

Social Media Representations of Makerspaces

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Libraries across the world have increasingly established makerspaces and incorporated making-related activities into their programming. Yet little is known about how this proliferation translates digitally. In response, this study uncovers how libraries construct virtual representations of makers and makerspaces through their social media content and the evolution of content across time. This research analyzed 36,756 social media posts created between 2012-2021 and identifies statistically significant changes in quantitative metrics, uncovers the themes present in posts, and describes the identities and topics featured. Revealing these digital representations of makers and making is important because this content can replicate oppressive structures by influencing who uses these spaces and what is created.

Libraries across the world have increasingly established makerspaces and incorporated making-related activities into their programming over the past two decades. Yet little is known about how this proliferation is represented within libraries' digital presences. In response, this study uncovers how libraries around the world construct virtual representations of makers and makerspaces through their social media content using a mixed methods research (MMR) approach.

Representations of makers and making are important because they can influence who uses these spaces and what is created. For example, Buechley (2014) analyzed the covers and content of *Make: Magazine*, finding white men were vastly overrepresented in images, which works to limit the inclusive potential of making. More recent analysis of digital content from European makerspaces found a similar gender disparity (Eckhardt et al., 2021). Moreover, prior research confirms "makerspaces are both physically and ideologically at odds with serving racially, economically, and gender diverse communities" (Melo, 2020, p. 60). This is particularly concerning because marketing and media

portrayals that reflect and reinforce hegemonic power dynamics perpetuate social inequalities and marginalization (Sobande et al., 2020).

To better understand libraries' digital representations of their makerspaces, we analyzed Facebook posts that included the word "makerspace" and related terms to identify statistically significant changes between 2012-2021. We also sampled these posts to identify the themes present in posts and further reviewed the most popular content from each year to uncover the identities and topics featured. Our research is organized around three sub-questions:

- A. Are there significant differences in post frequencies, engagement rates, content types, and countries of origins and how have these evolved over time?
- B. What themes are present in these posts?
- C. Are particular identities and/or topics highlighted in digital constructions of makerspaces?

Literature Review

The Rise of the Maker Movement and Makerspaces

While humans have been "making things" since the dawn of civilization, the maker movement (as referred to by scholars and practitioners) broadly refers to the people and spaces involved in the creation of artifacts, particularly those who share their processes and work with others (Halverson & Sheridan, 2014, p. 496). The maker movement's rise in popularity led to the creation of informal teaching spaces where people create items that may (or may not) use technological tools, what we know today as makerspaces. Other related environments (often used synonymously with

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makerspaces) include fablabs and hackerspaces; the former refers to spaces with digital fabrication machines – such as 3D printers, computer numerical control (CNC) machines, and laser cutters – while the latter refers to spaces where groups of computer programmers gather to repurpose code and hardware (Mersand, 2021).

The number of makerspaces has grown rapidly. This was noted by the ALA Center for the Future of Libraries, who further described a recent shift from “traditionally collecting institutions” to their adaptations of “new functions, providing communities with opportunities to create or co-create content for an individual’s own use, for use by the community, or for inclusion in the library collection” (2014). A recent census of makerspaces based in U.S. public universities found 31% of state universities or colleges had or planned to have a makerspace on campus, most often associated with their institutions’ libraries (Melo et al., 2023).

While makerspaces relied heavily on in-person collaboration prior to closures from the COVID-19 pandemic, a media analysis study at Drexel University found related work transferred to users’ home environments, with adults and children alike jumping into cooking, crafting, and DIY home improvements (Mattson et al., 2021). Makerspaces also developed take-home kits that could be picked up from libraries or mailed to homes. These remote opportunities, coupled with the reopening of facilities towards the end of 2020, led to the continued popularity of makerspaces, as more and more libraries shifted to online programming (Digital Promise, 2021).

Representations of Identity and Technology in Makerspaces

Buechley (2014) discussed her deep dive into nine years of *Make: Magazine* volumes, finding the majority of people represented were men and boys (85%), with women and girls making up 15%, and no representation of BIPOC individuals. These findings echo Barton et al.’s (2017) description of the maker movement as remaining “an adult, white, middle-class pursuit, led by those with the leisure time, technical knowledge, experience, and resources to make” (p. 5). These representations matter, as they highlight which users and technologies are celebrated, and can affect who feels comfortable and welcome in the space (Eckhardt et al., 2021).

Further, researchers have found men make up a higher proportion than women and non-binary users across all types of makerspaces (Axup et al., 2014; Peppler et al., 2017; Nation of Makers, 2019). On the other hand, a recent Digital Promise (2021) survey of makerspace educators in the U.S. found the majority (72%) of respondents self-identified as female, perhaps due to the feminization of teaching and library fields. Concerningly, Peppler et al. (2017) found a

significant decrease in racial diversity amongst U.S. makerspaces between 2014-2017, which they hypothesize might be due to the influx of new sites “opening more easily in affluent, predominately White settings” (p. 5).

There are also gendered differences in the use of makerspace technologies and products. Melo (2020) examined the gender biases connected with makerspace technology, finding men were more active in makerspaces and visited more “touchpoints” in the setting than women (p. 64). Similarly, Axup et al. (2014) described how women “make,” using different means than their male counterparts, as the “making they engage in is less likely to be...taken seriously as ‘making’” (p. 30). Overall, Barton et al. (2017) argued there is scant evidence to show the maker movement has successfully involved diverse users over a sustained period of time (p. 5).

Social Media Use by Libraries & Makerspaces

Social media networks (such as Facebook, Twitter, TikTok, and Instagram) are defined by their ability to shift online communication into interactive dialogues (Montalvo, 2011). This user engagement can be measured through metrics including views, comments, and shares. However, more than half of American public libraries do not have a marketing or communications strategy to determine whether social outreach efforts are successful (OCLC, 2018, p. 2).

Almost all libraries have a presence on social media, increasing from 85% of public libraries in 2012 to 97% in 2018 (Library Journal Research, 2018, p. 9). Facebook is the most popular social network by users worldwide (Statista, 2021) and is also the most widely used platform by libraries (OCLC, 2018; Library Journal Research, 2018). Social media use is important because it offers “a place where libraries can share the work they are doing – and reinforce relationships with decision makers and the communities they represent” (ALA, 2020). Unfortunately, Deodato (2018) found that while the literature on libraries’ social media use often centers on its ability to enhance services, expand user bases, and facilitate interactions with community members, the majority of accounts fall short of these transformative applications.

Prior research also highlights libraries’ struggle to garner user interest in – and engagement with – their channels and activities (Jones & Harvey, 2019; Deodato, 2018; Chu & Du, 2013). Perhaps this is because libraries’ most popular objective for using social media is one-way marketing-related promotion (Simons et al., 2016; Oosman et al., 2014). Yet Young and Rossman (2015) found that shifting library messaging to an “interesting” (sharing personality-rich content) and “interested” (interacting with and responding to users) strategic approach resulted in a 275% rise of

interaction rates and a 366% increase of student followers on Twitter.

Previous studies identified that nearly all library social media content centered on announcements, institutional information, and events (Phillips, 2011; Harrison et al., 2017). Jones and Havey's (2019) analysis of 335 posts from 20 U.K. academic library feeds confirms social media posts continue to focus on promotional content. Table 1 defines and aligns the themes found (and their frequencies) in social media posts studied by Harrison et al. (2017) and Jones and Harvey (2019).

Other related research incorporates data on social media use by makerspaces outside of the U.S. Menendez-Blanco and Pernille Bjørn (2019) analyzed 500 Facebook accounts from five Danish makerspaces and identified three characteristics (reach, transparency, and discourse) that shaped online open design activities and allowed makerspaces to produce different identities and foster broader definitions and potential participation. Eckhardt et al. (2021) studied photographs from both Facebook galleries and website homepages of 10 maker initiatives in Europe, finding the people featured skewed male (55%-70%), although Facebook pages offered a more balanced (though still male-dominated) gender representation. The authors cited Kanter's (2008) theory of homo-social reproduction and tendency for homophily to describe why people with similar interests and characteristics are more likely to be present in social environments in both physical and virtual spaces (Eckhardt et al., 2021).

Methods

The intent of this research is to holistically understand how libraries create digital representations of makerspaces and how these representations may have changed over time. As such, this study uses a qualitative-dominant MMR approach. MMR remains a valuable research approach, as both numbers and words are needed to better understand our world (Miles et al., 2020, p. 35). MMR offers analytic texture and an extra dimension to analysis and findings, which serves to capture researchers' interpretations (Miles et al., 2020, p. 36).

We used a convergent MMR design to collect both qualitative and quantitative materials in parallel, which we analyzed separately and merged (Creswell & Creswell, 2018; Creswell & Plano Clark, 2018). Table 2 details the alignment of each research sub-question to the methods used, their justification, and the sample size studied. Researchers focused on three primary methods: linear regression, thematic content analysis, and visual discourse analysis.

Linear regression is a statistical test used to identify whether two variables are related and, if so, the strength of their relationship (Ware et al., 2013, p. 124). In this study,

researchers tested whether – or not – variables associated with RQA (i.e., post frequency, pages producing content, engagement, country of origin, and types of content) were associated with time. Data was grouped into months between January 2012 and December 2021 for a total of 119 months. However, one month (April 2012) had zero posts and no interactions.

Thematic analysis identifies and describes the implicit and explicit ideas within data (Guest et al., 2012, p. 9). The themes coded in this study were guided by Harrison et al.'s (2017) prior findings (see Table 1 for these themes and their definitions). Additionally, researchers noted other possible emergent themes during the coding process.

Visual discourse analysis (Rose, 2016) provides a method for thorough investigation between social media content and broader contexts. It allows researchers to uncover “the social practices both in which that production is embedded and which it itself produces” from an authoritative account (Rose, 2016, p. 194). Discourse analysis of visual culture provides “ways of seeing brought to particular images by specific audiences, or to the social institutions and practices through which images are made, circulated and displayed” (Rose, 2016, p. 188). Visual discourse analysts are advised to focus on quality, and not quantity, of the material to be studied. Prior work on social media using this method focused on 2-13 images (KhosraviNik, 2017; Lischer-Katz, 2017; MacKenzie, 2020), although Tonkiss (1998) asserted even a single artifact “can generate very fruitful themes for analysis” and advised to focus instead on the richness of textual detail (p. 253).

Limitations of Methods

MMR is a complex approach requiring extensive data collection, additional time for analysis, and familiarity with both qualitative and quantitative research (Creswell & Creswell, 2018, p. 298). However, MMR remains the method best suited for research questions – such as the ones guiding this study – in which one data source is insufficient (Creswell & Plano Clark, 2018, p. 43). Quantitative analysis using linear regression is limited by its inability to explain the causes behind correlations. Conversely, while thematic analysis of 30 posts per year identifies ideas present within data, this method does not produce statistically significant results. Similarly, visual discourse analysis does not aim to provide a reproducible nor fully-representative overview of a phenomenon – instead, it examines how an idea or attitude is shaped, reproduced, and legitimized through content (Tonkiss, 1998, p. 254).

Table 1. Alignment of Themes Present from Recent Library Social Media Research (with Frequencies in Parentheses)	
Harrison et al. (2017)	Jones and Harvey (2019)
Archives: Original historical photos, papers, and artifacts (Not listed)	
Collections: Databases, books, guitars, umbrellas, and audiovisuals (~45)	Library resource promotion (83)
Exhibit: Current and historical university collections, liberal arts and science presentations (~50)	
Events: Within the library including book fairs/sales, game nights, poetry readings, and speakers (~90)	Library event promotion (66) College event promotion (23) Non-college event (20)
Facility: Photos of the actual building structure, library lighting, potential arrangement of new furniture to be placed in common areas within the library, and addition of electronic charging stations (~15)	
Services: Orientation to the library, mobile library, library instruction, and the hours of operation (~44)	Library services promotion and information (31) Promotion of library’s other social media accounts (4) General message (10)
Sentiments: Words of appreciation, congratulations, welcome, and memorials (~20)	Motivational quote (7)
Site management: Changing cover photos to reflect activities occurring internal and external to the library structure, including external landscape around the building, and internal landscape of use of common areas (~15)	
Library community: Any mention of library related activities external to the university library, such as ALA banned books, academic learning centers, and library ambassadors/advocates (~40)	General literary information (21) Humor (18) Study skills tips (17)
University/outside community: Non-library related activities that support the university, such as academic achievements of university faculty, staff, and support personnel (~43)	Local information (7) College information/promotion (6) Educational debate (6) Careers promotion/information (8)

Table 2. Alignment of research sub-questions, methods, justification, and sample

Research Sub-Question	Method	Justification	Sample
A. Are there significant differences in post frequencies, engagement rates, content types, and countries of origins and how have these evolved over time?	Quantitative: Linear Regression	Determines statistically significant differences in post frequency, pages producing content, engagement, country of origin, and types of content.	All 36,756 posts made by self-defined library pages on Facebook between January 1, 2012 and December 31, 2021.
B. What themes are present in social media posts?	Qualitative: Thematic Content Analysis	Identifies the topics highlighted by social media content.	30 posts for each of the 10 years studied (300 total), selected by simple random sampling.
C. Are particular identities, themes, or topics highlighted in digital constructions of makerspaces?	Qualitative: Visual Discourse Analysis	Reveals how libraries construct representations of makers and makerspaces.	3 of the top-performing photo posts for each of the 10 years studied (30 total), selected by “overperformance” rating.

Table 3.
Linear Regressions of Post Frequencies, Distinct Pages, Total Interactions, and Country of Origin

Variable	Coefficient	Intercept	SE	95% CI [LL, UL]	R ²	t	df	p
Posts frequency per month	0.166	-6852.3	0.010	[0.147, 0.188]	0.695	16.328	117	< 0.0001
Distinct pages	0.081	-3293.6	0.006	[0.070, 0.092]	0.647	14.645	117	< 0.0001
Total interactions	1.890	-77827.3	0.115	[1.662, 2.118]	0.697	16.409	117	< 0.0001
Country of origin	0.005	-204.2	0.0002	[0.005, 0.005]	0.806	22.06	117	< 0.0001

Note. SE = standard error, CI = confidence interval, with LL and UL indicating the lower and upper limits, respectively. The independent variable for all regressions was time in months.

* indicates p < 0.05

Data Collection and Sampling

Researchers used CrowdTangle, a social media insight and scraping tool owned by Meta (Facebook's parent company), to search for and download all 36,756 posts that included the terms "makerspace," "makerspaces," "maker space," and/or "maker spaces" posted by self-identified library pages on Facebook between January 1, 2012 and December 31, 2021. CrowdTangle was unable to identify Facebook posts with these terms prior to January 1, 2012, which could be due to tool limitations or a lack of any related content. Researchers chose to limit their data collection to Facebook because it was the largest social network throughout the time studied (Ortiz-Ospina, 2019; Statista, 2021). The researchers also chose not to include the search term "maker" on its own, as this collected thousands of non-making-related posts, e.g., unrelated content that included terms such as "decision maker," "law maker," and "money maker." Data was also limited to content made by self-identified library accounts (as defined by the "Page Category" selected by administrators). Moreover, self-identified "Branded Content" – i.e., a post "from media companies, celebrities or other influencers that features a third party product, brand or sponsor" (Facebook, 2017) – were also removed from data collection.

All 36,756 posts adhering to the conditions listed above were subsequently downloaded from CrowdTangle into a shared spreadsheet. The spreadsheet contained the following information for each piece of content used in the analysis process: page name, page admin country, post created date and time, post type (e.g., link, photo, text status, video type), total interactions, individual types of interactions (e.g., likes, comments, shares), post URL, post text, links in posts, and overperformance score. This spreadsheet was saved as an Excel 360 file behind a university-managed firewall and password-protected as requested by the study's IRB protocol. Only public posts were collected, and all content could be reviewed without a Facebook account via the associated post's URL.

Researchers then performed linear regression tests on all 36,756 posts. For thematic analysis, researchers identified a simple random sample of 30 posts per year (300 total) using Excel's random number function. The choice of 30 posts satisfied Fugard and Potts's (2015) quantitative calculator for thematic analysis, which found a sample size of 29 is required for 80% power to detect more than one instance of a theme with 10% prevalence. A simple random sample is more representative and efficient than constructed sampling for social media data (Kim et al., 2018).

For visual discourse analysis, researchers reviewed the top three most popular Facebook image-based posts for each year studied (30 posts total containing 69 images). CrowdTangle's "Relative Scoring" metric (as defined by

each post's "overperformance score") was used to identify the most popular content, as this metric illustrates how user engagement with a post (i.e., likes, comments, and shares) compares relative to other posts on the account's page (Silverman, 2021). By choosing to identify popular posts through their relative scoring (indicating increased popularity over typical content on individual pages), the content ultimately selected for review did not penalize pages with smaller followings. Studying the most popular image-based posts allowed researchers to uncover the identities, themes, and topics within library-associated makerspaces content that resonated with users.

Data Analysis

To identify statistically significant changes over time, researchers performed linear regression tests using Excel and Tableau on the following variables:

- number of posts created;
- number of unique pages producing content;
- total interactions (engagement);
- number of countries where posts originated; and
- content types (i.e., link, live video, uploaded video, photo, text/status update).

Excel's Analysis ToolPak provided statistical data and Tableau, a data visualization tool, offered enhanced charts and visuals provided in the Results section. While CrowdTangle specified multiple video post types, the researchers grouped these into two major types of video content: Live Videos (made up of Live Video Scheduled and Live Video Complete posts) and Uploaded Videos (made up of Native Video, Video, Vine, and YouTube posts).

While statistical analysis was performed, the two researchers also coded all 300 posts sampled for thematic analysis using Harrison et al.'s (2017) codes for guidance using different columns within the shared Excel file and noted any posts that required additional review or a new emergent theme. After the initial round of coding, Cohen's κ was run to determine intercoder reliability. There was substantial agreement between the two coders, $\kappa = .790$ (95% CI, .731 to .849), $p < .001$ (Landis & Koch, 1977). The researchers then met virtually and discussed all 40 posts with codes that did not match and agreed upon the finalized codes. At this same meeting, the researchers also determined and defined two emergent codes – "Requests" and "Examples." The researchers also decided any post with a specific date and time attached would be coded as "Event" even if it also describes other themes (e.g., services, facilities, sentiments).

After completing thematic coding, the researchers began performing a collaborative visual discourse analysis on the most popular image posts. Along with columns devoted to identity-based variables (i.e., identifying the number of

Table 4. Linear Regressions of Types of Posts

Variable	Coefficient	Intercept	SE	95% CI [LL, UL]	R ²	t	df	p
Link	0.031	-1239.51	0.006	[0.020, 0.043]	0.208	5.524	116	< 0.0001
Live Video	0.019	-804.37	0.002	[0.014, 0.024]	0.469	7.743	68	< 0.0001
Uploaded Video	0.021	-853.96	0.001	[0.018, 0.023]	0.74	17.36	106	< 0.0001
Photo	0.104	-4285.21	0.007	[0.090, 0.118]	0.669	14.767	108	< 0.0001
Text Only	0.0004	-6.55	0.001	[-0.001, 0.002]	0.004	0.662	111	0.509

Note. SE = standard error, CI = confidence interval, with LL and UL indicating the lower and upper limits, respectively. The independent variable for all regressions was time in months.

Table 5. Themes Identified and their Frequency by Year (Sorted by Total)

Themes	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Events	15	10	12	15	19	25	22	26	13	19	176
Services	3	7	3	7	1	2	2	1	5	9	40
Library Community	9	8	7	2	1	0	0	0	2	1	30
Sentiments	1	1	2	4	3	2	2	1	3	0	19
Facility	0	2	3	0	3	0	2	1	2	1	14
Requests*	1	1	2	0	1	1	1	0	2	0	9
Examples*	0	0	0	0	2	0	1	0	2	0	5
Exhibit	1	0	0	1	0	0	0	1	0	0	3
Collections	0	1	1	0	0	0	0	0	1	0	3
Outside Community	0	0	0	1	0	0	0	0	0	0	1

* indicates new emergent themes identified in this study.

people pictured, their gender, their race/ethnicity), the topics, and the technology featured, the researchers coded the posts according to Rose’s (2016) and March’s (2021) strategies for visual social media content interpretation (p. 214):

- sources;
- recurring references;
- effects of truth;
- complexity and contradictions; and
- invisible elements.

Researchers then collated this data into information on the identities (including the gender, race, and age of people featured), topics, and technologies present in the images. Even though this study classifies the gender and race/ethnicity of people portrayed in images, the researchers do not condone any exclusive identity expressions. However, as gender and race/ethnicity constructions are an important part of this research, the authors took steps to mitigate potential bias. Both researchers coded all images for social identities and their findings (as related to age, gender, and race/ethnicity) were in perfect agreement ($\kappa = 1$).

Table 6. Featured Makerspace Technology	
Technology	Frequency
3D Printers/Printing	6
Sewing Machines/Textiles	5
Computers	5
Painting/Arts & Crafts	3
Book Repurposing	2
Laser Cutter/CNC	2
Audio Tools	2
Cricut/Die Cut	2
Heat Press/Transfer	2

Findings

RQA: Linear Regression Findings (Statistical Differences Over Time)

Results of linear regressions performed on post frequencies, distinct pages, total interactions, and countries of origin between 2012 and 2021 are provided in Table 3. Post counts and the distinct pages producing content are charted visually in Figure 1. Similarly, Figure 2 charts the number of posts but includes the total number of interactions using a second y-axis scale measuring in the thousands. Figure 3 illustrates the countries producing posts by year. All of these variables are statistically significant at the $p < 0.05$ level, with high effect sizes (as noted in the R2 column).

Table 4 outlines the linear regression results of the post types created between 2012 and 2021. All variables except text/status update were significant at the $p < 0.05$ level. Figure 4 charts this data over time.

RQB: Thematic Analysis Findings (Post Themes)

“Events” were, by far, the most often coded theme. Only two themes, “Events” and “Services,” were present every year between 2012 and 2021. Table 5 details the raw data of the thematic analysis and Figure 5 visually charts these changes over time.

Interestingly, the number of posts coded as “Library Community” dropped off in 2015. The year 2020 saw a drop in “Events” posts, which was probably connected to the beginning of the COVID-19 pandemic. However, posts coded as “Events” regained popularity in 2021.

RQC: Visual Analysis Discourse Findings (Popular Identities and Topics)

Of the 69 images analyzed from 30 posts, researchers identified a total of 182 people, the majority of which featured adults (168), although 14 children were also identified. Men also made up the majority (53%) of the people studied (as referenced in Figure 6). The vast majority (97%) of images with people featured white makerspace users and personnel.

Lastly, topics present in two or more Facebook posts are detailed in Figure 7. Sixteen images did not include any people; rather, the images showed pictures of makerspace technology, links to websites, pictures of makerspaces, or weekly schedules. Similarly, 14 posts highlighted examples of work produced in the space or during events.

Discussion and Conclusion

Our research on makerspace-related social media content reveals significant increases of posts over time, a focus on

event-related content, and a pervasive lack of diversity in representations of makers. Findings from this study confirm prior research asserting the continued growth and popularity of making and makerspaces in libraries since 2012, as illustrated by the statistically significant increase in the associated number of posts, unique pages producing content (and their countries of origin), and user engagement. While there was a noticeable dip in content during the initial stages of the COVID-19 pandemic during spring 2020, numbers rebounded and continued to rise in 2021. Perhaps people tasked with generating Facebook posts were furloughed or let go; Frederick and Wolff-Eisenberg's (2020) research on academic libraries' responses to the pandemic found approximately one-third of staff were furloughed or had their hours reduced, and around 10% eliminated positions altogether (p. 24). Yet Koulouris et al.'s (2020) emergent work on Greek libraries' social media content during COVID-19 noted that social media posting frequency was not significantly altered, with less than 10% of survey respondents reporting a decrease during shutdowns and 25% reporting a significant increase.

Alternatively, the decrease of posts in 2020 could be due to the canceling of makerspace-related events, as event-related posts represented the most frequent theme of content throughout the years studied, aligning with Harrison et al.'s (2017) and Jones and Harvey's (2019) more general findings. However, focusing on event-related posts represents a missed opportunity for libraries, as content featuring educational and interactive themes receive much more user engagement than event marketing posts (Lundgren & Crippen, 2017, 2018; Baker, 2017; Trucks, 2019). Producing more socially responsive content – such community-themed posts – may help libraries foster more meaningful engagement with broader audiences (March, 2022). Moreover, our analysis identified two additional themes of makerspace-related posts not previously identified: requests and examples. Posts coded as requests included fundraising petitions and user surveys, while examples featured work created in the makerspace. These additional themes may help future scholars in their coding and analysis of social media content produced by libraries.

Though there was an overall decrease in Makerspace-related posts in 2020, there were statistically significant increases in all but one type of content produced: photo posts. Photos represented the most popular post type across all years studied. Both uploaded and live videos showed a marked increase beginning in 2020, possibly due to a proliferation of how-to videos and live-streamed events hosted by libraries during COVID-19 shutdowns (March, 2022).

The visual discourse findings of this study still point to a lack of representation in makers and makerspaces.

Relatively few people or examples of work were featured in the images studied, which is surprising because pictures featuring human faces and relevant content increases user engagement with posts (Bakhshi et al., 2014; Valentini et al., 2018). This may be due to a lack (or use) of library-specific research related social media engagement (Jones & Harvey, 2019).

Posts that did include images of people most often featured adult white men. Like Eckhardt et al.'s (2021) research, this study found 54% of people in the sampled images were male. Even more concerning is the dominance of white people (97%) pictured in popular images. Furthermore, identities, topics, and technology featured in posts did not noticeably change throughout the years studied. This may be due to the tendency of people with similar characteristics to share the same physical and virtual spaces (Kanter, 2008; Eckhardt et al., 2021), which presents a compelling reason why more diverse users should be showcased in makerspace-related content. While we strongly disagree with the tokenization of featuring people from traditionally marginalized backgrounds solely as a performative practice on virtual platforms, evidence-based cues that show observers whether (or not) an organization fosters a diverse climate can affect Black and Latinx expectations (Wilton et al., 2020). As Melo (2020) argued, "simply promoting inclusive and equitable makerspaces [is] not enough: at its core, the makerspace is imbricated with gender biases" (p. 66). The display of work not traditionally associated with white, male, and technology-centered making (such as the textile projects featured by posts analyzed in this study) may offer another means to encourage other nontraditional users (Barton et al., 2017).

Overall, the pervasive homogeneity of identities featured in makerspaces' social media content may lead to further decreases in diversity. This is concerning because marketing and media portrayals that reflect and reinforce hegemonic power dynamics perpetuate social inequalities and marginalization (Sobande et al., 2020). Not only do we need to ensure our visitors feel safe and comfortable while physically inside makerspaces, but we must also be aware of how our virtual representations impact potential future users. It is important we understand how this lack of diversity transfers from online to offline (and vice versa), so we can work towards a more equitable and inclusive future.

Limitations and Future Research

Data used in this study was collated through CrowdTangle – as such, this work is limited to Facebook content publicly accessible on the web at the time of data collection by accounts that self-identified as libraries and included the search terms previously identified. Moreover, the interaction rates described in these findings do not

necessarily equal the posts with the most views or reach (Meta, 2021). While Facebook remains the most popular social media platform worldwide, other platforms may be more prevalent in different countries. Similarly, this research is limited to the English search terms used. Suggestions for related future work include incorporating multi-platform data, using additional search terms in multiple languages, and drilling down further into the content created (such as differentiating the types of videos produced). Further work on videos is particularly encouraged, as we foresee the significant increase of live and uploaded videos since the COVID-19 pandemic could mark a beginning of more widespread hybrid makerspace programming, where interested users can choose whether to engage virtually or in-person.

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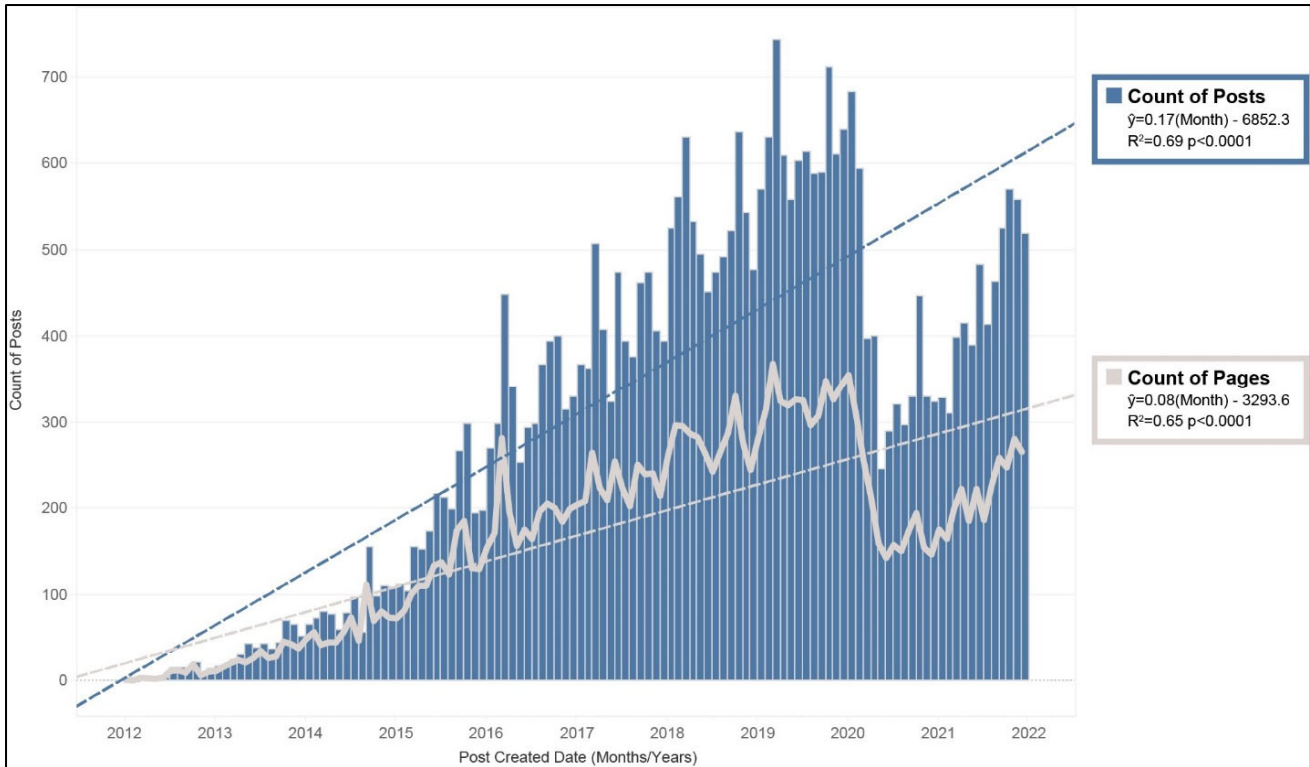


Figure 1. Number of Posts and Unique Pages Producing Content by Month

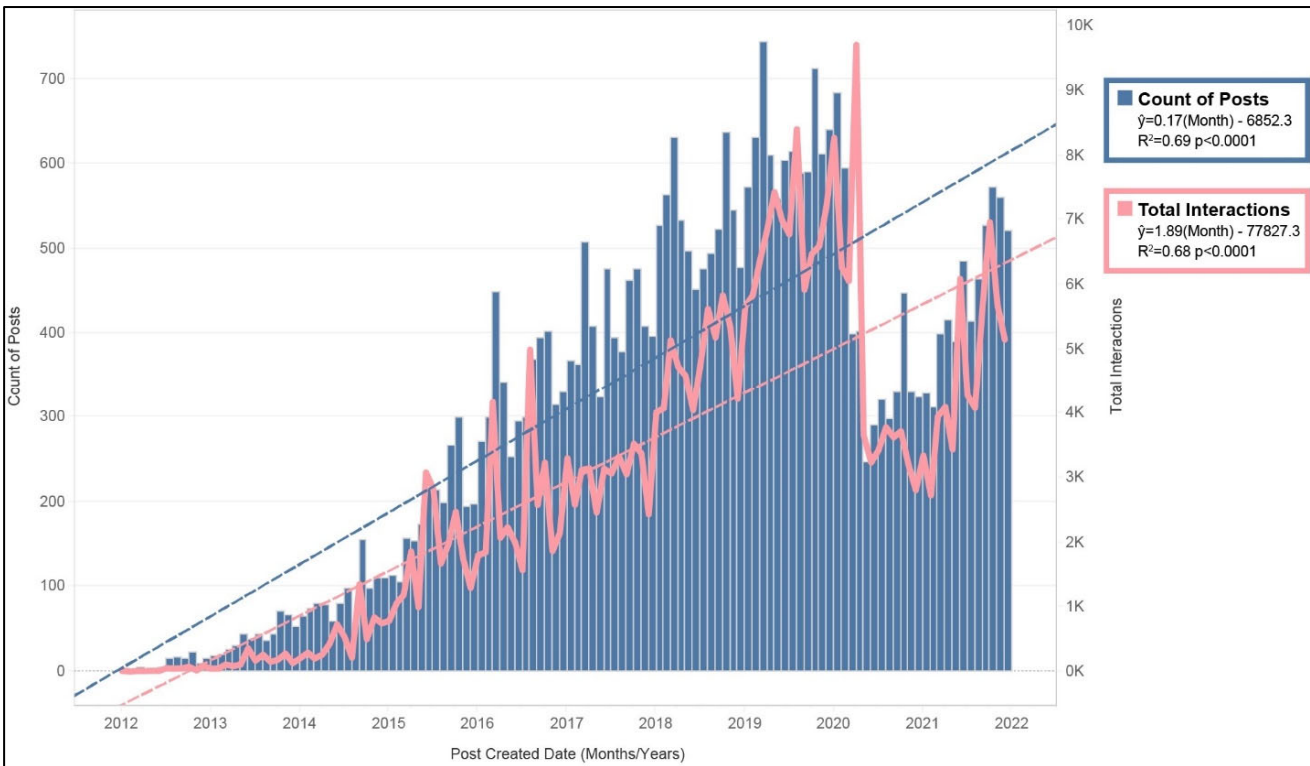


Figure 2. Number of Posts and Total Interactions by Month

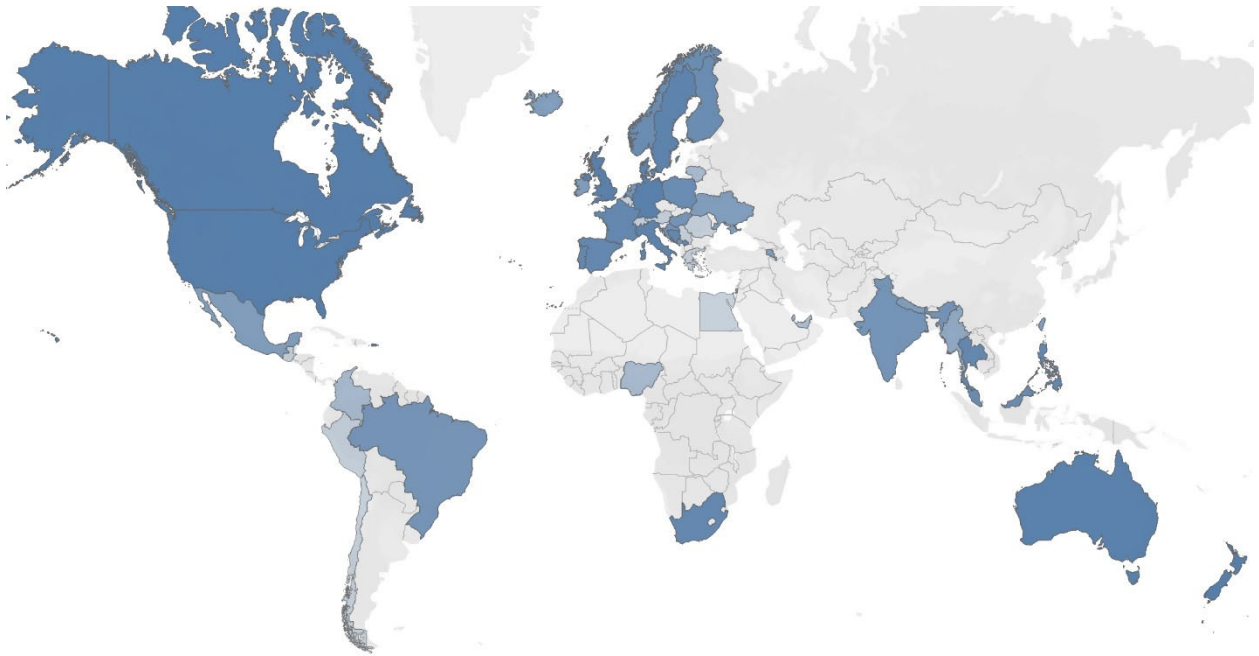


Figure 3. Map of Post Origin Countries
View Animated GIF: <https://lauramarch.com/socialmakerspaces>

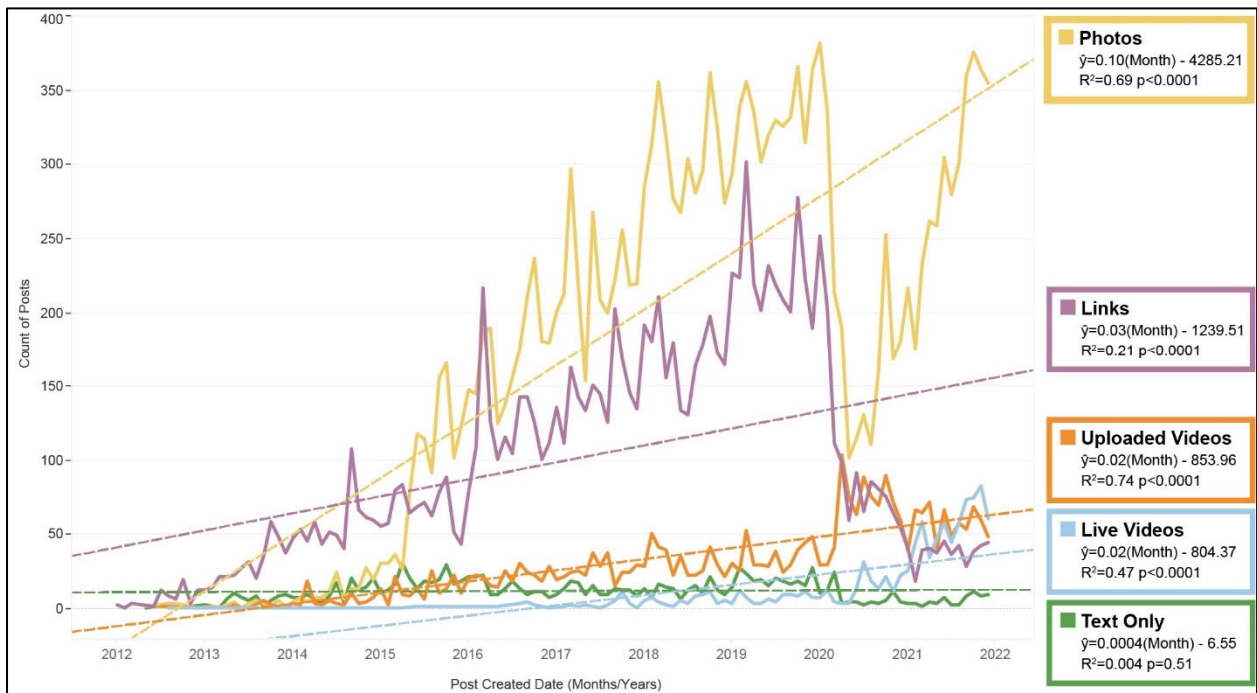


Figure 4. Type of Posts Over Time

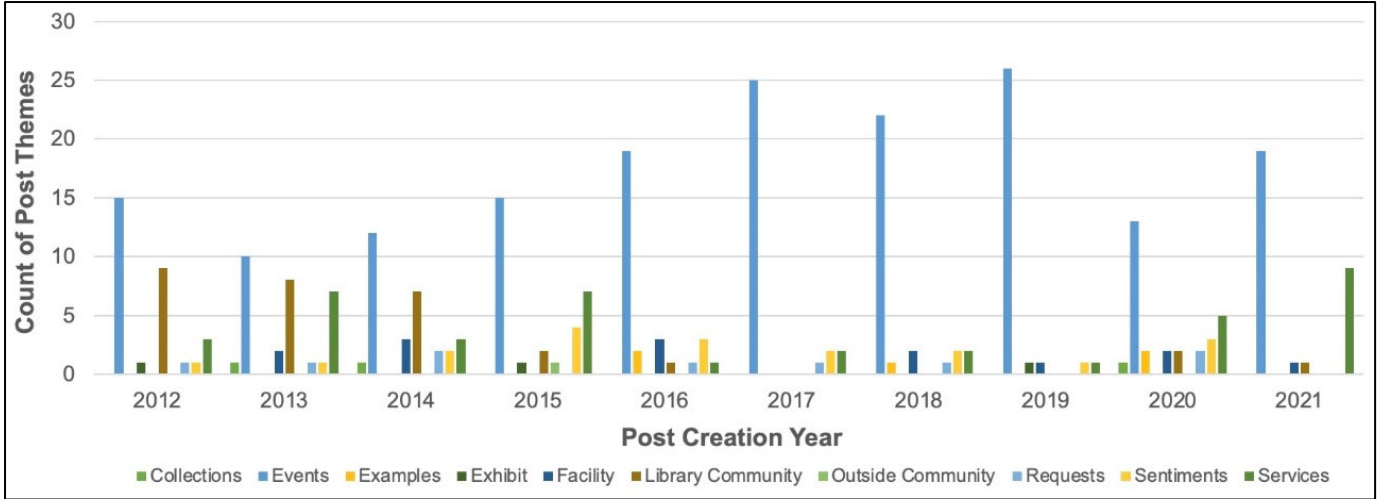


Figure 5. Themes of Posts by Year

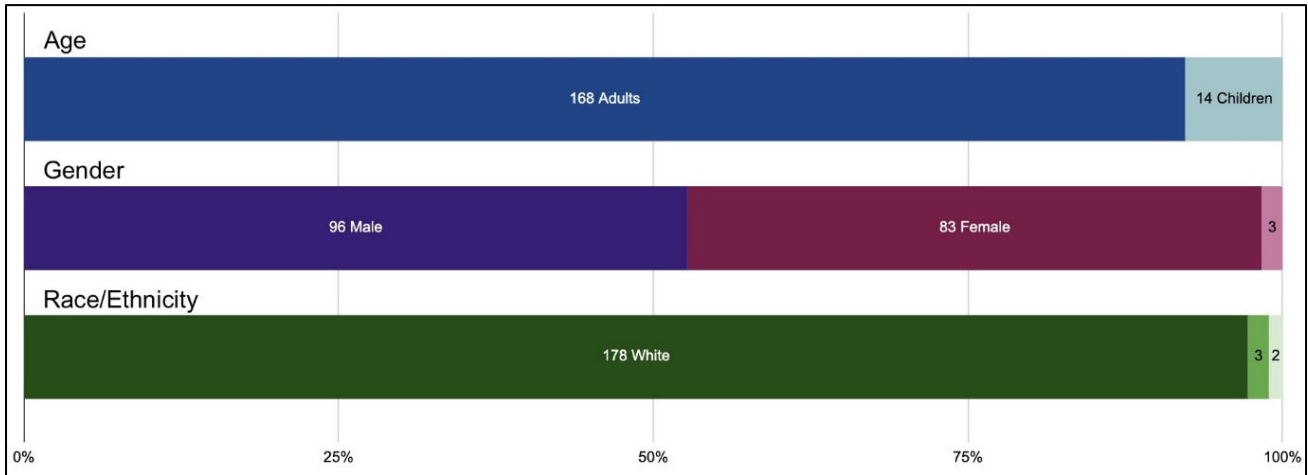


Figure 6. Identities in Makerspace Images

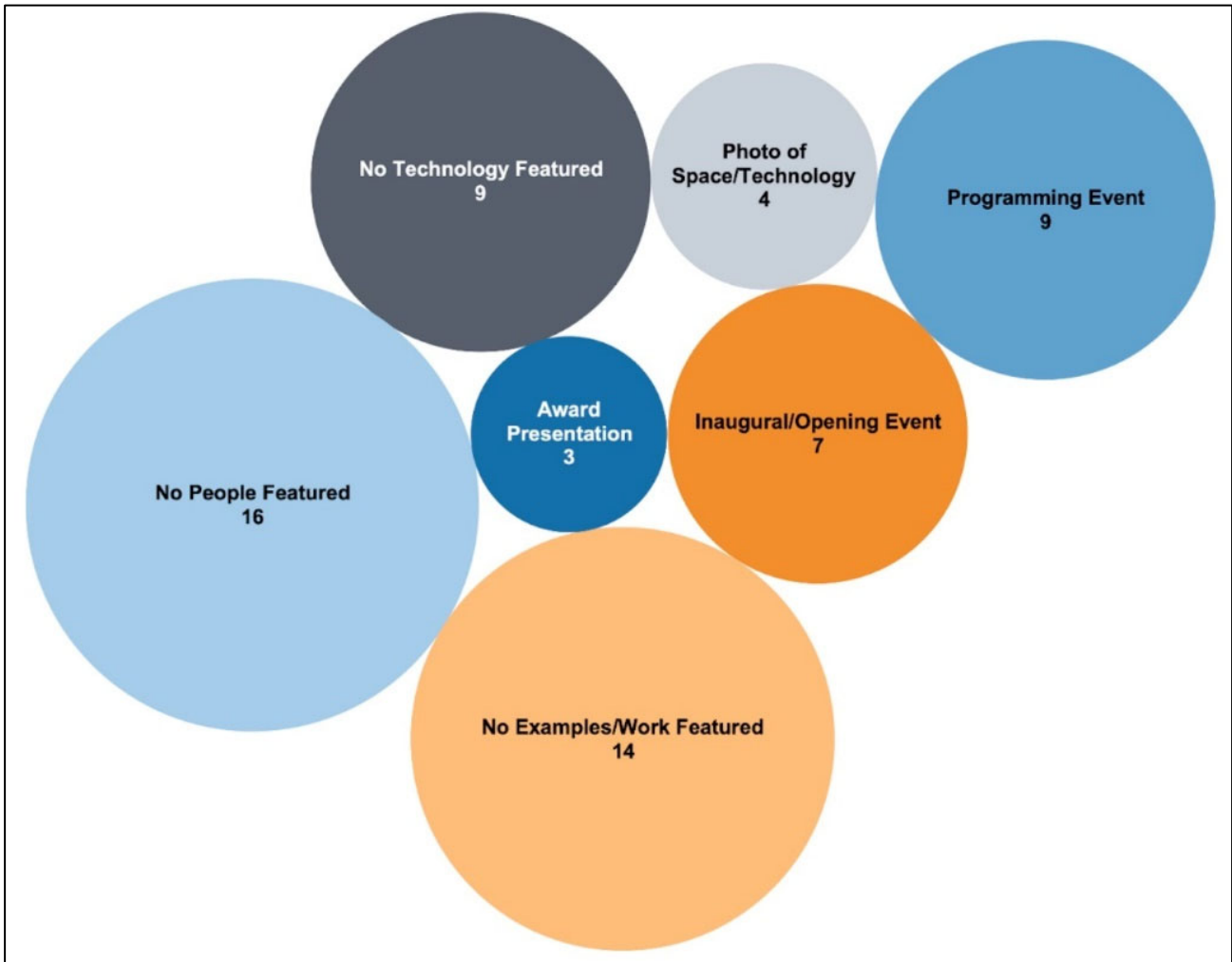


Figure 7. Makerspace Image Topics