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LONG PAPER

Accessibility of large events: an empirical study of the Expo 2020 Dubai

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Abstract
Event management is a growing sector in the tourism industry and one of the fastest growing industries in the world. The sector contributes significantly to global economies and provides substantial employment opportunities. Events are spaces for social interaction, education, leisure and opportunities. More recently, interest is being placed in making events accessible, yet the emerging body of research on accessibility, inclusion and diversity in events is still scarce. The objective of this paper is to contribute to understanding the accessibility of large events in an increasingly technology-dependent industry. With this purpose in mind, an evaluation of the accessibility of the Expo 2020 in Dubai has been conducted. Expos are events that showcase the latest technologies and innovation, are attended by million visitors and have hefty budgets. These factors make these events the ideal breeding ground for the implementation of advanced technologies. The study adopts a case study approach and draws on data from observation, in-depth interviews and online, qualitative questionnaires. The participants are people with disabilities (PwDs), the organizations in charge of the accessibility of the Expo and staff that worked at the event—some of whom were also PwDs. The experiences of PwDs at the event, the accessibility provision in place and the challenges and insights of accessibility experts involved are discussed, as well as the implications and recommendations for managing the accessibility of large events.

Keywords Accessibility · Accessible tourism · Dubai · Events · Expo · Inclusion

1 Introduction

Events are places for social interaction, where learning, leisure, work, rites and ceremonies take place. In terms of size, events can be attended by small numbers of people or millions. In critical event studies, events are seen as "microcosms of society" [1]. In that, they are places that reflect societal changes and norms in the point in time they are held and where we can learn about how societies operate. Social cohesion and community building are goals ascribed to festivals [2] and, we argue, events in general.

The key role of events for our societies calls for events to be spaces accessible to all. However, evidence suggests that events marginalize certain groups and individuals, both in consumption and production [3]. Research has traditionally focused on hegemonic populations; thus, there is a scarcity of scholarly literature on the diversity, inclusion and accessibility of events [1, 4, 5]. This study responds to the calls by scholars for critical research that inform practice-based inquiry [4, 5].

The aim of this paper is to contribute to the understanding of the management of accessibility and the experiences of people with disabilities at large events. To explore this, the study has focused on the Expo 2020 in Dubai. The relevance of this event for such a study is substantial: (1) It is an event in which different practices and expertise converge as it provides a space for all countries in the world; (2) nations showcase new technologies and advancements which, because of the current political and social climate, should be more accessible; (3) the venue and facilities are built explicitly for the event; (4) the event has a hefty budget; (5) it is a public, open for all event; and (6) Dubai is actively working to become one of the most accessible cities in the world [6, 7]—in fact the government of the city advertised the event as the most accessible Expo event to date [8].

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This study has adopted a case-study format and draws on data from observation, in-depth interviews and online, qualitative questionnaires. The participants are people with disabilities (PwDs), the organizations in charge of the accessibility of the Expo and staff who worked at the event (some of which were also PwDs).

The research questions addressed in this study are the following:

- What was the accessibility provision of the Expo 2020 Dubai?
- How did PwDs experience the event? Did they find it accessible?
- How is the management of the accessibility of large events, especially when so many different countries and organizations come together in the same event?
- What recommendations do PwDs and the organizations managing the accessibility have for future Expos and other large events?

To the author's knowledge, this paper represents one of the first studies that analyses the accessibility of large events. It combines data from PwDs, the accessibility consultants and the PwDs staff that worked at the event. This study aims to provide an understanding on the accessibility of large events and offer suggestions for managing the accessibility of future events, based on the experiences and learnings from accessibility experts and PwDs.

2 Literature review

2.1 Accessibility studies and accessible tourism

The multidisciplinary areas of accessible tourism and accessibility studies are growing fields of study, whose first works started to emerge of late; in the last decade for accessibility studies [9], and last fifteen years for the case of accessible tourism [10]. In recent years, accessibility has come to play a fundamental role in our societies, in light of the increased awareness of the need to create more inclusive societies as well as the recent legislations passed in many countries that require that spaces, information, media, among others, be more accessible. Access is now understood to be for all human beings, as opposed to concerning only specific groups of people, i.e., people with disabilities. This new universalist account of access, which is integrated and holistic, has replaced the outdated particularist account, which viewed accessibility to affect only certain groups of people [9].

Accessibility studies have been defined as "the research field concerned with the critical investigation of accessibility processes and phenomena, and the design, implementation, and evaluation of accessibility-based and accessibility-oriented methodologies" [9]. The importance of the users, their knowledge and contribution to the design process and the involvement of experts and different stakeholders in the design process are the methodological backbone of accessibility studies.

In tourism studies, accessible tourism has been defined as that which "enables people with access requirements, including mobility, vision, hearing and cognitive dimensions of access, to function independently and with equity and dignity through the delivery of universally designed tourism products, services and environments. This definition is inclusive of all people including those travelling with children in prams, people with disabilities and seniors" [11]. Accessible tourism is also conceived by scholars and international organizations as part of the social, environmental, and economic requirements for the fulfilment of sustainable tourism. Authors such as Darcy et al., [12], Nigg and Eichelberger [13], Sica et al., [14], place accessibility as a central element of sustainable tourism and a prerequisite in policy development and the formulation of sustainable tourism strategies [14, 15]. The promotion of tourism for all has also been included as part of the Sustainable Development Goals 2030 by the United Nations [16] and by the United Nations World Tourism Organisation (UNWTO). Among its initiatives, the UNWTO has created an award, the Accessible Tourism Destination, to recognize destinations that are examples of good practice [17].

This study adopts a socially constructed understanding of disability. The social model of disability "sees the issue as a 'socially constructed' environment that excludes people with disabilities from participation" [10]. Implicit in the adoption of this approach is the recognition that many tourism environments are disabling by nature and that, as a society, we have the responsibility to create enabling, inclusive and accessible environments. Both in accessibility studies and accessible tourism, notions such as universal design, and more recently, inclusive design, design for all, and user-centered design, have become crucial in the creation, development and provision of products, experiences, spaces, information and media. The next section discusses the barriers and necessary steps to make events and cultural experiences accessible.

2.2 Accessible events and cultural experiences

Making an event accessible to everyone is a complex proposition, given the wide range of impairments that may affect individuals' ability to access event spaces. It requires careful consideration and investment, as one missing link in the accessibility chain could hinder access and enjoyment of tourism services [1, 10].

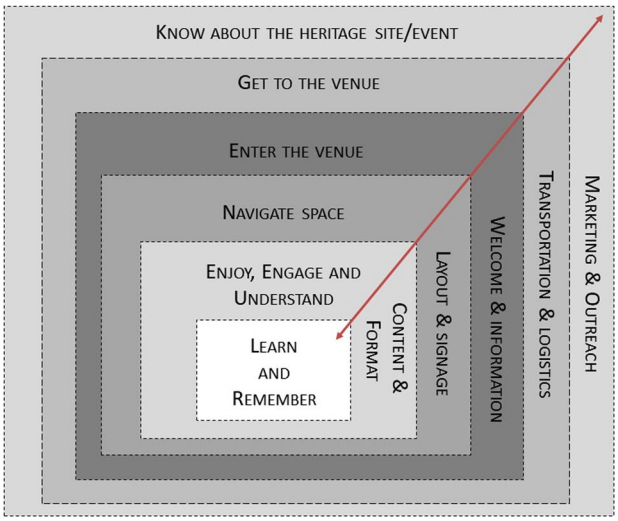

Fig. 1 Stages of the cultural experiences (reproduced from Neves [22] with author's permission)

In tourism studies, scholars have determined a variety of barriers to access. Buhalis and Darcy [10] identify the following access requirements for accessible tourism: physical accessibility, accessible information on the tourist attraction and information on the accessibility of the attraction [10].

Martínez Carrillo [18] distinguishes between two types of barriers: physical and social. Physical barriers include all barriers related to infrastructure and environment, including access to information and technologies; social barriers are those related to staff training, lack of awareness and sensitivity about accessibility, prejudice and even discrimination toward tourists with disabilities. To guarantee accessible events and to facilitate the work of organizers, a number of guidelines and handbooks have been produced such as those by Matausch and Miesenberger [19] and, more recently, by Cornell University [20].

However, making an event or attraction accessible considering the above physical and social barriers does not guarantee participation or experience of the attraction, especially if these include experiential or immersive experiences. In the words of Mundy [21], "access is walking through the door, inclusion is sitting at the table, and participation is eating the meal and talking about it." A more comprehensive model is found in Accessibility studies. The Russian Doll model [22], adopted for the creation of accessible cultural experiences, places the visitor at the heart of the Russian doll, with multiple layers surrounding the person representing their individual requirements. All stages of the experience must meet the visitor's specific requirements. Figure 1 illustrates the various stages of the cultural experience and the corresponding agents or stakeholders called for action in each stage.

To meet the specific requirements of visitors and allow access to every stage of Russian doll model, museum, destination and event organizers should make use of specialized resources and technologies to allow participation of all. Some examples are audio description, thermal embossing printing, sounds, the use of smells and textures, and the use of inclusive tourism-specific interactive systems (e.g., booking engines, self-check-ins, voice assistants, assistive robots). The use of information communication technologies, such as smartphones apps and social media, has also been identified as a key component of in the successful creation of tourist experiences for all [23–26]. The ambition in this model is that *all* content is accessible in multiple formats, with different levels of complexity and allowing for diverse modes of interaction. These would be made available to all visitors (as opposed to being labelled as "for the blind"), as most formats and access services can serve the requirements of a wider array of visitors [22].

Studies on the accessibility of large events are scant. The two main extant studies examine the Olympic and Paralympic games. This is probably no coincidence but due to the fact that PwDs are key participants in these events.

In 2003, Darcy and Harris [41] conducted a study that looked at the operationalization of the event planning in Australia. It presented a "best practice" case study of the Sydney 2000 Olympic and Paralympics Games. To the author's knowledge, their work constitutes the only other study examining the accessibility of large events. While it has been twenty years since the publication of that study, little progress in the field of accessible events research has been made.

The study identifies the main requirements for an inclusive and non-discriminatory approach to venue and event management, but its emphasis is on physical access to the event and support with ticketing and wayfinding, neglecting key requirements for participation of some PwDs in the event. For example, there was no provision for audio description for the blind and visually impaired.

Prior, during and after the event, a number of audits were conducted by relevant teams and a series of recommendations were put forward. These recommendations included the provision of captioning on some score boards and video screens and closed captioning for live broadcast. Likewise, it was recommended employing PwDs with appropriate expertise for the event and the provision of accurate information on access provisions in alternate formats. The study does not state whether the recommendations were implemented.

Despite the recommendations and preparation, a number of issues arose during the event. These included an underestimation of the number of PwDs attending the event, resulting in a shortage of accessible buses, and the impossibility of PwDs to pre-plan their Olympic experience due to a lack of information on access provided with sufficient time.

The second study on the Rio 2016 Olympic and Paralympic Games reviewed the tangible and intangible heritage that the accessible event bestowed the city of Rio. This study demonstrates that the impact of making such events accessible goes beyond the event [27]. The event transformed the physical accessibility of the city—which has become tangible legacy and had societal influence (intangible legacy). This intangible heritage includes an increased awareness among the population about accessibility and disabilities and has driven the development of more infrastructure that is also accessible [27].

2.3 People with disabilities in the United Arab Emirates (UAE)

The Government of Dubai has put considerable effort into making the city accessible, which has become a leading global events destination [28]. In Dubai, PwDs are referred to as People of Determination [30] and are protected by Federal Law No. 29 of 2006 (later amended in 2009). The law states that the country shall take "the necessary measures to ensure the participation of people of determination in the cultural, sporting and leisure aspects of life"; among other rights, it guarantees and protections (Federal Law No. 29, Article 20). More recently, in 2017, the government introduced the Accessibility Code for built environment [31], a set of standards intended for consultants, architects, planners and developers when designing new buildings. The code also states that existing buildings have to adhere to the code by 2021. To that end, the Government launched a service, the Wosool service, to provide assessment services on how existing buildings can meet the requirements of the new code, as well as providing training on Dubai Universal Design Code [32]. The venues of the Expo event are, therefore, required to be accessible.

By passing these laws and setting up government services that support organizations and citizens to implement the accessibility laws, the Government of Dubai is showing its commitment to ensuring equal access and protecting the rights of people of determination. In this context, it is expected that no efforts were spared in making an event of such magnitude and reach accessible for all.

Furthermore, the city has put Accessible Tourism, an important sector for the UAE economy, at the forefront of the Tourism agenda [29]. To that end, the government has launched a dedicated Accessible Travel and Tourism Team, and hosts, among other events, the Dubai Accessible Travel and Tourism International Summit[1] and the AccessAbilities Expo.[2]

3 Research methodology

This paper presents a case study. Case study research is suitable for research that has clearly defined boundaries and that intends to gain in-depth knowledge within a particular context [35]. Case studies use a range of different types of information and develop a narrative about a particular organization, type of individual, geographical area or event [35].

3.1 Study area: the Expos

World Expos are global events that bring together countries and governments and are attended by millions of visitors. Expos are "dedicated to finding solutions to fundamental challenges facing humanity by offering a journey inside a chosen theme through engaging and immersive activities" [33].

Education is one of the primary goals of the Expos: the events offer visitors a variety of visual and sensual experiences coupled with an innovative architecture, showcase interactive exhibits, ground-breaking technology, and offer visitors a glimpse of world cultures. The first Expo was held in 1851 in London and since then it has occurred every 5 years approximately, every time organized in a different city and country.

The events have a duration of up to six months. Countries, international organizations, and other non-official participants (cities, regions, companies, civil society and NGOs) build their own pavilions or rent a dedicated space in which they exhibit technologies and culture and share knowledge. The innovative, technical and scientific nature of Expos makes these events breeding ground for research on accessible tourism experiences.

3.1.1 Expo 2020 Dubai

The Expo 2020 was held in Dubai (United Arab Emirates) between the October 1, 2021, and March 31, 2022. The theme of the Expo 2020 Dubai was "Connecting minds, creating the future," which aimed at bringing communities and individuals together to shape a sustainable, smart and connected future [33]. It has been the first Expo organized in the Middle East, Africa and South Asia region.

According to the organizers, the Expo 2020 Dubai was attended by over 24 million visits. Out of the 24 million, 107,000 were visits from people of determination and around 723,089 of senior citizens [34], some of whom may be users of accessibility services.

[1] https://dubaiaccessibletourism.com/.

[2] https://accessabilitiesexpo.com/.

3.2 Instruments

This study has focused on the accessibility provision and experience of PwDs at the Expo event in Dubai, drawing on various sources of information. For the collection of data, three tools have been employed: observation, qualitative questionnaires and in-depth interviews.

Observation helps researchers to "have a better understanding of the context and phenomenon under study" and can increase validity when complemented with other data collection tools [37]. In this study, observation provided the researcher with first-hand information on the event and a foundation on which to build on with the data from the interviews and questionnaires.

An open-ended questionnaire was designed and sent to organizations supporting people with disabilities in Dubai and Abu Dhabi. Open-ended questionnaires are flexible and enable the collection of in-depth responses and most suitable for small-scale, exploratory research studies [35]. The questionnaire was reviewed by two accessibility experts working in two universities in Barcelona. The author gathered their feedback and made minor changes to the questionnaire.

The questionnaire contained open-ended questions related to the accessibility provision at the Expo, the accessibility of information and experiences, access to services and pavilions, the physical environment and support from staff. It included a final question on how the accessibility of the Expo compares to that of other tourist attractions. A copy of the questionnaire can be found in Appendix 1.

The in-depth interviews were semi-structured, and the questions asked were related to their tourism practices in general and to their experience at the Expo: from booking their ticket, to getting there and exploring the different pavilions. Interviews were seen as a space where opinions were (re)constituted rather than reported and taken as indicative or illustrative of particular social phenomena, or as a way of eliciting meanings that had been previously "stored" in the mind of the interviewee/s [38].

3.3 Procedure

A research proposal and Data Protection form was submitted in March 2022 to Middlesex University's Ethical Committee.[3] The study obtained institutional approval and ethics clearance. This study has also followed the practices for accessibility studies proposed in Matamala et al. [36].

Observation was conducted on March 17, 2022, by the author, and the duration of the session was approximately 6 h. During the observation session, notes and photographs were taken (see Appendix 2) and a small number of field interviews with visitors and staff were conducted.

In parallel, the open-ended questionnaire was sent to organizations supporting people with disabilities in Dubai and Abu Dhabi. A total of eleven organizations were contacted and two agreed to take part in the study. These organizations were asked to distribute the online questionnaire among their service users. The questionnaire included a final question that asked participants if they would be willing to be interviewed and, if so, to provide their e-mail address. The participants that responded positively were interviewed. Interviews were held online or face-to-face, at the discretion of the participants. PwDs who volunteered to the interview were interviewed between April and May 2022, shortly after the Expo 2020 ended.

The two organizations in charge of the accessibility of the event were contacted and agreed to take part in the study. The in-depth interviews with the accessibility professionals were conducted online on August 24 and September 14, 2022.

Interviews were audio recorded (except of one as the participant did not agree to be recorded) and lasted between 15 and 50 min. Participants were not paid or compensated in any way for their participation.

3.4 Participants

There are four types of participants: PwDs, accessibility consultants, family of PwDs and Expo Staff. Details of the participants involved, the tools employed and the topics that were explored in each activity are presented in Table 1.

The ages of questionnaire participants ranged from 25 to 75. Six of them visited the event with family, and one visited alone. Four participants visited the Expo multiple times, and three of them visited once. One participant identified as a person with autism spectrum disorder, two had a vision impairment or disability, and four had a physical impairment or disability.

Regarding the interviewees that were visitors of the EXPO and had a disability (i.e., users), three of them had a physical impairment or disability, and one had a cognitive impairment or disability.

The accessibility consultants (also users of access services, see Table 1) worked for organizations that provide accessibility services nationally and/or internationally (the UAE, the USA and the UK). During the time of the interviews, two accessibility consultants were based in the UK and the USA, respectively, but the three of them had been based in Dubai during the Expo.

[3] The author was affiliated to Middlesex University, UK, when the study was conducted.

Table 1 Participants involved, tools and topics investigated

Participant	Self-identified disabilities	Topics investigated	Tools	Number	Identifier
PwDs	Cognitive impairment or disability Physical impairment or disability (n.3) Visual impairment or disability (n.2) neurodivergent visual and physical impairment	Experiences at the event Suggestions to make the event more accessible	In-depth interviews Questionnaires	4 7	I01 102 103 104
Accessibility consultants and experts at expo	Disability or impairment not specified (1) neurodivergent (1) none (1)	Work conducted with regard to the accessibility of the event experiences managing accessibility projects of large events	In-depth interviews	3	I05 106 107
Family of PwDs	None	Experiences at the event accompanying a PwDs	Micro-interviews during observation	2	MI01 MI02
Expo staff	None	Accessibility services available	Micro-interviews during observation	3	MI03 MI04 MI05

3.5 Data analysis

The interviews were analyzed using thematic analysis by means of manual live coding [39]. The benefits of live coding include the possibility to record paralinguistic behavior such as tone, rate of speech and intonation [37]. The live coding process was developed following the approach as described in Parameswaran et al. [39]. The emerging codes were then grouped into overarching categories or themes. The results presented in the next section are organized based on these overarching themes. The data from the questionnaires were analyzed qualitatively.

The findings from the interviews, observation and questionnaires are presented in the next section. The information on the accessibility of the Expo 2020 Dubai available online, which was also examined, is also included below.

4 Findings

This section reports the key findings from the various data collection activities: in-depth interviews, questionnaires, observation and micro-interviews. The themes discussed include: the experience of PwDs at the event, the accessibility of the event, specifically, the services available at the event and the feedback of PwDs on these, the physical accessibility of the Expo site and the contribution of staff to making the event accessible, and finally, the insights and experience of accessibility consultants working at the event.

4.1 Experiences of people with disabilities at the Expo

The most salient notion from the data was the considerable efforts made to make the event accessible. The experiences of PwDs were positive, and there was overall a sense of gratification and appreciation regarding the accessibility of the event. The factors that were key to the experience of PwDs were the infrastructure, the services offered and the staff, i.e., volunteers, guest services representatives at the pavilions, security personnel and police officers.

Overall, the experience of PwDs at the Expo Dubai was positive. Interviewees had visited multiple times (from 10 to 30 times) and reported enjoying every visit. Some of the words used to describe their experience at the event were "amazing," "safe for PwDs" and "great." The overall sentiment was that considerable efforts were made to ensure PwDs could access and enjoy the Expo. In the words of one of the interviewees, "[PwDs] did not feel forgotten" (I03). All participants described the Expo as the most accessible tourism attraction and event they had attended. In the case of accessibility consultants, it was the most accessible event they had worked on.

On the other hand, the data show that there were significant gaps or missing links in the accessibility chain. These gaps prevented PwDs from fully experiencing and navigating the Expo. Participants were not fully autonomous in their visits, for example, wheelchair users needed help to open the doors of accessible toilets and sometimes missed part of the experience by using alternative wheelchair routes in pavilions. Wheelchair users found this incomprehensible. Interviewees I03 and I05 stated that they believe that feedback from PwDs had not been gathered for the design of the Expo site. Despite the issues, their general feedback from the event was positive.

A final salient point in the experiences of PwDs was the enjoyment and learning from working at the event. Three participants had worked at the event in one of the pavilions (two were PwDs and one was an accessibility expert) and the

Table 2 Accessibility services offered

Accessibility services	
Sunflower lanyard	Social narratives (PDF file)
Quiet rooms	Sensory access rates for each pavilion
Headphones and children's sunglasses	Hearing enhancement systems
Open captions on digital experience videos	Scannable code with sign language
Sign language tours and interpretation	Tactile paving and maps
Audio content	Audio description in Arabic and English
Touch tour	Wheelchairs
Wheelchairs charging stations	Accessible toilets
Quiet rooms	Service dog relief areas

positive impact of the experience, for PwDs, other staff and visitors, was manifest. The two participants with disabilities were extremely happy with their work experience, which had given them a sense of belonging and accomplishment: they had been active participants of a historical moment in Dubai. They also enjoyed the interactions with the visitors and other staff and developed their social skills. They were both actively looking for employment as a result of their formative experience at the Expo.

4.2 Accessibility of the event

This section discusses the accessibility services and the feedback of PwDs on these, the physical accessibility of the site and the contribution of staff to making the event more accessible.

4.2.1 Accessibility services

The official Expo website includes a list of the accessibility provision at the event,[4] which is advertised as the most accessible Expo in history. Table 2 lists the accessibility services listed in the Expo website.

According to the data, the accessibility services most employed and valued by PwDs were the sunflower lanyards, also known as hidden impairment lanyards (see Fig. 19 in Appendix 2), the fast-track pass in queues, and for people with reduced mobility, the wheelchairs, lifts, buggies and scooters (see Figs. 15, 16, 17, 18 in Appendix 2). The fast-track pass and the lanyards were particularly appreciated by PwDs. These two were key to making the visits enjoyable to PwDs. It is important to note that the Expo was free for PwDs and one companion could get the ticket half-price.

The lanyards were provided to PwDs at the site entrance, and their purpose was to let the staff and volunteers know that visitors with a lanyard may need additional assistance and had a fast-track pass in pavilions (PwDs did not have to queue to enter pavilions). Yet, lanyards were not readily available at all entrances and, at times, PwDs were not aware of this service or had to ask for a lanyard to staff.

Scooters (see Fig. 17 in Appendix 2) were initially free for PwDs. At a certain time, they became payable, at 200 AED per day (around 50€) as a result of high demand, possibly by non-PwDs, according to participants. Some participants also raised that the accessible buggies (see Fig. 4 in Appendix 2), which were designed to transport PwDs for longer distances, were at times used for protocol over PwDs.

Wheelchairs were available at visitor and information centers and could be borrowed free of charge. The issues raised by participants were that these were very heavy and had to be returned in the same center in which the wheelchair was borrowed. This system was inconvenient for those who decided to rent them in the middle of their visit as they had to then return them in a center that was far from their car in the disability parking.

Regarding the technologies advertised on the website, none of the participants of the study used any of these technologies i.e., hearing enhancement systems, scannable codes, touch tours, tactile paving and tactile maps, sensory access rates or others (see Table 2). The researcher did not encounter any of the other resources or technologies advertised during the observation session either, with the exception of the sensory access rate cards, which can be found online. These provided people with sensory processing sensitivities with the necessary information prior to their visit.

During observation, the researcher enquired in the different Visitor centers about bespoke tours for PwDs (as advertised). Most staff were unaware of these tours. In the last Visitor center the researcher was given the e-mail address for booking tours at the Expo. The researcher e-mailed the address on March 28, 2022, but there was no response. The lack of response could be due to the fact that contact was made too close to the end of the event on 31st of March.

[4] https://www.expo2020dubai.com/en/plan-your-visit/accessibility/special-requirements.

4.2.2 Physical accessibility of pavilions

The Expo site was organized around large open-air avenues leading to pavilions of different sizes (see Figs. 3, 4 and 11 in Appendix 2). There were two types of pavilions: country and thematic pavilions.

Thematic pavilions were managed by Dubai and had to adhere to the country's laws on accessibility. Country pavilions were considered the territory of the country and were therefore not required to follow the regulations of Dubai: the accessibility of their pavilions was at their own discretion (I05). This differentiation translated in a discrepancy in the accessibility provision of the various types of pavilions within the Expo site.

Country pavilions were of different sizes: Small pavilions had a similar size and layout, while larger pavilions (usually reserved to countries with affluent economies) were designed by each country.

The UAE pavilion and the thematic pavilions were found to be accessible; some of the country pavilions were accessible while others inaccessible. Some large pavilions had automatic doors or no doors, while small pavilions had heavy, large doors, which made it impossible for wheelchair users to enter autonomously (see Fig. 10 in Appendix 2). Surprisingly, accessible toilets, located on the ground floor for accessibility purposes, had also manual doors (see Fig. 9 in Appendix 2). According to one participant (I03), these were very heavy, and the participant could not use the bathrooms without the help of their partner.

Pavilions had ramps (see Fig. 11 in Appendix 2) and wheelchair access to other floors and areas. However, these designated routes for wheelchair users sometimes had obstacles, which made passing difficult (see Fig. 14 in Appendix 2). In some cases, these alternative routes went through back corridors which resulted in wheelchair users missing part of the exhibitions and experience.

4.2.3 Contributions of staff to the accessibility of the event

Staff at the event were key to the experience of PwDs. According to Martínez Carrillo [18] and Zorková [40], staff is one of the key links in the accessibility chain. At the event, the reasons for their substantial contributions were twofold: First, staff had disability awareness. Staff received training on disabilities and, during the event, they "always tried to go the extra mile to make PwDs visits an enjoyable one" (I06). According to a staff member (I04), guidance had been provided to staff and volunteers to offer full support to PwDs throughout their visit.

Secondly, the high number of staff and volunteers present at the site made it easy for PwDs to reach out for help, directions or information when needed. Support from staff began at the parking, which was reported as being very important for PwDs. For example, some were directed to the PwDs parking by staff (showing a disability badge was not required). At the Expo site, there was special Dubai police division for PwDs who spoke International and Arabic sign language and who were available to support and accompany PwDs during their visit. One interviewee (I05) indicated that staff at the pavilions would at times do bespoke tours for PwDs, for example, for people with visual impairments, but these were not bookable or available on offer.

4.3 Accessibility planning and management: accessibility consultants

There were two teams in charge of the accessibility of the event: one for the general accessibility and another in charge of the sensory accessibility. Accessibility consultants recognized that the Expo was the most complex project that we have worked on (I07). They also claimed that the event was the first global event that has attempted to be as accessible (I06), specially that it did not only focus on people with mobility or visual impairments, but it also considered neurodiversity.

Accessibility consultants were satisfied with their work and the willingness of event organizers to incorporate their recommendations. They highlighted the benefit of having two teams working on the event, as it allowed for the combination of different areas of expertise and distinctive ideas coming together. The consultants designed the training courses for Expo staff and adopted a top-down approach to training: They trained the managers of different teams who would train their staff. Among their achievements, they highlight the increased awareness on disabilities among the local community, and the popularity and recognition of the sunflower lanyards across the country.

Accessibility consultants addressed some challenges in the execution of their duties. The work on the accessibility of the event started only a year and a half before the event was due to start, when a lot of progress had been made on building the event site. The delay presented serious limitations to their work and to the accessibility of the event.

Another challenge was related to the Dubai Universal Design Code (see Sect. 2.3), which set the requirements for the accessibility for buildings in Dubai. The code came into effect after the work on the site had already started and adhering to the code became problematic. To overcome this challenge in future events, consultants suggest the inclusion of an accessibility clause in the contract that countries sign when they agree to participate in the event. This clause will ensure that all participating countries adhere to the accessibility mandate or code set for the event.

Accessibility consultants had no direct contact with stakeholders (management of country pavilions and retailers), which made communication with stakeholders challenging. This was further complicated by the fact that country

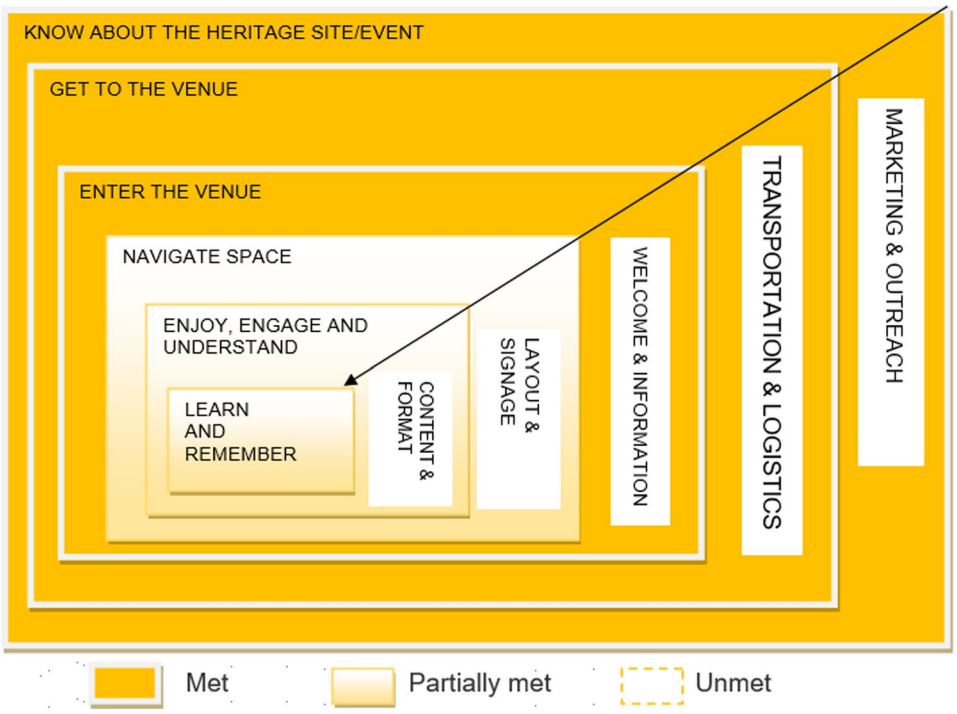

Fig. 2 Stages of the cultural experience: the case of the Expo Dubai 2020 (adapted from Neves [22], reproduced with the author's permission)

pavilions could decide whether they wanted to make their pavilion more accessible. As raised in Sect. 4.2.1, these pavilions did not have to follow UAE regulations on accessibility.

The restrictions associated with the COVID-19 pandemic also affected the accessibility of the event. For example, touch services were reduced to prevent the spread of the virus, and the compulsory use of masks was a detriment to the deaf community.

5 Discussion

The findings of this study have brought to the fore the efforts and successes of the accessibility of the Expo, but have also uncovered some missing links in the accessibility chain. Visitors appreciated the provision and efforts made to accommodate their access needs, which were greater than what visitors with disabilities are accustomed to. Yet, PwDs were still dependent on family members or carers during their visit and rarely did they venture to visit the event on their own. The Accessibility Code passed by the Emirate of Dubai contributed partially to making the event accessible, but the failure to enforce the code in all pavilions led to inconsistencies in the navigation of the event and jeopardized the experience and access of PwDs to certain spaces.

The work and continued efforts of accessibility consultants provided a wide range of access services and participation, but said access and participation were not ubiquitous due to the fact that experts were not involved from the start of the "product"; a principle in present-day design approaches (be they referred to as user-centered, universal or design for all). At that stage, certain errors could not be corrected, especially with regard to physical access.

To ascertain the extent to which the event was accessible, the results from the study have been measured against the stages of cultural experience as proposed by Neves [22]. Figure 2 illustrates the stages of the cultural experience and whether and to what extent these were met. The findings from this study indicate that the first three stages (know about the event, get to the venue and enter the venue) were met in the Expo 2020 Dubai. The event organizers were successful in marketing and outreach, transportation and logistics, and welcoming and providing accessible information to PwDs. The two remaining stages (navigate space, enjoy, engage and understand) were only partially met. For example, wheelchair users could not access the accessible toilets (navigating space), people with visual impairments could not enjoy and engage the exhibitions unless they booked a bespoke tour in advance, and wheelchair users could not access the displays on tables in certain pavilions (enjoy, engage and understand). This means that the main goal, to learn and remember, could only be partially achieved at the Expo event.

6 Summary of recommendations for future events

This section gathers the recommendations for future large events based on the findings of this study on the Expo2020 Dubai. The suggestions below are drawn from the data

Table 3 Suggestions for future events (author's own elaboration)

Summary of suggestions
Mandatory
Before the event
Ensure that accessibility experts are part of the event since the very beginning
Inclusion of an accessibility clause in the contract that participating countries/companies sign when they agree to take part in the event
Train staff on accessibility by using a top-down approach
During the event
Supply and have on display sunflower lanyards at the entrance
Use automatic doors in all entrances
Give fast-track passes to PwDs to avoid queueing
Provide free motorbike or scooters for people with reduced mobility
Ensure wheelchair users can enjoy the full experience and exhibitions in pavilions
Ensure accessible toilets are fully accessible, i.e., have automatic doors
Easy rental system of higher-quality wheelchairs
Organze and advertise bespoke tours for PwDs, to ensure that these can be easily booked
Recommended
Employing PwDs at the event
Engage various teams with different expertise on accessibility

collected for this study: the highlights and shortcomings raised by PwDs, the challenges and suggestions of the accessibility consultants and the data from the questionnaires and observations, Table 3.

6.1 Limitations and further research

This study reports on interviews and questionnaires of PwDs from the UAE, but we were not able to engage in this study with PwDs from other countries that visited the Expo. Furthermore, while the researcher contacted eleven local organizations, only two agreed to take part in the study. Future studies can include visitors from other countries to have a wider sample.

Another limitation is that there was only one observation event, due to time and resources constrains. Having multiple observations on different days, times and months would have allowed for contrasting the data gathered in the first observation, especially via micro-interviews with PwDs during their visit.

Finally, we acknowledge the impact of the COVID-19 pandemic on the event and hence on the planning and execution of the accessibility provision. As a result of the travel and social gathering restrictions, the event was delayed by a year; the preparation for the event was interrupted during the peak of the pandemic, the accessibility provision was affected by the restrictions and safety recommendations, i.e., touch tours and other sensory experiences or services were limited to prevent the spread of the virus. We acknowledge that the complexity of making an event of this magnitude accessible to all was further complicated by the COVID-19 pandemic.

Further research is also encouraged on the impacts of employing people with disabilities in large events. The data from this study indicate that it has the capacity to raise awareness and educate the general population on disabilities. Furthermore, the beneficial effects of working at the Expo on the lives of the participants with disabilities became evident in the interviews. Research that explores the impact that working in large, international events has on the lives of people with disabilities is also encouraged.

7 Conclusions and further research

This study has gathered the experiences of PwDs and accessibility experts at the Expo2020 in Dubai and has shed light on the complex and necessary task of making events and experiences accessible to all. The desire to make the event accessible and the involvement of accessibility consultants did not suffice to meet the access requirements of visitors. We agree with Finkel and Dashper [5] in that a better understanding of accessibility, diversity and inclusion will lead to advances in events that benefit more people and communities. It is hoped that the findings of this study can be used in planning and managing future large events.

It is important to acknowledge that there is still much progress to be made. While efforts have been made to improve inclusivity and accommodate individuals with disabilities, there are still significant challenges to overcome. However, it is encouraging to see that steps are being taken in the right direction. Event organizers, communities and advocacy groups are increasingly recognizing the importance of

accessibility and working towards implementing inclusive practices. Through continued collaboration, awareness and commitment, we can hope to bridge the accessibility gap and ensure that large events become truly inclusive spaces for everyone. It is a journey that requires ongoing dedication, but the fact that efforts are being made is a positive sign for a more accessible and inclusive future.

In addition to creating a more inclusive tourism experience, it has become apparent that the impact of making an event of this magnitude accessible goes beyond the temporal and physical confinement of the event: Making these events accessible can contribute to the country's legacy. Accessible events have the potential to raise awareness on disabilities among the community (local and, we dare say, international), to set standards and examples for future events and to leave behind a tangible legacy in the city: in the case of Dubai, a fully accessible facility, the Expo city,[5] for future visits and events.

Appendix 1: Questionnaire

Demographics

1. With which of the option below do you identify with?

   Vision impairment
   Hearing impairment
   Mobility impairment
   Cognitive impairment
   Speech impairment
   Other: please specify
   None of the above: I accompanied a person who used the accessibility services at the Expo)

2. How old are you?

   18–25
   26–35
   36–45
   46–55
   +55

3. Where do you live?

Questionnaire

4. When did you visit the expo?
5. How many visits?
6. Who did you go with?
7. Did you check which accessibility services were provided by the Expo before visiting? If so, where/how did you check?

General

8. What is your opinion of the accessibility provision at the Expo? **(Interaction with staff)**.
9. How were your interactions with staff members at the Expo? **(Access to information and experiences (media accessibility))**.
10. What accessibility services/features did you use? Please select. (Show list shown in Table 2).
11. Which one did you find the most useful? Why? **(Access to services such as food/toilets and access to pavilions)**.
12. Can you tell us about your experience in the restaurants, toilets? **(Experience at the Expo vs other tourist attractions)**.
13. Have you visited other tourist attractions (in the UAE or abroad) recently? How does your experience at the Expo compare to that of other places you have recently visited?

Appendix 2: The Expo2020 Dubai. Photos taken during observation

See Figs. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19.

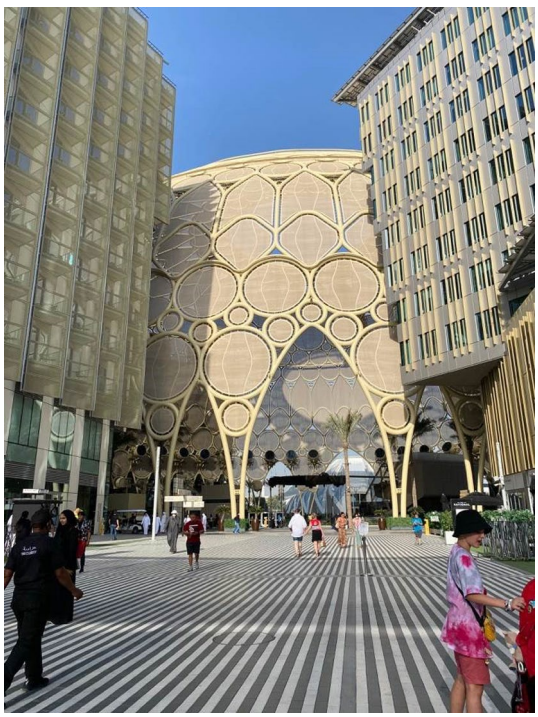

Fig. 3 Avenues leading to pavilions

[5] https://www.expocitydubai.com/en.

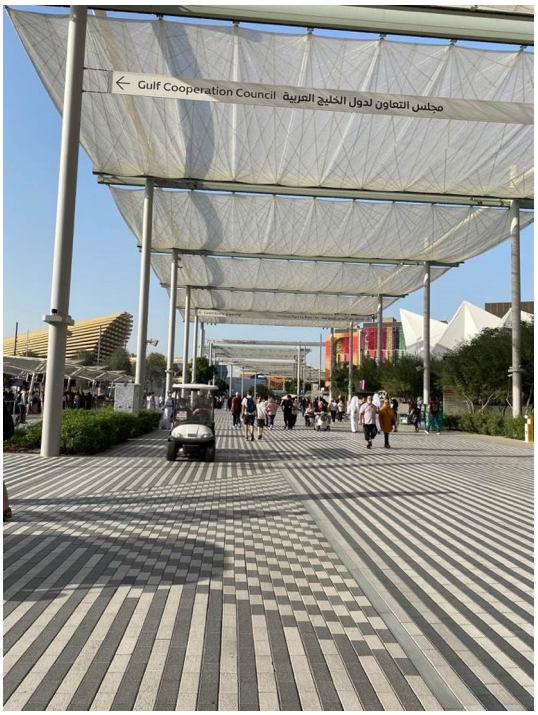

Fig. 4 Avenues leading to pavilions of different sizes. This picture also shows two modes of transports used by PwDs: carts or buggies (left) and e-scooters (right)

Fig. 6 Signage

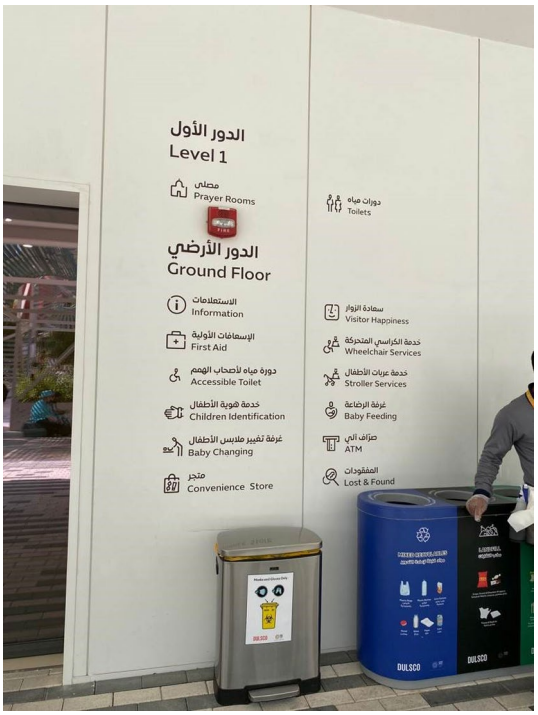

Fig. 5 Signage

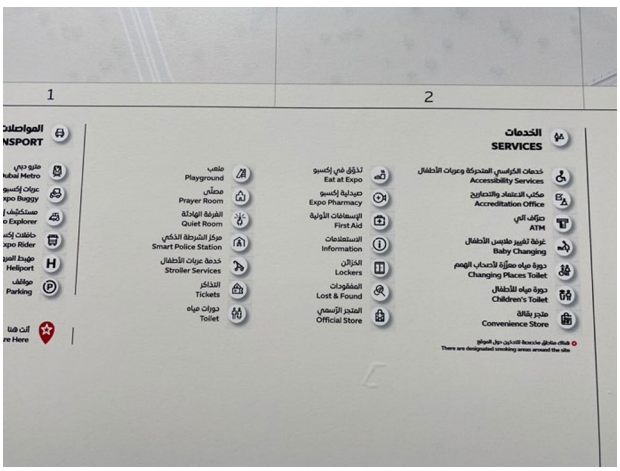

Fig. 7 Key of the Expo map

Fig. 8 Wheelchair charging station

Fig. 10 Manual doors in small pavilions

Fig. 9 Accessible toilets with manual doors

Fig. 11 Ramp access to the Peruvian pavilion

Fig. 12 Ramp access to a building

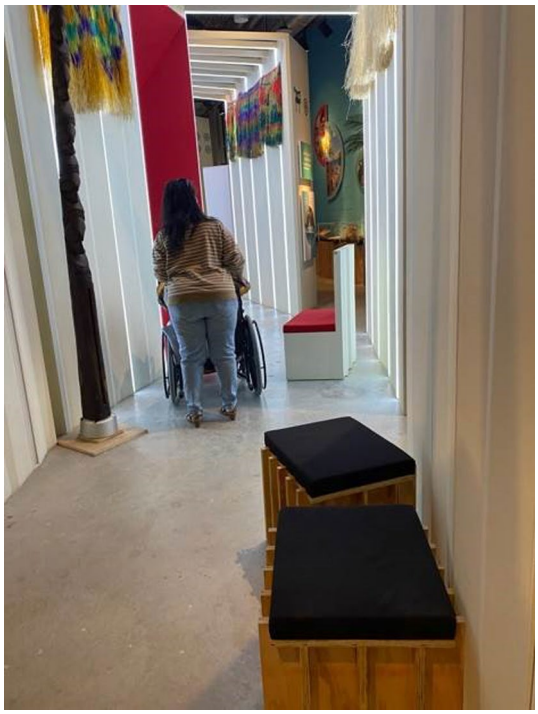

Fig. 14 Obstacles to wheelchairs in pavilions

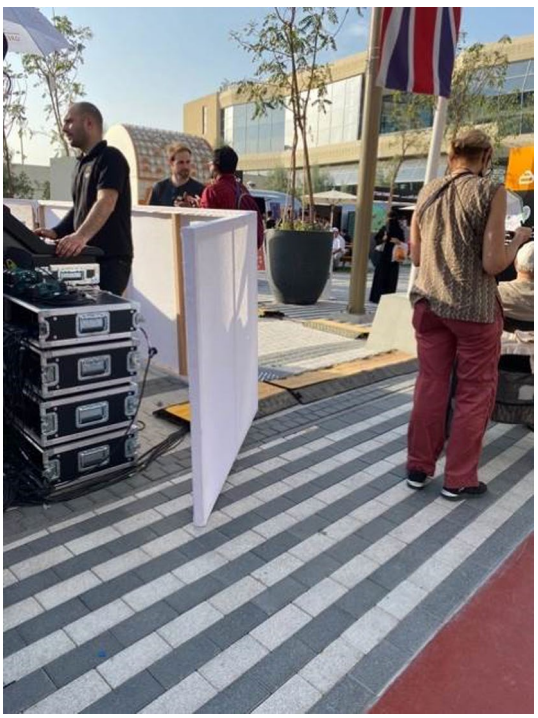

Fig. 13 Obstacles to wheelchairs in avenues

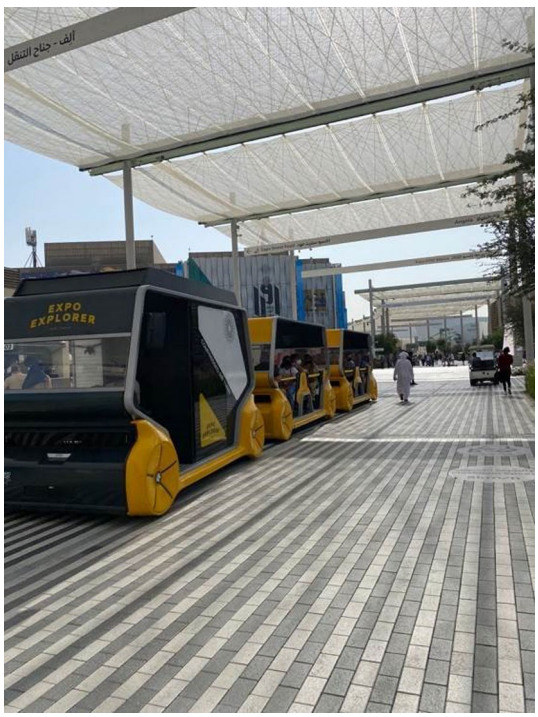

Fig. 15 Mode of transport used by people with reduced mobility. Compressed air train

Fig. 16 Modes of transport used by people with reduced mobility: cart

Fig. 17 Mode of transport used by people with reduced mobility: The Expo Explorer

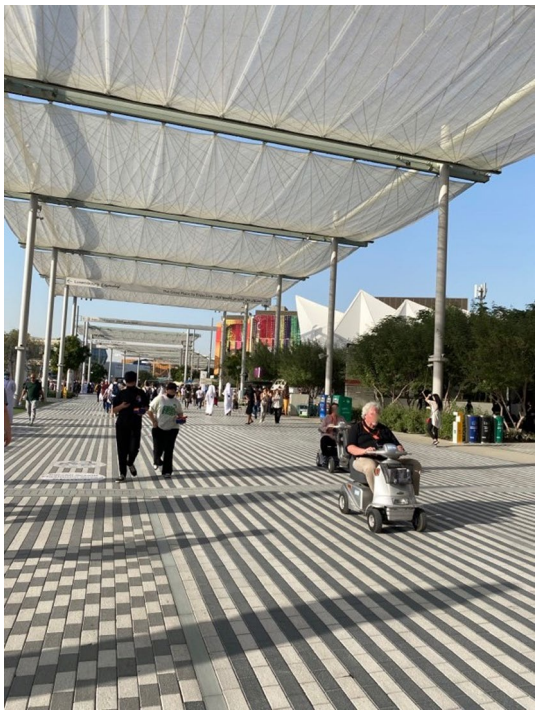

Fig. 18 Mode of transport used by people with reduced mobility: scooters

Fig. 19 Sunflower lanyard (*source* https://www.expo2020dubai.com/en/plan-your-visit/accessibility/special-requirements.html)

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Declarations

Conflict of interest The author declares that they have no conflict of interest.

References

1. Finkel, R., Sharp, B., Sweeney, M.: Accessibility, inclusion, and diversity in critical event studies. Routledge, Abingdon (2019)
2. Duffy, M., Mair, J., Waitt, G.R.: Addressing community diversity: the role of the festival encounter. In: Finkel, R., Sharp, B., Sweeney, M. (eds.) Accessibility, inclusion, and diversity in critical event studies, pp. 9–20. Routledge, Abingdon (2019)
3. Meeting Professional International (2019) A research report: The state of inclusion in meetings and events. MPI Foundation, https://www.mpi.org/docs/default-source/academy/inclusion-report-final.pdf. Accessed 24 February 2023
4. Barrera-Fernandez, D., Hernández-Escampa, M.: Inclusion of people with reduced mobility in festivals: perceptions and challenges at the Guelaguetza Festival, Mexico. In: Finkel, R., Sharp, B., Sweeney, M. (eds.) Accessibility, inclusion, and diversity in critical event studies, pp. 21–32. Routledge, Abingdon (2019)
5. Dashper, K., Finkel, R.: Accessibility, diversity, and inclusion in the UK meetings industry. J. Conven. Event Tour. (2020). https://doi.org/10.1080/15470148.2020.1814472
6. Lindo N (2020) How Dubai has become one of the most accessible cities in the world. Euronews. https://www.euronews.com/next/2020/11/19/how-dubai-has-become-one-of-the-most-accessible-cities-in-the-world. Accessed 24 February 2023
7. United Nations Human Settlements Programme (2022) Expo2020 Dubai, 2020.Dubai Universal Accessibility Strategy and Action Plan. https://www.urbanagendaplatform.org/best-practice/dubai-universal-accessibility-strategy-and-action-plan-duasap. Accessed 24 February 2023
8. Expo 2020 Dubai (2020) Accessibility at Expo 2020 Dubai. https://www.expo2020dubai.com/en/plan-your-visit/accessibility Accessed 25 February 2023
9. Greco, G.M.: The nature of accessibility studies. J. Audiov. Transl. **1**(1), 205–232 (2018)
10. Buhalis, D., Darcy, S.: Accessible tourism: concepts and issues. Channel View Publications, Bristol (2010)
11. Darcy, S., Dickson, T.: A whole-of-life approach to tourism: the case for accessible tourism experiences. J. Hosp. Tour. Manag. (2009). https://doi.org/10.1375/jhtm.16.1.32
12. Darcy, S., Cameron, B., Pegg, S.: Accessible tourism and sustainability: a discussion and case study. J. Sustain. Tour. **18**(4), 515–537 (2010)
13. Nigg, J.J., Eichelberger, S.: Sustainable product development for accessible tourism: case studies demonstrating the need for stakeholder collaboration. Sustainability (2021). https://doi.org/10.3390/su132011142
14. Sica, E., Sisto, R., Bianchi, P., Cappelletti, G.: Inclusivity and responsible tourism: designing a trademark for a national park area. Sustainability (2021). https://doi.org/10.3390/su13010013
15. Sisto, R., Cappelletti, G.M., Bianchi, P., Sica, E.: Sustainable and accessible tourism in natural areas: a participatory approach. Curr. Issue Tour. (2021). https://doi.org/10.1080/13683500.2021.1920002
16. Urosevic Z, Ross M, Lisboa C et al (2018) Tourism and the sustainable development goals – Journey to 2030. United Nations Development Programme. https://www.undp.org/publications/tourism-and-sustainable-development-goals-journey-2030?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=CjwKCAjwlqOXBhBqEiwA-hhitH3z_xc7AcAQaIRWnp5ZIxCrZuyeNSs5UA8VgtPpotHkKmofhdxScBoCKHMQAvD_BwE Accessed 24 February 2023
17. United Nations World Tourism Organisation (2020) UNWTO and Fundación ONCE deliver international recognition of 'Accessible Tourist Destinations' at FITUR. https://www.unwto.org/unwto-and-fundacion-once-deliver-international-recognition-of-accessible-tourist-destinations-at-fitur Accessed 24 February 2023
18. Martínez Carrillo, M.J.: Museos accesibles para todos. Diagnóstico de la accesibilidad universal de los museos de Caen (Francia). Rev. Int. de Tur. Empresa y Territorio (2020). https://doi.org/10.2171/riturem.v4i2.12931
19. Matausch K, Miesenberger K (2010) Planning of inclusive and accessible events. In: Computers Helping People with Special Needs: 12th International Conference, ICCHP. https://doi.org/10.1007/978-3-642-14097-6_43
20. Cornell University (2023) Accessible Meeting & Event Checklist. https://accessibility.cornell.edu/event-planning/accessible-meeting-and-event-checklist/ Accessed 24 February 2023
21. Mundy J (2017) Access is walking through the door. Inclusion is sitting at the table. Participation is eating the meal and talking about it.#creativestate. Tweet published on 29 June 2017, https://twitter.com/JodeeMundy/status/880254164231573504
22. Neves J (2018) Cultures of Accessibility: Translation making cultural heritage in museums accessible to people of all abilities. In: The Routledge handbook of translation and culture. Routledge, pp. 415–430
23. Buhalis, D., Michopoulou, E.: Information-enabled tourism destination marketing: addressing the accessibility market. Curr. Issue Tour. (2011). https://doi.org/10.1080/13683501003653361
24. Blichfeldt, B.S., Nicolaisen, J.: Disabled travel: not easy, but doable. Curr. Issue Tour. (2011). https://doi.org/10.1080/13683500903370159
25. Eichhorn, V., Miller, G., Michopoulou, E., Buhalis, D.: Enabling access to tourism through information schemes? Ann. Tour. Res. (2008). https://doi.org/10.1016/j.annals.2007.07.005
26. Yau, M.K.S., McKercher, B., Packer, T.L.: Traveling with a disability: more than an access issue. Ann. Tour. Res. (2004). https://doi.org/10.1016/j.annals.2004.03.007
27. Dos Santos, C., Neto, S., Santana De Oliveira, A.F., Denardin Cardoso, V., De Castro, H.M.: Rio 2016 Paralympics and accessibility: breaking barriers in urban mobility? In: Finkel, R., Sharp, B., Sweeney, M. (eds.) Accessibility, inclusion, and diversity in critical event studies, pp. 167–176. Routledge, Abingdon (2019)
28. Dubai World Trade Centre (2022). Why Dubai is a leading global events destination. https://www.dwtc.com/en/industry-insights/why-dubai-is-a-leading-global-events-destination/ Accessed 24 February 2023

29. TradeArabia (2022) Dubai Team for Accessible Travel and Tourism launched. Zawya. https://www.zawya.com/en/business/travel-and-tourism/dubai-team-for-accessible-travel-and-tourism-launched-eo55oe3o Accessed 24 February 2023
30. The United Arab Emirates Government Portal (2022) Protection, support and assistance of people of determination. https://u.ae/en/information-and-services/social-affairs/people-of-determination/protection-support-and-assistance-of-people-of-determination#:~:text=coverage%20on%20WAM.-,Who%20are%20people%20of%20determination%3F,their%20achievements%20in%20different%20fields Accessed 24 February 2023
31. Dubai Municipality (2017) Dubai Guide for built environment and Universal design. https://www.dm.gov.ae/wp-content/uploads/2020/11/Dubai-Guide-for-Built-Environment-Universal-Design-1_compressed.pdf Accessed 24 February 2023
32. Government of Dubai (2023) Wosool Service. https://www.dm.gov.ae/municipality-business/dubai-universal-design-code/ Accessed 24 February 2023
33. Bureau International des Expositions (n.d) What is an Expo? https://www.bie-paris.org/site/en/what-is-an-expo Accessed 24 February 2023
34. Gulf news (2022) Expo 2020 Dubai recorded more than 24 million visits over its six months. https://gulfnews.com/expo-2020/expo-2020-dubai-recorded-more-than-24-million-visits-over-its-six-months-1.86911202 Accessed 24 February 2023
35. Brotherton, B.: Researching hospitality and tourism. Sage, London (2015)
36. Matamala A, Orero P, Rovira-Esteva S et al (2018) User-centric approaches in access services evaluation: profiling the end user. In: Proceedings of the Eleventh International Conference on Language Resources Evaluation (LREC 2018), pp 1–7. ELRA. https://ddd.uab.cat/pub/caplli/2018/189707/1_W14.pdf
37. Kawulich, B.: Participant observation as a data collection method. Forum Qual. Sozialforschung/Forum Qual. Soc. Res. (2005). https://doi.org/10.17169/fqs-6.2.466
38. Edley, N., Litosseliti, L.: Contemplating interviews and focus groups. Res. Method. linguist. **155**, 179 (2010)
39. Parameswaran, U.D., Ozawa-Kirk, J.L., Latendresse, G.: To live (code) or to not: a new method for coding in qualitative research. Qual. Soc. Work. (2019). https://doi.org/10.1177/1473325019840394
40. Zorková, D.: The issue of accessibility from the point of view of tourism service providers. Ekon. Revue Cent. Eur. Rev. Econ. Issues **19**, 53–61 (2016)
41. Darcy, S., Harris, R.: Inclusive and accessible special event planning: an Australia perspective. Event manag. **8**(1), 516–536 (2003). https://doi.org/10.3727/152599503108751685