Unveiling Museum of The Asian African Conference Needs for Assistive Technology through a collaborative tapestry of Views

[1]Amanda Bunga Gracia; [1]Wa Ode Seprina; [1]Nisa Nurmauliddiana Abdullah; [1]A. Hasan Al Husain; [1]Sarah Derma Ekaputri; [1]Fiqie Lavani Melano
[1] Faculty of Communication and Business, Telkom University

*Email correspondence: moonwave@telkomuniversity.ac.id

Abstract

Indonesian museums have recognized the importance of ensuring equal access to exhibits and educational content for people with disabilities. Because, the significance of historical information in a museum plays a role in individuals' understanding of the world, their identities, and their societal place. The Museum of Asian-African Conference has been known to promote inclusivity, accessibility, and equal opportunities for individuals with disabilities, focusing on blind visitors. The determination of museums to facilitate visitors in Indonesia with assistive technology for people with disability, especially those with visual impairments or the blind who are not able to experience the museum has not been distributed equally. This research aims to understand the accessibility information needs of blind visitors, and to identify gaps in current research related to the challenges they faced in enjoying museum attractions. The goal of narrative study in this research is to comprehend the diversity and complexity of human experiences through qualitative approach. This study found that pairing assistive technology with professional and educated instructors should be a top priority, as well as the importance of inclusive design in overcoming barriers to accessibility. In conclusion, information accessibility and assistive technology are not mere attention but essential components that shape a museum's uniqueness as an inclusive and educational space.

Keywords: *Inclusivity in museum, effective communication, assistive technology, sustainable tourism.*

Introduction

Preserving cultural history, public education, and providing meaningful experiences are the important functions of museums (Ahmad et al., 2022; Guo et al., 2022). The museum's role somehow would not be adequate when its function is unable to facilitate people with disabilities (Poria et al., 2009). Hence, museums must be able to attend to their visitors' requirements to achieve the aim of inclusivity and accessibility by exploring the difficulties experienced by people with disabilities and the existing implementation status (Argyropoulos & Kanari, 2015). Moreover, the possibility of integrating assistive technology becomes indispensably vivid (Vaz et al., 2020). Indonesian museums have recognized the importance of ensuring equal access to exhibits and educational content for people with disabilities

(Doktrinaya, 2022; Meylani, 2022). As a result, they have started integrating various forms of assistive technology to enhance the museum experience, such as a virtual museum tour that provides not only a 360° panorama view but also E-Book and Audio from the website. Some other also facilitates blind visitors to have a sense of touch with the models or statues. However, those facilities are not equally distributed for all museums available in the country (Kementrian Luar Negeri Republik Indonesia, 2021; Nurulliah, 2019; Ramadhanti, 2019).

According to Lidwina (2020), Indonesia maintains 439 museums spread across the country. West Java Province, as the focus of this study, owns about 41 museums where Museum of The African Asian Conference and Sri Baduga Museum pioneered the initiation to design a disability-friendly museum (Humas Disparbud Jabar, 2023; Kementrian Luar Negeri Republik Indonesia, 2021). Exceptionally, the Museum of Asian-African Conference has been known to promote inclusivity, accessibility, and equal opportunities for individuals with disabilities, focusing on blind visitors (Kementrian Luar Negeri Republik Indonesia, 2021). The Asian-African Conference in Bandung on April 18, 1955, was a pivotal moment in Indonesian foreign policy and a significant occasion for the country (Phillips, 2016). The historical moment was later commemorated to be the Museum of Asian-African Conference, constructed by the Government of the Republic of Indonesia, and is now run by the Ministry of Foreign Affairs (Fernando et al., 2022; Museum Konferensi Asia Afrika, n.d.). The importance of historical information in a museum plays a role in individuals' understanding of the world, their identities, and their societal place (Ahmad et al., 2022; Liu & Hilton, 2005). The educational materials and cultural experiences available should support inclusive and high-quality education. Which aligned with Sustainable Development Goals (SDGs) number 4, to ensure inclusive and equitable quality education, and promote lifelong learning opportunities for all. Hence, reducing inequalities (SDGs number 10) through facilities such as museums, mirroring SDGs goal number 11, sustainable cities and communities (United Nations, 2015). The determination of museums to facilitate visitors with assistive technology answers the prolonged problems for people with disability, especially those with visual impairments or the blind who haven't been able to experience the museum at its best through their other possible senses (Vaz et al., 2020). Another strong foundation that supports the need for assistive technology is mentioned in the constitution of the Republic of Indonesia, number 4, 1997, article number 6 mentions that "Every person with disabilities has the right to access accessibility in the framework of independence," thus it is crucial to take several actions to ensure that this right is upheld and that individuals with disabilities can participate fully in society. Furthermore, in article 8, "The government and/or society are obliged to strive for the realisation of the rights of persons with disabilities." This means that the stakeholders must promote inclusivity and ensure that the individuals get their rights. Lastly, article 10 states that equal opportunity for people with disabilities in all aspects of life, and livelihood should be carried out through the provision of accessibility to create conditions and environments that are more supportive for them to fully live in society (Undang- Undang Republik Indonesia No. 4 Tahun 1997 Tentang Penyandang Cacat, 1997).

For people with disabilities, including those who are blind, technology provides alternative means of communication. These technologies bridge the communication gap and enable effective interaction with the digital world (Mesquita & Carneiro, 2021; Vaz et al., 2020). Nevertheless, the technology itself may still be dependent on the human touch to create

more effective communication to maximise efficiency, clarity or accuracy, relevance, and comprehension between blind visitors and museum educators (Dean & Oetzel, 2014; Rickheit & Stohner, 2008). According to the problem statements as well as the existing regulation, this research aims to understand the accessibility information needs of blind visitors, and to identify gaps in current research related to the challenges they faced in enjoying museum attractions. The study considers the growing use of assistive technology for communication, education, and social interaction, and how it plays a role as a communication tool to overcome these challenges to improve accessibility and facilitate their experience of the attractions in the museum.

Method

This research is based on a qualitative approach, utilising a narrative study lens of experiences from the key informants (Creswell & Creswell, 2018). The narrative study aims to learn more about people's lived experiences, viewpoints, and meanings by gathering and analysing their personal stories or narratives. This method is especially fascinated by the ways in which people develop and communicate their experiences through narrative. The goal of narrative research is to comprehend the diversity and complexity of human experiences. It also offers a thorough examination of participant viewpoints (Denzin & Lincoln, 2018; Flick, 2014; Pavlenko, 2002). The key informants in this study were blind visitors (n=16), museum educators (n=4), and researchers in the tourism industry (n=4). A focus group discussion (FGD) was conducted face-to-face at the Museum of Asian-African Conference where a survey was completed in advance to assess the museum educators' (n=24) evaluation of their experience in communicating with blind visitors, focusing on effective communication, interpersonal communication, and problem-solving skill (Eeuwijk & Angehrn, 2017). Numbers later analysed by spss to provide a single descriptive value that summarises the data's central location of educators' self-report evaluation (Hayes, 2005).

The moderator started the discussion with three key questions that lead to other specific ones. The interaction that occurs between participants were enforced as a powerful stimulus for discussion and encouraged the key informants to develop or justify idea, opinions, and even feelings (Amato, 2008). To break the ice and earn the meaning from the point of view of the key informants, the moderator allowed and motivated them to share some amusing experiences and role-play, thus leading to proper reflexivity of the researcher (Creswell & Creswell, 2018). The three lead questions include the barriers to information accessibility, user experience, and satisfaction, and recommendations and best practices.

The FGD was recorded by mobile phone application and transcribed verbatim, where later coded accordingly (Table 1) (Fielding et al., 2017; Lungu, 2022). The coding itself used a hybrid approach, deductive-inductive coding. As the initial set of codes was prearranged, the emerging codes were anticipated to appear in the stage of data analysis. Coding went through two cycles- descriptive and pattern coding and was paired into emerged themes (Proudfoot, 2022; Saldana, 2013).

Results and Discussion

The study emphasised how crucial it is for the museum to be accessible to blind visitors. The participants highlighted that inclusive practices foster a sense of connection and involvement with exhibits (diorama, images, etc) as well as improve the overall experience for people with visual impairments (Jingyu et al., 2023). Blind visitors discussed their viewpoints on their experience visiting the museum (Argyropoulos & Kanari, 2015), and other tourist attractions. They indicated a need for more immersive, interactive encounters that would let them use touch and other senses to comprehend historical exhibits better (Fernando et al., 2022; Ginley, 2013). Although they valued the braille information already available in the library, their investigation was constrained by the lack of tactile exhibits (Argyropoulos & Kanari, 2015).

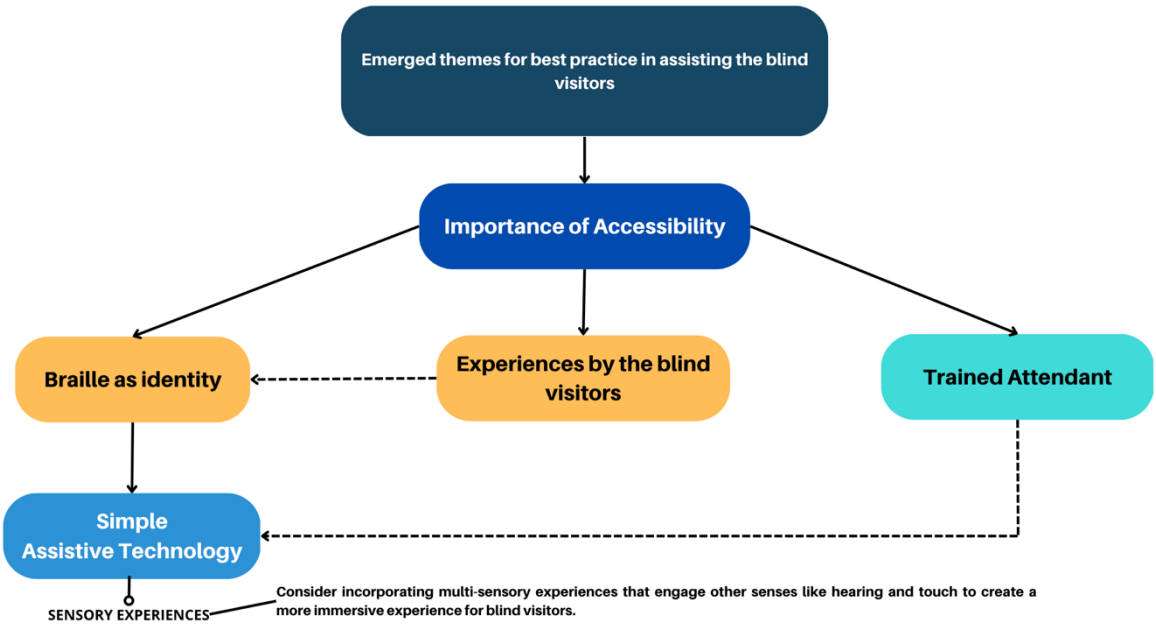
The outcome of the thematic analysis found five- emerged themes, such as the importance of accessibility, experiences by the blind visitors, braille as identity, simple assistive technology, and lastly trained attendant (Figure 1).

This research found that the importance of accessibility is considered to play the most important role from the point of view of blind visitors (Jingyu et al., 2023). It is highly associated with the incorporation of assistive technology. They believe that screen readers, braille displays, and tactile exhibitions would enable them to participate fully in cultural heritage, promoting independence, inclusivity, and a better understanding of the past (Fernando et al., 2022). However, their opinion leaned strongly toward the concept of simple assistive technology (Table 2). They dislike complexity, such as using a third party such as a mobile device to scan to get to listen to e.g., audio information. The blind visitors also pointed at the necessity of using assistive technology for information accessibility is not necessarily have to be highly advanced or costly. They mentioned that the technology provided should be easily accessed efficiently and in a timely manner because of their limitation of sight (total and partially sighted) (Deakin, 2022). The accessibility-focused museums respect moral standards and show a dedication to improving the overall museum experience for all visitors, thus portraying the spirit of SDGs point number 4 (United Nations, 2015), where blind visitors can have equal opportunities in cultural and historical learning activities (Ahmad et al., 2022). Hence, people with a range of disabilities may access and appreciate the richness of the cultural history (Vaz et al., 2020). This result confirms the research result of Kusumaningrum (2018), who mentions that the industry of tourism is referred to as having no boundaries or limits. Accessibility for tourists with disabilities must be developed to be accessible and simple so that the tourist attraction can be enjoyed by people with inclusivity (Mesquita & Carneiro, 2021).

Moreover, the second theme emerged, about the experiences of blind visitors. The participants shared their personal experience guiding disabled friends and expressed that there is no special attraction exclusively for them. They highlighted the challenge faced in not being able to touch many original items in the museum. They propose the use of props that enable blind visitors to have a sense of touch in addition to audio information, enhancing their overall experience (Ginley, 2013). To fulfil the requirements of a variety of audiences, especially the blind, museums could go one step further by offering improved guided tours that are created especially for patrons with visual impairments (Deakin, 2022; Grenier, 2010). The study of Mesquita and Carneiro (2021) suggests the importance of three main stages in

the consumption experience of blind visitors in the museum, involving "pre-visit" that should prioritise detailed- information to simplify their visit plan. "On-site visit" highlights design importance where there could be specialised tours provided (Asakawa et al., 2018). Lastly, "post-visit," where post-experience by visitors would lead to re-visit. This is usually activated by proper communication regarding services available through different types of platforms accessible for blind visitors. The challenges faced by blind visitors in this research could be solved by those steps, leading them to become more participative and engaged (Guo et al., 2022; Mesquita & Carneiro, 2021).

Figure 1. Emerged themes based on thematic analysis.



Source: Researchers' own elaboration

Thirdly, for braille as identity. Braille emerged as a powerful symbol of identity and empowerment for blind individuals. Participants stressed that braille provides a tangible connection to the exhibits, enabling them to independently access information and retain their individuality within the museum's narrative (Douglas, 2022; Lupetina, 2022). This result confirms the importance of braille as the habit of reading is irreplaceable and creates cognitive advantages for blind visitors (Lupetina, 2022). Conversely, some participants mentioned that braille requires too many pages to print, thus it will take pages for them to read and becomes impractical. Many blind friends, especially the new generation, may not be able to read braille because of the growth of technology especially for partially sighted people. This finding can conclude that assistive technologies should be able to complement Braille rather than becoming its replacement (INDATA, 2017).

The fourth emerged theme remarks the need for simple assistive technology for blind visitors. The participant mentioned that the museum facilities are quite informative but lack proper delivery due to the absence of assistive technology. They suggested creating duplicates (Vaz et al., 2020) of untouchable dioramas to allow blind visitors to have a tactile experience

(Argyropoulos & Kanari, 2015). As blind visitors avoid complexity (Galesi et al., 2020) as stated beforehand, they proposed the need for more efficient and straightforward methods, such as a press button, for accessing information (Fernando et al., 2022). One visitor said that she had experience with an automatic censor that would trigger the audio device to inform the room's name with audio automatically as she passed the current room she was at. Hence, audio technology plays a critical role for them as well (Vaz et al., 2020).

Table 1. Coding for best practice in assisting blind visitors.

FGD-Transcribed text	Descriptive Coding
(R, blind visitor) Today, I also would like to tell you a little bit about my story of when I became blind. Well, I have not blind since birth. I used to visit a zoo in Bandung, you know, blind visitors have no need to pay when visiting the zoo, hehehe. The zoo management might think that what are these people going to do anyway, hehehe. The possibility of activities may only be limited to smelling, and probably hearing, or touching. And we went to different places with different animals. I asked the guide at one point, what animal it is now, and he mentioned it was a snake. I actually wanted the touch experience. However, I was limited by a glass window. Then, I just knocked on the glass hehehe. The snake is alive. Thus, media and facilities would likely enable the accessibility of information when provided adequately. For example, just like D said, they can provide audio, not the sound of the animal. but information through audio for what we are at. Such as, a voice saying that, right in front of you is the crocodiles' cage hehehhe. Or this is the cage of tigers.	1 Experience of Blindness and Visiting the Zoo 2Desire for Tactile Experience at the Zoo 3 Challenges in Accessing Information at the Zoo 4 Importance of Media and Facility for Accessibility
(W, museum educator) In 2018 or 2019, I will guide our blind friends. In that time, we had a watching- together occasion here, in this room. So, I just found out that when our blind friends watch a movie, they need an attendant right behind him or her to explain. Nah, after watching the movie, I took them	1Assisting Blind Friends 2 Handling Multiple Blind Friends 3Lack of Training and Experience 4 Apologizing and Feeling Unprepared

around the museum. At that moment, one guide handled three to four blind friends. Even at that moment, we did not have any training. We just jumped into guiding right away. Because I was not used to guiding disabled friends, I apologised a lot during guiding. I said in my mind, astagfirullah (oh my God). So, I said at that moment, this is our former president, Soekarno right in front of you friends. ...Because, I really had no experience before at that moment. And we haven't been trained for such techniques in guding our disabled friends.	5 Providing Description during Guiding
(I, blind visitors) There are things I'd like to say about the needs of assistive technology. I believe when blind visitors visit the museum, the most important thing is the attendant, it is a must to have an attendant to help anytime. This is most important, because when there is no attendant, then, how is it possible for us to walk into the museum. They also play a role in describing what is in front of you, e.g., this is Jawaharlal Nehru, he looks like this....and that... And then, ... this is even more simple...i guess technology would be too much. and for braille, we can always create the path to show what document is in the display, then there could be audio to explain more. I guess, for me, barcodes are very complex. We need to download first, and scan, which is going to be even harder. I guess the most efficient is to be able to have a press button. If we use a barcode, we gotta open our phone, it takes a long time. Button is easier because we just have to press the button. We should have a trip today and be guided properly. So, we can learn more and get to know what is in this museum, especially for me who has never been here before. So, if we have the tour, you guys can observe what is in the real field.	1 Importance of Attendant for Blind Visitors 2 Assistive Technology and Accessibility Combining Braille and Audio Information 3Desire for a Guided Tour recommended traditional approach
(H, scholar) In this museum, there are many original things built in 1955, hmmm, and	1 Enhancing Experience for Blind Visitors

can't be touched by the blind visitors. Thus, there should be props that will enable blind visitors to get the sense of touch besides audio. Thus, they can maximise the experience from the two functions or facilities. I think, in my opinion, we can have a barcode that can be scanned by our low-vision friends, thus can help to set up the audio for our totally blind friends. So, every image, statue, got their own barcode. And I also agreed that every attraction needs its own braille information, so our blind friends won't lose their characteristic and identity. From my experience with 3 total blind people in the family, I kind of understand how hard it is. Thus, expecting the application to be useful.	2. Barcode Technology for Accessibility 3 Importance of Braille Information 4. empathy and understanding
(P, scholar) The facilities seem to be quite informative. But hmmm it hasn't been delivered properly as it lacks assistive technology. Starting from an untouchable diorama, maybe, we can create a duplicate. And maybe we shall look for a sponsor to make it happen! Thus, allowing the blind visitors to touch and feel. And, secondly, when we talk about tourism, we are talking about attraction. This museum itself contains many kinds of attractions, such as diorama, library or images are the attractions itself in this museum. We may create one attraction, specialised for blind visitors. So, when they (maybe) enter that room, by touching any object provided, they can enjoy them completely. There could be an initiation of technology, hehe just like my childhood experience in 4D cinema. This attraction could facilitate the blind visitors, maybe with sound-effect, or air blown, or maybe using a very cold temperature to create an intense impression. The braille is necessary, even obliged at every museum in Indonesia. However, additional objects can add more experiences for the blind visitors.	1 Lack of Assistive Technology and Accessibility 2. creating Specialised Attractions for Blind Visitors 3 Importance of Braille and Additional Objects seeking Sponsorship for Assistive Technology

(D, blind visitors) I would like to continue from what R mentioned about audio. A little story back in our institution of wiyata guna…ehh when we pass a place…emmm there is a censor that will be speaking, informing where we are. Such as "this is a dining room." So, there is an audio censor. And then, about ehh...the images, I couldn't agree more. As the image shape is a flat, there may be a better way to portray it, like a statue model. Thus, we would know...for example, ohh this is our former president's nose. So, we can imagine, because even if there is a description, we still have no idea what a pointy or pug nose looks like.	1 Accessibility through Audio Information 2 Challenges with Flat Images 3 Suggested Solution: Statue Models for Tactile 4 Understanding
(W, museum educators) This Museum of Asian-African Conference proclaimed itself in 2021 as a museum for all, and that statement was delivered together with the book launching "The Bandung Connection" in braille. Because, we already have a braille library. The thing is not only about guiding that involves the people with disability. We call them "our disabled friend", but many activities, various events that involve our friends. For example, in 2021, in the month of September, I was trusted to create a "bulan literasi Asia-Afrika" (The literacy month of Asia-Africa). There was a week allocated for people with disabilities. I held a talk show, mini concert for disabled people with talent. It allows them to amplify their talent and interest... But, for guide matters, honestly this is a personal experience, there is no treatment for a special attraction for our disabled friends. For recommendations or inputs, we did not only gain from our blind friends, but others with different kinds of disabilities. For example, the entrance shall accommodate the friends who are in a wheelchair, like that. Moreover, signage availability to touch. We	1Assisting Blind Friends 2 Handling Multiple Blind Friends 3Lack of Training and Experience 4 Apologizing and Feeling Unprepared 5 Providing Description during Guiding

do have a divider, but we do not have signage to portray what is written on it. This museum mostly has images and documents, nah that makes it even harder. I have some ideas, but it needs permission from all stakeholders. We need time as well. There are images that can be transformed to be a statue- like and touchable. The atmosphere of the trial may be transformed and can be touched. Emmmm, maybe that's it...
Wait, one more thing, we will be having an event called "night at the museum" on the 5th of June. On Sunday, Monday night. That event is also open for people with disabilities. Coincidentally, there are disabled friends who've registered. They are people with hearing disability or deaf. And, facilitating them needs sign language. As it happens that we also have a community called "sahabat museum" (museum friends), there are members who have sign language skill. Thus, those friends are the ones guiding the disabled visitors directly.

Source: Researchers' own elaboration

The trained attendant as a fourth theme emerged, signed that no matter how independent blind visitors are, their need for an attendant when visiting a museum is undeniable. The participant emphasised the necessity of having a skillful attendant (Philadelphia Museum of Arts, 2023) to assist them during their museum visit, especially welcoming them from the very start, before beginning the tour. The attendant's role is crucial in guiding and describing exhibits and providing essential information about the surroundings. The role of a trained attendant was underscored as essential in facilitating the museum experience for blind visitors (Kayukawa et al., 2023). Participants emphasised the significance of trained staff who could serve as guides, offering detailed descriptions, and providing assistance when needed, enhancing the overall visit (Herskovitz et al., 2023; Philadelphia Museum of Arts, 2023).

In addition, corresponds to this finding about the significance of trained attendants. A survey questionnaire as a form of self-evaluation of museum educators' experience in communicating with blind visitors is presented in Tables 2, 3, and 4. Educators (Table 3) who in this research were considered as attendants were confident to have the skills of communicating effectively. They self-assuredly answered, always trying to talk clearly to the visitors. Hence, this confirms the statement of Rickheit and Stohner (2008) about the importance of clarity competence for communicators, reflected in visitors' expectations

towards educators to avoid vagueness or ambiguity. Moreover, the mean score in providing accurate information (4.29) and also relevant (4.21) was also recorded as high. The findings affirm the previous study of Dean and Oetzel (2014) on the importance of conveying clear, concise, and accurate information to patients, such as, often masks listening and building relationships. The educators also scored high indicating they always try to understand requests from disabled visitors. Lastly, the score of understanding and facilitating expectations of visitors are documented as moderately high (4.08 and 4.00 respectively). In conclusion, Figure 1 shows the relationship between emerging themes, recommending the best practice for assisting blind visitors. When considering blind visitors in the museum, the importance of accessibility becomes the number one priority in establishing what kind of experiences they will undergo. This experience itself shall be facilitated by braille as it portrays the identity of the blind visitors and thus can become an anticipatory cue for them before utilising the assistive technology. Finally, a trained attendant is pondered as most significant because even though assistive technology promotes the independence of visitors, the facility itself is inadequate in this country.

Table 2. Self-evaluation on effective communication skills of museum educators

Effective Communication

	N	Mean	Std. Deviation
Talk clearly	24	4.29	.859
Information accuracy	24	4.29	.955
Information relevancy	24	4.21	.884
Understand request	24	4.21	.977
Understand expectation	24	4.08	.929
Facilitate expectation	24	4.00	.834
Valid N (listwise)	24		

Source: IBM Statistics 25

Based on the self-report of the museum educators (attendant), the equality for visitors' rights marked the highest (4.66). This means the awareness of the equal rights of disabled visitors is high among the attendants. The finding confirms SDGs number 10 where the need for equal treatment and facilities should be provided by the museum appropriately (Cerquetti & Montella, 2021).

Table 3. Self-evaluation on interpersonal communication skills of museum educators

Interpersonal Communication

	N	Mean	Std. Deviation
Oppenness towards critics	24	4.2500	.60792
Oppenness towards quick response	24	4.0833	.71728
Oppenness towards solving problem based on own experience	24	4.0417	.75060
Empathy towards visitors' limitation	24	4.1667	.56466
Empathy towards providing assistance	24	4.2500	.53161
Equality for no discrimination	24	4.2083	.97709
Equality for treatment	24	4.3333	.76139
Equality for rights of visitors	24	4.6667	.56466
Valid N (listwise)	24		

Source: IBM Statistics 25

In this term, the attendant serves as a human-centric facility as complementary to the assistive technology (Guo et al., 2022). Furthermore, empathy towards providing assistance for the blind is shown by its moderate (4.25) score as educators answered to always take the initiative to help visitors with difficulties. A similar result occurred for the indicator of openness towards critics. The interpersonal communication skill of museum educators (attendants) for blind visitors, in this case, should not only focus on treating them equally but with both empathy and openness (Bakić-Tomić et al., 2015; Crow & Bowles, 2018).

The two skills in effective communication and interpersonal communication described are a set of personal competence (Toshtemirovich, 2019) of museum educators (attendants), where the function is to increase understanding and assists blind visitors in grabbing the content conveyed. This effective communication skills enables educators to engage (Allen & Crowley, 2014) blind visitors, then museum visit becomes more enjoyable and informative (Rayward & Twidale, 1999). Moreover, educators should represent the capacity for building and maintaining relationships with blind visitors to create a successful interpersonal communication (Bakić-Tomić et al., 2015).

Table 4. Self-evaluation on problem solving skills of museum educators

Problem Solving

	N	Mean	Std. Deviation
Problem identification	24	4.0417	.85867
Think fast in situation	24	4.0833	.88055
Find best option	24	4.1250	.89988
Evaluate with solution	24	4.1667	.86811
Think creatively	24	4.0833	.97431
Modify creatively	24	3.7500	.98907
Create idea to solve	24	3.8750	.89988
Confident in solving	24	3.8750	.94696
Optimistic in solving	24	4.0000	.88465
Respond proactively	24	3.9167	.97431
Anticipate possible challenges	24	3.8333	.91683
Aware of opportunity to solve	24	4.0000	.93250
Valid N (listwise)	24		

Source: IBM Statistics 25

Finally, the social competence in this study is reflected by the ability to solve problems (Snyder & Snyder, 2008). Educators most likely believe that they can evaluate with solutions used so they can see the advantages and disadvantages. The educators also answered they always tried to look for the best option to solve problems faced by the blind visitors. Thus, confirms the study of Hendricson et al. (2006), mentions that being "competent" is typically connected with being able to execute a professional function and solve frequently occurring difficulties without help. This is the starting point for developing the fluid, smooth, accurate, and flexible performance that is the sign of true expertise. Conversely, educators' evaluation on ability to modify problems in creative way scored the lowest (3.75). Hence, it should be considered that educators may need training in creative thinking. Aside from prioritising information accessibility utilising assistive technology, and the experience of blind visitors. Educators' personal competence and social competence should be taken as an important programme as a reflection of SDGs number 10 and 11 (Allen & Crowley, 2014; Asakawa et al., 2018; Basadur et al., 2014; Grenier, 2010; United Nations, 2015).

Conclusion

The combination of assistive technology and the prioritisation of accessibility in museums grasps immeasurable meaning for blind visitors. By utilising screen readers as audio guides, braille displays, and tactile props, blind visitors are enabled to access and engage with cultural history which promotes inclusivity. The anticipation of accessible features not only

warrants equal access to information but also strengthens the unique identity and cultural experiences of blind visitors within the museum context. Museums in Indonesia are recommended to fulfil the ethical and legal obligations to demonstrate their commitment to inclusivity and represent accessibility. Hence, creating an environment that accommodates the needs of visitors, irrespective of their disabilities, promotes positive perceptions of museums as friendly and diverse establishments. Moreover, the employment of assistive technology operates as a catalyst for enabling the blinds to autonomously move around exhibits, form momentous contacts with pieces, and augment their whole museum experience. While improvement has been made, there remains room for further perfection. Collaborative works among museum stakeholders, technology professionals, disability advocates, and blind individuals are fundamental in motivating continuing innovations in information accessibility. Museums may provide transformative experiences that celebrate cultural diversity by continuing to innovate and investigate new possibilities for inclusive practices. Museums can benefit from the experiences and viewpoints offered by blind visitors in their search for a more accessible future. This study emphasizes the transformative potential of assistive technology and the need for constant collaboration and conversation to bring together the expanding demands of blind people in the museum setting. For museum educators, it is also essential to have a strong sense of personal competence, which includes both successful effective communication and interpersonal communication skills. Moreover, educators' social competence should foster the expertise of problem-solving when challenged in a specific state. As a result, pairing assistive technology with professional and educated instructors should be a top priority, as well as the importance of inclusive design in overcoming barriers to accessibility. In conclusion, information accessibility and assistive technology are not mere attention but essential components that shape a museum's uniqueness as an inclusive and educational space. When these principles are woven into the museum experience, a beautiful tapestry of cultural history is created. It also embraces the extraordinary tales of human experiences. Hence, supporting a justifiable and significant engagement with the past, present, and future.

References

Ahmad, A., Jubaedah, S., Fajarianto, O., & Nurlia, T. (2022). Use of the National Museum as a Learning Resource for Social Science Subjects. *Journal of Socio Humanities Review (JSHR)*, *2*(2), 56–62.

Allen, L. B., & Crowley, K. J. (2014). Challenging Beliefs, Practices, and Content: How Museum Educators Change. *Science Education*, *98*(1), 84–105. https://doi.org/10.1002/sce.21093

Amato, P. P. (2008). Focus group methodology Part 1: Considerations for design. *International Journal of Therapy and Rehabilitation*, *15*(2), 69–73.

Argyropoulos, V. S., & Kanari, C. (2015). Re-imagining the museum through "touch": Reflections of individuals with visual disability on their experience of museum-visiting in Greece. *Alter*, *9*(2), 130–143. https://doi.org/10.1016/j.alter.2014.12.005

Asakawa, S., Guerreiro, J., Ahmetovic, D., Kitani, K. M., & Asakawa, C. (2018). The present and future of museum accessibility for people with visual impairments. *ASSETS 2018 - Proceedings of the 20th International ACM SIGACCESS Conference on Computers and Accessibility*, 382–384. https://doi.org/10.1145/3234695.3240997

Bakić-Tomić, L., Dvorski, J., & Kirinić, A. (2015). Elements of teacher communication competence: An examination of skills and knowledge to communicate. *International Journal of Research in Education and Science*, *1*(2), 157–166. https://doi.org/10.21890/ijres.54372

Basadur, M., Gelade, G., & Basadur, T. (2014). Creative Problem-Solving Process Styles, Cognitive Work Demands, and Organizational Adaptability. *Journal of Applied Behavioral Science*, *50*(1), 80–115. https://doi.org/10.1177/0021886313508433

Cerquetti, M., & Montella, M. M. (2021). Meeting Sustainable Development Goals (SDGs) in museum evaluation systems. The case of the Italian National Museum System (NMS). *Sinergie*, *39*(1), 125–147. https://doi.org/10.7433/s114.2021.08

Creswell, W. J., & Creswell, J. D. (2018). Research Design: Qualitative, Quantitative adn Mixed Methods Approaches. In S. Helen, C. Neve, M. O'Heffernan, D. C. Felts, & A. Marks (Eds.), *Journal of Chemical Information and Modeling* (5th ed., Vol. 53, Issue 9). SAGE Publications, Inc. file:///C:/Users/Harrison/Downloads/John W. Creswell & J. David Creswell - Research Design_ Qualitative, Quantitative, and Mixed Methods Approaches (2018).pdf%0Afile:///C:/Users/Harrison/AppData/Local/Mendeley Ltd./Mendeley Desktop/Downloaded/Creswell, Cr

Crow, W., & Bowles, D. (2018). Empathy and Analogy in Museum Education. *Journal of Museum Education*, *43*(4), 342–348. https://doi.org/10.1080/10598650.2018.1529904

Deakin, T. (2022). *How museums can remove barriers to access for blind and partially sighted people*. MuseumNext. https://www.museumnext.com/article/how-museums-can-remove-barriers-to-access-for-blind-and-partially-sighted-people/

Dean, M., & Oetzel, J. G. (2014). Physicians' Perspectives of Managing Tensions Around Dimensions of Effective Communication in the Emergency Department. *Health Communication*, *29*(3), 257–266. https://doi.org/10.1080/10410236.2012.743869

Denzin, N. K., & Lincoln, Y. S. (2018). The SAGE Handbook of Qualitative Research. In *The Sage Handbook*. SAGE Publications, Inc.

Doktrinaya, K. G. (2022). *Tiga Museum Dirancang Ramah Disabilitas*. Bali Express. https://baliexpress.jawapos.com/bali/671183112/tiga-museum-dirancang-ramah-disabilitas

Douglas, G. (2022). *Braille: a powerful practical tool and symbol of empowerment*. University of Birmingham. https://www.birmingham.ac.uk/news/2022/braille-a-powerful-practical-tool-and-symbol-of-empowerment

Eeuwijk, P. Van, & Angehrn, Z. (2017). How to conduct a focus group discussion (FGD): Methodological manual. In *Zurich Open Repository and Archive* (Issue April).

Fernando, W. D., Rizal, E., & Yuliawati, A. K. (2022). Development of Accessible Museum for Blind Tourists. *IJDS Indonesian Journal of Disability Studies*, *9*(02), 225–242. https://doi.org/10.21776/ub.ijds.2022.009.02.07

Fielding, N. G., Lee, R. M., & Blank, G. (2017). Online Surveys Methods. In J. Burger (Ed.), *SAGE Publication* (2nd ed.). SAGE Publications Ltd.

Flick, U. (2014). The SAGE Handbook of Qualitative Data Analysis. In K. Metzler (Ed.), *SAGE Publications, Ltd*. SAGE Publications Ltd. http://dx.doi.org/10.4135/9781446282243

Galesi, G., Giunipero, L., Leporini, B., Pagliucoli, F., Quatraro, A., & Verdi, G. (2020). SelfLens: A Personal Assistive Technology to Support the Independence of People with Special Needs in Reading Information on Food Items. *17th International Conference, ICCHP 2020 Lecco, Italy, September 9–11, 2020 Proceedings, Part I*, *12376 LNCS*, 526–533. https://doi.org/https://doi.org/10.1007/978-3-030-58796-3_60

Ginley, B. (2013). Museums: A Whole New World for Visually Impaired People. *Disability Studies Quarterly (DSQ)*, *33*(3).

Grenier, R. S. (2010). "Now this is what i call learning!" A case study of Museum-Initiated professional development for teachers. *Adult Education Quarterly*, *60*(5), 499–516. https://doi.org/10.1177/0741713610363018

Guo, S., Zheng, X., & Heath, T. (2022). Research on the Design of Community Museums Based on the Fuzzy Comprehensive Evaluation Method. *Sustainability (Switzerland)*, *14*(17), 1–17. https://doi.org/10.3390/su141710802

Hayes, A. (2005). *Statistical Methods for Communication Science* (L. Bathgate & K. W. Bates (eds.); Issue 1). Taylor & Francis e-Library.

Hendricson, W. D., Andrieu, S. C., Chadwick, D. G., Chmar, J. E., Cole, J. R., George, M. C., Glickman, G. N., Glover, J. F., Goldberg, J. S., Haden, N. K., Meyerowitz, C., Neumann, L., Pyle, M., Tedesco, L. A., Valachovic, R. W., Weaver, R. G., Winder, R. L., Young, S. K., & Kalkwarf, K. L. (2006). Educational Strategies Associated with Development of Problem-Solving, Critical Thinking, and Self-Directed Learning. *Journal of Dental Education*, *70*(9), 925–936. https://doi.org/10.1002/j.0022-0337.2006.70.9.tb04163.x

Herskovitz, J., Xu, A., Alharbi, R., & Guo, A. (2023). Hacking, Switching, Combining: Understanding and Supporting DIY Assistive Technology Design by Blind People. *Conference on Human Factors in Computing Systems - Proceedings*. https://doi.org/10.1145/3544548.3581249

Humas Disparbud Jabar. (2023). *SEMANGAT KOLABORASI DAN INOVASI CIPTAKAN MUSEUM SRI BADUGA YANG LEBIH RAMAH UNTUK PENYANDANG DISABILITAS*. Dinas Pariwisata Dan Kebudayaan Provinsi Jawa Barat. https://disparbud.jabarprov.go.id/semangat-kolaborasi-dan-inovasi-ciptakan-museum-sri-baduga-yang-lebih-ramah-untuk-penyandang-disabilitas/

INDATA. (2017). *The Future of Braille*. Easterseals Crossroads. https://www.eastersealstech.com/2017/03/22/the-future-of-braille/#:~:text=Experts we spoke to%2C though,Braille rather than replacing it.

Jingyu, S., Xinyi, L., & Zeyou, Z. (2023). Research on Museum Accessibility for the Visually Impaired. *SHS Web of Conferences*, *163*, 02022. https://doi.org/10.1051/shsconf/202316302022

Kayukawa, S., Sato, D., Murata, M., Ishihara, T., Takagi, H., Morishima, S., & Asakawa, C. (2023). Enhancing Blind Visitor's Autonomy in a Science Museum Using an Autonomous Navigation Robot. *Conference on Human Factors in Computing Systems - Proceedings*. https://doi.org/10.1145/3544548.3581220

Kementrian Luar Negeri Republik Indonesia. (2021). *Museum KAA Canangkan Diri Sebagai Museum Ramah Disabilitas*. Kementrian Luar Negeri Republik Indonesia. https://kemlu.go.id/portal/id/read/2424/berita/museum-kaa-canangkan-diri-sebagai-museum-ramah-disabilitas

Kusumaningrum, H. (2018). Kajian Kebutuhan Wisatawan Difabel Dalam Berwisata (Studi Kasus Museum Benteng Vredeburg). *Jurnal Kepariwisataan*, *12*(03), 35–44. https://doi.org/10.47256/kepariwisataan.v12i03.77

Lidwina, A. (2020). *Jumlah Museum per Provinsi*. Katadata.Co.Id. https://databoks.katadata.co.id/datapublish/2020/01/22/10-provinsi-dengan-jumlah-museum-terbanyak-di-indonesia

Liu, J. H., & Hilton, D. J. (2005). How the past weighs on the present: Social representations of history and their role in identity politics. *British Journal of Social Psychology*, *44*(4), 537–556. https://doi.org/10.1348/014466605X27162

Lungu, M. (2022). The Coding Manual for Qualitative Researchers. SAGE Publication. *American Journal of Qualitative Research*, *6*(1), 232–237.

Lupetina, R. (2022). The Braille System: the Writing and Reading System That Brings Independence To the Blind Person. *European Journal of Special Education Research*, *8*(3), 1–13. https://doi.org/10.46827/ejse.v8i3.4288

Mesquita, S. V., & Carneiro, M. J. (2021). *Assistive Technologies in Museums for People With Visual Impairments*. *April*, 256–276. https://doi.org/10.4018/978-1-7998-6428-8.ch012

Meylani, S. (2022). *Museum Kretek Upayakan Ramah Disabilitas*. Joglo Jawa Tengah. https://joglojateng.com/2022/09/16/museum-kretek-upayakan-ramah-disabilitas/

Museum Konperensi Asia Afrika. (n.d.). *Museum KAA*. Retrieved May 20, 2023, from https://www.asiafricamuseum.org/halaman/Tentang-Museum-KAA

Nurulliah, N. (2019). *Museum Geologi Semakin Ramah bagi Penyandang Disabilitas*. PikiranRakyat.Com. https://www.pikiran-rakyat.com/bandung-raya/pr-01320074/museum-geologi-semakin-ramah-bagi-penyandang-disabilitas

Pavlenko, A. (2002). Narrative Study: Whose Story Is It, Anyway? *TESOL Quarterly*, *36*(2), 213.

Philadelphia Museum of Arts. (2023). *Accessibility*. Philadelphia Museum of Art. https://philamuseum.org/visit/accessibility

Phillips, A. (2016). Beyond Bandung: the 1955 Asian-African Conference and its legacies for international order. *Australian Journal of International Affairs*, *70*(4), 329–341. https://doi.org/10.1080/10357718.2016.1153600

Poria, Y., Reichel, A., & Brandt, Y. (2009). People with disabilities visit art museums: An exploratory study of obstacles and difficulties. *Journal of Heritage Tourism*, *4*(2), 117–129. https://doi.org/10.1080/17438730802366508

Undang- undang Republik Indonesia No. 4 Tahun 1997 Tentang Penyandang Cacat, (1997).

Proudfoot, K. (2022). Inductive/Deductive Hybrid Thematic Analysis in Mixed Methods Research. *Journal of Mixed Methods Research*, *17*(3), 308–326. https://doi.org/10.1177/15586898221126816

Ramadhanti, D. (2019). *PARIWISATA RAMAH DISABILITAS(Studi Deskriptif Tentang Penyediaan Layanan Bagi Penyandang Difabel Di Museum Negeri Mpu Tantular, Sidoarjo)* [Universitas Airlangga]. https://repository.unair.ac.id/84589/

Rayward, W. B., & Twidale, M. B. (1999). From Docent to Cyberdocent: Education and Guidancein the Virtual Museum. *Archives and Museum Informatics*, *13*(1), 23–53. https://doi.org/10.1023/a:1009089906902

Rickheit, G., & Stohner, H. (2008). Handbook of Communication Competence. In G. Antos & E. Knapp (Eds.), *Handbook of Communication Competence* (Vol. 1). Library of Congress Cataloging-in-Publication Data Handbook.

Saldana, J. (2013). *The Coding Manual for Qualitative Researchers* (2nd ed.). SAGE Publications Ltd.

Snyder, L. G., & Snyder, M. J. (2008). Teaching Critical Thinking and Problem Solving Skills How Critical Thinking Relates to Instructional Design. *The Delta Pi Epsilon Journal*, *1*(2), 90–100.

Toshtemirovich, R. Z. (2019). Development of Professional Competence of Educator. *European Journal of Research and Reflection in Educational Sciences*, *7*(10), 99–106. www.idpublications.org

United Nations. (2015). *THE 17 GOALS*. Department of Economic and Social Affairs Sustainable Development. https://sdgs.un.org/goals/goal3

Vaz, R., Freitas, Di., & Coelho, A. (2020). Blind and Visually Impaired Visitors' Experiences in Museums: Increasing Accessibility through Assistive Technologies. *The International Journal of the Inclusive Museum*, *13*(2), 57–80. https://doi.org/http://doi.org/10.18848/1835-2014/CGP (Journal)