A Survey of Universal Design at Museums: Current Industry Practice and Perceptions

Jennifer K. Fortuna
Colorado Mesa University – USA, jennifer.fortuna@wmich.edu

Kayleigh Thomas
Grand Valley State University – USA, thomask@mail.gvsu.edu

Jenna Asper
Grand Valley State University – USA, asperj@mail.gvsu.edu

Laura Matney
Grand Valley State University – USA, matneyl@mail.gvsu.edu

Kyra Chase
Grand Valley State University – USA, chaseky@mail.gvsu.edu

See next page for additional authors

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Abstract

Background: Museums are key educational and cultural resources in the community, yet many are not accessible to visitors with disabilities. Universal design promotes products and environments usable to the greatest extent possible by all people, regardless of ability. This study explores current industry practice and perceptions of accessibility and universal design in a small sample of American museums. Suggestions for how occupational therapists can help museums go above and beyond ADA guidelines are provided.

Method: An 17-item cross-sectional survey was used to collect data. Twenty-five museum associations assisted with recruitment. A descriptive numerical summary and qualitative analysis were used to summarize the results.

Results: Sixty respondents participated in the survey. Accommodations for visitors with visual impairment and physical barriers created by historical buildings were identified as both challenges and successes by the respondents. Confusion between ADA standards and universal design was evident in several responses.

Conclusion: The most frequently reported accessibility rating was good. Staff training and community-based partnerships are important, but often overlooked practices for improving accessibility. Local agencies who serve people with disabilities are underused resources in the community. There is a potential role for occupational therapists to assist museums with staff training, recruiting people with disabilities, and establishing community partnerships. Additional research is warranted.

Comments

Keywords

museum, disability, accessibility, universal design, occupational therapy

Cover Page Footnote

Complete Author List

Jennifer K. Fortuna, Kayleigh Thomas, Jenna Asper, Laura Matney, Kyra Chase, Stephanie Ogren, and Julia VanderMolen

Credentials Display

Jennifer Fortuna, PhD, OTR/L; Kayleigh Thomas, OTS; Jenna Asper, OTS; Laura Matney, OTS; Kyra Chase, OTS; Stephanie Ogren, PhD; Julia VanderMolen, PhD, CHES

People with disabilities often face barriers to accessibility that limit participation in public programs and services. Following the passage of the Americans with Disabilities Act (ADA), cultural organizations, such as museums, made substantial efforts to improve accessibility (ADA, 1990; Cho & Jolley, 2016; Rappolt-Schlichtmann & Daley, 2013; United States Department of Justice Civil Rights Division, n.d.). Museums include any non-profit, permanent institution that serves society and its development. Open to the public, museums acquire, conserve, research, communicate, and exhibit the tangible and intangible heritage of humanity and its environment for the purposes of education, study, and enjoyment (International Council of Museums, 2007). Each year, close to one billion people visit American museums (American Alliance of Museums [AMM], 2020). Museum visitors are a diverse group with and without disabilities. As central educational and cultural resources in the community, museums must be accessible to all visitors (Cho & Jolley, 2016; Deng, 2017; Silverman & Bartley, 2013). Offering equal opportunities to all museum visitors has proven challenging (Sandell et al., 2010).

The ADA is a federal law that protects the civil rights of people with disabilities. In contrast, universal design is a concept that promotes inclusion for people of all ages and abilities. Universal design refers to the design of products and environments usable to the greatest extent possible by all people, regardless of age, ability, or circumstance (R. L. Mace Universal Design Institute, 2019). Universal design includes seven principles (see Table 1). Applying these principles in a museum setting promotes inclusion and participation for all visitors (Silverman et al., 2012).

Table 1
Universal Design Principles

Principle	Description
Equitable Use	The design is useful and marketable to people with diverse abilities.
Flexibility in Use	The design accommodates a wide range of individual preferences and abilities.
Simple and Intuitive Use	The use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
Perceptible Information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
Tolerance for Error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Low Physical Effort	The design can be used efficiently and comfortably and with a minimum of fatigue.
Size and Space for Approach and Use	Appropriate size and space are provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.

Note. Universal Design Institute. (2023). *Universal design principles*. https://www.udinstitute.org/principles

As key educational resources in the community, museums must also provide inclusive learning experiences. Universal design for learning (UDL) is a framework used to optimize teaching and learning for all people (Center for Applied Special Technology [CAST], 2018). The CAST guidelines for creating UDL environments are grounded in three principles (CAST, 2018). The first principle is providing multiple means of representation to access learning content. According to the CAST (2018), offering information in various formats (e.g., print, auditory, visual, tactile, and different languages) promotes the transfer of learning and generalization. The second principle is providing multiple means of action and expression. Providing different ways to navigate learning content and express understanding supports learners with diverse skills and abilities. The third principle is providing multiple means of engagement.

Recognizing variations in learner affect and preferences promotes curiosity, effort, and self-regulation. Incorporating UDL into educational programming ensures learning experiences are accessible to the largest audience of museum visitors.

Literature Review

Universal design promotes equal opportunities for all people. Therefore, it is important to explore existing literature on barriers to participation in museum settings for people with and without disabilities. Kay et al. (2009) identified eight common barriers to visiting cultural institutions (e.g., museums, art galleries, and exhibitions). These barriers include (a) physical access, (b) personal access, (c) cost, (d) time and timing, (e) product, (f) personal interest and peer group, (g) socialization and understanding, and (h) information. The authors state the relationships between these barriers are interconnected and complex. In addition, overcoming multiple barriers will require cultural institutions to provide novel experiences and use creative strategies.

According to the International Classification of Functioning, Disability, and Health, the key variables of person, environment, and activity should be at the heart of any universal design initiative (World Health Organization [WHO], 2021). These variables align with the field of occupational therapy, a client-centered profession concerned with the transactional relationship between the person, context, and occupations (American Occupational Therapy Association, 2020). The client-centered model is holistic and supports self-determination and well-being. Occupational therapists promote human performance through a system's theoretical perspective. Systems theory deepens understanding of occupational performance through the complex relationships between people, the environment, and occupations (Silverman et al., 2012). This perspective also reinforces an understanding of environments that may enhance occupational performance and meaning. Using a system's perspective, occupational therapists are well-suited to promote accessibility and universal design in museum settings.

Research exploring museum and occupational therapy partnerships is limited. Silverman et al. (2012) explored how a collaboration between a museum and occupational therapists promotes accessibility, innovative programming, and staff training. Fletcher et al. (2018) facilitated a partnership between museum educators and pediatric occupational therapists to create sensory gallery guides for children with autism spectrum disorder. Findings show the guides had a positive impact on the museum experience. Gallagher Worthley et al. (2018) explored a partnership between an art museum and occupational therapy and speech-language pathology educational programs. Students applied universal design principles to increase engagement for museum visitors with physical disabilities and communication disorders. The findings of this study show how the application of universal design led to increased community engagement for all museum visitors.

Additional research is needed to explore universal design and accessibility at American museums. The purpose of this study is twofold: (a) to identify current practices related to incorporating universal design in museum settings and (b) to gain insight from museum professionals regarding the accessibility of museums. Topics of interest for this study include public spaces, exhibits, educational programming, staff training, and consulting with people with disabilities. The results of this study can be used to inform the creation of functional and welcoming public spaces for museum visitors of all abilities.

Research Questions

This study aims to answer the following research questions:

1. How do museum professionals rate the accessibility of their public spaces, exhibits, and educational programs?
2. What are the challenges related to incorporating universal design at a museum?
3. How do museums incorporate universal design to promote inclusion and participation for visitors of all abilities?

Method

Research Design

A cross-sectional survey design was used because of cost and ease of distribution. The researchers contacted state and regional museum associations to assist with participant recruitment. Descriptive statistics and qualitative analysis were used to analyze the data set and report themes. The institutional review board at Grand Valley State University approved the study.

Study Participants

The researchers conducted an online search to identify museum associations located in the United States. The researchers contacted 54 museum associations to request assistance with survey distribution. Twenty-five museum associations agreed to share the survey with members using email, social media, and online newsletters. To qualify for this study, participants had to meet the following inclusion criteria: (1) employed by a museum, (2) located in the United States, and (3) have direct knowledge of policies and procedures related to accessibility. Participants who did not meet the inclusion criteria were excluded from this study.

Survey Instrument

An 17-item electronic survey was created using Qualtrics software (see Appendix). To increase the validity of the survey questions, the researchers collaborated with experts in universal design and museum administration. The first question addressed informed consent. For clarity, the researchers added an informational paragraph at the beginning of the survey describing the differences between ADA standards and universal design. This information was intended to help the respondents identify whether universal design was incorporated in their own museums. The remaining questions addressed self-reported accessibility ratings and the challenges and successes related to incorporating universal design in museum settings. The survey consisted of open-ended and multiple-choice questions.

Data Analysis

Data analysis was conducted by hand. During quantitative analysis, descriptive statistics were used to summarize and describe the survey data. Qualitative analysis took place in three phases: data reduction, data display, and conclusion drawing and verification (Miles & Huberman, 1994). During the data reduction phase, the researchers highlighted chunks of data that informed the research question. A basic coding process was used to categorize chunks of data with common meanings. During the data display phase, two concept maps were created to recognize patterns and relationships between the data (Mason, 2002). During the conclusion drawing and verification phase, the researchers identified common themes related to universal design challenges and successes in museum settings. All researchers participated in data analysis. Any discrepancies were brought to the attention of the group for resolution.

Results

The survey was administered between April 27, 2021, and August 1, 2021. Sixty respondents completed the survey. All of the responses provided beyond the demographic information were considered valid. The specific number of responses (*n*) is reported for each research question. All missing responses were factored out during data analysis. A summary of the respondent demographics is provided in Table 2.

Table 2
Respondent Demographics

Location n = 41 (%)		Job Title n = 88 (%)		Business Structure n = 43 (%)		Museum Category n = 92 (%)	
Nebraska	4 (10%)	Education	12 (14%)	Private Non-Profit	27 (63%)	History	20 (22%)
New York	3 (7%)	Curator	10 (11%)	Public	13 (30%)	Historical House	16 (17%)
Louisiana	3 (7%)	CEO; Exec Director	9 (10%)	University	2 (.04%)	Art	12 (13%)
Minnesota	3 (7%)	Exhibit Developer	9 (10%)	Non-profit	1 (0.2%)	Archive	9 (10%)
Colorado	2 (5%)	Collections Manager	8 (9%)			Other	8 (9%)
Michigan	2 (5%)	Visitor Experience Manager	8 (9%)			Library	7 (8%)
Wyoming	2 (5%)	Exhibits Project Manager	8 (9%)			Multi- Discipline	7 (8%)
Texas	2 (5%)	Other	8 (9%)			Science	5 (5%)
New Jersey	2 (5%)	Public Programs	7 (8%)			Park/Nature	3 (3%)
Iowa	2 (5%)	Exhibit Designer	5 (6%)			Natural History	3 (3%)
Utah	2 (5%)	Operations/Facilities	4 (5%)			Zoo/Aquarium	2 (2%)
Florida	2 (5%)	Curator/Curatorial Staff	10 (11%)				
Tennessee	2 (5%)	Exhibit Developer	9 (10%)				
California	2 (5%)	Exhibit Designer	5 (5%)				
Arizona	1 (2%)	Operations/Facilities Manager/Staff	4 (4%)				
Pennsylvania	1 (2%)						
Massachusetts	1 (2%)						
Mississippi	1 (2%)						
DC	1 (2%)						
Virginia	1 (2%)						
Washington	1 (2%)						
Indiana	1 (2%)						

Self-Reported Accessibility

The respondents were asked to rate the accessibility of their museum's public spaces for people with disabilities. A 5-point Likert scale with the following ratings was used to collect the responses: excellent, very good, good, fair, and poor. The responses collected include *n* = 42 for public spaces, *n* = 37 for exhibits, and *n* = 35 for educational programming. Among the most frequent ratings, *n* = 14 (33%) reported the accessibility of public spaces was good. Regarding exhibits, *n* = 15 (41%) reported the accessibility was good, and *n* = 13 (37%) reported the accessibility of their educational programming was very good. Table 3 provides a summary of all self-reported accessibility ratings.

Table 3
Self-Reported Accessibility Ratings

	Public Spaces n = 42 (%)	Exhibits n = 37 (%)	Programming n = 35 (%)
Excellent	6 (14%)	5 (14%)	5 (14%)
Very Good	8 (19%)	7 (19%)	13 (37%)
Good	14 (33%)	15 (41%)	12 (34%)
Fair	4 (10%)	9 (24%)	5 (14%)
Poor	4 (10%)	1 (3%)	0

Challenges: Public Spaces, Exhibits, and Educational Programming

The respondents identified challenges related to accessibility and universal design in public spaces, exhibits, and educational programming. Twelve of the respondents shared how the public spaces in their museums were not accessible to all museum visitors. Of these responses, $n = 8$ (89%) noted physical barriers created by historical buildings, and $n = 4$ (33%) reported a lack of accommodations for visitors with visual impairment. Ten of the respondents shared universal design challenges related to exhibits. Of these responses, $n = 6$ (60%) reported historical buildings created barriers for wheelchairs, and $n = 5$ (50%) noted they had no accommodations for visitors with visual impairment. Other reported challenges included a lack of staff $n = 5$ (50%), space $n = 4$ (40%), and funding $n = 3$ (30%). Five of the respondents provided examples of educational programming that was not accessible to all museum visitors. Of these responses, $n = 3$ (60%) reported limited knowledge, and $n = 2$ (40%) identified communication barriers (e.g., language and visual impairment).

Challenges: Training and Consultation

The respondents were asked to identify challenges related to staff training and consulting with people with disabilities. The respondents were specifically asked if they provided staff training related to serving museum visitors with disabilities. Thirty-four of the respondents answered this question. Of these responses, $n = 14$ (41%) indicated they did not provide staff training. When asked what prevented the museum from providing this type of training, $n = 6$ (43%) reported staffing shortages, $n = 5$ (36%) indicated funding and priorities, and $n = 3$ (21%) noted time and knowledge. Seventeen of the respondents reported challenges related to consulting with people with disabilities. Of these responses, $n = 15$ (88%) identified specific challenges preventing consultation, including $n = 9$ (60%) lack of knowledge or resources (e.g., not knowing anyone with a disability), and $n = 3$ (20%) reporting consultation was not a priority. Additional challenges include lack of time $n = 3$ (20%) and funding $n = 1$ (6%). A summary of challenges related to staff training and consultation is provided in Table 4.

Table 4

Challenges to Staff Training and Consultation

	Staff Training n = 14 (%)	Consultation n = 15 (%)
Staffing	6 (43%)	1 (6%)
Funding	5 (36%)	1 (6%)
Priorities	5 (36%)	3 (20%)
Time	3 (21%)	3 (20%)
Knowledge/Resources	3 (21%)	9 (60%)

The survey included several open-ended questions to identify common themes related to challenges incorporating universal design in museum settings. The questions were specific to public spaces, exhibits, educational programming, consultation, and staff training. Qualitative analysis took place in three phases, as described by Miles and Huberman (1994). The researchers identified common themes related to physical accessibility, accommodations for visual impairment, staffing, knowledge, resources (e.g., staff, time, space, and funds), and priorities. A summary of common themes and supporting quotes is provided in Table 5.

Table 5
Common Themes and Supporting Quotes for Universal Design Challenges

Themes	Supporting Quotes
Physical Accessibility	– "Historical buildings make ramps and steps harder to maneuver, minimal seating, no tactile materials." – "Since we are in a historical building, it is sometimes difficult to incorporate universal design." – "Object labels laid flat, making it hard for a person using a wheelchair to see. Object labels up too high due to historical features in the building that can't be covered." – "We have several historical buildings that are not accessible to individuals in wheelchairs." – "Natural, historical materials have worn down over time creating trip hazards." – "Exhibits are on a battleship below decks without elevator access."
Accommodations for Visual Impairment	– "We do not offer many ways for people with vision impairments to interact with exhibits." – "We have no braille signs or anything for hearing impaired individuals." – "Without a personal tour guide, all information is visual only with limited signage." – "We do not have much for people with vision impairments." – "Nothing for visually impaired."
Knowledge	– "I don't think the board or staff know about universal design." – "Our staff does not feel as if they have enough knowledge to lead a program for those with a disability and would like more consultation with community groups on this." – "No ASL; limited knowledge/implementation for those with learning disabilities." – "Lack of knowledge about how to be more accessible through our educational programming."
Resources	– "We have a small budget and only three staff members. Redoing exhibits to be accessible is beyond our budget for many years." – "Space and funding." – "We are a very small organization, and we are limited in what we can do in regards to time and cost." – "Cost, space, staff, time." – "Space requirements, staff time, knowledge."
Priorities	– "Not considered." – "Before they created an educator position (me), there was simply no one to think about these things. It was not a priority." – "We are so busy chasing other things it just wasn't a priority on our radar. It certainly isn't a cost issue and something we could easily incorporate into our overall training process." – "It hasn't been considered in the past." – "Labels, cases, and displays are all done without accessibility in mind. Designed only for looks, not for use."

Successes: Public Spaces, Exhibits, and Educational Programming

The respondents identified successes related to accessibility and universal design in public spaces, exhibits, and educational programming. Twenty-one of the respondents provided examples of how universal design is incorporated into public spaces. Of these responses, $n = 17$ (81%) focused on physical accessibility; $n = 7$ (33%) reported providing accommodations, such as assistive technology; and $n = 6$ (29%) provided information and signage in multiple formats (e.g., written, tactile, audible, braille, and different languages). Seventeen of the respondents reported incorporating universal design into exhibits. Of these responses, $n = 10$ (59%) were related to physical accessibility; $n = 6$ (35%) provided information in multiple formats; and $n = 4$ (24%) provided accommodations, such as large print labels. Twelve of the respondents shared examples of universal design in educational programming. Of these responses, $n = 10$ (83%) were related to physical accessibility (e.g., adjustable workstations); $n = 6$ (50%) provided information in multiple formats; and $n = 4$ (33%) provided accommodations, such as alt-text, closed-captioning, and touchable artifacts.

Successes: Training and Consultation

The respondents described their experiences with staff training and consulting with people with disabilities. Seventeen of the respondents shared basic information related to staff training. Of these responses, $n = 6$ (35%) reported who provided training (e.g., local agency), $n = 5$ (29%) shared what topics were covered (e.g., customer service), and $n = 5$ (29%) shared when training took place (e.g., orientation). In addition, $n = 4$ (24%) identified specific diagnoses (e.g., autism and dementia) as the focus of training. Sixteen of the respondents reported they consult with people with disabilities. Of these responses, $n = 7$ (44%) invited people with disabilities to visit the museum and provide feedback, and $n = 5$ (31%) established partnerships with local agencies serving people with disabilities. In addition, $n = 4$ (25%) of the respondents described the benefits of consultation (e.g., insightful, positive, enlightening, and helpful).

Common themes related to universal design successes were also identified through qualitative analysis (Miles & Huberman, 1994). Once again, the open-ended questions were specific to public spaces, exhibits, educational programming, consultation, and staff training. The researchers identified common themes related to physical accessibility, accommodations, training basics (e.g., who, what, when), and collaborative partnerships. A summary of themes and supporting quotes is provided in Table 6.

Table 6

Common Themes and Supporting Quotes for Universal Design Successes

Themes	Supporting Quotes
Physical Accessibility	– "Doorways, counter heights, tactile and multisensory experiences, ramps, private restrooms, and parking with assisted use." – "Ramps, seating areas, broad-access pathways, lighting." – "Seating incorporated into garden beds, single gender-neutral toilet rooms with space for a helper or families together." – "Open plan allows all exhibits to be accessed including by groups having multiple wheelchairs."
Accommodations	– "Mobile tours with both audio and text; high contrast labels; all spaces accessible without special equipment." – "Assisted listening devices, braille, large print wall labels, and text." – "Adjustable workstations, information provided in multiple formats (verbal, online, braille, large print, multiple languages)." – "Large font text, bilingual text, different height tables, and displays." – "High contrast, large print signage, captions on video." – "Step stools for children to better view an exhibit case, touchable object reproductions."
Training Basics	– "Diversity and inclusion committee." – "This is covered in visitor services." – "We have a council on site that offers staff development courses." – "Annual meetings or seminars or webinars." – "Three-hour staff training on accessibility, annual hourly refreshers." – "Through orientation." – "Staff brown bag events."
Collaborative Partnerships	– "We have brought in groups of people from the blind community to review exhibits. We have had groups with physical disabilities review, critique, and make suggestions." – "We have an advisory committee from local agencies." – "We recently provided a program in ASL and invited people of the hearing and Deaf communities to evaluate it. We are in the process of inviting advisors with varied abilities to further advise us on our accessibility master plan." – "We have invited them to visit our space and provide feedback of their experience, along with suggestions for improvement that would be helpful to them." – "Open listening and actually incorporating feedback from people with disabilities have led to many changes in my programs."

Discussion

This study explored current practices and perceptions of accessibility and universal design in a small sample of American museums. The first aim of this study was to explore how museum professionals rate the accessibility of their public spaces, exhibits, and educational programs. Using a 5-point Likert scale (poor, fair, good, very good, and excellent), the most frequent rating for public spaces and exhibits was "good," followed by "very good" for educational programming. As a federal law, the ADA ensures equal opportunities to participate in society (ADA, 1990). This requires museums to provide reasonable access and accommodations to visitors with disabilities. In this study, physical access and accommodations were reported as both common challenges and successes. According to Rappolt-Schlichtmann and Daley (2013), cultural organizations have made substantial efforts to improve accessibility in recent years. Despite these efforts, people with disabilities continue to report feeling excluded from public settings (Linton, 2006; Poria et al., 2009; Reich et al., 2011).

There is a growing body of evidence-based resources available to help museums go above and beyond ADA guidelines to create functional and welcoming experiences for visitors of all abilities. In 2021, the National Endowment for the Arts (NEA) published the Disability Design: Summary Report from a Field Scan (NEA, 2021). This report summarizes current trends, needs, and innovations in the field of disability design for public spaces. The Smithsonian Guidelines for Accessible Exhibition Design offers guidelines, tools, and resources for inclusive exhibit design (Smithsonian, 2010). Topics include making content accessible to multiple intellectual levels, learning styles, and languages. The Nanoscale Informal Science Education (NISE) Network (2008) published Universal Design Guidelines for Public Programs in Science Museums. This guide describes how educators can develop and implement educational programs that are inclusive of the wide range of abilities of museum visitors. The CAST published Universal Design for Learning Guidelines to optimize teaching and learning for people of all abilities (CAST, 2018). Application of research and resources such as these will promote inclusion and participation in public spaces, exhibits, and educational programming.

The second aim of this study was to identify challenges related to incorporating universal design in museum settings. One common theme was a lack of accommodations for visitors with visual impairment. According to Vaz et al. (2020), museum visitors with visual impairment often feel unwelcome by staff. Because of the variation in type and severity of visual impairment, it is important to provide information in multiple formats (e.g., written, tactile, audible). Providing multisensory experiences helps museum visitors who are visually impaired formulate mental images and reinforces understanding of verbal information (Vaz et al., 2020). Art Beyond Sight (ABS) is a non-profit organization that supports access and inclusion to arts and culture activities for people with disabilities (ABS, n.d.). ABS partners with museums and cultural organizations to develop accessible programming for people who are blind and visually impaired. Another common challenge reported in this study was physical barriers created by historical buildings. There are circumstances where environmental modifications are limited by the physical structure of a museum. According to Gallagher Worthley et al. (2018), low-cost environmental modifications are possible despite limitations created by historical buildings. Examples include increasing font size and contrast on signage and labels and providing information in multiple formats (e.g., written, audible, and tactile) and languages.

Staff training and consultation with people with disabilities are key components of inclusive museums. Approximately 40% of the respondents do not provide staff training on disability. This type of

training is an important but often-overlooked component of accessibility practices. Lack of training may create unintentional barriers to participation for museum visitors with disabilities. Therefore, all staff who interact with the public need to be trained on the basic needs of museum visitors with disabilities. Over 50% of the respondents did not consult with people with disabilities. A lack of knowledge and resources are common challenges that can be addressed by forming collaborative partnerships with local organizations that serve people with disabilities, such as the Association for the Blind. Organizations such as these employ trained professionals who have direct access to people with disabilities.

The third aim of this study was to identify successes related to incorporating universal design in museum settings. Common successes included physical accessibility and providing accommodations. This finding was interesting because the same themes were reported as common challenges. It is possible the respondents did not perceive the method for delivering information (e.g., large print, touchable objects, and multiple formats of information) as an accommodation. Another interesting finding was the variation in the descriptions of staff training. Most of the respondents provided basic information on who provided the training, when training took place, and what diagnoses were covered. Detailed descriptions of staff training were lacking. During data analysis, confusion between ADA standards and universal design principles became evident. For example, some of the respondents identified ramps and accessible bathrooms as successful applications of universal design. A paragraph identifying the differences between ADA standards and universal design was embedded at the beginning of the survey; however, it is possible some of the respondents skipped over this information.

Implications for Occupational Therapy

Occupational therapists are uniquely qualified to help museums overcome challenges related to accessibility and universal design. Physical barriers created by historical buildings and a lack of accommodations for people who are visually impaired are examples of two common challenges. Occupational therapists can address these challenges through environmental assessment and modification, developing information in multiple formats (visual, auditory, and tactile). The respondents identified a lack of knowledge and resources as barriers to consultation and training. Reich et al. (2011) stated a lack of training for museum staff working directly with visitors is an emergency necessity. Occupational therapists are qualified to educate museum staff on a variety of topics, including disability awareness, assistive technology, and universal design principles (Gallagher Worthley et al., 2018; Silverman et al., 2012). In addition, occupational therapists can facilitate consultation by helping museums establish community partnerships with local organizations and people with disabilities. Collaborations such as these promote inclusion, participation, and societal justice (Silverman et al., 2012; Silverman & Bartley, 2013). Museum and occupational therapy partnerships can benefit all stakeholders involved.

Limitations

The data for this study were collected during the COVID-19 pandemic. As a result, many museums in the U.S. removed touchable artifacts and volunteers to reduce the risk of spreading the virus. This may have influenced the accessibility practices of the respondents. Also, the self-reported nature of the survey may have resulted in biased responses from respondents who were unwilling to disclose information that reflected poorly on their organization. In addition, the cross-sectional design of the survey may be more susceptible to bias. Qualtrics software was used to confirm the inclusion criteria for this study. Since no identifying information was collected, there is no way to verify whether the respondents met all criteria. The researchers and a panel of experts created the survey. Therefore, test-retest reliability of the instrument

was not confirmed. Six of the survey questions refer to accessibility, whereas only two questions refer to universal design. This may limit construct validity and content validity of the survey. Lastly, the small sample of respondents and declining response rate throughout the survey may limit the generalizability of findings.

Future Research

This study could serve as a pilot for future research; however, changes are recommended before expanding on this work. Future research could assess the validity of the survey instrument to reduce potential response bias. Additional research is needed to explore alternative ways to educate respondents on the differences between ADA guidelines and universal design principles. For example, a table with a side-by-side comparison may be easier for respondents to read and apply to a museum setting. Additional questions on universal design should be added to the survey to improve validity of the instrument. Future research could also explore the long-term benefits of the museum and occupational therapy partnerships. In addition, future studies could identify best practices for training to ensure staff has the knowledge and skills needed to support museum visitors with disabilities. Most importantly, future studies should include direct feedback from people with disabilities in the research and decision-making process. One way to accomplish this is through participatory action research (PAR). The PAR design involves all stakeholders and is consistent with client-centered occupational therapy practice (Letts, 2003).

Conclusion

This study explored accessibility and universal design challenges and successes in a small sample of American museums. The most frequently reported accessibility rating for public spaces, exhibits, and educational programs was "good." In addition, the physical environment and accommodations for visitors with visual impairment were identified as both challenges and successes for applying universal design. Staff training and consulting with people with disabilities are important but often overlooked components of inclusion and participation in museum settings. Museums would benefit from establishing partnerships with local agencies that serve people with disabilities. Occupational therapists can assist museums with staff training, recruiting people with disabilities, and establishing community partnerships with local agencies. Partnering with occupational therapists can help museums move beyond ADA guidelines to create functional and welcoming experiences for visitors of all abilities.

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Appendix
Survey Questions

Note: The symbol ⇢ signifies a follow-up action or survey question.

Demographics

2. Are you completing this survey while physically located in Europe?
   Yes ⇢ Exclude from study
   No

3. Do you have direct knowledge of museum policies and procedures related to accessibility?
   Yes
   No ⇢ Exclude from study

4. Is the museum located in the United States?
   Yes ⇢ Please select your State [drop-down menu]
   No ⇢ Exclude from study

5. Which of the following titles best describes your role in the museum?
   Executive Director/CEO
   Curator/Curatorial Staff
   Collections Manager/Staff
   Exhibit Developer
   Exhibit Designer
   Exhibits/Project Manager
   Operations/Facilities Manager/Staff
   Visitor Experiences Manager/Staff
   Other [text box]

6. Select the term that describes the business structure of your museum:
   Public
   Private Non-Profit
   For Profit
   Other [text box]

7. Select all terms that describe your museum's category:
   History museum/historical society
   Historical house/historical site
   Park/nature area
   Art museum/art center
   Science museum/science center

       Natural history museum
       Archive
       Library
       Zoo/ aquarium
       Multi-disciplinary museum (e.g., art and science)
       Other [text box]

8. Prior to the COVID-19 pandemic, approximately how many people visited your museum annually?
       [text box]

Introduction

Accessible Design versus Universal Design: What is the Difference?

The Americans with Disabilities Act (ADA) is a federal law that protects the civil rights of people with disabilities to ensure equal opportunities to participate in society. The ADA standards for accessible design require businesses and facilities to provide reasonable access and accommodations to people with disabilities. For example, ADA standards may be used to determine if changes in outdoor surface levels require a ramp to be installed or the height to install grab bars above the floor in a public bathroom. ADA regulations are enforced by federal law, whereas universal design (UD) is a concept that proposes inclusion for people of all abilities. UD is described as the design of products and environments that are usable to the greatest extent possible by all people, regardless of age, ability, or circumstance. UD examples in the physical environment include tables, seats, and service counters available at multiple heights, ramps with resting areas, and private restrooms with enough space for assisted use. In exhibits, UD includes primary routes wide enough for a wheeled mobility device to pass an ambulatory person, signage that provides visual, tactile, and audible information, and displays that do not conflict with circulation spaces. UD examples in educational programming include the use of assistive technology such as listening devices, adjustable workstations, and information provided in multiple formats (e.g., verbal, online, braille, large print, 3-D models, and multiple languages). UD goes beyond ADA guidelines to create public spaces that are both functional and welcoming to people of all abilities.

Survey Questions

9. In general, how would you rate the accessibility of your museum's public spaces for people with disabilities?
       Excellent
       Very good
       Good
       Fair →
       Poor → Share examples of how your museum's public spaces are not accessible to people with disabilities [text box]

10. Does your museum incorporate universal design into the physical environment, such as

public spaces, employee workspaces, exhibits, and galleries?

      Yes → Share examples of universal design in the physical environment at your museum. [text box]

      No → What are some challenges to incorporating universal design into the physical environment at your museum? [text box]

11. In general, how would you rate the accessibility of your museum's exhibits for people with disabilities?

      Excellent

      Very good

      Good

      Fair →

      Poor → Share examples of how your museum exhibits are not accessible to people with disabilities [text box]

12. Does your museum incorporate universal design into exhibits?

      Yes → Share examples of universal design in your museum exhibits [text box]

      No → What are some challenges to incorporating universal design into exhibits? [text box]

13. At what point in the design process are accessible features incorporated into exhibits?

      During conceptual design/idea generation

      During schematic design/development of detailed drawings

      During final design/preparation for construction

14. In general, how would you rate the accessibility of your museum's educational programming for people with disabilities?

      Excellent

      Very good

      Good

      Fair →

      Poor → Share examples of how educational programming is not accessible to people with disabilities [text box]

15. When designing new exhibits and educational programs, does your museum consult with people with disabilities from the local community or partnering organizations serving people with disabilities?

      Yes → Please describe past experiences consulting with people with disabilities [text box]

      No → What has prevented your museum from consulting with people with disabilities in the past? [text box]

16. Does your museum provide training or resources for staff members to learn how to serve people with disabilities?

        Yes → Provide a brief description of the staff training provided. [text box]

        No → What has prevented your museum from providing training to staff members in the past? [text box]

17. Please share any additional information you feel is important to include in this study.

        [text box]