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Understanding technological contributions to accessible tourism from the perspective of destination design for visually impaired visitors in Hong Kong

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ABSTRACT

Increasing concerns about disability, accessibility and universal environments for travel and destinations have reached the academic and industrial attentions worldwide, especially for the understanding of the role of technology in tourism. This study presents a qualitative study to the objectives of: (1) understanding different types of barriers encountered by the visually impaired (VI) in visiting urban attractions; (2) exploring technological contributions in removing barriers for the VI smartphone and computer users in touring urban attractions; and (3) examining the implications for technological innovations that improve the accessibility of tourism in Hong Kong for the VI. The targets of the study were young local VI visitors of Hong Kong attractions who were also smartphone and computer users. Results revealed that the interviewees' main concerns regarding barriers were knowledge constraints. This study confirms the contribution of technology toward increased accessibility by highlighting that mobile applications have the capability to remove knowledge constraints for the VI. The study also shows that maps and images are the two areas for future technology innovation.

1. Introduction

The concepts of inclusivity and accessibility in tourism destinations are attracting increasing public awareness in the recent decades. The United Nations was the first mover in driving more accessible tourism development. In 2006, the Convention of the Rights of Person with Disabilities (Convention) (UN, 2006) advocated for the right of people with disabilities to travel with equal freedom, dignity and opportunity. This also incorporated the concept of accessible tourism in Article 9 and Article 30 of the Convention that people with disabilities should be able to have equal access to the physical environment, transportation, information and communications, tourism venues, facilities and services (UN, 2006). Furthermore, the World Tourism Organization (UNWTO), a specialized agency of the UN, established the theme 'tourism for all' for the world tourism day 2016 (UNWTO, 2016a).

Nowadays, the visually impaired are still a marginalized group in academic research (Small & Darcy, 2010). This may be due to the way the term 'sightseeing' highlights the vision sense 'sight' and 'see' as the dominant sense in a tourism experience. The tourism gaze theory also emphasizes vision as the most significant sense in a tourism experience (Urry & Larsen, 2011). However, visually impaired persons are just like other people who travel for leisure and recreation. In view of that, the UNWTO former Secretary General Taleb Rifai has identified that "technology and innovation are the most useful key tools" in developing accessible tourism (as cited in UNWTO, 2017). Moreover, the contributions of technology to assist the visually impaired extend from access to empowerment (Singh, 2013), and from empowerment to the creation of social, cultural and economic impacts (UNWTO, 2016a). Young travelers aged 15 to 29, being the fastest-growing traveler segment, would be the key contributors to creating impacts that drive the accessibility of tourism to the disabled travelers (UNWTO, 2016b).

In recent years, the use of smart technology to enhance the tourist experience has been a new strategy for Hong Kong's tourism development blueprint (Tourism Commission, 2017). Technology is incorporated in the destination design, in which urban attractions in Hong Kong are keen to increase their smartness of offering and enriching sensory experiences to visitors. The Hong Kong Tourism Board and NGOs have increasingly seen technology as a solution to the access problems of impaired and disabled populations including the visually impaired. Visually impaired persons, being one of the user groups of tourism facilities, have first-hand experience of what the barriers to accessibility are, and how technology transforms the travel and visit

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experience from their collective viewpoint.

In this paper, the term 'visually impaired visitors' will be used to refer to individuals who have low vision or blindness. Since it is extremely difficult to sample inbound visually impaired visitors, this exploratory study is based on the experiences of local visually impaired persons to attractions in Hong Kong. The objectives of this paper are threefold: (1) to understand different types of barriers encountered by the visually impaired in visiting urban attractions; (2) to explore technological contributions in removing barriers for visually impaired smartphone and computer users in touring urban attractions; and (3) to examine the implications for technological innovations that improve the accessibility of urban tourism for the visually impaired. The paper presents a literature review of accessible tourism research to derive the above-mentioned research gap. In order to shed more light upon the perceived barriers of the visually impaired with regard to visiting urban tourism destinations, a qualitative survey of visually impaired persons in Hong Kong was conducted. The paper highlights technology as a crucial part of destination design and discusses the findings before it concludes with implications for both destination management and marketing and future research.

1.1. Literature review

Accessible tourism encompasses the research fields of disabilities studies and tourism studies. There are various similar terms including 'disabled tourism', 'disability tourism', 'easy-access tourism', 'barrier-free tourism', 'inclusive tourism' and 'universal tourism'. Embedded in all of these terms is the desire for inclusion and removal of barriers for the disabled travelers (Agovino, Cassacia, Garofalo, & Marchesano, 2017; Buhalis & Darcy, 2011; Packer, Mckercher, & Yau, 2007; Yau, Mckercher, & Packer, 2004). The removal of barriers is a complex issue due to heterogeneous access requirements of disabled travelers. In this regard, design thinking, which is a process to solve challenges for the creation of tourism experience and successful tourism development (Sheldon, Fesenmaier, & Xiang, 2017), would be able to drive innovative technological solutions to fulfill the access requirement of the disabled visitor, as well as to respond to the three core values accessible tourism including independence, equality and dignity (Buhalis & Darcy, 2011).

The UNWTO (2005) define disabled persons as individuals who "suffer a limitation in their relational ability" (p.1). Such a limitation induces the presence of a barrier that affects the preferences, participation and satisfaction of disabled participants in leisure activities (Iso-Ahola & Mannell, 1985). To better understand the nature of barriers, Crawford and Godbey (1987) attempted to categorize such barriers into three dimensions: firstly, intrapersonal barriers, which are the individual attributes that include sensory impairment, emotional feeling and lack of sufficient knowledge; secondly, interpersonal barriers, which are barriers to interacting with companions, service providers and strangers in the travel; and thirdly, structural barriers, which are based on factors such as transportation, facilities, environment and individual financial resources (Crawford & Godbey, 1987). Crawford, Jackson, and Godbey (1991) also proposed a hierarchical model for the leisure barriers, in which the intrapersonal dimension is the fundamental barrier. Daniels, Drogin, Rodgers, and Wiggins (2005) and Packer et al., 2007, in contrast, found an interrelated structure rather than hierarchical relationship between types of barrier.

With regard to Crawford and Godbey's (1987) categorization of barriers, previous studies have explored the level of significance of different types of barriers to disabled communities in daily life (e.g. Allan, 2015; Daniels, Drogin Rodgers, & Wiggins, 2005). Some researchers have examined visually impaired individuals' embodied experiences and have suggested that environmental, emotional, service provision, companion and knowledge aspects present the major barriers to visually impaired visitors (Mothiravally, Ang, Baloch, Kulampallil, & Geetha, 2014; Richards, Pritchard, & Morgan, 2010; Small, 2014; Small, Darcy, & Packer, 2011). There is, however, a lack of published tourism research that identifies the most significant types of barrier by visually impaired visitors. Little academic contribution exists to connect their views with the perspective of destination design and accessible tourism (see e.g. Loi & Kong, 2017). An information gap is present for investigating the perceived barriers in the destination context of visually impaired persons in Hong Kong.

Human-centered design, as suggested by Tussyadiah (2014), is a design approach that calls for tourism suppliers to make provision for the needs of end users. Including consideration of different forms of stimuli in the integration of technological elements in the servicescape could serve to enhance customer experience (Sheldon et al., 2017). With respect to its application in the context of accessible tourism, the primary concern is the functional capacity of access of the tourism destination by the disabled person (Buhalis & Michopoulou, 2011). The term 'functional capacity of access' refers to physical access, sensory access and access to communication at both the site level and at the level of the exhibited objects (Darcy, 1998; Mesquita & Carneiro, 2016; Packer et al., 2007). With regard to physical access, it includes transport to the tourism attraction as well as the inclusive and universal design of the tourism attraction site to allow disabled persons to get into and move around the tourism attraction (Buhalis & Michopoulou, 2011; Iwarsson & Stahl, 2003; Turco, Stumbo, & Garncarz, 1998). This design approach in tourism attraction, although it aims to ensure that the environment can be used by all people, is recognized to be particularly helpful for disabled people with moderate or low access requirements (Darcy & Buhalis, 2011). In terms of sensory access, it is about the provision of assistive sensory facilities or devices especially for the disabled person with visual or hearing impairment (Dann & Jacobsen, 2003; Darcy, 1998). With respect to access to communication, the aim is to provide information in readable format in accordance to the needs of different type of disability, for example, readable written text for VI persons.

Information and communication technology (ICT) is a strategy employed as a solution to the accessibility problems of some disabled populations (Allan, 2015; Ashraf, Hasan, Lewis, Hasan, & Ray, 2016; Buhalis & Law, 2008; Buhalis & Michopoulou, 2011; Daniels et al., 2005; Michopoulou and Buhalis, 2013). It is also an important tool in the destination-design process (Tussyadiah, 2014). Given that tourism is an information-intensive phenomenon, ICT, particularly when accessed through the Internet, helps people to source the various types of information required in every stage of the travel decision process, from pre-trip to post-trip (Pedrana, 2013). Indeed, the tourism industry has been keen to become 'smart' by making information available by applying smart services including, but not limited to, tourism attraction websites, mobile apps, e-tour maps and guiding information services (Wang, Li, Zhen, & Zhang, 2016), any of which can contribute in important ways to destination design and imaging.

Visually impaired persons have been reported to have a high level of dependency on technological products (Harris, 2010). The visually impaired, with the use of mobile assistive technology, can use smartphones to access information by translating information in visual presentations into accessible tactile and audio formats (Hakobyan, Lumsden, O'-Sullivan, & Bartlett, 2013; Rodriguez-Sanchez, Moreno-Alvarez, Martin, Borromeo, & Hernandez-Tamames, 2014). Mobile assistive technology designed for the visually impaired even enables them to use navigation technology through a smart phone, just like sighted people (Hakobyan, Lumsden, O'sullivan, & Bartlett, 2013). Hence, the visually impaired rely upon the Internet for information searches (Michopoulou and Buhalis, 2013; Mothiravally et al., 2014) and to find suitable tourism products (Buhalis & Michopoulou, 2011; Vila, Darcy & González, 2015). As such, smartphones can remove leisure-travel barriers, bringing higher levels of independence, safety and quality travel experiences for the visually impaired (Mountain, 2004). However, there is an apparent research gap in terms of the contribution of technology to the removal of leisure-travel barriers, particularly in the context of

domestic travel as a supply-side investigation. Given the inseparable relationship between information and tourism, this study presents a justification for exploring the ICT contributions to through the use of smartphone for more accessible tourism for the visually impaired visitors when visiting urban attractions. More importantly, it shows how destination design is characterized by such mobile ICT and tourism accessibility.

2. Methodology

2.1. Research design

This study employed a qualitative approach with the use of in-depth interviews in research designed to explore the research topic so as to fully address the opinions and past experiences of the interviewees.

Initially, interview questions were developed based on previous studies (e.g. Mesquita & Carneiro, 2016; Mothiravally et al., 2014; Poria, Reichel, & Brandt, 2011; Richards et al., 2010; Small, 2014; Small et al., 2011; van Niekerk, 2017) that addressed the travel needs, travel barriers and travel-barrier -removal strategies of disabled persons. Pilot studies were performed to test the research targets, the wording of questions, questions' sequence and estimated interview time for each interview.

The final version of the in-depth interview guideline questions consisted of two parts. Part 1 consisted of six background pre-coded questions, which included gender, reasons for visual impairment, level of visual impairment, education level, occupation and monthly income. Information collected in Part 1 served to help the researchers to understand the visual capability and personal background of the interviewees, which were likely to impact the types of barriers they encountered and their behaviors regarding smartphone usage. Part 2 of the interview had 13 open-ended questions, with follow-up questions for clarification and more detailed responses when required. Questions were related to the barriers encountered by the interviewees in their previous visit experience at local attractions, ICT usage and their comments on ICT in the context of tourism. Definitions of the terms ‘accessible tourism’ and 'attractions' as well as the scope of 'barriers' were explained to ensure that the interviewees would understand the questions and reply with valid responses for later content analysis.

2.2. Data collection

Hong Kong was chosen as a study site to investigate visually impaired persons' perceptions of leisure and tourism experiences because it represents a popular urban leisure and tourism destination in Asia that focuses on developing smart tourism (Tourism Commission, 2017).

Due to the extreme difficulty of sampling inbound visually impaired visitors, the research subjects of this study were young Hong Kong visually impaired residents. In Hong Kong, 3100 out of 174,800 persons with seeing difficulty were between the ages of 15 and 29 in 2013 (Census and Statistic Department, 2014). This study sampled research subjects who met all three of the following criteria:

1) Have previous experience in visiting Hong Kong's attractions
2) Aged between 15 and 29
3) Use smartphones and computers in their daily life

The interviews took place between 12 May and June 15, 2017. A total of 20 interviewees were recruited (R1-R20). Interviews were conducted either face-to-face or by telephone according to the availability of the interviewees. The interviews were conducted in Cantonese and each interview took between 30 and 90 min. During the interviews, notes were taken and they were also audiotaped. The replies of the interviewees were summarized and confirmed by the interviewee to ensure that the notes taken truly reflected the interviewees' meanings and ideas. After the interviews, the researchers translated and transcribed the interview content from Chinese to English for data analysis under the themes identified in the current literature.

This study employed firstly the convenience sampling method and then the snowball sampling method. These two sampling methods were adopted because people with visual impairment were not highly accessible and not likely to be easily identified by their appearance. Moreover, the visually impaired have an active network and they were able to recommend suitable interviewees relevant to the research subjects. Five 'seeds' were first recruited, who were either members of the Hong Kong Blind Union or the Hong Kong Society for the Blind. After interviewing the 'seeds', each was asked to recommend the next interviewee that would meet all the sampling requirements. The sample size of 20 is considered to be saturated to address the research objectives as the visually impaired persons shared similar barriers encountered in their past travel experiences when the interviewer reached the twentieth interviewee. The sample provided high-quality responses and useful information about accessibility and destination design for the urban attractions.

2.3. Data analysis

The data were analyzed with descriptive summary and comparative pattern analysis. Comparative pattern analysis, being a form of interpretive content analysis, sorted the narratives of the interviewees into categories and represented them in numerical counts (Baxter, 1991). The data-analysis process started by grouping previously visited attractions, visitor groups and information regarding sources of attractions into categories, and described both frequency and percentage. The transcript was then read again to confirm the code that emerged with regard to the barriers encountered, as well as to behaviors linked to smartphone and computer usage. The narratives were coded deductively and fitted into the subsections within the three categorizations of barriers, namely interpersonal barriers, intrapersonal barriers and structural barriers, as defined by Crawford and Godbey (1987) as shown in Table 1. The proposed subsections were adopted from the study by Daniels et al. (2005) on physically disabled individuals that were considered relevant to the disabled visitor experience.

3. Results

Table 2 shows the socio-demographic profiles of the 20 interviewees. There were 11 males and nine females. Of these, five interviewees had acquired visual impairment and 15 interviewees had congenital visual impairment. In terms of the level of visual impairment, one of them had mild low vision, two had moderate low vision, 11 had severe low vision, and six had total loss of vision. Most of the interviewees were students and had a post-secondary education background.

Regarding the interviewees' past travel experience, Table 3 shows that the interviewees visited Hong Kong attractions mainly with family, friends and/or NGOs. Visiting local attractions alone was revealed to be

Table 1
Categorization of constraints.
(Source: Daniels et al., 2005)

Dimensions	Constraints
Intrapersonal	• Sensory • Emotional • Knowledge
Interpersonal	• Travel companion • Service provider • Stranger
Structural	• Transportation • Facility • Environment • Financial

Table 2
Profiles of interviewees.

	Gender	Reason of visual impairment	Level of visual impairment	Education level	Occupation	Salary
R1	M	Acquired	Severe low vision	Post-secondary (non-degree)	Full time employed	10,000–14,999
R2	M	Acquired	Severe low vision	Post-secondary (non-degree)	Student	N/A
R3	F	Congenital	Total loss of vision	Post-secondary (non-degree)	Student	N/A
R4	M	Congenital	Severe low vision	Post-secondary (non-degree)	Full time employed	7000–9999
R5	F	Congenital	Total loss of vision	Post-secondary (non-degree)	Student	N/A
R6	M	Congenital	Severe low vision	Secondary	Full time employed	10,000–14,999
R7	F	Acquired	Severe low vision	Post-secondary (non-degree)	Student	N/A
R8	F	Congenital	Mild low vision	Secondary	Full time employed	4000–6999
R9	M	Congenital	Moderate low vision	Secondary	Full time employed	7000–9999
R10	M	Congenital	Severe low vision	Post-secondary (non-degree)	Student	N/A
R11	F	Congenital	Severe low vision	Post-secondary (non-degree)	Student	N/A
R12	F	Congenital	Severe low vision	Post-secondary (degree)	Student	N/A
R13	F	Congenital	Total loss of vision	Post-secondary (degree)	Student	N/A
R14	M	Congenital	Severe low vision	Post-secondary (non-degree)	Student	N/A
R15	M	Acquired	Total loss of vision	Secondary	Student	N/A
R16	F	Congenital	Severe low vision	Post-secondary (degree)	Student	N/A
R17	F	Congenital	Moderate low vision	Post-secondary (degree)	Student	N/A
R18	M	Congenital	Severe low vision	Post-secondary (non-degree)	Full time employed	10,000–14,999
R19	M	Congenital	Total loss of vision	Post-secondary (non-degree)	Student	N/A
R20	M	Acquired	Total loss of vision	Post-secondary (degree)	Student	N/A

Table 3
Group types for visiting Hong Kong attractions.

Group	Number of counts	Percentage
Family	15	75%
Friends	15	75%
School	9	45%
NGOs that serve the visually impaired	11	55%
Alone	4	20%

Table 4
Attractions visited.

Category	Number of counts	Percentage
Themed attractions	41	24%
Museums	30	18%
City parks	4	2%
Outlying islands	30	18%
Modern architecture	3	2%
Historical sites	5	3%
Nature parks	30	18%
Harbor Views	12	7%
Arts venues	4	2%
Other attractions	10	6%
Total	**169**	**100%**

a minority option. The interviewees listed the local attractions they had visited, and a total of 169 counts were recorded. Table 4 groups these named attractions into different categories by their nature as defined by the Hong Kong Tourism Board (http://www.discoverhongkong.com). While themed attractions were popular among the interviewees, museums, outlying islands and nature parks also received 30 counts, representing the fact that interviewees visited a diverse category of attractions.

Information about the attractions is required for the potential visitors to know about the sites. The Internet was the main source of information (Table 5): 85% of the interviewees used the Internet to browse the official websites of attractions and other websites that contain information about the tourist attractions. Along with this, 30% of interviewees expressed that they received information about attractions through social media sites such as Facebook. Other information sources included friends' recommendations, the radio, magazines, TV, news reports, attraction enquiry hotlines, schools and NGOs.

Table 5
Type of information sources for Hong Kong attractions.

Type of information source	Number of interviewees	Percentage of interviewees
The Internet	17	85%
Social media	6	30%
Friends' recommendation	7	35%
Radio	1	5%
Magazine	1	5%
TV	3	15%
News	3	15%
NGOs that serve the visually impaired	1	5%
School	2	10%
Attraction enquiry hotline	1	5%

3.1. Barriers encountered

This section documented the barriers encountered by the interviewees. During the interview, the interviewees were asked to describe the barriers they encountered in their past visits to Hong Kong attractions. The constraint narratives were then classified into the three emergent themes of the study, namely interpersonal, intrapersonal and structural constraints, and each of these dimensions was further divided into three sub-categories.

A total count of 73 constraint narratives was identified in the transcripts. The summary of findings is shown in Table 6. It was found that 51% of the constraints were intrapersonal, 12% were interpersonal and 37% were structural. Knowledge constraints in the intrapersonal dimension were found to be the most significant barrier for the visually impaired to visit Hong Kong attractions. None of the interviewees mentioned about financial constraint out of the structural dimension.

Intrapersonal dimension: Knowledge constraints were prominent (62%), largely due to the lack of thorough design thinking in the tourism attraction which failed to provide adequate information throughout different travel stages. The constraints appear from the trip-planning stage when the interviewees tried to search information on the Internet. The current assistive technology is able to translate the text but not graphics into readable format for the visually impaired. Interviewee R4 complained that “there are some websites where information is framed in graphics; there are **few textual descriptions** which limit my information access”. When traveling to the attraction, the interviewees found it difficult to navigate after getting off public transport. For instance, R9 expressed that “the **difficult** part is how to

Table 6
Frequency of constraints by category and by theme.

Category	Number of instances	Percentage by total	Percentage by category
Intrapersonal	**37**	**51%**	**100%**
Sensory constraint	5	7%	14%
Emotional constraint	9	12%	24%
Knowledge constraint	23	32%	62%
Interpersonal	**9**	**12%**	**100%**
Travel companion constraint	1	1%	11%
Service provider constraint	5	7%	56%
Stranger constraint	3	4%	33%
Structural	**27**	**37%**	**100%**
Transportation constraint	2	3%	7%
Facility constraint	19	26%	70%
Environment constraint	6	8%	22%
Total	**73**	**100%**	

walk to the attraction entrance after I get off the MTR or bus". This wayfinding issue persists when moving around different checkpoints in the attraction due to lack of locational information, as stated by, for example, interviewees R13 and R15 who expressed that guidance was required from them to know the **location of facilities for the visually impaired**.

Another area of concern in the attraction site is the **unavailability of** visually-impaired-**accessible- and-friendly information on the interpretation boards and display format of exhibits** such as those in museums. Interviewee said that "all the exhibits in the museums of Hong Kong are placed inside glass cabinets. There is no audio guide, braille guide or audio description service" (R11); "exhibits in the museums are generally locked in the glass cuboid, which I am unable to touch" (R12); and "I am unable to read the text on the interpretation boards and I cannot touch the exhibits." (R13). As a result, the knowledge constraint **lowered the engagement and interest of the visit**. For instance, RI expressed that "the insufficient sensory experience and audio description service in most of the attractions lowered my interest in the attractions". Interviewee R3 also complained that "I did not feel engaged when the guide only talked and described without giving me something to touch."

Emotional constraints (24%) related to negative emotions in the visit experience. Some interviewees had self-generated negative emotions including insecurity, exclusion and embarrassment (R3, R19 and R20).

In other situations, **negative emotion was caused by interactions** with strangers or service providers. Interactions were at times direct, indirect, verbal, non-verbal, intentional or unintentional in nature. Interviewee R10 recalled his peak-tram experience when he was in the wrong queue, in which "other people in the queue stared at me and that was not a good experience". Interviewee R7 also shared her feeling in a theme park visit when "people at the attraction saw me as a trouble and treated me differently, saying that I was eating too slowly and walking too slowly". Interviewee R12 also expressed her discomfort in the museum visit when "other museum visitors would feel weird if I use earphones to listen to the audio guide interpretation, and that makes me **feel uncomfortable** to stay in that area". Some interviewees were sensitive to the wording by a third party. Interviewee R20, for instance, mentioned that verbal expression like "have you been to the wrong place?", "is that girl (companion) a volunteer?", and "you can walk alone, you are so smart!" would generate negative emotion which "make(s) me **feel** that I was **inferior** and should not appear at that site". Interviewee R10 felt negatively about unintentional verbal expression in a situation encountered in which "there was once a kid looking at me curiously and the parent told his kid not to look at me. Although the parent might want to take care of my feelings, I felt bad because of his expression".

For sensory constraints (14%), five interviewees highlighted their visual limitations, stating "I could not see the image in front of me clearly" (R6) and "I experienced some **difficulty in reading the interpretation board** in the museums. I had to stand very close to the interpretation boards to read the text" (R10). These limitations affected their appreciation of and satisfaction with their experiences during their visits to the attractions. Some interviewees were discouraged, for example, because "I am **not able to appreciate the exhibits** no matter how well my companion describes them. It is because I can only use my imagination when the exhibit cannot be touched" (R13). Other examples show that the limited eyesight has "**restricted the depth of appreciation** for the attraction environment" (R18); and "the park only gave us the **privilege to sit in the front row** for the theater show, but it **was useless** as I can't see" (R11).

Interpersonal dimension: The service-provider constraints (56%) encountered by the interviewees were concerned with unhelpful and insensitive service providers with respect to the needs of visually impaired visitors at various attractions. In particular, visually impaired visitors would find it **difficult to find customer service** staff when they wanted to make an enquiry. Interviewee R10 indicated that "it is not easy to find a customer service staff around the Peak when I have questions". He also elaborated unclear directional instruction as a cause of barrier and shared his previous experience which "the Peak Tram staff would help directing me to the right queue but his instruction of 'the right queue is over there' did not actually mean anything to a blind person".

In addition, visually impaired visitors encountered obstacles in their interaction with strangers (33%). As stated by R7, the **communication with foreign visitors was ineffective** as "I tried to communicate with other people, but I didn't know their language. In particular, Mainland visitors often skipped the queue". Strangers might not show an understanding of the visual restriction of the visually impaired, since many visitors "were unhappy that I took the wrong queue" (R9). Moreover, the obstacle also appeared in wayfinding, when seeking help on the street was not reliable. Interviewee R14 said that "some people would point me to a totally wrong direction, whereas some people would just ignore me".

Lastly, travel-companion barriers (11%) were insignificant as interviewees usually had a **trusted companion**. However, this barrier could occur when the companion was irresponsible and provided limited information. Interviewee R19 shared a previous fieldtrip experience, when "my class teacher would assign schoolmates to be my sight guides. However, the schoolmates would usually leave me behind in the middle of a trip and pass me to the teaching assistant. They were unable to explain clearly the full picture of things and just gave me some shallow information".

Structural dimension: Facility constraints (70%) pointed to the failure of destination design to provide accessible facilities to the interviewees. Various facilities including interpretation boards, signposts, tactile and braille maps, tactile guide paths and warning tiles in staircases at the attractions created barriers to the visually impaired. It was reported by several interviewees that "**many interpretation boards and operation systems** of the activities inside the attraction **required participants to use eyesight**" (R4); "the texts of signpost in the country parks were too small for me to read" (R8); "the tactile and braille maps installed at the entrance of the attractions do not help as I will forget the information immediately after touching the maps" (R11); "the **tactile guide paths** may have defect as a path may **suddenly end** and does not guide me anywhere" (R20); "the **staircases had no contrasting colour**" (R10); and "there is no braille marking for the toilet sign in most of the Hong Kong attractions" (R2). Similarly, the price tags in shops, the menus at restaurants and the bus-stop stands were also reported to be nonaccessible facilities due to small font size (R16, R17).

As for environment constraints (22%), the location, attraction-site size and paths to the attractions were key areas of concern. Before the

visually impaired visitor reached the attraction site, the accessibility of the attraction site was affected by the colour contrast and completeness of any tactile guide path outside the attraction site. It was also affected by the means of transportation required. Some interviewees considered **transport interchange** to the attraction challenging. For instance, "Noah's Ark Hong Kong was not an accessible attraction as well. The location was far from the city which I needed to exchange for Park Island Bus after I got off at Tsing Yi MTR station" (R19). Other interviewees commented that **places with many staircases** were hard to access: "The Big Buddha was not an accessible attraction as there were too many staircases" (R11). The interviewee also claimed that large attractions could reduce the accessibility: "The HKCEC was not an accessible attraction as the place was too big for me to find the exhibition hall".

Finally, transportation constraints (7%) were considered minor. The interviewees make good use of the transportation system and its mobile application for return trips to the attractions. Buses and the MTR have audio announcements for every stop. A barrier emerged, however, when "the **audio announcement system** in the bus may be in a very low volume or even turned off" (R18).

3.2. Barrier removal

Companionship and technology are the main forces that can help remove leisure-travel barriers for the interviewees and move toward the goal of accessible tourism for the visually impaired.

The role of companion: It is usual for a visually impaired person to visit an attraction with a companion. While the knowledge barrier is their most significant concern, a companion is a reliable means to overcome this barrier. Interviewees believed that the function of their companion was a "sighted guide" (R1), who can resolve any wayfinding issues (R15) and provide the required environmental or attractions information (R10). The overall visitor experience was improved with a trusted companion, which R20 explained that "he/she can precisely describe the environment or exhibits for my imagination and get involved in the attraction".

Moreover, the companion can help with the interaction and communication with strangers in special situations; "I may crash into another person carelessly when walking, that person may scold me immediately but my family member can help to explain my eyes restriction to that person" (R7).

Although interviewees ascertained that the companion can remove leisure-travel barriers, not every companion can perform this function well. This was described by one interviewee, who is able to capture the desired information more quickly if a touchable item is available; "sometimes I feel that I could get the desired information quicker by touching the real stuff, for example the tactile and braille map" (R13).

The role of technology: Useful smartphone functions and mobile applications: Interviewees stated that mobile technology, including various smartphone functions and mobile applications, are useful in removing barriers when visiting attractions (Table 7). A total of 23 counts were recorded, covering transportation, restaurants, navigation, attractions, image recognition and camera functions. For instance, the camera function of the smartphone can act as a means of magnification for the visually impaired person with low vision. Transportation applications had the highest number of supporters. For example, the useful functions of the mobile bus application include alight reminder and estimated time of arrival, whereas the useful functions of the MTR application include estimated traveling time and exit information regarding indoor and outdoor areas with environmental information. Moreover, four counts of navigation applications were recorded to help with indoor and outdoor wayfinding, including Google Map, Voice Map and indoor map applications.

Navigation technology: Although 11 of the 20 interviewees had used navigation technology in their wayfinding, only some of them found the navigation mobile applications useful. The four supporters of the navigation mobile applications had moderate low vision to severe low vision, so they would prefer to find their way on their own with their limited eyesight. However, for the other interviewees who only used mobile applications on an as-need basis or even those who rejected the use of this technology, a number of reasons were given. Firstly, the lack of accuracy of the GPS-embedded navigation mobile applications (e.g. Google Map and Voice Map) can hinder their level of dependency on these applications. As some interviewees elaborated, "although GPS can tell me the direction, it is not 100% accurate. For example, when the navigation guided me to go straight for 30 m and turn left, the turning point was either passed or not yet reached" (R3) and "The remaining distance to the destination is not updated frequently and sometimes the guided direction would change even I do not move my smartphone" (R4).

Table 7
Useful smartphone functions and mobile applications.

Type	Number of counts
Smartphone functions	
Camera	1
Mobile applications	
Transportation, not specified	2
MTR	4
Bus	7
Attractions	2
Tap my dish	1
Google Map	1
Voice map	1
Indoor map, not specified	1
Navigation, not specified	1
Image recognition	1
OpenRice	1
Total	**23**

Secondly, the time cost issue resulted in interviewees finding that asking people was more efficient. As stated by two interviewees, "It is too slow to find the way by phone on the street. Asking people is a straightforward and simple way for wayfinding" (R12) and "Hong Kong is a place where there are many people on the street or at the attractions, therefore it would be a lot more efficient to grab someone around to ask than using technology" (R13).

Thirdly, the mobile application is not accessible to some interviewees who reported that the screen-reading function of the smartphone was unable to read the map. Interviewee R16 clarified that she "found that the voice-over function of the phone cannot read all the information like how many meters are left". Next, holding a mobile phone while walking may cause possible danger for the visually impaired with total loss of vision as described by interviewee R5: "I do not use mobile phone while I am walking. As I am blind, walking on the street means that I have to hear the surrounding environment, hold the white cane and be very attentive to road obstacles. There is no more room for me to hold the smartphone for wayfinding on the street. It would be dangerous".

Technological innovation: Some interviewees suggested that the destination design can be enhanced by technological innovations through the use of radio-frequency identification (RFID) technology, QR codes, location technology and infrared technology. With regard to information access to interpretation content, interviewees R4 and R9 remembered their experience in the museum in foreign countries: "there are some audio guide systems using Bluetooth/Infrared technology through which the interpretation content can be automatically played when you arrive at an interpretation checkpoint" (R4). Other interviewees imagined "there can be a sensor in front of the exhibit that can tell me the materials, shape and other historical details of the exhibit once I touch the sensor" (R10), and "there is a button on the interpretation board that the content can be read out when I press the button" (R11).

For information access to the surrounding environment, some interviewees looked forward to the advancement of location-based technology that would help navigation, such as the development of RFID technology to the white cane users (R1), tactile and braille map with audio description embedded at each attraction (R12), and enhanced mobile application (R10 and R15).

4. Discussion

4.1. Barriers encountered by the VI population

This study has explored the significance level of barriers encountered by the visually impaired interviewees in accordance with Crawford et al. (1991)'s categorization of barriers, namely intrapersonal, interpersonal and structural dimensions.

The results align with the results of Allan (2015), in which intrapersonal barriers were the most significant barrier and travel imposed requirements that were beyond disabled visitors' capabilities. The constraints for the visually impaired visitors were mainly caused by the restricted or deprived access to information due to visual impairment. The visually impaired interviewees highlighted the lack of access to materials that were presented in a visual format, including the difficulty of understanding interpretation materials, finding their way to a tourist attraction and moving freely around the attraction. In addition, the existence of accessible facilities may not be known to the visually impaired visitor. As a result, the accessible facilities installed inside the attractions have turned from must-have items to good-to-have items to supplement visually impaired visitors' information needs.

This study also supports the view that intrapersonal barriers are fundamental, as suggested by Crawford et al. (1991). Intrapersonal barriers are significant in terms of the need to overcome travel challenges to an unfamiliar place in the first place, and are specifically related to psychological and informational preparation for a smooth journey. The results also support the argument of Daniels et al. (2005) that the three forms of barrier are interrelated. Structural barriers can create intrapersonal barriers due to insufficient facilities and inaccessible exhibit objects. Interpersonal barriers can create intrapersonal barriers due to inadequate understanding of the needs of visually impaired people. Structural barriers and intrapersonal barriers can induce the engagement of strangers, companions and service providers, which may in turn result in interpersonal barriers.

4.2. Technology contribution to the removal of leisure-travel barriers

The contribution of technology to removing leisure-travel barriers relates to the information -access perspective (Michopoulou & Buhalis, 2013). On the one hand, it has been learned that interviewees use the Internet or online social platforms as their sources of information. Interviewees informed the researchers that the use of the smartphone for Internet searches is convenient with the use of embedded screen readers, implying that assistive technology can enable the visually impaired person to access the Internet for information quite smoothly.

On the other hand, accessible mobile applications provided the information needed to take public transportation. The audio announcement systems in the MTR and on buses, complemented by the use of transportation mobile applications, enable the visually impaired person to get off the MTR and buses with minimal error. This shows that transportation applications in Hong Kong have been very successful in providing for the information needs of the visually impaired and shows that accessible mobile applications have the capability to remove knowledge constraints for the visually impaired quite effectively.

Nonetheless, this study echoes with the findings of Poria et al., 2011 that the removal of barriers for a visually impaired person is a complicated issue for which technology cannot fully replace human companionship in the travel experience. As commented by the interviewees, human companionship has the capability to remove all the barriers encountered, including the interactive barriers and emotional constraints with strangers. This highlights an underlying social issue of the insufficient understanding of the sighted people towards those who are visually impaired, which may lead to decrease in motivation to travel or even non-participation in travel (Smith, 1987). In the end, human companionship and understanding will be the ultimate means to overcoming leisure-travel barriers.

While the study confirmed the positive contribution of technology in removing leisure-travel barriers, it was also found that not every mobile application is considered to be useful or accessible from the perspective of the visually impaired person. GPS-embedded navigation technology is sometimes inaccurate in providing indoor and outdoor navigation information. In addition, the inclusion of visually impaired people in the mobile technology is still in an early stage. The visually impaired interviewees commented that mainstream mobile applications may have pop-up advertisements and that the information may be displayed as graphics which screen readers are unable to access.

4.3. Implications for destination design in improving accessibility

Destination design encompasses the infrastructure, facilities and services of the attraction. When destination design is used in accessible tourism, inclusive design is applied which the core value is to design the destination in a way that is accessible for all type of visitors (Darcy & Buhalis, 2011), and to use technology to provide innovative solutions (Wang et al., 2016). The findings of the study reveal that just a few simple actions in the destination design can fulfill the access requirement of the visually impaired visitor.

Regarding the facilities in the attraction, the interviewees mentioned the supporting elements that can improve accessibility including, but not limited to, large colour contrast, large font size, sufficient lighting (indoor area), audio systems, braille marking and tactile guide paths. On the one hand, a tourism destination should incorporate these supporting elements in its signposts, toilet signage, staircases, interpretation panels, price tags, elevators, escalators and other attraction facilities by applying the inclusive design concept. On the other hand, a tourism destination should also utilize the other four-senses (i.e. smell, touch, taste and sound) in addition to sight in the design of visitor's experience. Furthermore, the development of location-based technology that is combined with a dynamic interpretation system can auto-play the interpretation content and facilitate knowledge transfer. Dynamic navigation systems, with an indication of accessible paths from “you are here” to the desired destination, can guide visually impaired visitors to the target location with some safety consideration. In this connection, smartphones are devices that support technological innovations through the development of mobile applications.

Since the research findings reported that the largest constraints perceived by visually impaired visitors derive from structural (facility) and intrapersonal (knowledge and information) dimensions, destination design must address these two areas of quality to improve the accessibility of visually impaired visitors (Michopoulou & Buhalis, 2013). Measures should tackle the limitations in interpretation boards and operation systems, and physical features such as tactile guide paths and staircases, to provide a more visually impaired-friendly environment at individual attractions and the destination as a whole. Information delivery and knowledge transfer under the intrapersonal dimension should be improved through design solutions such as setting of routes, staff and service quality, interpretation formats and specific information for visually impaired visitors. More engagement should also be offered to visually impaired I and other disabled visitors by upgrading some of the sensory exhibits and facilities (Vila et al., 2015). It is also necessary to design both indoor and outdoor spaces that may minimize the insecure and embarrassed feelings of visually impaired and disabled visitors, although emotional constraints are not the paramount concern among the interviewees sampled in this study. These design elements should be wisely integrated technically with ICT

and mobile advancements, and, more importantly, the concept and theoretical foundation of universal design in the academic field of accessible tourism.

5. Conclusion

This paper has presented the barriers experienced and perceived by the visually impaired and how they are heterogeneous in nature. Knowledge constraints and facility constraints were the top two types of constraint identified. Inclusive destination design with the use of technology can improve the physical, sensory and informational access of the visually impaired population at both the site level and the exhibit level.

The study confirms the capability of mobile technology to remove certain constraints for the visually impaired visitor. Mobile phones are handy and have built-in functions and applications that facilitate the flow of information. Mobile technology would be an effective tool for disability empowerment in independent travel and could replace traditional accessible facilities. The visually impaired would be free to use the tool that they feel is the most useful for their individual needs, creating an equal opportunity for the visually impaired to plan a travel, participate in social interaction and share information as they wish.

In these ways, the voices of the visually impaired can be seen and create positive impact in terms of attitudinal change for both society and the visually impaired with regard to participation in tourism by the disabled persons and to stimulate businesses to target the disabled traveler market. As suggested by the findings of this study, teh travel companions of disabled visitors are a group of potential visitors in the development and sustainability of accessible tourism. This applies both to mobility and sensory impaired visitors. There are areas where technology simply cannot be seen as a panacea for achieving universal accessibility: for example, due to the lack of knowledge by the visually impaired visitors themselves or the insufficient understanding of disability by the destination stakeholders, especially planners and designers (Nyanjom, Boxall, & Slaven, 2018). Nonetheless, there is still plenty of room for technological advancement and innovation, of which maps and images in mobile applications should be the future focus (e.g. Ribeiro, Silva, Barbosa, Silva, & Metrôlho, 2018). At the same time, application developers should think from the perspective of users to create tailor-made services in inclusive tourism including the implementation of information technology (e.g. Devile & Kastenholz, 2018; Dickson, Darcy, Johns, & Pentifallo, 2016).

Furthermore, the present paper has attempted to highlight that especially the development of inclusive tourism can benefit from the destination design perspective. In this regard, design should be interpreted as an ‘open-ended process' (Erschbamer, 2018) that allows stakeholder participation and thus fosters transformational design supported by various actors in the destination (Sommer & Welzer, 2017).

In conclusion, the development of accessible tourism destination design has reached the era of technology and innovation. The use of smart technology can facilitate information transfer and mediating the travel experience but not completely replace human companionship. As reflected in the visually impaired visitors' responses, the smart use and installation of ICT within and around tourist attractions, as well as the paths connecting these sites, can reduce the structural and intrapersonal dimensions of accessibility barriers. This advancement can particularly address the problem of sensory disabled visitors, who might rely heavily on the interactions with the others and the exhibits and materials for experience enhancement. ICT can be personal, tailor-made or universally designed for all types of visitors.

While accessibility is often seen as a social issue, an inclusive destination design can achieve the vision of accessible tourism, and hence social sustainability, by facilitating equitable use of destination resources and improving public awareness and understanding of the visually impaired population. It is clear that destination design based on structural and architectural design (e.g. Volgger, Pechlaner, Innerhofer, & Scuttari, 2016) is strongly linked to the (re-)design of an inclusive destination. However, as pointed out by Erschbamer (2018), disruptive or dissonant design techniques that help to totally re-think destination experiences and to re-design these experiences for new or other segments (e.g. such as disabled tourists) should be taken into consideration for future destination development processes.

5.1. Research limitations

This study was limited in several ways. Firstly, it was conducted using convenience- and snowball-sampling methods. The sample group of interviewees originated from the recommendation of interviewees who may share a similar experience. It is hard to generalize using just the experiences of young visual impaired people. Secondly, this study is also limited to the review of local young visually impaired people in Hong Kong. Middle-aged and older visually impaired persons may perceive technology and barriers encountered differently. Inbound visually impaired visitors to Hong Kong may also perceive the same experiences differently. As such, extended research to collect data across different age ranges and visitor types would enhance the representativeness of the findings in the visually impaired population. When the sampling size is sufficient, a quantitative analysis would be used to support the qualitative analysis.

Finally, this study serves as a pioneer study to affirm the positive contribution of mobile technology to accessible tourism. It does not explain the extent to which technology can help to reduce different types of barriers for visually impaired visitors to Hong Kong's attractions. Future study to explore the effectiveness of the design of the mobile applications would be necessary to achieve the core values of accessible tourism with the use of technology. In a wider context, research can be extended to other kinds of disability, which would be a further step to the development of accessible tourism in Hong Kong. It could also explore how the integration of technology in destination design can mediate the traveling experience. In such a context, destination design can be interpreted as an attitude and behavior of stakeholders that enables ongoing re-thinking, and a process of co-development and co-production (Peters, 2017).

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jdmm.2020.100434.

References

Agovino, M., Casaccia, M., Garofalo, A., & Marchesano, K. (2017). Tourism and disability in Italy. Limits and opportunities. *Tourism Management Perspectives, 23*, 58–67. https://doi.org/10.1016/j.tmp.2017.05.001.

Allan, M. (2015). Accessible tourism in Jordan: Travel constrains and motivations. *European Journal of Tourism Research, 10*, 109–119.

Ashraf, M. M., Hasan, N., Lewis, L., Hasan, M. R., & Ray, P. (2016). A systematic literature review of the application of information communication technology for visually impaired people. *International Journal of Disability Management, 11*, E6. https://doi.org/10.1017/idm.2016.6.

Baxter, L. A. (1991). Content analysis. In B. M. Montgomery, & S. Duck (Eds.). *Studying interpersonal interaction* (pp. 239–254). New York, NY: The Guildford Press.

Buhalis, D., & Darcy, S. (2011). *Accessible tourism: Concepts and issues.* Bristol, UK; Tonawanda, NY: Channel View Publications.

Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet — the state of eTourism research. *Tourism Management, 29*(4), 609–623. https://doi.org/10.1016/j.tourman.2008.01.005.

Buhalis, D., & Michopoulou, E. (2011). Information-enabled tourism destination marketing: Addressing the accessibility market. *Current Issues in Tourism, 14*(2), 145–168. https://doi.org/10.1080/13683501003653361.

Census and Statistics Department (2014). *Persons with disabilities and chronic diseases (Special topics report no. 62)*. Retrieved Feb 21, 2017, from Census and Statistics Department: http://www.statistics.gov.hk/pub/B11301622014XXXXB0100.pdf.

Crawford, D. W., & Godbey, G. (1987). Reconceptualizing barriers to family leisure. *Leisure Sciences, 9*(2), 119–127. https://doi.org/10.1080/01490408709512151.

Crawford, D. W., Jackson, E. L., & Godbey, G. (1991). A hierarchical model of leisure constraints. *Leisure Sciences, 13*(4), 309–320. https://doi.org/10.1080/

01490409109513147.
Daniels, M. J., Drogin Rodgers, E. B., & Wiggins, B. P. (2005). "Travel tales": An interpretive analysis of constraints and negotiations to pleasure travel as experienced by persons with physical disabilities. *Tourism Management, 26*(6), 919–930. https://doi.org/10.1016/j.tourman.2004.06.010.
Dann, G., & Jacobsen, J. K. S. (2003). Tourism smellscapes. *Tourism Geographies, 5*(1), 3–25. https://doi.org/10.1080/1461668032000034033.
Darcy, S. (1998). *Anxiety to access: Tourism patterns and experiences of New South Wales people with a physical disability*. Retrieved May 2, 2017, from http://www.tourismtasmania.com.au/_data/assets/pdf_file/0003/16914/anxiety.pdf.
Darcy, S., & Buhalis, D. (2011). Conceptualising disability. In D. Buhalis, & S. Darcy (Eds.). *Accessible tourism: Concepts and issues* (pp. 21–45). Bristol: Channel View Publications.
Devile, E., & Kastenholz, E. (2018). Accessible tourism experiences: The voice of people with visual disabilities. *Journal of Policy Research in Tourism, Leisure and Events, 10*(3), 265–285. https://doi.org/10.1080/19407963.2018.1470183.
Dickson, T. J., Darcy, S., Johns, R., & Pentifallo, C. (2016). Inclusive by design: Transformative services and sport-event accessibility. *Service Industries Journal, 36*(11–12), 532–555. https://doi.org/10.1080/02642069.2016.1255728.
Erschbamer, G. (2018). Destination design: Perspektiven für die Destinationsentwicklung? In H. Pechlaner (Ed.). *Destination und lebensraum. Entrepreneurial management und standortentwicklung (Perspektiven für unternehmen und destinationen* (pp. 217–223). Wiesbaden: Springer Gabler.
Hakobyan, L., Lumsden, J., O'sullivan, D., & Bartlett, H. (2013). Mobile assistive technologies for the visually impaired. *Survey of Ophthalmology, 58*(6), 513–528. https://doi.org/10.1016/j.survophthal.2012.10.004.
Harris, J. (2010). The use, role and application of advanced technology in the lives of disabled people in the UK. *Disability & Society, 25*(4), 427–439. https://doi.org/10.1080/09687591003755815.
Iso-Ahola, S. E., & Mannell, R. C. (1985). Social and psychological constraints on leisure. In M. G. Wade (Ed.). *Constraints on leisure* (pp. 111–151). Springfield, IL: Thomas.
Iwarsson, S., & Stahl, A. (2003). Accessibility, usability and universal design-positioning and definition of concepts describing person-environment relationships. *Disability & Rehabilitation, 25*(2), 57–66. https://doi.org/10.1080/dre.25.2.57.66.
Loi, K. I., & Kong, W. H. (2017). Tourism for all: Challenges and issues faced by people with vision impairment. *Tourism Planning & Development, 14*(2), 181–197. https://doi.org/10.1080/21568316.2016.1204357.
Mesquita, S., & Carneiro, M. J. (2016). Accessibility of European museums to visitors with visual impairments. *Disability & Society, 31*(3), 373–388. https://doi.org/10.1080/09687599.2016.1167671.
Michopoulou, E., & Buhalis, D. (2013). Information provision for challenging markets: The case of the accessibility requiring market in the context of tourism. *Information & Management, 50*(5), 229–239. https://doi.org/10.1016/j.im.2013.04.001.
Mothiravally, V., Ang, S., Baloch, G. M., Kulampallil, T. T., & Geetha, S. (2014). Attitude and perception of visually impaired travelers: A case of Klang Valley, Malaysia. *Procedia - Social and Behavioral Sciences, 144*, 366–377. https://doi.org/10.1016/j.sbspro.2014.07.306.
Mountain, G. (2004). Using the evidence to develop quality assistive technology services. *Journal of Integrated Care, 12*(1), 19–26. https://doi.org/10.1108/14769018200400005.
van Niekerk, M. (2017). Contemporary issues in events, festivals and destination management. *International Journal of Contemporary Hospitality Management, 29*(3), 842–847. https://doi.org/10.1108/IJCHM-01-2017-0031.
Nyanjom, J., Boxall, K., & Slaven, J. (2018). Towards inclusive tourism? Stakeholder collaboration in the development of accessible tourism. *Tourism Geographies, 20*(4), 675–697. https://doi.org/10.1080/14616688.2018.1477828.
Packer, T. L., Mckercher, B., & Yau, M. K. (2007). Understanding the complex interplay between tourism, disability and environmental contexts. *Disability & Rehabilitation, 29*(4), 281–292. https://doi.org/10.1080/09638280600756331.
Pedrana, M. (2013). Location-based services and tourism: Possible implications for destination. *Current Issues in Tourism, 17*(9), 753–762. https://doi.org/10.1080/13683500.2013.868411.
Peters, M. (2017). Social systems and tourism design. In D. Fesenmaier, & Z. Xiang (Eds.). *Design science in tourism. Tourism on the Verge* (pp. 139–150). Cham: Springer.
Poria, Y., Reichel, A., & Brandt, Y. (2011). Blind people's tourism experience. In D. Buhalis, & S. Darcy (Eds.). *Accessible tourism: Concepts and issues* (pp. 149–159). Bristol, UK; Tonawanda, NY: Channel View Publications.
Ribeiro, F. R., Silva, A., Barbosa, F., Silva, A. P., & Metrôlho, J. C. (2018). Mobile applications for accessible tourism: Overview, challenges and a proposed platform. *Information Technology & Tourism, 19*(1–4), 29–59.
Richards, V., Pritchard, A., & Morgan, N. (2010). (Re)envisioning tourism and visual impairment. *Annals of Tourism Research, 37*(4), 1097–1116. https://doi.org/10.1016/j.annals.2010.04.011.
Rodriguez-Sanchez, M. C., Moreno-Alvarez, M. A., Martin, E., Borromeo, S., & Hernandez-Tamames, J. A. (2014). Accessible smartphones for blind users: A case study for a wayfinding system. *Expert Systems with Applications, 41*(16), 7210–7222. https://doi.org/10.1016/j.eswa.2014.05.031.
Sheldon, P. J., Fesenmaier, D. R., & Xiang, Z. (2017). *Design Science in tourism: Foundations of destination management (tourism on the Verge)*. Cham: Springer International Publishing.
Singh, J. (2013). Exploiting ICT for empowering people with disabilities (PWDs). *Indian Journal of Inclusive Growth, 1*(1), 113–119.
Small, J. (2014). Interconnecting mobilities on tour: Tourists with vision impairment partnered with sighted tourists. *Tourism Geographies, 17*(1), 1–15. https://doi.org/10.1080/14616688.2014.938690.
Small, J., & Darcy, S. (2010). Tourism, disability and mobility. In S. Cole, & N. Morgan (Eds.). *Tourism and inequality: Problems and prospects* (pp. 1–20). Wallingford: CABI.
Small, J., Darcy, S., & Packer, T. (2011). The embodied tourist experiences of people with vision impairment: Management implications beyond the visual gaze. *Tourism Management, 33*(4), 941. https://doi.org/10.1016/j.tourman.2011.09.015.
Smith, R. W. (1987). Leisure of disable tourists: Barriers to participation. *Annals of Tourism Research, 14*(3), 376–389. https://doi.org/10.1016/0160-7383(87)90109-5.
Sommer, B., & Welzer, H. (2017). *Transformationsdesign. Wege in eine zukunftsfähige Moderne. München.* Oekom Verlag.
Tourism Commission. (2017). *Development blueprint for Hong Kong's tourism industry*. Retrieved Sept 25, 2018, from Tourism Commission: https://www.tourism.gov.hk/popup/files/Development_Blueprint_for_Hong_Kongs_Tourism_Industry_Eng.pdf.
Turco, D. M., Stumbo, N., & Garncarz, J. (1998). Tourism constraints for people with disabilities. *Parks & Recreation, 33*(9), 78–84.
Tussyadiah, I. P. (2014). Toward a theoretical foundation for experience design in tourism. *Journal of Travel Research, 53*(5), 543–564.
United Nations (UN) (2006). *Convention on the rights of persons with disabilities.* Retrieved Mar 4, 2017, from http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf.
Urry, J., & Larsen, J. (2011). *The tourist gaze 3.0* (3rd ed.). Los Angeles, Calif.; London: SAGE.
Vila, T. D., Darcy, S., & González, E. A. (2015). Competing for the disability tourism market–a comparative exploration of the factors of accessible tourism competitiveness in Spain and Australia. *Tourism Management, 47*, 261–272.
Volgger, M., Pechlaner, H., Innerhofer, E., & Scuttari, A. (2016). Architectural governance. Koordination der baukultur und landschaftsgestaltung. *Turrisbabel: Zeitschrift der architekturstiftung südtirol, 12*(104), 54–63.
Wang, X., Li, X., Zhen, F., & Zhang, J. H. (2016). How smart is your tourist attraction?: Measuring tourist preferences of smart tourism attractions via a FCEM-AHP and IPA approach. *Tourism Management, 54*, 309–320. https://doi.org/10.1016/j.tourman.2015.12.003.
World Tourism Organization (UNWTO) (2005). *Accessible tourism for all.* Retrieved Jan 16, 2017, from http://www2.unwto.org/sites/all/files/docpdf/2005resolutionaccessibletourismforall.pdf.
World Tourism Organization (UNWTO) (2016a). *Accessible tourism, theme of world tourism day 2016.* Retrieved May 29, 2017, from World Tourism Organization: http://media.unwto.org/press-release/2016-09-20/accessible-tourism-theme-world-tourism-day-2016.
World Tourism Organization (UNWTO) (2016b). *Global report on the power of youth travel-volume thirteen*. Retrieved May 29, 2017, from World Tourism Organization: http://cf.cdn.unwto.org/sites/all/files/pdf/2wyse_ultimoscambios.pdf.
World Tourism Organization (UNWTO) (2017, March 23). *Innovation and technology, keys to increasing the competitiveness and sustainability of tourism in Europe.* [Press release]. Retrieved from http://media.unwto.org/press-release/2017-04-04/innovation-and-technology-keys-increasing-competitiveness-and-sustainabilit.
Yau, M. K., Mckercher, B., & Packer, T. L. (2004). Traveling with a disability: More than an access issue. *Annals of Tourism Research, 31*(4), 946–960. https://doi.org/10.1016/j.annals.2004.03.007.

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