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Academic libraries' social media posts related to disabilities: A review of libraries' tweets in terms of their content and accessibility

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ABSTRACT

Many academic libraries have active social media accounts, using them to promote content and provide timely information to their users. Social media can, however, present both potential opportunities and challenges for users with disabilities, both in terms of learning about a library's offerings, and being able to successfully access the full content of these posts. As such, this study focused on identifying and analyzing Twitter posts from academic libraries pertaining to disabilities over a five-year period (2017–2021). This analysis looked at basic descriptive information about these tweets as a whole, as well as more detailed examination of their content, including text, images, and accessibility considerations. Within the identified set of tweets, we found a wide variety of content promoted by libraries, and a seemingly strong impact of the pandemic on the tweets' contents. In terms of accessibility, we found a notable increase in use of alt text over the five-year period, but also important omissions within the provided alt text, and also areas for additional investigation in terms of language and images used in these posts. This work reveals insights into academic libraries' use of social media, and considerations for how academic libraries can approach social media posts moving forward, particularly for content pertaining to disabilities.

Introduction

Many academic libraries have established social media channels as a way to communicate information to their users in a timely and concise fashion. However, like any mode of communication, social media posts have the possibility to inform users and build connections, but also the ability to create barriers and frustrations.

In the last several years, there has been an influx of publications exploring how academic libraries can better support and connect with users with disabilities. Some of this work has focused on broad level accessibility efforts and understanding (McCann & Peacock, 2019; Peacock & Vecchione, 2019; Pontoriero & Zippo-Mazur, 2019), while others have focused on understanding of the needs of specific groups within the disability community(Cheney, 2020; Curtis, 2020; Dow et al., 2021; Everhart & Anderson, 2020; Lorbeer, 2020; Pionke et al., 2019; Xie et al., 2021). Other publications have focused on particular issues such as assistive technology (Pomputius, 2020; Potnis & Mallary, 2021), accessibility of website content (McCann & Peacock, 2021; Silvis et al., 2019; Yang et al., 2020), and online documentation of relevant library information (Brunskill et al., 2021; Ezell et al., 2022; K. T. L. Vaughan & Warlick, 2020).

While this speaks to a growing interest in the experiences of users with disabilities, no research was located that looked at library content posted on social media in the context of disabilities or accessibility. Even non-research literature appeared scant, although some best practices for accessibility and social media were discussed in a chapter by Christensen & Pionke et al. (2019), including use of image descriptions, captions for videos, and the use of CamelCase—capitalization for each additional word in a phrase when spaces and punctuation are not used—for hashtags (Christensen & Pionke, 2019). In Wilkinson's (2018) case study about using Instagram's API for their archives and special collections account, they did describe their workaround to overcome the lack of support for alt text—alternative text associated with an image to describe it to someone who may not be able to otherwise view the image, such as someone relying on a screen reader—in Instagram, but they also specifically noted that accessibility concerns tend to be absent in literature about social media and libraries.

Literature on social media use in academic libraries without a specific focus on disability or accessibility is much more prevalent, and while academic libraries have experimented with many forms of social

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media, Twitter is one of the most popular ones, with one study finding 88 of the 100 academic libraries reviewed had Twitter accounts (L. Vaughan & Gao, 2016). Previous research on Twitter use by libraries has looked at the content of these tweets (Al-Daihani & AlAwadhi, 2015; Martínez-Cardama & Pacios, 2020; Neilson, 2016; Stvilia & Gibradze, 2014), retweets and favoriting of library tweets (Stellrecht & Hendrix, 2016; Stewart & Walker, 2018; Stvilia & Gibradze, 2014) and identifying frequently used words and phrases (Al-Daihani & Abrahams, 2016). Most of these studies involved a review of the tweets for a small number—under twenty—of specifically chosen library accounts. In contrast, Stellrecht & Hendrix looked at the accounts of 82 Association of Academic Health Sciences Libraries (AASHL), but they retrieved only broad descriptive statistics about these accounts and did not collect or review individual tweets. None of these studies focused on a particular type of content for the tweets.

Outside of the library context, there have been a number of research studies looking at the use of Twitter by users with disabilities, including users with traumatic brain injury (Brunner et al., 2015), stroke survivors (Garcia-Rudolph et al., 2019), communication disabilities (Hemsley et al., 2015, 2018) and users who are blind (Morris et al., 2016). These studies have often documented both benefits to using Twitter for these users, as well as frustrations and barriers. A survey of blind Twitter users found accessibility challenges including an increasing emphasis on image-based content(Morris et al., 2016), and two studies both finding that less than 1 % of the tweets with images that they reviewed had alt text (Alkhathlan et al., 2021; Gleason et al., 2019). Emoji use was also identified by users as presenting accessibility difficulties, including overreliance on them instead of actual words, risk of misunderstandings and confusion, and technological challenges (Tigwell et al., 2020).

Technology can change rapidly however, and some of the above literature, including most of the library research, was conducted prior to some significant changes to Twitter. At the end of March 2016, Twitter added the option to add alternative text to images (Twitter, 2016), and in November 2017 Twitter changed the character limit from 140 characters to 280 (Aliza, 2017). In addition to these user-level changes, there has also been a notable change to how Twitter allows researchers to search and retrieve tweets via their API. Before 2021, the Twitter API limited searches to a seven-day period, but as of January 2021, Twitter released an academic track for its API, which includes a full archives search option for researchers who submitted a successful proposal. In 2022, there was also a change in ownership on this platform, for which the ramifications are continuing to evolve.

Our goal for this study was to use this increased access to tweets for research to explore and analyze academic libraries' tweets that specifically relate to disabilities, both because we wanted to examine what kind of content libraries were posting pertaining to disabilities and because we wanted to gather a themed cross section of tweets from across libraries to review in terms of accessibility considerations. We collected and reviewed broad descriptive data about these tweets, and conducted an analytic review of the tweets themselves, with a particular emphasis to considerations around accessibility. With this study, we aim to provide insights into both how libraries have been approaching social media content pertaining to disabilities, as well as areas for further consideration and improvement.

Methods

We gained access to query Twitter by submitting a successful application to use Twitter's Academic API. We created a search query that searched for tweets that included the terms library or libraries and also basic keywords or hashtags that appeared in preliminary searches to be commonly associated with tweets related to disabilities, with a focus on retrieving items that specifically referenced disability. The full query is available in Table 1.

We choose to pull tweets from a five-year period, 2017–2021, with the goal of retrieving tweets that included ones posted before and after the beginning of the pandemic, since we thought that the pandemic might have had a strong impact on libraries' communications and offerings. The query was also designed to restrict the results to English language, and to exclude retweets and replies as we wanted to focus only on original posts from libraries rather than engagement between libraries. To run the query and retrieve the matching tweets we used twarc2 (https://twarc-project.readthedocs.io/en/latest/twarc2_en_us/), a command line tool and Python library for archiving Twitter JSON data, with assistance from a librarian with social media research experience and technical expertise.

Table 1
Search query used for retrieving tweets.

```
twarc2 search archive start-time 2017-01-01 end-time 2021-12-31 "(disability OR
  disabilities OR disabled OR handicap OR handicapped OR
  #DisabilityAwarenessMonth OR #disabilityinclusion OR #disability OR
  #DisabilityTwitter OR #disabilities OR #disabled) (library OR libraries) lang:en -is:
  retweet -is:reply"
```

This query retrieved 29,531 tweets. The query results were converted from the original JSON data format to CSV using the function available in twarc2. We then opened the CSV file in Excel where we conducted an iterative process to limit the data to tweets posted by a library account. In order to aim for consistency among our sample and the information that a library could potentially promote regarding disabilities, we decided that our definition of a library account was an official library account for a physical library that aimed to provide information about the library to patrons. Accounts were excluded if they were an account for a library association, library school, individual librarian, fan of libraries, friends of the library group, library foundation, library vendor, publisher, charitable organization, or a library that was purely digital in nature. Accounts were also automatically excluded if they did not reference a variation of the stem "librar" (i.e., library, libraries, librarian) in their author username, author name or author description.

We reviewed a selection of tweets to identify initial content categories, which we continued to iterate and review until we did our final coding, and the final list of content codes is listed in Table 2. We also coded these tweets by library type, with the types defined as academic, public, school (K-12) and other/special. Due to the academic library type ultimately having both the clearest definition of the library types—any library affiliated with a higher education institution—and a large but manageable number of tweets (1014) we decided to concentrate on

Table 2
Definitions of tweet content categories.

Event: A specific event offered/sponsored/promoted by the library (not just a book display)
Awareness campaign: Discussion of an awareness campaign, such as a day, week, or month dedicated to a particular group or topic
History/archives: Information about historical items, such as photos, events in the past
Services information: Services provided by a person at the library itself or another, such as home delivery, reference help, assistance with pulling materials from shelves, assistance with a technology (printing, assistive technology) but not just mention of the technology itself
Technology information: Any technology information about software or hardware available at library (including printing), or technical information about digital options
Collection information: Information about a library's collection of materials (not tech) which can include the highlighting of a single item or a display (this can be their own collection or another libraries), including materials with accessible features
Facilities information: Information about the internal or external physical environment of a library (library closure, parking information, transportation, furniture, bathroom, construction, hours, service dogs…)
Opportunities for PWD (People with Disabilities): Opportunities for people with disabilities, could include programs that involve longer commitment programs, volunteer opportunities or jobs (distinct from services)
Other: Anything that does not fit cleanly into any of the above (such as generic statements or a giveaway, link to larger guide)

the tweets from academic libraries.

We developed image categories with the intent of looking at what kind of additional information they might provide, be it illustrative, textual, or simply serving as decoration. We were particularly interested in whether any textual content included in the image would be available to users navigating Twitter with a screen reader, especially text necessary for acting upon or understanding the tweet which we termed "informative text". Examples of this would include date/time information for an event or the title or author of a displayed book. Each image was assigned only a single category, all of which are shown and further defined in Table 3.

We also were interested in whether the images used included anything that could be deemed "disability specific imagery", in some way referencing or showing disabilities, to learn more about how libraries visually represent disabilities.

We imported all of the tweets coded as coming from academic libraries into Access, where we created a form to code the type(s) of content that the tweet included, and, if an image was included, what type of image it was, and then whether it included disability specific imagery. We reviewed 50 tweets each and then compared our chosen content and image codes for each tweet, and then coded 20 tweets together. After that, we divided the tweets, and periodically met to review tweets that we'd flagged for further discussion. In this process, we encountered some tweets that used our search terms in ways other than we'd initially anticipated, such as ones that used "disabled" as a synonym for something being taken out of use, so we decided that to be included tweets should be about disabilities or otherwise pertinent to users with disabilities. We also ended up flagging and ultimately removing tweets from accounts that were not, upon further inspection, belong to academic libraries.

After completing the category and image coding in Access, we reviewed the resulting data set for information including geographic location of the account, the date the tweet was posted, and the presence of images, videos, hashtags, links, and emojis. In many cases, this involved some data cleanup for appropriate extraction and analysis and in some cases data had to be manually retrieved. We also conducted more focused analysis of tweets with selected attributes such alt text or emojis. For alt text, while some recommend long and detailed descriptions for library images (Chee et al., 2022), blind users' preferences for alt text depend on context (Stangl et al., 2021), and researchers' approach and criteria for assessing alt text quality have varied considerably (Simons et al., 2020), so we ultimately took a pared down approach that focused simply on the replication or omission of informative text that existed in the image within the provided alt text. For emojis we looked at some basic attributes recommended in a guide created for promoting readability of social media content (Content Design London, n.d.), and Tigwell et al. (2020), including placing decorative emoji at the end of content or at least at the end of a sentence, and avoiding using an emoji to convey critical information or replace a word.

To look at language used across all of the tweets, we searched for terms and phrases in the Excel spreadsheet pertaining to outdated language, person-first language, and identity-first language, and then analyzed retrieved tweets in further detail. We also looked at trends across time, particularly before and after the start of the pandemic in terms of the content categories of the tweet, and by year for the use of images, alt text, and hashtags.

Table 3
Image categories & definitions.

Category	Definition	Example(s)
No informative text—illustrative/ contextual	The image does not contain informative text, but provides a sense of the content.	Photograph of a speaker for an event Photograph of a book truck
No informative text—decorative only	Generic image not clearly focused on content from tweet	Stock photos of buildings, computers, keyboards, student studying, cups of coffee, notepads.
Includes some duplication of informative text from tweet, no additional informative text	The image contains text that is informative but that is also contained in the tweet text	Image of book cover that shows title and author, when title and author information is also specified in the tweet text
Includes additional informative text	Includes informative text that is not otherwise present in the tweet.	Image is a composed advertisement for an event, including details such as where and when it will take place not included in the text of the tweet. Image of a book cover where the title and author is clearly apparent, and this information is not included in text.

Results

We analyzed a final total of 982 tweets meeting inclusion criteria that included content that pertained to disabilities, from 350 accounts. The number of tweets per account ranged from 1 to 77, with 207 of the accounts having only a single tweet included.

In terms of what we analyzed about these tweets, we looked at the geographic location of the library accounts, the type of content discussed within a tweet and the apparent impact of the pandemic on this content, the language used within the tweet, and other attributes of the tweet including images, emojis, hashtags, and links, disability specific content in the images. We also looked at accessibility considerations for hashtags, emojis, videos and animated GIFS, and images.

Geographic locations of the accounts

By a large margin, the highest number of tweets came from accounts based in the UK, but the largest number of accounts was based in the USA. Tweets also came from twelve other geographical locations, as listed in Table 4.

Content categories

524 of the tweets (53 %) had only one coded content type, but for the rest of the tweets multiple content types were selected (see Fig. 1 for breakdown). "Other" ended up being the most commonly applied content type with 373 tweets being categorized that way, followed by Awareness campaign tweets, Collection Information, Services Information, and then Events. Opportunities for PWD (people with disabilities)

Table 4
Geographic areas for tweets and accounts.

Geographical area	# tweets	# of accounts
UK	530	118
USA	296	165
Canada	65	33
Republic of Ireland	44	10
Australia	30	14
South Africa	7	3
Turkey	2	1
New Zealand	2	1
Netherlands	1	1
Namibia	1	1
Indonesia	1	1
India	1	1
Finland	1	1
Fiji	1	1

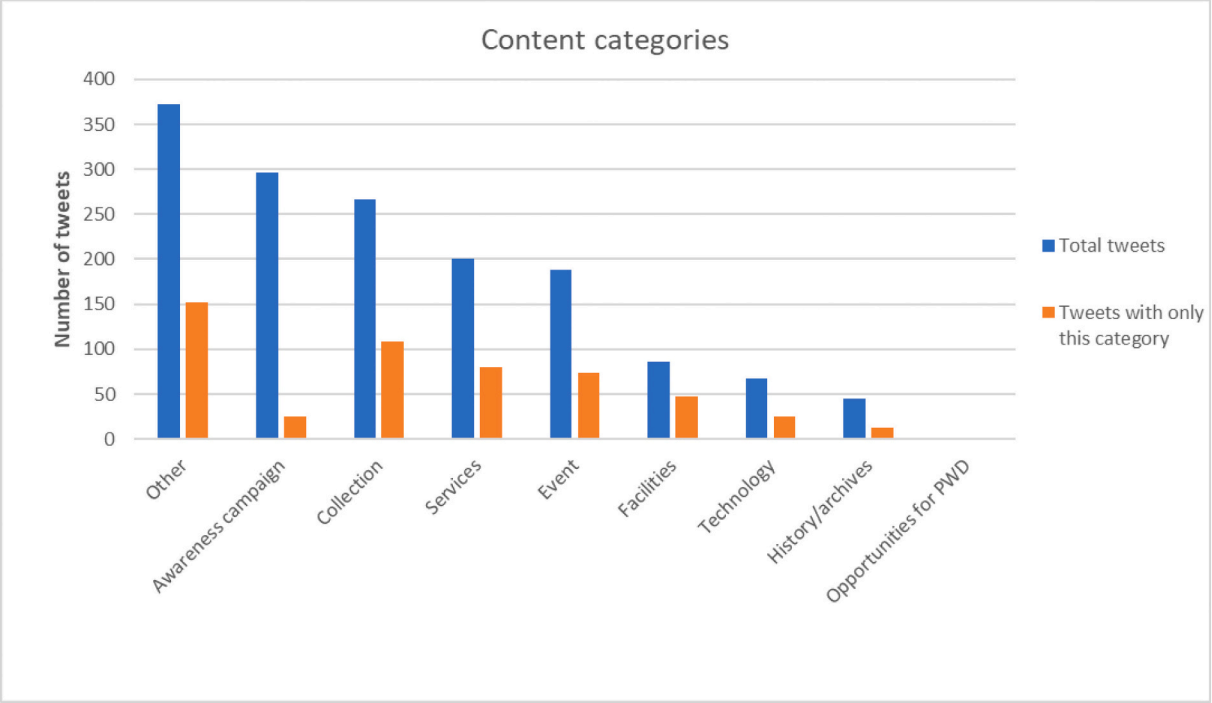

Fig. 1. Content categories for tweets, total and tweets with only this category. [Description: A bar char that shows, in descending order, the number of tweets in each category, and also how many tweets were only assigned that category and no other.]

had by far the lowest number of tweets, with only two tweets coded exclusively with this content type.

Content category summaries

Events

Within the tweets pertaining to events, the content included film screenings, library tours, networking events, speakers, workshops, orientations for students registered with the campus disability resource center, drop-in support sessions, therapy dogs visits to the library, and events sponsored by Disability Services. In some cases, the event itself was not specific to users with disabilities, but they included information or links about how to access the event for users with disabilities.

Awareness campaigns

Within the tweets pertaining to designated awareness campaigns, references to twenty-seven different awareness events were located. Nineteen of these focused on disabilities writ large, while eight of these were specific to a particular health condition or broader type of health condition (see Table 5). This count reflects an assumption that some slight variations in wording still reflected the same awareness event. In some cases, it was not clear if the awareness event was specific to the institution versus one established by an external party.

Services information

Tweets about services typically provided broad, general information such as links to guides specified to have information on services, and information about how to get additional help or information about library services such as specific contact information or upcoming events where services would be discussed. However, there were also ones that discussed more specific service offerings, such as trainings for assistive technology, book retrieval services, book baskets, file conversion services (done by staff), and extended loans.

Technology information

Tweets about technology included information on specific areas within the library where assistive technology was available, and also highlighted specific software available at/through the library, including SensusAccess, Bookeye 4, NCBI Bookshare, Jaws 17, Kurzweil 3000, ZoomText 10, 3-D printing, hearing loops, and Read & Write. There were also links to guides indicated to have information about assistive technology, and tweets with information on how to make websites and also ebooks more accessible, information on how to convert documents, and information about workshops and assistive technology fairs.

Table 5
List of awareness campaigns.

- AccessAbility Week
- All Abilities Awareness Week
- Disabilities Day
- Disability Awareness Month
- Disability Awareness Week
- Disability Celebration week
- Disability History and Awareness Month
- Disability History Month
- Disability Inclusion Week
- Disability Independence Day
- Disability Pride Month
- Disability Recognition Month
- Disabled Access Day
- Global Accessibility Awareness Day
- International Day of Persons with Disabilities
- National Disability Employment Awareness Month
- UK Disability History Month
- Condition specific campaigns
- Deaf Awareness Week
- Dyslexia Awareness Week
- Dyslexia Scotland Awareness Week
- Learning Disability Week
- Tinnitus week
- World Braille Day
- World Dyslexia Awareness Day
- World Autism Awareness Day
- Speech Pathology Week
- World Mental Health Day

Collection information

Common trends within these tweets were book displays or guides created in honor of awareness campaigns, and highlighting individual books written by people with disabilities or that were about disabilities. There were also tweets that highlighted items within digital collections, that asked for book suggestions pertaining to disabilities, information on how to access alternate versions of a title, and a handful that highlighted specific journal issues or articles pertaining to disability.

Facilities information

Tweets in this category sometimes advertised the existence of spaces within the library facility, such as sensory spaces, reflection spaces, spaces with specialized technology, reservable spaces, and the presence of the Student Disability Services office within the library. They also sometimes promoted information about temporary disruptions, such as elevators being out of order, changes in hours for the building or parts of it, closures to rooms, parking, or bathrooms due to maintenance, and changes in entrances due to construction.

History/archives information

Tweets in this category often featured an image from, or link to, university's special collections or a digital collection that they curated. Content included recognition of anniversaries of events, highlighting of specific collections within the archives, and highlighting of specific individuals with disabilities or other advocates for disability rights.

Opportunities for PWD

There were only two tweets that were coded as opportunities for PWD. One promoted a news story about a company that was coming to the area that employed people with disabilities. The other was about internship opportunities at the library for young adults with disabilities.

Other

Tweets that were categorized as "other" covered a wide variety of content including book giveaways, exhibits, general statements of support, job opportunities at the library pertaining to providing disability services, library tips, requests for feedback about the library's disability services, quotations, tweets that highlighted someone who has a disability or works to support students with disability, or news items about grants or awards. This category was also used when a tweet discussed and included a link to a guide, podcast, blog post, or news items indicated to be relevant to disabilities but without specifying anything further about the nature of its content.

Impact of the COVID-19 pandemic

The pandemic is defined here as starting March 2020. 523 tweets (53 %) were from before the pandemic started, and 459 were from after it started. As seen in Fig. 2, tweets about events and facilities dropped notably after the start of the pandemic, whereas there was an increase in tweets about awareness campaigns, collections information, and history/archives information.

Language

Outdated terminology

Only 11 tweets used the term 'handicap' or 'handicapped', and none of these tweets used either of these terms in reference to users. In two tweets, the term was used to refer to a specific organization or event that itself used this term, and another used it as part of a hashtag that mirrored the organization name used in the associated image. Another two used it in relation to restrooms, two used it about doors/entrances, and then one each used it for parking and ramps. One used it as part of the name for a library department, and one library used it as part of the name for a specified room within the library.

Person-first vs. identity-first language

In terms of person-first language, 133 tweets used "with disability" or "with disabilities" in reference to a person/group of people, and an additional 21 used "with a disability". Conversely, in terms of identity-first language, 127 tweets used "disabled" in reference to a person/group of people. An additional 37 tweets used a combination of person first and disability first language within their tweet. 30 of these tweets came from the same account and "disabled" was part of the title of a page within their website.

While there were many instances where the language used seemed to be at the discretion of the tweet author, sometimes the language came from a specific organization, campaign, legal act, book title, or was a direct quote from an individual. This was the case for tweets using person-first language, identity-first language, and a mixture of the two.

When analyzed by date of posting (Fig. 3) there was not a clear trend in terms of the language type shifting over the time span reviewed.

However, there was a notable difference in terms of geography for the accounts. While both UK libraries and US libraries had very similar numbers of tweets using person-first language (54 vs 57), UK accounts had 102 tweets using identity-first language versus United States accounts having 16 such tweets.

Attributes: images, emojis, hashtags, and links

648 (66 %) tweets included an image that had been deliberately uploaded by the tweet author, rather than automatically generated as a

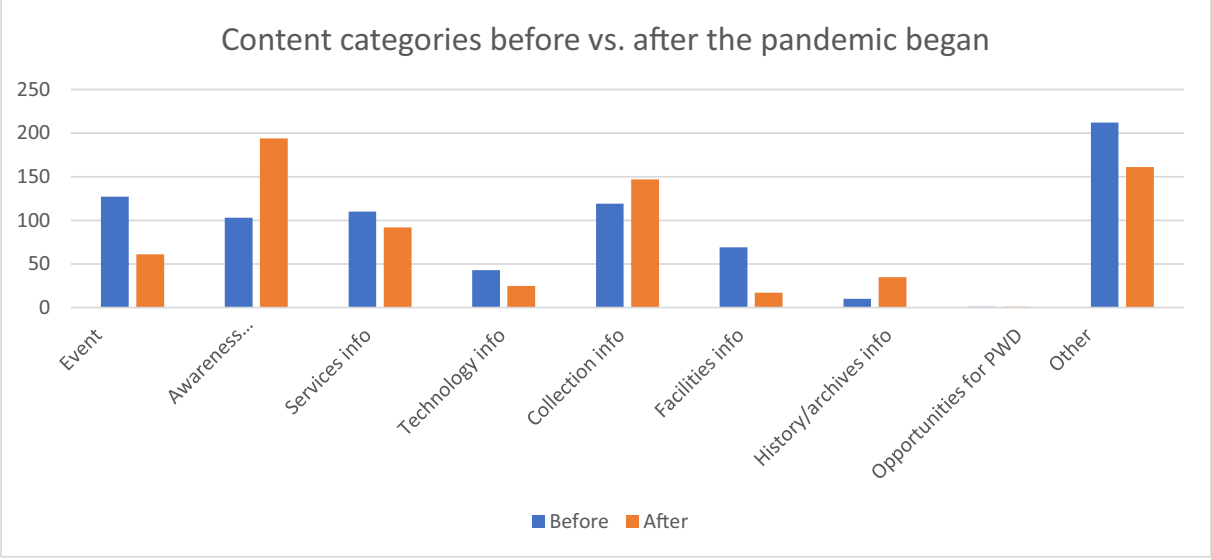

Fig. 2. Content categories before versus after the start of the pandemic. [Description: A bar chart that shows the number of tweets by content categories both before and after the pandemic began, to highlight areas of change.]

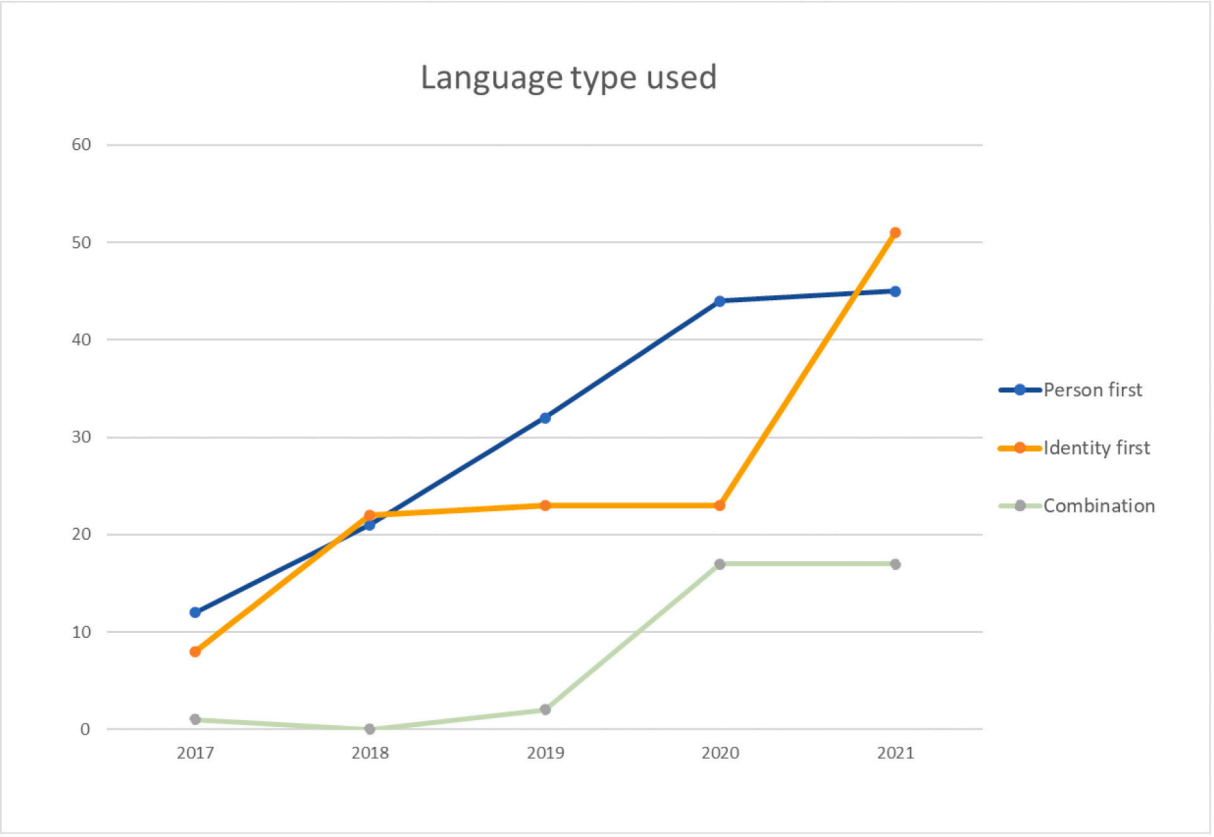

Fig. 3. Language type used in tweets (person-first vs. identity-first, and combination). [Description: Show the language type used in tweets by year over the period of 2017–2021.]

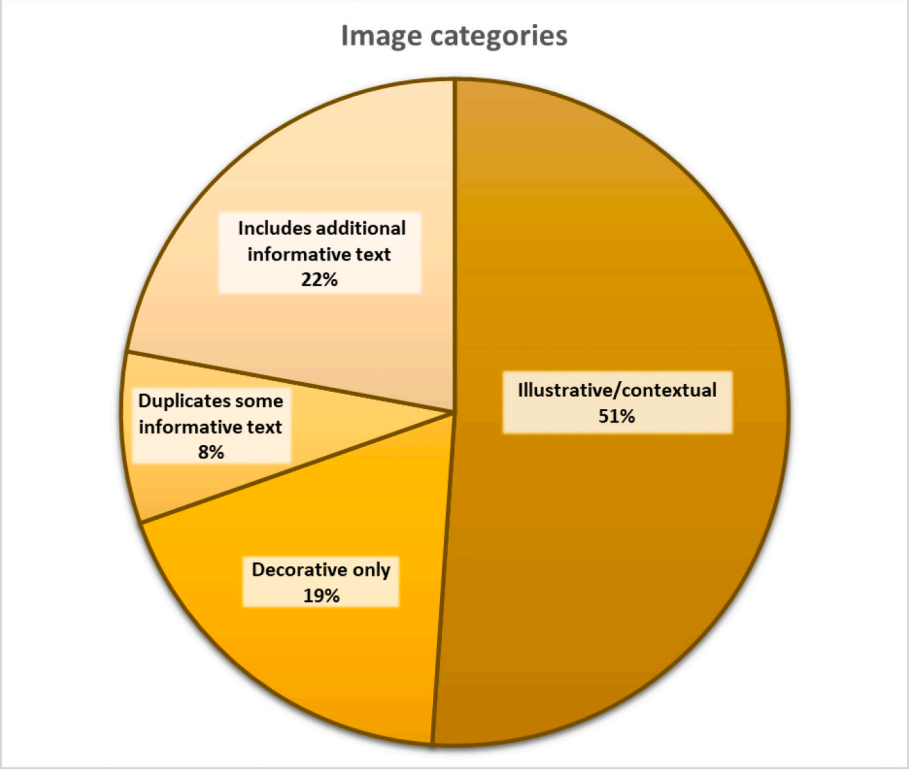

Fig. 4. Image categories. [Description: A pie chart showing that 51 % of images were decided to be illustrative/contextual, 19 % decorative only, 8 % duplicating some informative text, and 22 % included additional informative text.]

link preview, with 48 including multiple images. 51 % of those with images were coded as being illustrative/contextual, 22 % included additional informative text within the image that was not contained in the text of the tweet. The rest of the image category breakdown is available in Fig. 4.

One hundred seven tweets used an emoji within the text of the tweet, and 25 of the tweets included a video or animated gif. 828 tweets (84 %) included a link within the tweet and of these, 299 were identified as using one of the following link shorteners: bit.ly, ow.ly, or tinyurl, which meant the full URL was not identifiable from the data.

Overall, 488 (50 %) tweets used at least one hashtag. 829 hashtags were used across all of the tweets, with 416 unique hashtags. The average number of hashtags per tweet doubled across the overall five-year period, from 0.5 hashtags per tweet in 2017 to 1.1 in 2021. The three most common hashtags not specific to an educational institution were #accessibility (n = 63), #DisabilityHistoryMonth (n = 40), and #UKDHM (UK Disability History Month, n = 29).

Disability specific content in imagery

A wide interpretation of what might constitute disability specific content was used, and we erred on the side of inclusion in cases of uncertainty. 193 tweets were classified as having images with disability specific content, representing 30 % of all the tweets with images. Of these 193 tweets, 48 of these contained a book cover.

Accessibility considerations

CamelCase for hashtags

Within the hashtags, 357 had multiple words in the hashtag and used CamelCase, while 103 had multiple words in the hashtag but did not use CamelCase. The remaining 368 either contained only single words, were instances when it was unclear if CamelCase should have been used, or, in a handful of cases, contained what looked like an incomplete attempt at CamelCase.

Emoji use

In four of the 107 tweets that included an emoji or a symbol, the emoji or symbol was used to replace a word, in 33 tweets they were not placed at the end of a sentence.

Videos & animated GIFs

Eleven tweets included an attached video, and only two of these included captions. However, the majority of them were soundless videos, often visually highlighting collections such as a display of books. There was only one video that had sound but no captions. With one potential exemption, all of the videos were clearly created by the libraries posting them.

Fourteen tweets included an animated gif, and of these six had alt text included. Only one of these gifs was specific to the library/institution posting it, with most of the others instead being clips from popular media.

Alt text

Both the number and percent of tweets with alt text increased each year (see Fig. 5). Overall, 26 % (166) of the tweets with images included alt text. However, according to the Web Content Accessibility Guidelines, alt text does not need to be provided for non-text content that is purely decorative(Web Content Accessibility Guidelines WCAG, 2018), and 46 of the images with alt text were coded as purely decorative. Surprisingly, removing these tweets, and the ones of them with alt text, actually decreased the percentage of images with alt text to 22 % (120/528).

Of the 143 tweets coded as having images that included additional informative text–text that provided information that was not mentioned in the text of the tweet itself but appeared only in the image– only 23 had

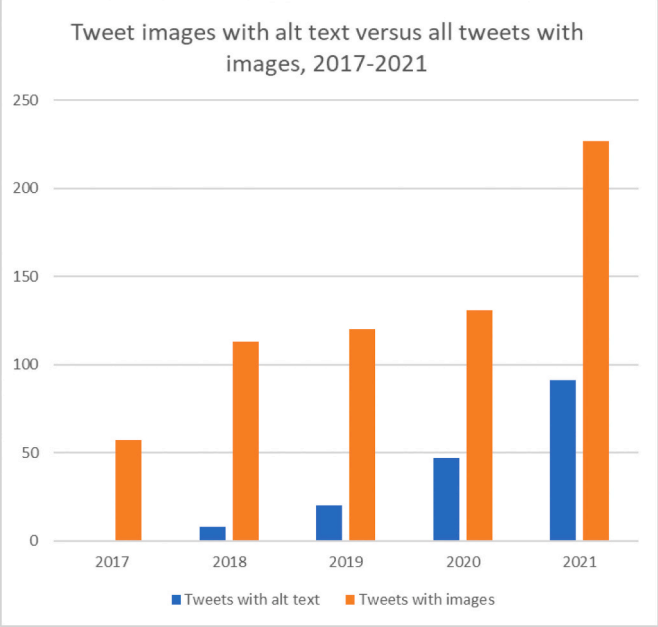

Fig. 5. Tweets that included alt text by year. [Description: A bar chart showing the number of tweets including images with alt text versus all tweets containing images by year, from 2017 to 2021. It shows an increase in both but also a proportional increase in the number that included alt text.]

alt text provided. Of these 23 tweets, 9 included all of the informative text in their alt text and the other 14 included either none or only some of the informative text available in the image. Omissions included simply describing a document as a physical item ("image of a flyer"), not listing time or date information for an event that was available in the image, not including subtitle, author or editor information for an image of a book cover, not listing out URL information for a webpage, not including social media handles, and not mentioning that an event was connected with an awareness campaign. Overall, of the 143 tweets coded as having images that contained additional informative text, in only 6 % (9) would all of that information been available to someone relying on a screen reader.

Fifty-six of the 193 tweets coded as having images with disability specific content had alt text. For some, the alt text did not mention anything pertaining to disabilities, but there were also general descriptions of a person being disabled, as well as more specific descriptions (see Table 6 for list).

Discussion

The tweets reviewed provided insights into what content academic

Table 6
Image descriptions that included disability specific language.[a]

- someone reading braille
- mentions of wheelchairs
- describing someone as blind
- mentioning someone lacks hands and legs beyond the knee
- a white cane
- a sign with a wheelchair logo
- a white cane
- a sign with a wheelchair logo
- a closeup of someone's hands on a refreshable braille display
- a prosthetic leg
- that the person appears to be signing and the shape of their hands
- a patient having polio
- a guide dog
- the use of a technology for a sport to assist with accessibility
- Special Olympics
- a description of books pertaining to disabilities
- a person using a cane
- a person with a cast and sling
- a disability pride flag

[a] Some of these are summaries of the description or abstracted to avoid easy identification of the original tweet, as specified in the API application.

libraries are discussing and promoting relating to disabilities, as well as how the passage of time, and the advent of the pandemic, influenced the content and its associated attributes, including accessibility features.

Overall, the tweets showcased a wide array of content for potentially connecting with, and informing, users with disabilities and the broader university community about content pertaining to disabilities. While tweets were often used as a general jump-off point for a link to webpage with additional information, many tweets also highlighted specific resources, services, technologies, and events that the library made available, and there were some examples of libraries highlighting accessibility information for events that were not themselves focused on disabilities. Tweets coded as being about awareness campaigns, the most common category after "other", were usually associated with an additional category as well, such as promoting an associated event, items in the collections, or a guide—indicating that libraries often used these campaigns as a prompt or opportunity for outreach to users with disabilities. Facilities tweets were used both to promote the existence of spaces within the library facility, and time sensitive information about temporary disruptions. Tweets that were categorized as "other" covered a wide variety of additional content, including links to guides, podcasts, blog posts, or news items that were broadly indicated to be relevant to disabilities. Opportunities for people with disabilities had by far the lowest number of tweets, with only two tweets with this content type.

Perhaps not surprisingly, the pandemic seemed to impact the content promoted by libraries, with tweets about events and facilities dropping notably after the start of the pandemic, and there being an increase in tweets about awareness campaigns, collections information, and history/archives information. This likely reflects an extended period of limited to no events at many libraries and a decreased emphasis on, and availability of, facilities, and an attempt to instead focus on sharing things such as awareness campaigns and collections that were less easily disrupted by pandemic safety protocols.

While the content categories were independently developed through iterative review of tweets meeting the search criteria for this study, there was at least some overlap between the categories for this study and those created in previous library Twitter research. Al-Daihani and AlAwadhi, 2015 study of academic libraries' tweets separated out the tweets into four main categories of information types and three of these, technology, library services, and library collections, largely map to categories used in this study. Stvilia and Gibradze (2014) divided academic libraries' tweets into nine categories, of which three of them, operations updates, events, and resources, corresponded to ones in our study, while the remaining six, study support, community building, staff, survey, club, and Q&A, did not. Content categories that seem to be particular to this study were awareness campaigns, history/archives information, and opportunities for PWD.

The use of additional attributes beyond the text of the tweet was common, with 84 % including links, 66 % including images, and 50 % including hashtags. The rate of usage of these attributes was quite different than that found in previous library studies, including Al-Daihani and AlAwadhi (2015) study of academic libraries' tweets in which only 7 % of the tweets included links, and a mere 1 % included images and in Stellrecht and Hendrix (2016) where links were used in about half of the tweets from AAHSL libraries but hashtags were rarely used, and image use was not examined. However, it seems likely that a substantial contributing factor to these differences may be changes to Twitter, both in terms of structural changes including the doubling of the available character length in 2017, and an increased focus on visual elements more broadly.

There were some positive findings in terms of accessibility considerations and language. Libraries rarely used the outdated terms "handicap" or "handicapped" in tweets and none of them used these terms to describe users. Use of CamelCase was far more common than an omission of capitalization for multiple word hashtags. While the majority of images did not have alt text associated with them, the percentage was notably higher than the under 1 % found by Alkhathlan et al. (2021) and Gleason et al. (2019), possibly indicating that tweet authors may be more predisposed to pay attention to accessibility considerations for content pertaining to disabilities, and it was encouraging to see the steep increase in alt text usage over time.

On the less promising side, many still did not provide alt text, and even the alt text that was provided often did not include all of the informative text contained within the image. In some cases the latter meant key information would be unavailable to someone using a screen reader even when alt text was present, or even that the tweet itself would not make sense because it relied on the image to fill in necessary context. All this indicates those who are posting these tweets may not be aware of how to include alt text, or clear on what information should be included in the alt text. The latter is consistent with Simons et al. (2020) study about users creating captions, where many expressed interest in additional guidance on how to create a caption, and some indicated uncertainty about what information would be useful.

It was initially surprising to find so many tweets using identity-first language, and that this did not seem to trend downwards over time. However, when broken down by geography, the pattern seems consistent with Lazzeretti (2021) study of language on museum websites, where British museums were much more likely to use identity-first language than American museums. It should also be noted that while person-first language is now often recommended by journals and other publications, person-first language is not always the preference of all users with disabilities (Andrews et al., 2022). For people with some disabilities, such as autism, identity-first language is in fact much more commonly preferred (Taboas et al., 2022).

Disability specific imagery was ultimately a much more complicated topic than originally envisioned. Initially, this category was expected to capture items such as logos, graphics or photographs depicting assistive tools or equipment, to learn more about how libraries were representing disabilities visually. However, we soon also encountered photographs of people, with some instances where they were specifically stated to have a disability, and others where a disability was implied or seemed likely but was not made explicit, and it was at times unclear whether the image was simply a generic stock image, or one of a specific referenced program or service. Not categorizing images of someone who is disabled as being disability specific imagery felt contrary to the larger idea of identifying imagery that represented disability, but assumptions about a person's disability status can also be incorrect and harmful. The question of what information about a person can, or should, be codified within an image description is not a simple one: a study that interviewed people who used screen readers and also had marginalized racial or gender identities found they had mixed and situation specific feelings about when race, gender and disabilities information should be included in image descriptions (Bennett et al., 2021). The presence of disability specific imagery is also certainly not necessarily the same as positive, or even neutral, disability representation, such as the puzzle piece sometimes used to connotate autism awareness (Gernsbacher, Raimond, Stevenson, Boston, & Harp, 2018). Ultimately, this served mostly as an initial attempt at classification that ultimately highlighted the need to further unpack what kind of imagery, and associated alt text, might be relevant and appropriate.

Recommendations & considerations for library social media

Awareness of accessibility features: When using social media, or any kind of communication platform, learn about what kind of accessibility features it supports and what best practices might be applicable in that environment. If certain features do not seem to be supported, see if there are any common workarounds being used, and periodically check to see if updates have been made and, if so, adjust accordingly. Also check whether any media that is being posted, such as videos, includes appropriate accessibility features, such as captions. If multiple people are involved in contributing content to a platform, document how to handle accessibility considerations for consistency across authors.

Alt text: Think carefully about what information is either specifically included in, or more generally conveyed by, the image that you are using. Include any informative text within the alt text, and also consider whether it should be incorporated into the main text of the communication—reliance on the alt text for key context information, such as the title of a promoted book, could make the information more frustrating to parse.

Imagery: Be thoughtful about what images you use and what information they might, or might not, convey to a reader. Be careful also about what assumptions either you or the viewer might be making about individuals in the images, particularly if it is not clear whether the image is generic stock imagery or of someone specifically associated with a particular program or event. Avoid codifying assumptions into alt text, and consider what kind of descriptions might be useful and appropriate both for the subject and the reader.

Accessibility of events: Try to provide information about accommodations for events, or a link to such information, irrespective of whether the event itself is focus on accessibility or disabilities, so that users needing these accommodations know that their attendance is anticipated and welcomed.

Language: Consider what language around disabilities is used by those at your institution most familiar with disabilities, such as at the campus's Disability Resource Center. Be aware that this may change over time, and also that preferences may vary both between and within groups in the disability community.

Promoting a variety of content types: Try to promote a range of different types of content that might be useful to users with disabilities, including information about items pertaining to services, technology, facilities, events, and collections. Also, while awareness campaigns can be a useful prompt for promoting information about resources that might be useful to users with disabilities, avoid using these as the only opportunities to promote useful information.

Impact of the pandemic: Consider whether the pandemic led to changes in the long or short term that should either be promoted or possibly revisited. Are there library services or spaces that were temporarily unavailable that need to be promoted as being available again? Are there increased remote offerings, such as consultations via Zoom? Given the amount of change throughout the pandemic, users may need explicit updates and clarifications about the library's new normal.

Limitations

This study reviewed only tweets that were retrieved by the search parameters which were designed to retrieve tweets that included broad-level text or hashtags specific to disability. As such, tweets that focused on specific disabilities that did not use broader language would not have been retrieved. The search query included six hashtags, but ultimately only one of them, #disability, was used in more than ten tweets, and the most common hashtag among the results pertaining to disabilities, #accessibility, was not one that had been included in the search. While accessibility is a term that is also often used outside of a disability context, for a more wide-ranging and comprehensive review of tweets related to disabilities it would be important to include it in the search.

The analysis of images included some limitations. Some content may have had disability specific imagery that was not recognized as such by the authors, and while the distinction between decorative versus contextual images sometimes felt clearcut, at other times we encountered grey areas and our idea of what constituted decorative imagery could also differ from how others might define it.

Future research

It is currently unclear what social media platforms will be available or popular among academic libraries over the next few years. Since the end of the collection period for this data, Twitter has added an "ALT" badge to images with alternative text (Silberling, 2022) and enabled a reminder feature for adding alt text (Twitter., 2022), but it has also undergone new ownership and the long term consequences of that are currently uncertain. However, what does seem clear is the importance of libraries staying informed about different best practices and accessibility features available within any communication platforms they use, and considering whether any users might be excluded by decisions that they make about how to present their content.

This study also pointed to questions that need to be further unpacked about disability imagery and representation, and what positive intentional representation might look like, and what appropriate descriptions should include, or not include, and also how this might change in different contexts. Conversations with users with disabilities about their hopes for, and frustrations with, library's social media use could add some critical insights and context to how libraries move forward with both what they post about and how.

As we move further away from the start of the pandemic, it will be also interesting to see whether the move away from events and a decreased emphasis on physical facilities was perhaps more of a temporary effect due to library closures and enhanced safety protocols, or if this may reflect a longer-term impact. It will also be worth exploring whether the library needs and priorities of users with disabilities may have shifted with the pandemic, and if some may find that increased online or hybrid course offerings mean that they can, and wish to, spend less time physically on campus, and are more interested in remote forms of support.

Conclusion

During 2017–2021, academic libraries tweeted about a wide array of content pertaining to disabilities, and these tweets also shifted within this period in terms of their content, use of hashtags, and use of alt text. While there were some more promising findings in terms of accessibility language and considerations, there remains considerable room for progress in terms of making this content accessible for users with disabilities, particularly users of screen readers. While specific social media platforms may continue to change and transform, libraries can and should be intentional about the content about disabilities they promote, and also try to stay informed about, and use, accessibility features available and best practices for this content.

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Amelia Brunskill: Conceptualization, Methodology, Investigation, Data curation, Writing – original draft, Visualization, Project administration, Writing – review & editing. **Emily Gilbert:** Methodology, Investigation, Data curation, Writing – review & editing.

Declaration of competing interest

None.

Data availability

The original data cannot be more broadly shared as it was specified during the application process for access to the Twitter API that individual tweets would not be made available.

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