Empowering people, driving change: social innovation in the European union. Publications of the European Union, Luxembourg (2011)
8. McDonagh, S., Brescia-Zapata, M.: Combining XR, Accessibility and sustainability in the classroom: Results of an exploratory study. Bridging the XR technology to practice gap. *Methods and strategies for blending extended realities into classroom instruction*, 1(2) (2023)
9. Web accessibility initiative: In: Making events accessible, checklist for meetings, conferences, training, and presentations that are remote/virtual, in-person, or hybrid, <https://www.w3.org/WAI/>

- [teach-advocate/accessible-presentations/](#) (2022). Accessed 10 March 2023
10. European commission: Eco-management and audit scheme. Green business, https://green-business.ec.europa.eu/eco-management-and-audit-scheme_en (n.d.) Accessed 26 June 2023
 11. Cornell University: Accessible meeting and event checklist, <https://accessibility.cornell.edu/event-planning/accessible-meeting-and-event-checklist/> (n.d.) Accessed 27 June 2023
 12. University of Kansas: Best practice guidelines for planning an accessible event, <https://accessibility.ku.edu/best-practice-guidelines-planning-accessible-event> (n.d.) Accessed 27 June 2023
 13. Oregon State University: Events accessibility, <https://accessibility.oregonstate.edu/events> (n.d.) Accessed 27 June 2023
 14. Inclusion Europe: In: Recommendations for organisers of meetings and conferences, <https://www.inclusion-europe.eu/wp-content/uploads/2018/10/Recommendations-accessible-events.pdf> (2018). Accessed 10 March 2023
 15. European disability forum: EDF guide for accessible meetings for all, https://www.edf-feph.org/content/uploads/2021/02/edf_guide_for_accessible_meetings_1.pdf (2021) Accessed 10 March 2023
 16. New European Bauhaus. <https://new-european-bauhaus.europa.eu/> (n.d.) Accessed 29 June 2023
 17. La Nit de la Recerca. <https://lanitdelarecerca.cat/> (n.d.) Accessed 29 June 2023
 18. World wildlife fund: Footprint calculator, <https://footprint.wwf.org.uk/> (n.d.). Accessed 27 June 2023.
 19. Jones, M.: Sustainable event management. Routledge, A practical guide (2014)

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.