

## **Keywords and key emoji: Investigating a university's Twitter posts before, during and after Covid-related restrictions**

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**Abstract:** Many universities use social media to communicate and engage with stakeholders, including students and staff. In recent years, universities were also faced with navigating the challenges resulting from the Covid-19 global pandemic and related restrictive measures that disrupted routine operations. In this paper, we examine a case study of a UK University and its posts on Twitter (now X) prior to, during and following the period of restrictive measures. With a focus on features of the 'Conversational Human Voice' (Kelleher, 2009), we report keywords and key emoji in a corpus of Twitter posts between 2018 and 2022. We demonstrate that despite the disruption of the pandemic and restrictive measures, the University maintained a consistent strategy, capitalising on the timeliness and broadcast functions of the platform to celebrate activities of its personnel and promote local events. Furthermore, we demonstrate how emoji and other paralinguistic elements can be incorporated into a multimodal corpus analysis.

**Keywords:** crisis communication, social media, emoji, annotation, multimodality

### **1. Introduction**

The effects of the Covid-19 pandemic have been disruptive to university activities, as they have to most other aspects of people's lives around the world. Writing about events in the U.S., Mohlman and Basch (2022: 2253) recall that:

college students faced many sudden and dramatic changes to their daily lives. As the normal activities of most universities wound down to essential functions, students were forced to relocate, leave their on-campus jobs and social milieu, and prepare for in-person classes to be converted to an online distance-learning format. In many cases, these changes took place in a matter of days, against a backdrop of impending life-threatening illness.

In England, 'social distancing' and 'lockdown' measures introduced in March 2020 resulted in the closure of most organisational operations, including those of higher education institutions. Further legislative health protection regulations in response to the Covid-19 pandemic were introduced in December 2020 (Public Health England, 2020). In this 'crisis' context, social media platforms such as Twitter<sup>1</sup> became pivotal in providing the technological and social infrastructure that enabled members of the public to access key information, seek assistance, and

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<sup>1</sup> Twitter was rebranded as 'X' in July 2023, but as the platform was known as Twitter throughout the duration of our study period, we continue to refer to it as such.

stay connected with their friends and family (Chen *et al.*, 2020). In a study of information-seeking behaviours among university students based in China, Malaysia and the Philippines between April and June 2020, Htay *et al.* (2022) found that after search engines (92.0% of participants), students were most likely to highly utilise social media (88.4%) for Covid-related information seeking, ahead of news portals (82%) and websites of public bodies (68.2%).

The World Health Organization (WHO) declared Covid-19 a public health emergency of international concern on 30 January 2020. Shortly after this, the WHO stressed that in addition to seeing an epidemic, the world was facing an ‘infodemic’ and revealed that the WHO was working with social media platforms to minimise the spread of what it considered to be misinformation (WHO, 2020). Thus, while the WHO called upon governments and news agencies to communicate ‘the appropriate level of alarm’ (WHO, 2020), universities also had a role to play in capitalising on the institutional ‘trustworthiness’ (Kharouf *et al.*, 2015) bestowed on them by their student populations and in providing guidance relating specifically to university procedures and life on campus.

In this paper, we focus on the social media activity of one campus-based UK higher education institution, Lancaster University, over the period 2018-2022. Our study investigates keywords for annual sub-corpora of posts by the official Lancaster University Twitter profile (@LancasterUni) according to three phases: pre-pandemic; navigating restriction measures; and following Covid-related restrictions. We analyse keywords and key emoji as indicative of the most distinct content produced at each of these stages and consider how these indicate aspects of a Conversational Human Voice (Kelleher, 2009). Through the investigation of Lancaster University’s Twitter posts, we report the construction of a social media corpus for analysis using the software tool *#LancsBox X* (Brezina and Platt, 2023). In doing so, we demonstrate the use of eXtensible Markup Language (XML) for annotation procedures that can support further analyses of paralinguistic features, including visual semiotics, for multimodal corpus analysis.

## **2. Crisis communication and social media**

### **2.1 Communicating pandemics**

Researchers have documented the important contributions that social media platforms – and Twitter specifically – have made during global health threats such as the 2009 H1N1 flu (Chew and Eysenbach, 2010), the 2015-2016 US Zika virus outbreak (Hagen *et al.*, 2018) and the Covid-19 pandemic (Chen *et al.*, 2020). Chew and Eysenbach (2010), for example, demonstrate the potential to track live information dissemination and public perception through Twitter. Hagen *et al.* (2018: 526) similarly highlight how platforms such as Twitter provide opportunities for ‘emergency responders, public health officials, and even media outlets to communicate directly with the public, eliminating the time it takes for emergency information to flow through traditional communication channels’.

It is important to acknowledge that the very mechanisms of social media which enable the wide dissemination of public health information also increase the potential for the spread of misinformation (Van Dijck and Alinejad, 2020: 8; Lin *et al.*, 2022). However, in their study of social media around the 2009 H1N1 flu, Chew and Eysenbach (2010: 8) coded only 4.5% of tweets (i.e., Twitter posts) as possible misinformation (meaning claims did not include a

reference from a fixed range of sources) and found that 90.2% of tweets provided links when a reference was necessary. Ultimately, while users need to remain vigilant in trying to limit the consumption and spread of low-quality information, for the most part, Twitter's capacity for widely disseminating information and facilitating engagement, as well as highlighting differences in challenges and responses at a regional level, demonstrate the valuable contribution social media can make in times of crisis (Houston *et al.*, 2014).

## 2.2 Universities and crisis communication

Higher education institutions have embraced social media 'for a variety of purposes including general communications, marketing, teaching, learning, and research' (Veletsianos *et al.*, 2017: 2). However, there have been concerns that university social media activity does not necessarily capitalize on the dialogic potential of the mode, rather adopting a 'campus news feed' strategy (Veletsianos *et al.*, 2017: 15) that centres around the broadcasting of information. In their study of Twitter profiles representing Canadian universities, Veletsianos *et al.* (2017: 15) assert that, while Twitter posts included features with interactive potential such as @-tags, hashtags and links, these were mostly in reference to the university's own personnel and activities, rather than engaging with other users and facilitating wider conversations on the platform. Furthermore, Veletsianos *et al.* (2017: 15) question the 'overwhelmingly positive picture of university life' conveyed by institutional Twitter accounts, suggesting they offer an incomplete and potentially misleading presentation that does not acknowledge some of the challenges of student life. Kimmons *et al.* (2017: 109) analysed 5.7 million tweets from 2,411 college and university Twitter accounts and similarly found that 'the preponderance of tweets a) are monologic, b) disseminate information, c) link to a relatively limited and insular ecosystem of web resources, and d) express neutral or positive sentiment'.

Quiroz Flores *et al.* (2021) studied 166 UK universities with an active Twitter account during the Covid-19 pandemic, noting that in the absence of university-specific guidance from central government, there was variation in how UK universities responded to the developing Covid-19 situation. For example, while universities broadly used social media 'to communicate with students and staff in a frequent, timely, open, and targeted manner' (Quiroz Flores *et al.*, 2021: 2), universities with larger student communities and those with larger financial resources were quicker to engage in risk communication using social media than those with smaller student populations. Nevertheless, university Twitter activity at this time can provide insights into how university representatives perceive their role and responsibilities towards their staff and students – particularly if we compare this to university Twitter content outside the crisis context. For instance, Mohlman and Basch (2022: 2255) studied the Twitter communication of 151 universities in the New York metropolitan area during the Covid-19 pandemic and found that the content focused on institutional credibility, reducing panic and encouraging readers' resilience.

One set of relational strategies observed in organisational communication, including that of universities, has been termed a Conversational Human Voice (CHV): an 'engaging and natural style of organizational communication' (Kelleher, 2009: 177) believed to help organisations create 'a sense of proximity, receptivity, and immediate engagement' (Creelman, 2022: 8) in online service encounters. Through their integrative literature review, Liebrecht *et al.* (2021) created a taxonomy which consists of seventeen categories related to what have been cited (by Van Noort *et al.*, 2014) as the three main tactics for CHV, namely: Message Personalization;

Invitational Rhetoric; and Informal Speech. Visual elements such as emoticons, emoji and images, along with ‘informal vocabulary’ (e.g., ‘That’s awesome’) and approximations of audible elements (e.g., ‘haha’, ‘soooo’) are associated with Informal Speech (Liebrecht *et al.*, 2021). Examples of Message Personalization include personally addressing oneself (e.g., ‘I’, ‘we’) and use of a personal signature (e.g., ‘^Thomas’ at the end of a tweet). Individual Rhetoric refers to the strategies through which followers are invited to contribute, as demonstrated by what Liebrecht *et al.* (2021: 127) call ‘stimulating dialogues’. Examples include formulations such as ‘Could you explain what is the matter?’. We will discuss the use and frequency of such features in our exploration of the social media posts by the official Lancaster University Twitter profile, @LancasterUni.

In this paper, we consider not only the content of a university’s Twitter posts during periods of national restrictive measures in response to the pandemic, but also how this compares with the content produced prior to the pandemic, and the lasting effect of Covid-related adaptations following the end of restrictive measures. This provides a view of the more general use of Twitter by the university, as well as how their content changed at a time when wider events disrupted routine university business and had overwhelmingly negative effects on the general population. In the next section, we introduce the data used in this study, outlining our procedures for preparing the corpus and the statistical measures used for keyness analysis.

### **3. Corpus construction and analysis**

#### **3.1 Data collection**

Our data comes from the Twitter posts of Lancaster University: a higher education institution situated in the north-west of England that has approximately 16,000 registered students at its home campus (Lancaster University, n.d.). Like many other higher education institutions, Lancaster University has a dedicated social media team that generates content for popular platforms such as Twitter, Facebook, YouTube, Instagram, LinkedIn, Weibo and TikTok, alongside its webpages that represent its various colleges, departments, research centres, staff profiles and associated businesses located on the campus.

We collected Twitter posts from the official university profile, @LancasterUni, from the period 1 January 2018 to 31 December 2022 using the freeware social media and data analysis toolkit *FireAnt* (Anthony and Hardaker, 2022). Changes to the permissions policy for Twitter (now X) mean that automatic data collection from the platform is no longer possible through tools such as *FireAnt*, although the Digital Services Act (EU 2022/2065) in the EU enables access to licensed data for special research purposes (i.e., public interest research on systemic risks). Prior to the policy change, *FireAnt* facilitated the collection of historic data generated by @LancasterUni, including post content and associated metadata.

The resulting corpus was 10,477 Twitter posts (232,450 tokens). Reposts (i.e. ‘retweets’) of other users’ posts were excluded in order to focus solely on the communicative strategies of writing by the University profile. In Section 4.1, we discuss the distribution of this content in terms of posts, tokens and emoji per month.

Our data does not include images or videos attached to the posts. *FireAnt* provides a record of such content in the form of a URL, but researchers would need to determine a way to document

image content in a machine-readable format to enable corpus analysis using tools such as *#LancsBox X*. There are examples of researchers recording image content for the purposes of corpus analysis using manual and/or automated annotation (e.g., Collins, 2020; Baker and Collins, 2023). However, there is not yet a standardised system for capturing image/video content in a consistent and efficient manner with software tools to analyse it.

Emoji are a common visual semiotic mode in social media discourse that we therefore wish to analyse. These *are* captured in the machine-readable output of tools such as *FireAnt*, but few corpus tools are equipped to automatically analyse them. In this paper, we set out to build on prior efforts to document emoji in a way that could be extended to other semiotic modes, including annotation schemes for images and video. Based on this, we identify key emoji prior to, during and after Covid-related restriction measures and include them in our observations of changes in the Twitter content generated by @LancasterUni.

### 3.2 Annotation

Emoji pose something of a challenge for Natural Language Processing (NLP) tasks; tagsets for Part of Speech (POS) and semantic annotation schemes built into popular corpus analysis tools do not typically include categories for emoji. As such, documenting their form or meaning currently requires bespoke annotation. Shardlow *et al.* (2022: 6) report their attempts to establish a semantic network of emoji meanings, reaffirming the polysemous nature of emoji and finding that the meanings of emoji ‘are more varied than words’.

Collins (2020) introduced a basic form of annotation for emoji that tags characters with their hexadecimal code point as defined by the Unicode Standard (Berard, 2018) and which can be applied according to the simple ‘underscore’ notation recognised by *#LancsBox* versions 2-6 (Brezina *et al.*, 2020). The Unicode values can subsequently be queried according to the basic functions of *#LancsBox* for key words in context, frequency lists, keyness analysis, collocation analysis, etc. In this approach, interpretation of ‘meaning’ is best reserved for manual analysis of emoji alongside the co-text, such as in the study of concordance lines. Here, we demonstrate how more complex features of emoji can be captured in XML annotation, to be used alongside other lexical and grammatical annotation, which is enabled by more recent developments in *#LancsBox X* (Brezina and Platt, 2023). As Hardie (2014a) proposes, even ‘modest’ XML annotation enables the tagging of multiple elements associated with individual tokens. For instance, our XML annotation for a single emoji appears as follows:

```
<c type= “emoji” description=“Detective” original=“🕵️”>🕵️</c>
```

Variant selectors are removed from the actual text for normalisation, but preserved in the ‘original’ attribute. The `<c>` element normally denotes punctuation, meaning that emoji are treated as a paralinguistic supplement to the linguistic content of a text. As a result, they do not contribute to word counts and have not been assigned part-of-speech annotations.

With our annotations, users can conduct queries in *#LancsBox X* according to:

- The exact element content: `/🕵️/`
- A regular expression on the element content: `/punc=“🕵️.*”/`
- The ‘original’ attribute (also supports regular expressions): `/original=“🕵️”/`

- The ‘short name’ in the ‘description’ attribute: /description= “.\*detective”/
- All emoji in a part of the corpus: /type=“emoji”/

In implementing our XML annotation, we encountered some logistical challenges that it is important to be aware of when (automatically) tagging a corpus comprising data that includes emoji characters. First, there can be issues with tokenisation, given that when typed, emoji characters are not always separated by whitespace characters. This has implications for subsequent processes such as lemmatisation, POS-tagging, and semantic tagging, as character strings that include emoji will deviate from forms that the taggers are programmed or trained to recognise. Similarly, any program designed to locate emoji characters could miss those attached to other character strings.

Once emoji characters have been separated from punctuation characters and lexical tokens to a satisfactory degree, analysts relying upon pre-existing automated taggers (e.g., grammatical or semantic) will likely have to replace the tagging they apply to emoji with their own annotations. In our case, for example, we uploaded our corpus files to *#LancsBox X* to apply standard tokenisation, lemmatisation, POS-tagging (using spaCy model *en\_core\_web\_md v3.7.0*) and semantic tagging (using the PyMUSAS extension based on the UCREL Semantic Analysis System: Rayson, 2008). As such, prior to applying the emoji tagset, the POS-tags and semantic tags that had been automatically applied to emoji characters had to be removed. But if one is not using a pre-existing automated tagger or has more control over its implementation, it should be possible to apply the appropriate emoji annotations when the other text is being tagged. For spaCy, this can be done with the *spacymoji* extension (Montani, 2023), although *#Lancsbox X* does not support this extension.

Finally, there are multiple ways in which emoji can be encoded; Zappavigna and Logi (2021) provide a useful summary of the different forms of encoding for emoji characters, which we demonstrate with examples from our data:

- A single codepoint e.g., U+1F609 (Winking face) = 😜
- A codepoint with variation selector-16 (the emoji variation selector): U+2764 (Heavy black heart<sup>2</sup>) plus U+FE0F (Variation selector-16) = ❤️
- A codepoint with a skin tone modifier: U+1F448 (Backhand index pointing left) plus U+1F3FD (Medium skin tone<sup>3</sup>) = 🖐️
- Flags: U+1F3F4 (waving black flag) plus U+E0067 (tag Latin small letter G) plus U+E0062 (tag Latin small letter B) plus U+E0077 (tag Latin small letter W) plus U+E006C (tag Latin small letter L) plus U+E0073 (tag Latin small letter S) plus U+E007F (Cancel tag) = 🏴 (🇬🇧🇨🇦🇸🇨🇦🇸🇨🇦 on Twitter)
- Tag sequences: U+1F469 (👨) plus U+200D (Zero-width joiner) plus U+1F393 (🎓) = 👨🎓

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<sup>2</sup> This character predates emoji, so was originally intended only to match the font colour (usually black), but now with the emoji variation selector its colour need not be related to the font colour. Without the variation selector, the Unicode U+2764 appears as ♥.

<sup>3</sup> Skin tone modifiers correspond with the Fitzpatrick scale (1988) as follows: Type 1-2: Light skin tone (U+1F3FB); Type 3: Medium-light skin tone (U+1F3FC); Type 4: Medium skin tone (U+1F3FD); Type 5: Medium-dark skin tone (U+1F3FE); Type 6: Dark skin tone (U+1F3FF).

- Keycap sequences: U+23 (#) plus U+FE0F (variation selector-16) plus U+20E3 (Combining enclosing keycap) = .

Each emoji character also has a ‘short name’, which we have taken from the online archive Emojipedia.org (Zedge Inc., n.d.) and used for the ‘description’ of each emoji in our annotation scheme. Emojipedia.org offers a user-friendly interface for searching for emoji characters to retrieve technical information (such as their Unicode value) and to view the different display formats according to vendor (i.e., whether the emoji is viewed on the Twitter app or a web browser, according to what operating system, etc.). These short names are informed by those recorded in the Unicode Standard.

### 3.3 Keyness analysis

We applied the ‘remainder method’, as described in Baker *et al.* (2019), to identify keywords and key emoji for each annual sub-corpus of the data. As shown in Table 1, this approach involves separating a defined sub-corpus (e.g., all data from 2018) from the larger dataset and comparing it against the data that remains (data from 2019, 2020, 2021 and 2022, labelled ‘Minus2018’). This approach ensures that the comparison corpus is matched for contextual factors such as text producer style and platform conventions, thereby maximising the likelihood that observed differences in the relative frequencies of the content are attributable to the criterion that differentiates the sub-corpora, which in our case is time (i.e., year). Furthermore, it is a process that highlights the most marked differences between one sub-corpus and the rest of the data. We measured keyness according to the effect size measure Log Ratio (Hardie, 2014b), setting a threshold of 3.0 and a minimum frequency of 5 to focus on a manageable set of key items that most distinctly characterised each annual sub-corpus.

Sub-corpus	Tokens	Posts	Comparison corpus	Tokens	Posts
2018	61,027	2,686	Minus2018	171,423	7,791
2019	67,867	3,377	Minus2019	164,583	7,100
2020	43,714	2,037	Minus2020	188,736	8,440
2021	33,915	1,320	Minus2021	198,535	9,157
2022	25,927	1,057	Minus2022	206,523	9,420

Table 1. Keyness comparisons.

As *#LancsBox X* only generates wordlists for tokens (denoted by <w> elements), it does not ordinarily support keyness analysis for content wrapped in <c> elements. Thus, in order to perform our key emoji analyses, we wrote a separate program to generate lists of emoji in the corpus and sub-corpora (including frequency information) and used these in place of *#LancsBox*-generated wordlists. However, other corpus tools often treat <c> elements similarly to word-like tokens and thus should include emoji annotated according to our scheme in keyword lists.

## 4. Results

In this section, we report our observations of the posts generated by the @LancasterUni Twitter profile prior to and over the course of the Covid-19 pandemic. Our analysis highlights features that demonstrate the prevailing communicative strategies used by the social media team producing the content and consider how this was affected by the Covid-19 pandemic, specifically the restrictive measures introduced in England to mitigate its effects.

#### 4.1 @LancasterUni Twitter activity

Figure 1 demonstrates the number of posts (indicated by the right axis) and number of tokens (left axis) per month of the study period. There is a decline in the number of posts (and consequently, tokens) after the latter part of 2019. Peaks in August for subsequent years coincide with the publishing of exam results and associated recruitment activities by the University social media team.

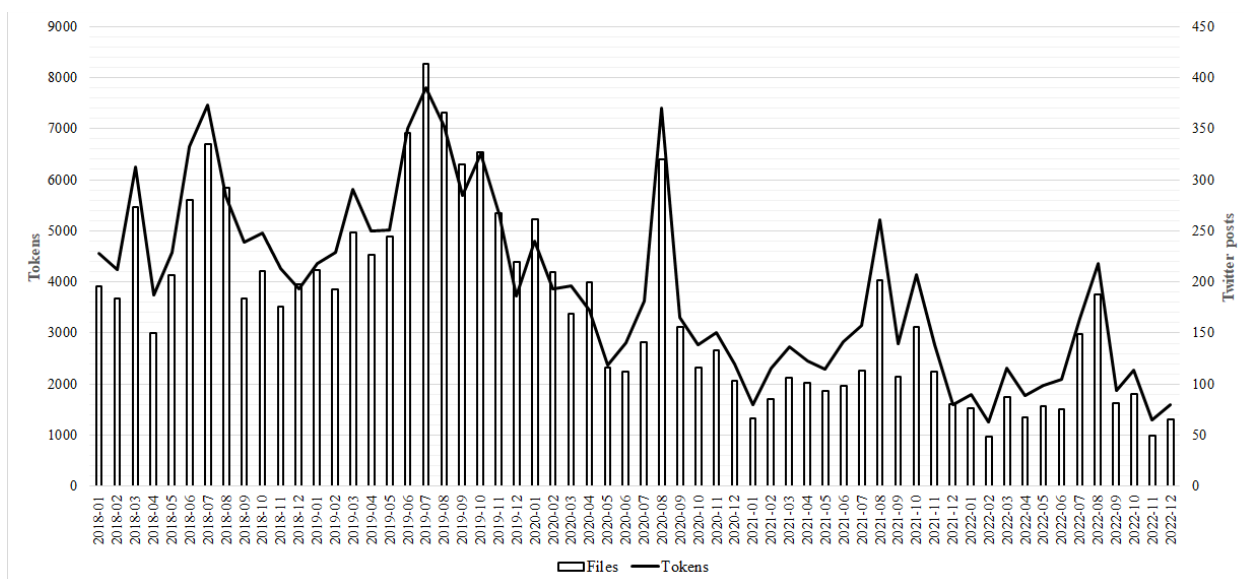


Figure 1. Number of Twitter posts (files) and tokens per month.

While there is a trend towards a lower number of posts towards the latter stages of the corpus, the average post length indicates that, if anything, the posts are marginally longer. The post length means and standard deviations (s.d.) are as follows:

- 2018: 22.720 tokens, 10.995 s.d.
- 2019: 20.097 tokens, 11.421 s.d.
- 2020: 21.460 tokens, 12.790 s.d.
- 2021: 25.693 tokens, 12.244 s.d.
- 2022: 24.529 tokens, 12.188 s.d.

Further analysis is required to make sense of any correlation between the number of posts and their length, which could be informed by the preferences of individual team members. However, the standard deviations did not change as significantly as we might have expected if there had been a shift in communicative strategy.



Before we discuss the keywords that distinguish the annual sub-corpora in our data, we offer a brief overview of the prevalent terms in the corpus overall, as identified through a keyness comparison with the E-language component of the BNC2014 (Brezina *et al.*, 2021). This sub-corpus comprises 5,291,594 tokens (2,381 files) of data in the form of posts on Twitter, Facebook, blogs and forums, as well as emails, SMS instant messages and online reviews.

#### 4.1.1 @LancasterUni keywords

Table 2 shows the thematic categories that we have determined for the top 100 keywords in our Twitter corpus when ranked by Log Ratio score.

Thematic category	Keywords (occurrences)
Direct address	@lancsunilec (314), @lancastersu (270), @lancastermanage (185), @lancasterunilib (111), @licaatlancaster (111), @lancuniphysics (106), @lancsuniscitech (104), @profsueblack (97), @lancasterarts (92), @scc_lancaster (91), @lancaster_words (91), @lancsunien (86), @lancsunilaw (84), @sociologylancs (71), @lancastermedsch (67), @lael_lu (66), @lancasteruni (63), @lancasterhistor (61), @countycollege (59), @conversationuk (58), @pprlancaster (57), @ucas_online (52), @thetimes (51), @lancasterfass (50), @delclancaster (47), @hiclancaster (47), @green_lancaster (45), @imaginationlanc (42), @lancsunimaths (40), @lupscentre (38), @lancastercityuk (36), @sportlancaster (36), @lancastercc (35), @gradcoll (35), @pendlecollege (35), @uniofyork (35), @cgeinnovation (35), @adatomy (34), @lancscareers (33), @bowlandcollege (32), @jim_wild (32), @lancaster_help (32), @fyldecollege (31), @williamsonpark (30), @dustinhosseini (30), @lancaster_fhm (29), @edreslancaster (27), @mikebernerslee (26), @geospacedman (26), @campusinthe city (25), @lancspsychres (25), @bbcradio4 (25), @the_storey (25), @compuniguide (24), @timeshighered (24), @futurelearn (24), @ukri_news (23), @blslancasteruni (23)
Celebratory	#LoveLancaster (960), #LancasterLeads (245), #LUMadeIt (173), #HelloLancaster (80), #FromOurArchive (55), #FestiveLU (48), #LUGlobal (33), #FridayFeeling (30), #LUSummer (27), #GoodUniGuide (24)
Social media team personnel	^david (896), ^morganna (691), ^luke (669), ^mathew (558), ^hollie (279), ^rachel (114), ^cat (39), ^louise (36), ^laura (34), ^paul (27)
University events and initiatives	#Gradcaster (104), #RosesAreRed (56), #LUEasterEggHunt (66), #Roses2018 (50), #LUDuckHunt (32), #NoMow (28), #Clearing2022 (24)
Grammatical elements	's (563), 're (297), n't (148), 've (109), £ (84), 'll (58)
Visual elements	(197), ★ (36),   (32), — (24)
External events	Covid-19 (47), #COVID19 (43), #ALEvelResults2019 (23)

Links and contact information	<a href="https://t.co">https://t.co</a> (37), 9542 (28)
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Table 2. Keywords in the Lancaster University Twitter corpus.

These keywords demonstrate the frequent use of @-tags to directly address and promote other profiles, which are predominantly university departments (typically indicated by the inclusion of ‘lancaster’/‘lancs’), colleges (@countycastle, @gradcoll, @pendlecollege, @bowlandcollege, @fyldecollege), personnel (@profsueblack, @jim\_wild, @adatomy) and initiatives (@campusinthe city). There is also engagement with locations and activities in the wider city of Lancaster (@lancastercityuk, @williamsonpark, @the\_storey), academic associates (@ucas\_online, @uniofyork, @futurelearn, @ukri\_news) and media (@conversationuk, @thetimes, @bbcradio4). This use of @-tagging more typically demonstrates a means of notifying and promoting the recipient of the tag, rather than indicating a direct reply to a previous post.

The selection of user profiles targeted by @LancasterUni indicates a strategy for promotion of the activities of its personnel and departments. This practice is not optimised for facilitating dialogue, given the short-form conventions of microblogging and since there are likely to be alternative forms of internal communication between staff and departments of the same university. The category of keywords we have labelled Celebratory similarly demonstrates promotion of the University’s achievements, past and present (#LancasterLeads, #LUGlobal, #FromOurArchive), as recognized by national media (#GoodUniGuide), alongside celebrating the recruitment of students to the University and local community (#LUMadeIt, #HelloLancaster), as part of a wider appreciation of the region (#LoveLancaster). This celebratory tone is also offered in relation to seasonal trends (#FestiveLU, #LUSummer) and sentiments more generally associated with social media practices (#FridayFeeling). These celebratory hashtags demonstrate what are reported (i.e., by Zappavigna, 2018) to be the two key functions of hashtags, generally: i) enabling ‘searchable talk’ and the aggregation of posts orienting around a shared topic; and ii) providing evaluative metacommentary. As such, a hashtag such as #LUGlobal serves to generate an ever-growing archive of the University’s contribution to global (academic) events, while the hashtag #LUMadeIt invokes a mark of success, typically deployed in response to other users sharing news about their exam results as a step towards their enrolment with the University.

The category University events and initiatives also exclusively comprises hashtags, marking recruitment activities (#Clearing2022) but also ceremonial events (#Gradcaster – a portmanteau of ‘graduation’ and ‘Lancaster’) and seasonal events (#LUEasterEggHunt). Lancaster University participates in an annual sports competition with the University of York, which is predicated on the historical civil wars; this is known as the ‘Roses’ Tournament, based on the respective emblems of the red rose (Lancaster) and white rose (York). Twitter serves as a useful platform through which to provide live updates of the sporting events and the use of the rallying call #RosesAreRed, encouraging support for Lancaster University representatives and celebration for achievements.

A separate category of keywords captures references to events external to the University. This includes the hashtag #ALEvelResults2019 – which is not strictly a university event, but which has direct correspondence with university recruitment – and keywords referring to the Covid-19

pandemic, demonstrating its significance as a global event and the regular engagement with the topic by the @LancasterUni profile, as we discuss in Section 4.2.2.

In the category of Social media team personnel, we find explicit examples of the Message Personalization practice (Liebrecht *et al.* 2021) of providing a signature for a post. This reflects the fact that there are multiple team members generating content for the profile, which is a common practice in ‘customer service’ style social media content (Page, 2014). The Visual elements category demonstrates another aspect of the Conversational Human Voice, as visual components are understood to promote familiarity and engagement (Luzón, 2023).

The keywords categorized as Links and contact information indicate that Twitter may not be the optimum mode for extended information (given the character limit and typical user habits); hyperlinks provide a direct link to resources better suited to providing longer texts (such as blogs, news articles and research papers) and the keyword ‘9542’ represents part of a telephone number to facilitate direct, spoken interactions.

What we can see from specific examples is that these keyword elements are often used in combination, as in the following:

- (1) Congratulations to all our new students set to join us at Lancaster University. We can’t wait to welcome you! 🙌🎉  
#LUMadeIt #LoveLancaster #ALEvelResults2019 <https://t.co/aLMZfNunW1>

Furthermore, it is important to check the distribution of key features. Hashtags, in particular, are oriented around specific timeframes. For instance, while A-Level Results are delivered on an annual basis, most users will only find one set of results relevant to them and therefore, it is useful to differentiate e.g., #ALEvelResults2018, #ALEvelResults2019, etc.

#### 4.1.2 Emoji activity

The frequency of emoji characters is pertinent to our study of the use of a CHV, and we identified 14,391 emoji tokens, according to 816 types, in the whole corpus. The implementation of our corpus annotation enables the simple computation of frequency and distribution of the collated emoji characters in the corpus. Figure 2 shows the frequency (indicated on the left axis) and relative frequency (per ten thousand, right axis) of emoji characters for each month across the corpus. The frequency of emoji declines after the end of 2019, corresponding with the decrease in posts shown in Figure 1. However, the relative frequency of emoji throughout 2022 (mean 570.23, s.d. 80.60) is slightly higher than 2018 (mean 497.21, s.d. 85.72), with peaks in 2019.

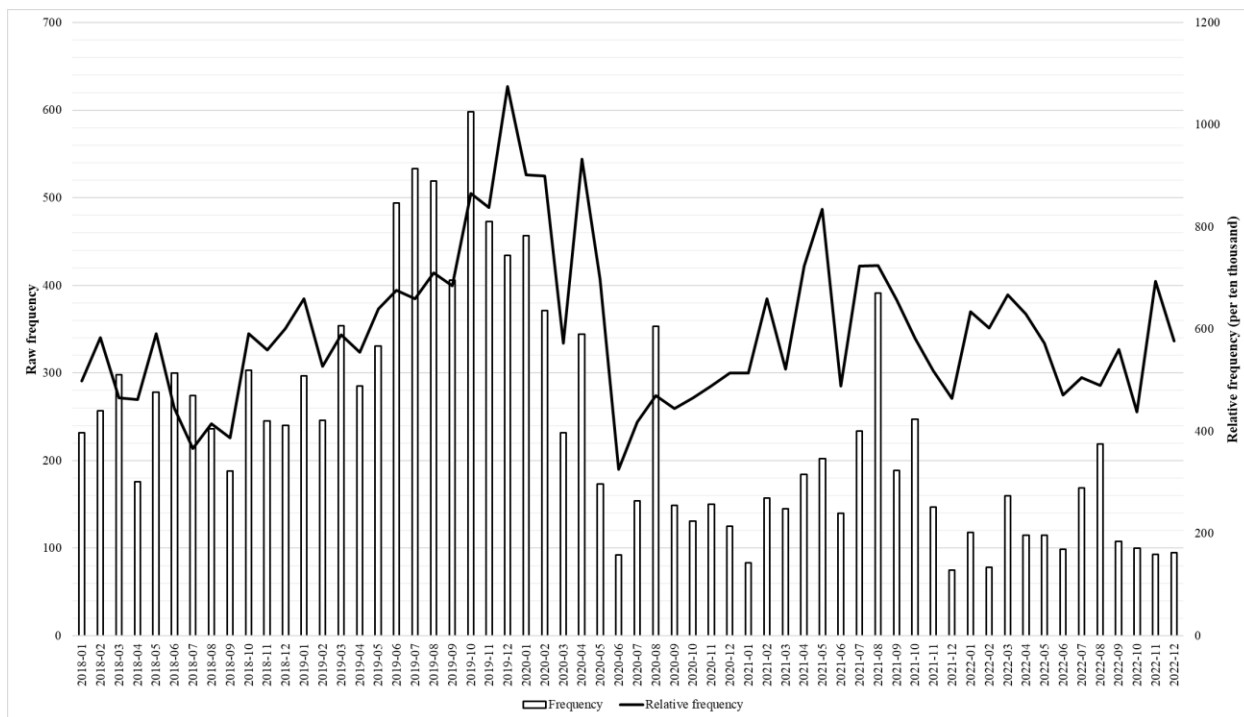


Figure 2. Frequency and relative frequency of emoji characters per month.

In terms of individual posts, 7,402 (70.65%) include at least one emoji, and of the remaining posts, 316 (3.02%) include an emoticon. Emoticons were identified by manually reviewing the results of a corpus query of strings with punctuation characters. Once the sequences that were identified as ‘non-emoticons’ were removed, the remaining combinations were then queried to check their frequency and occurrences in individual posts. This means that there were 2,759 (26.33%) posts with no emoji or emoticons. For each year, the average proportion of posts that include an emoji remains relatively consistent, ranging from 67.08% in 2022 to 79.63% in 2019.

Table 3 shows the most frequently used emoji in the corpus, providing a broad indication of the content alongside the keywords discussed above.<sup>4</sup>

Emoji character	Short name	Unicode tag	Frequency
👉	Backhand Index Pointing Right	U+1F449	1566
👏	Clapping Hands	U+1F44F	969
😊	Smiling Face with Smiling Eyes	U+1F60A	570
🦆	Duck	U+1F986	409
👇	Backhand Index Pointing Down	U+1F447	405
❤️	Red Heart	U+2764	397
🎉	Party Popper	U+1F389	316

<sup>4</sup> Emoji characters are not specially annotated in the E-language sub-corpus of the BNC2014, meaning that we could not conduct a keyness comparison.































	Raising Hands	U+1F64C	311
	Graduation Cap	U+1F393	310
	Camera with Flash	U+1F4F8	309
	Rose	U+1F339	269
	Waving hand	U+1F44B	210
	Camera	U+1F4F7	177
	Winking Face	U+1F609	163
	Spiral Calendar	U+1F5D3	154
	Backhand Index Pointing Left	U+1F448	147
	Smiling Face with Heart Eyes	U+1F60D	139
	Christmas Tree	U+1F384	134
	Snowflake	U+2744	127
	Link	U+1F517	116
	Round Pushpin	U+1F4CD	114
	Books	U+1F4DA	104
	Seedling	U+1F331	104
	Sun	U+2600	99
	Face with Open Mouth	U+1F62E	96

Table 3. Top 25 most frequent emoji characters in the corpus.

The emoji characters , , , , ,  indicate positive reactions, as shown in Example (1), and thereby demonstrate one of the common interpersonal functions of Twitter posts generally (Zappavigna and Logi, 2021). Similarly, the emoji  is described at Emojipedia.org (Zedge Inc., n.d.) as ‘slack with surprise or shock, as if saying *Wow!* or *Oh my!*’ and ‘[m]ay convey such feelings as awe or disbelief’. In the data,  is typically used as an expression of awe in response to celebrated events, e.g.:

- (2) You know you’ve made a breakthrough when your project is referred to by the CEO of Microsoft! 

We can also include the emoji  among those that serve an interpersonal function, given its use to acknowledge and greet other users.

We can use the corpus annotation to conduct a more inclusive search of emoji characters that we determine to have meaningful shared thematic or affective elements. For example, we can use the query `/description="smiling.*"/` to collate the examples  (Smiling face with smiling eyes, U+1F60A) and  (Smiling face with heart eyes, U+1F60D), and this would also incorporate  (Smiling face, U+263A),  (Smiling face with sunglasses, U+1F60E),  (Smiling face with halo, U+1F607),  (Smiling face with horns, U+1F608),  (Smiling cat with heart eyes, U+1F63B),  (Smiling face with open hands, U+1F917),  (Smiling face with hearts, U+1F970) and  (Smiling face with tear, U+1F972). This query resulted in 864 occurrences in

the data. Further annotation could be applied to mark other meaningful groupings (e.g. animals), if these do not readily correspond with the short name descriptors.

The emoji 🙄 provides an example of the ‘Interpretative’ function described in Escoufflaire’s (2021: 227) taxonomy of emoji functions, in ‘[s]ignaling the presence of an implicature in the message and guiding the interpretation of the implicature’, e.g.:

(3) As you know Kerrie, the sun always shines up here in Lancaster! 😏

In Example (3), the 😏 can be interpreted as signalling irony, in that Lancaster has a reputation for a high occurrence of rain (The Newsroom, 2018) rather than sun, as asserted in the propositional content of the post.

The emoji 📌, 📍, 📅 and 🔗 function to index information – specifically, hyperlinks that correspond with events and resources introduced in the posts. Their use is largely Referential (Escoufflaire, 2021), though they also perform structural functions in highlighting where interactive or informative content appears in the post. Scheduling information pertaining specifically to times and locations is marked using the emoji 📅 and 📍, e.g.:

(4) Be one of the first to see plans for a new lecture theatre coming to @LancasterFASS later this year!

📅 Thursday March 7th, 12.30pm

📍 County South PDR

🔗 <https://t.co/Uo3wV73h9S> <https://t.co/6842CknsTA>

The emoji character 🎓 is used to indicate graduation ceremonies, specifically, but also the general student population. Similarly, 📖 can accompany the promotion of specific monographs or represent the concept of study, more broadly. The 🌹 emoji carries a representational meaning that is particular to Lancaster (University), its association with the Roses tournament, as explained above, but likewise also has a metonymic function as an emblem of the county of Lancashire. The utility of the corpus annotation is demonstrated by the collocation analysis that is made possible through the *GraphColl* tool in *#LancsBox X* with 🌹 as the node. This allows us to formalise our observations of the co-occurrence of the emoji character and the tokens, ‘#RosesAreRed’, ‘#Roses2018’, ‘roses’, ‘York’, ‘#LancashireDay’, ‘#LoveLancaster and ‘beat’ – which are the top collocates of 🌹.<sup>5</sup> These collocates reiterate that the emoji is used as an emblem of both the city of Lancaster and, more specifically, the competitive sports events involving the University of York.

A small number of frequently occurring emoji direct us to a strategy that locates the poster – and, by proxy, the reader – within the campus environment. Firstly, the emoji 📷 and 📸 reflect the common practice of @LancasterUni to share photographic images, which are typically of the campus and the local area. Such images offer a view of the environment that contributes to a sense of place and community, which gained significance during periods of social distancing. The 🏡 emoji also bears a strong association with the University campus, as representative of

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<sup>5</sup> According to the default settings in *#LancsBox X*, which include a collocational span of L5< >R5, a minimum frequency of 5 occurrences and ranks collocates according to the Log Dice measure. Emoji are not considered potential collocates when using our annotation scheme, as they are not denoted as tokens.

the local wildlife and the emoji 🌱 similarly captures references to local plant life, in addition to its more general use to represent the natural world. Consistent with key hashtags, @LancasterUni also marks seasonal variation in terms of the visible changes in the weather in the area local to campus (❄️, ☀️), alongside the manufactured – and less region-specific – emblems of the season (🎄).

Table 4 indicates the top 10 most frequent emoji characters for each year of the corpus, alongside the absolute and relative frequency, reported per ten thousand words. The emoji characters that appear in the lists are largely consistent when we compare each annual frequency list and compare with the overall top 25 emoji characters in the corpus (see Table 3).

		2018			2019			2020			2021			2022	
		AF	RF		AF	RF		AF	RF		AF	RF		AF	RF
1.	👉	396	64.89	👉	402	59.23	👉	324	74.11	👉	267	78.73	👉	189	72.90
2.	🎉	169	27.69	👉	390	57.47	👉	241	55.13	👉	153	45.11	👉	120	46.28
3.	👉	140	22.94	😊	277	40.82	😊	139	31.80	👉	136	40.10	👉	108	41.66
4.	📺	81	13.27	👉	245	36.10	❤️	125	28.59	📅	110	32.43	🎓	57	21.98
5.	🎓	76	12.45	❤️	172	25.34	📺	89	20.36	🔗	102	30.08	📺	54	20.83
6.	👉	71	11.63	👉	142	20.92	👉	76	17.39	📺	87	25.65	🎉	45	17.36
7.	👉	70	11.47	🎓	138	20.33	👉	61	13.95	😊	63	18.58	📅	40	15.43
8.	👉	66	10.81	🌹	119	17.53	🌹	56	12.81	👉	39	11.50	📺	40	15.43
9.	😊	61	10.00	👉	85	12.52	👉	53	12.12	🔔	38	11.20	👉	30	11.57
10.	🌹	61	10.00	🎉	74	10.90	😊	51	11.67	🎉	30	8.85	😊	30	11.57

Table 4. Top 10 frequent emoji for each year, including absolute (AF) and relative frequencies (RF, per ten thousand words).

There are some fluctuations in the relative frequency values which could prompt us to consider combinations of values. For example, the characters 👉, 👉 and 🎉 occupy different rank positions each year and occur with different relative frequencies; nevertheless, it is worth considering the combined relative frequencies of emoji that serve a comparable communicative function (e.g., congratulating) to account for the individual preferences of members of the social media team. More nuanced differences in the meaning could be determined by examining concordance lines.

The frequency lists shown in Table 4 provide a preliminary entry point to consider differences across the time periods represented in the corpus. For instance, 🎓 does not appear in the frequency lists for 2020 and 2021 and when we check the occurrences, we confirm lower relative frequencies for both 2020 (4.35 per ten thousand) and 2021 (5.90). We have established that this emoji is typically used as an emblem of graduation ceremonies and with such events being postponed in 2020 and 2021 (discussed in Section 4.2.2 below), there may have been less visible celebration of the graduations on social media; communicating alternative arrangements would likely have been a higher priority than conveying Informal Speech elements of a CHV, such as emoji characters.

Our overview of features of the @LancasterUni Twitter corpus has demonstrated practices observed more widely in university social media activity, namely the dissemination of information, links to a somewhat insular ecosystem of users and resources, and a generally positive tone (Kimmons *et al.*, 2017). In terms of both number of posts and number of emoji per post, the evidence suggests an upward trajectory in the months that led up to the Covid-19 pandemic, followed by a decline. However, it is important to note that the relative number of emoji per post was consistent, despite the reduction in the number of posts. While basic frequency counts can offer a preliminary view of the data, a more systematic approach is required to identify statistically meaningful observations. As such, in the next section, we report our keyness analysis, which was designed to highlight distinctive words and emoji in each year. In our analysis of the three phases that we have determined around Covid-related restriction measures, we consider qualitative differences i.e., *what* is posted, alongside the number of posts reported in this section, to assess the extent to which changes in activity are related to the pandemic and associated restrictive measures.

#### 4.2 Keywords and key emoji by phase

We have conducted our keyness analysis according to annual sub-corpora and focused on how restrictive measures in the UK have shaped Lancaster University's communications via Twitter. Restrictive measures in response to Covid-19 were recommended or enforced by the UK government throughout 2020-2021, with the first of a series of 'lockdown' periods coming into effect in England on 26 March 2020, as part of the Health Protection Regulations (Public Health England, 2020). From March 2020 onwards, restrictive measures were periodically eased and re-enforced, with a second nationwide lockdown beginning on 5 November 2020 and a third announced on 6 January 2021. In February 2021, the UK Government set out its 'roadmap' towards relaxing restrictions, and when the 'Omicron' variant of the virus emerged in late 2021, the government championed a vaccine booster campaign as part of wider efforts towards 'living with Covid' (Cabinet Office, 2021). Thus, the events of 2020 and 2021 were characterised by Covid-related restrictions, which required the public to keep abreast of the changing regulations, particularly given the introduction of a 'three-tier' system that applied different restrictive measures according to variations in the number of cases by region.

Based on these restrictive measures, our findings are presented according to three phases:

1. Pre-pandemic: incorporating findings from 2018 and 2019
2. Navigating Covid restriction measures: covering 2020 and 2021
3. Following Covid-related restrictions: 2022.

This structure allows us to identify features that we can relate to the specific events of each phase and consider the extent to which these align with the broader strategies of the team behind the @LancasterUni profile. Identifying key items for each year enabled us to discern items that characterised the individual years from those that were more indicative of the pandemic 'phases', as we have defined them. For instance, we assert in Section 4.2.2 that activities related to restriction measures extending over the years 2020 and 2021 can be differentiated from seasonal events that are scheduled according to the calendar year. Furthermore, because there was only data from one calendar year available in the final phase, and because there was an overall decline in the number of posts per year (see Figure 1), conducting keyness analyses for annual sub-



corpora helped to regularise the timespan of the comparisons and to avoid greater disparities in the sample sizes that would result from the combined frequencies within a phase (see Table 1). Finally, the annual sub-corpora are smaller than the combined ‘phase’ sub-corpora, and thereby provide a greater opportunity to identify shifts in the use of different lexical items (e.g., changing hashtags) that capture some pertinent aspect of the phase.

Combining the content from 2018 and 2019, the pre-pandemic phase of the data comprises 6,063 posts (128,894 tokens). The second phase amounts to 3,357 posts (77,629 tokens); and the final phase comprises only the 1,057 posts (25,927 tokens) from 2022. To aid our comparative analytical discussion, we present the keywords according to thematic categories based on the prevailing use of the terms, which we have determined through close examination of concordance lines. These consistent themes serve to demonstrate that despite differences at the lexical level, the Twitter content attended to a relatively limited range of functions and topics throughout all three phases.

#### 4.2.1 Pre-pandemic: 2018 and 2019

The keywords and key emoji identified for the 2018 and 2019 sub-corpora highlight features of the data that are distinct from @LancsterUni Twitter content that followed the onset of the pandemic and are summarised in Table 5.

Thematic category	2018	2019
‘Hate speech’ response	seriously (7), <a href="https://t.co/zjthtkgdsk">https://t.co/zjthtkgdsk</a> (6)	
Direct address	@electricitynw (11), @easst2018 (9), @fentykiki (8), @james_sweeney (7), @adsoc_lu (6), robyn (6), @ski_fans (6), @thenwafor (6), @the_little_pea (8), @stagecoachcnl (10), @cartmel_college (14)	@rasnam2019 (16), @rosejamesauthor (8), @jcelt (7), @thepeonyfox (7), @youngquantum (7), @mgwhitfield (13), @festivalbugs (12), @lu_isolab (16)
Celebratory	#GoodVibesOnly (21), #FunAtWorkDay (17), #CUG2019 (16), #JanuaryHighs (11), ipad (9), buzz (7), Top100 (7), #SpringSeason (6), #FromOurArchive (49), #Top10 (11)	#GoodUniGuide (24), #JoinUsBeInspired (10), #ThisHappened2019 (9), #DiscoverNationalParks (8), #CUG2020 (7)
Social media team personnel		^lauren (12)
University events and initiatives	#Roses2018 (50), #LUDuckHunt (32), #LUREsearch (19), #StoriesFromTheSpine (14), #LULifeHacks (12), Deli (8), #LUChange (7), #LUGoldenDuck (7), hunters (6), Portuguese (6),	#NPAW2019 (16), #N8Postdocs (16), #NAM2019 (10), postdoc (9), #AskAlumni (8), #LUWelcome (8), #WorkWithLU (7), #LUL19 (7), #Roses2019

	#EASST2018 (6), chatting (18), egg (17), union (11), golden (16)	(10), ISS (15), planet (17), #NOVALancaster (10)
Visual elements	👉 (140), 🏠 (5), 🍷 (6), ⚽ (18), 🧑 (17)	★ (36), 🖍️ (17), CN (12), 🍀 (8), 🧑 (7), 💬 (7), 🤔 (7), PT (6), 📧 (5), 📩 (5), 📧 (5), 📧 (5)
External events	halloween2018 (8), week (7), #GreenGB (6), #WEF18 (6), #WorldCup (6), cup (11), match (8)	#ALevelResults2019 (23), #Spookcaster (21), #ALevelResultsDay (9)
Marking time	2018 (66)	2019 (67)
Links and contact information	<a href="https://t.co/llryngslb0">https://t.co/llryngslb0</a> (14), <a href="https://t.co/dnsay0iq2e">https://t.co/dnsay0iq2e</a> (7)	

Table 5. Thematic categories of 2018 and 2019 keywords (occurrences).

The first thing to note is the category that applies to 2018 data only: ‘Hate speech’ response. This category captures keywords that feature in multiple versions of a message addressing an incident in which representatives of the University Students’ Union were photographed at a white T-shirt social event<sup>6</sup> where some of the messages written on the shirts caused offense. In the days that followed, the @LancasterUni social media team addressed queries and discussion on Twitter, resulting in messages such as the following:

- (5) @sophie0 Hi Sophie. I just wanted to reassure you that this is being taken very seriously by the Students' Union and the University. Lancaster does not tolerate hate speech. This piece from the VC explains the response so far <https://t.co/zJThTKgDsK> ^Luke

In such cases, following the initial personalised address, providing a clear and consistent message appears to be a higher priority than including further Message Personalization or Informal speech features (such as emoji), which could be deemed inconsistent with the serious tone of the message. The consistency with which this message was delivered accounts for the relative frequency of its constituent terms (e.g., ‘seriously’).

The Direct address category shows that there are a small number of user profiles who are targeted for a limited period – i.e., they are key because they do not feature regularly across the corpus – and these are less likely to be user profiles that represent university departments and personnel. Indeed, @easst2018 is an example of a profile that was created specifically for an event hosted in 2018.

Similarly, the Celebratory category includes hashtags that are linked to events at specific times, although the examples #CUG2019 and #CUG2020 in 2018 and 2019, respectively, demonstrate that announcements which influence university activities (in this case the Complete University Guide), can be issued in anticipation of forthcoming business.

We can see from Table 5 that 49 of the total 55 instances of #FromOurArchive appear in 2018, indicating that this was a template for content that was not used regularly in the years that

<sup>6</sup> A type of gathering at which attendees wear a plain white T-shirt, with others encouraged to add comments and phrases using colourful marker pens over the course of the event.

followed. Similarly, in the category of University events and initiatives, there are a number of hashtags that provide schema for content indicated to be of relevance to campus residents (#StoriesFromTheSpine, #LULifeHacks), including specific events (#Roses2018, #LUDuckHunt, #LUGoldenDuck). Such events also account for the keywords ‘hunters’, ‘egg’ and ‘golden’ (linked to the #LUDuckHunt activity). Keywords in this category for 2019 show that research events and collaborations (#NPAW2019, #N8Postdocs, #NAM2019, #NOVALancaster) were more regularly promoted by the @LancasterUni profile at this time.

Among the Visual elements, the key emoji 📌 and 🔗 are variants of a practice that persists across the corpus, namely the indexing of key information, as discussed above. However, 140 of the total 150 instances of 📌 occur in 2018, indicating that this variant of the practice was less favoured after this time. Examples show that the ‘pointing left’ emoji typically occurs in combination with the right-side equivalent, as in 📌 [URL] 🔗, but that after 2018, the single ‘pointing right’ emoji was preferred and – as shown in Table 3 – the most common emoji character in the data.

The visual elements that were key for the 2019 sub-corpus indicate the themes of External events. For instance, the emoji 🧛 accompanies announcements relating to a series of events organised around Halloween (see also #Spookcaster) that explored Lancaster’s historical witch trials. The inclusion of such emoji, alongside verbal mentions of the referent (i.e., ‘witch’), highlight the Aesthetic function of emoji (Escoufflaire, 2021), as such instances do not provide new information but can offer a more visually stimulating post.

#### 4.2.2 Navigating Covid restriction measures: 2020 and 2021

The first acknowledgement of the novel coronavirus in the @LancasterUni Twitter data appears in a message posted on 27 January 2020, in response to a query from another user, as follows:

- (6) @Konyalti Hi. Thanks for your question. You can find out about action taken here at Lancaster within the information on our website: <https://t.co/kBOVT5AHtq> ^Luke

The link in the post directs viewers to a specific ‘coronavirus update’ University webpage, demonstrating that the University had already prepared some relevant information. The next mention does not appear until 13 March 2020 – again in response to another user’s query. In this second instance, the addressee is directed to an email address for ‘the coronavirus mailbox’. As such, the University appears to have chosen to facilitate discussion of the developing pandemic situation in other modes (such as webpages and email) while opting for a responsive approach on Twitter that involves signposting to other resources rather than producing announcements.

The timing of these initial queries corresponds with the spread of the coronavirus disease that would come to be known as Covid-19. Table 6 shows the keywords and key emoji for 2020 and 2021. As was the case in 2018, a specific incident in July 2020 – relating to controversial comments made by honorary Lancaster University graduate, Dr David Starkey – prompted a series of regularised posts from @LancasterUni, as follows:

- (7) @raikeswood Hi Gareth. Thank you for getting in touch. We were also outraged by those comments. Here is the response we posted earlier today ^David  
<https://t.co/MqnITuMW72>

In this instance, the extant source was a self-initiated Twitter post from @LancasterUni. In the post, the social media team demonstrates its CHV in the expression, ‘We understand and share the outrage that these comments have provoked’, which is also evident in Example (7).

Thematic category	2020	2021
‘Outrage’ message	outraged (13), comments (19), earlier (17), posted (13)	
Direct address	@tsrmatters (9), @robertw70139746 (6), @asykulski (5), @electionmapsuk (5), @dohertylawteach (7), caroline (8), @n8research (13), @puiyin (10), IG (26)	@philmartin26 (13), @lancasterstaff (8), @lancastermedics (9)
Celebratory	#WeAreTogether (13), jumper (8)	#StrongerTogether (5), #HistoricCity (5), worldwide (7), #TBT (8)
Social media team personnel	^lara (12), ^manu (9), ^paul (25), ^sarah (13)	
University events and initiatives	#Clearing2020 (7), #LUClassOf2020 (8), appeal (7), #DesktopNorman (7), #N8Women (7), #N8NewPioneers (6), #MyLancasterUni (5), #WeWearRed (5), #LancasterGrad2020 (6), carers (12)	#LUCOP26 (14), #TheLancasterExchange2021 (5), submit (8)
Visual elements	(32), — (24), ▢ (10), ▹ (10), ◀ (10), ▴ (10), ⦿ (6)	📅 (110), 🔗 (103), 📞 (19), ❤️ (12), 🤖 (10), 🎬 (9), ! (9), ⌚ (7)
External events	#IWD2020 (8), #GenerationEquality (6), #MeAt20 (6), #WFH (5), distancing (8), #COVID19 (33), vegan (13), lockdown (19)	#COP26 (20), #StressAwarenessMonth (8), #ResultsDay2021 (5), jab (8), gp (7), #GetVaccinated (5), vaccination (16), vaccine (15), lgbt+ (6), glasgow (8), clinic (14), registered (7), 18 (8), clinics (11), tests (8), required (13)
Marking time	23rd-30th (5), bst (20), 2020 (55)	2021 (32), 2:30pm (9), 1:30 (9)
Links and contact information	<a href="https://t.co/cxncrvqj1">https://t.co/cxncrvqj1</a> (7), <a href="https://t.co/mqnitumw72">https://t.co/mqnitumw72</a> (6), coronaqueries@lancaster.ac.uk (9), <a href="https://t.co">https://t.co</a> (26)	<a href="https://t.co/sftyed2wiq">https://t.co/sftyed2wiq</a> (6), +44 (11)

Table 6. Thematic categories of 2020 and 2021 keywords (occurrences).

Keywords for 2020 in the category of University events show that despite the need to postpone in-person events as part of the restrictive measures, @LancasterUni continued to promote events such as graduation (#LUCClassOf2020, #LancasterGrad2020), recruitment (#Clearing2020) and research partnerships (#N8Women, #N8NewPioneers). Furthermore, the @LancasterUni team engaged with wider external events such as #IWD2020 (International Women's Day), seasonal events indicated by the keywords [Christmas] 'jumper' and 'vegan' (prompted by 'Veganuary'), and social media trends (#MeAt20).

Outside of the Christmas (jumper) season, the only keyword we classified as Celebratory was the hashtag #WeAreTogether and this captures a sense of solidarity expressed – albeit not exclusively – in relation to efforts to mitigate the effects of Covid-19. The use of this hashtag is comparable to the 2021 keyword #StrongerTogether, which refers to community and research collaborations more generally. Indeed, #WeAreTogether was used specifically in the context of the campus community, as shown in this sequence of posts:

- (8) We're tremendously proud of Lorna Harrison and her @BowlandCollege colleagues for their work to support students during the Covid-19 crisis. They've been nominated for a Student Accommodation Hero Award <https://t.co/WionCwhRcG> 🙌 #WeAreTogether <https://t.co/yE3glRNTwF>
- (9) Lorna and the team put together goody bags for students who were still on campus through lockdown and the Easter break. They wanted to show students they were being thought of while also helping them stock up without having to visit shops #WeAreTogether
- (10) As lockdown continued they regularly checked in on students – many of them a long way from their families – to make sure they had what they needed and help with food shopping, appointments and prescriptions #WeAreTogether
- (11) “As strange as it sounds, it has helped us get to know more of our students,” said Lorna. “It's been a very challenging time for everyone, so the fact that one of our students has taken the time to acknowledge our efforts is overwhelming.”  
Well done to Lorna and the team 🙌

These sequential posts celebrate 'heroic' individual and collective efforts of University staff directly in response to lockdown measures. There is a high degree of CHV indicated in the use of 'we' and 'our'; the representation of the individual voice of 'Lorna'; and the expression of emotion in being 'proud' of the staff, the empathy for the students, and the acknowledgement of 'challenging' times.

The keywords, 'lockdown', 'distancing', '#COVID19' and '#WFH' further capture aspects of experiences under restrictive measures. This includes efforts toward continuing (safely) with 'ordinary' university activities, adaptations and coping strategies in response to restrictive measures, and the perspectives of students as they encounter modified ways of living and working on campus. The hashtags #COVID19 and #WFH function to establish the context, as does the prepositional phrase 'during lockdown'.

The 2021 keywords reflect a focus on the vaccination campaigns that began in December 2020 in the UK and continued throughout 2021. The keywords 'jab', 'gp', '#GetVaccinated', 'vaccination', 'vaccine', 'clinic', 'registered', '18', 'clinics', 'tests' and 'required' all refer to the availability of and stipulations for getting vaccinations, e.g.:

- (12) A walk-in vaccine clinic is open tomorrow from 9am to 7pm at our @HICLancaster on campus. So if you're over 18, in the local area, and haven't had your first #CovidVaccine jab, please head over and #GetVaccinated! No appointment or GP registration required. <https://t.co/pqZkcGEkbg>

We also see the impact of Covid-19 restrictive measures in the Visual elements, specifically the key emoji 🧐, reflecting the adoption of face masks. More generally, however, the Visual elements do not offer much evidence for elements that are specific to the events of 2020-2021; rather, the key emoji can be considered variants of practices demonstrated across the corpus. For example, 🕒 and 🕒 were key for 2020 and 2021, respectively, used in similar ways to index time information for events promoted by @LancasterUni. Furthermore, the co-text of keywords for this phase provides evidence of strategies that are used consistently across the corpus, e.g.:

- (13) We're SO proud of how our Lancaster University community is supporting national, regional and local efforts in the face of the coronavirus crisis ❤️👏 #COVID19 #LoveLancaster  
<https://t.co/HJ9q8mFZE3>

In Example (13), although the post references the specific events surrounding Covid-19, the use of the positive affective emoji ❤️ and 👏, along with additional Informal speech features ('SO'), Message Personalization ('We're SO proud') and the inclusion of a 'metacommentary'-type hashtag demonstrating pride in the local area are features that reflect more long-standing strategies deployed by the @LancasterUni team.

#### 4.2.3 Following Covid-related restrictions: 2022

In February 2022, the UK Government produced advisory materials on 'Living with Covid' and retired a number of its dedicated Covid-19 web resources (Sherrington, 2022). National restrictive measures were no longer in place, meaning that people could – in principle – return to normal patterns of behaviour in terms of occupying public spaces, including universities.

The keywords for 2022, as shown in Table 7, do not show any evidence of Covid-related content specific to 2022. Rather, what we can see are variations of content and practices much like those we have observed in data from other times in the corpus.

Thematic category	2022
'Incident' message	involve (13), UCLan (13), incident (12), institution (15), directed (13), central (14), aware (16), enquiries (13)
Direct address	@runshawcollege (8), @lancasterunifhm (14)
Celebratory	#WeAreInternational (12)
Social media team personnel	^ellen (11), ^elizabeth (9), ^holly (6), ^laura (22)
University events and initiatives	#Clearing2022 (24), phosphorus (9), blackpool (6), vacancies (17), fish (16), harassment (8), encourage (13)
Visual elements	(102), i (40), 🧩 (6)



External events	#ResultsDay2022 (11), 2023 (7), 2022 (35), #Results2022 (5), #ALEvels2022 (5)
Links and contact information	<a href="https://t.co/etofk7tata">https://t.co/etofk7tata</a> (11), <a href="https://t.co/xffyofjbne">https://t.co/xffyofjbne</a> (5), <a href="https://t.co/r2xuzrjjib">https://t.co/r2xuzrjjib</a> (5)

Table 7. Thematic categories of 2022 keywords (occurrences).

As was the case in 2018 and 2020, a small number of keywords relate to a specific response message, prompted by queries surrounding a controversial event in June 2022. However, in this instance, the incident involved students enrolled at the University of Central Lancashire, and so the Lancaster University message serves to clarify and redirect those who have mistakenly contacted @LancasterUni with their query, i.e.:

- (14) @tweetkre Hi. Please be aware this incident doesn't involve our institution. Any enquiries should be directed to University of Central Lancashire (UCLan) ^David

The remaining keywords correspond to the categories determined for keywords of other annual sub-corpora, and the corpus as a whole, thus indicating consistency in the themes of the posts. The variation, by which these specific types occur with relatively high frequency in 2022, shows once again that hashtags are typically designed to capture seasonal events and are updated accordingly (#Clearing2022, #ResultsDay2022). The variation also shows us the wide variety of research that is publicised ('phosphorous', 'fish'), and the changing membership of the social media team, as indicated by the new names in post signatures (^ellen, ^elizabeth). Finally, there are subtle indications of changing affordances and the integration of practices associated with social media. The 📱 emoji, for example, directs us to prompts for viewers to scan QR codes, e.g.:

- (15) 📅 29 November | 11am - 1pm,  
📱 Scan the QR code to join the Teams chat  
✉ Or email [transitions@lancaster.ac.uk](mailto:transitions@lancaster.ac.uk) <https://t.co/ArvAsFcXtH>

This demonstrates a diversification in the ways of engaging with university representatives and resources. The adoption of video-conferencing software such as Teams was accelerated by restrictive measures in response to Covid-19, and predictably, we see more frequent mentions and emoji promoting such tools. Perhaps more significantly, this represents another direction of readers away from Twitter in order to participate in alternative forms of communication. This may be related to the declining number of Twitter posts observed in Figure 1, for example if the University shifted some of its resources and efforts from Twitter content into managing these other platforms.

## 5. Discussion and conclusions

Our investigation has shown that the key themes of the content posted by the @LancasterUni Twitter profile largely correspond with what researchers have identified as common aspects of university social media content: news about campus events; a positive picture of university life; and links to other resources and Twitter profiles closely associated with the University (Kimmons *et al.*, 2017; Veletsianos *et al.*, 2017). The articulation of these themes principally involves features associated with Twitter and digital communication i.e., @-tags, hashtags and

emoji. Our analysis directed us to some instances of variation in the emoji used between years, however we determined that in many cases, alternative emoji performed comparable functions, such as the indexing of information using 📌 and 🔗, or the marking of time using 🕒 and ⌚. Ultimately, although our keyness approach served to highlight key differences at the lexical and emoji level, what we found was that the communicative strategies deployed by @LancasterUni during the disruption of measures intended to mitigate the spread of Covid-19 could still be summarised according to largely similar thematic categories as before and after the Covid-related restrictions. Furthermore, we were able to map these consistent thematic categories onto components of the Conversational Human Voice (CHV). For example, even key items that appeared to refer to events transpiring specifically from restrictive measures, such as the hashtags #WeAreTogether and #StrongerTogether, are examples of strategies for facilitating ‘proximity, receptivity, and immediate engagement’ (Creelman, 2022: 8). In short, we found the components of CHV to be consistent throughout the phases before, during and after the pandemic.

Examples in which a more serious tone was adopted, combined with minimal Informal speech and Message Personalization features, related to specific incidents separate from the impacts of the Covid-19 pandemic (such as the white T-shirt event in 2018). In the context of the unarguably negative effects of the Covid-19 pandemic and the restrictions in response to it, @LancasterUni Twitter posts did refer to the ‘lockdown’ context and subsequent impacts such as ‘#WFH’ (working from home). Responses included promoting solidarity, highlighting efforts to continue ordinary activities and new ways of working, and discussing strategies to cope with the restrictive measures. While universities may have been previously criticised for failing to acknowledge the challenges of student life (Veletsianos *et al.*, 2017), our analysis shows that the challenges associated with Covid-19 and the resulting restrictive measures were discussed in @LancasterUni tweets, even if this did not amount to more substantive changes in communicative strategy.

We found that @LancasterUni continued its focus on student recruitment during the pandemic, as indicated in the frequency of posts around A-Level Results Day (mid-August in the UK) and hashtags such as #ALevelResults, #LUMadeIt and #Clearing2022. Our observations therefore accord with those of Bularca *et al.* (2022: 22-23), who found – in their study of European university Facebook and Instagram content during the Covid-19 pandemic – that while universities posted about Covid-19 and vaccinations, they ‘tried not to put an emphasis only on the crisis situation’ and offered diversified content with the onus on maintaining ‘a favorable relationship with students, but also with potential students’. Arguably, the onus on maintaining a positive relationship with (potential) students has grown in importance, given the negative impact of Covid-19 on high school students’ readiness, willingness or ability to pursue higher education (Kim *et al.*, 2020). Furthermore, universities may look to highlight the ways in which they can offer students stability and continuity at a time when other aspects of their lives have been unsettled. Indeed, this aligns with the principles of encouraging resilience, reducing panic and reasserting institutional credibility observed by Mohlman and Basch (2022) in relation to universities in New York following the effects of the Covid-19 pandemic.

We observed a decline in the frequency of posts from late-2019 onwards, but it is important to note the relative frequency of emoji remained comparable with that of the earlier part of the



corpus, suggesting the continuation of the Informal speech aspects of a Conversational Human Voice style. It is not clear whether the reduction in posts was due to the onset of the Covid-19 pandemic or some unrelated cause, such as changes within the social media team, at the University, or across Twitter. With an understanding that there are continuous personnel changes to the team, which is partly staffed by student volunteers, the consistency of the messaging is all the more remarkable. Our analysis did point to increased integration of other digital communication tools in 2022, so future work could consider how Twitter communications are situated within a more diverse set of options for communicating with university stakeholders.

We conducted our keyness analysis at the level of individual items and have suggested that with respect to both lexical and emoji variants, there is value in looking at the thematic groupings we have presented in our analysis. We have suggested some ways in which our emoji annotation can facilitate advanced corpus queries – for example, a collective search for the ‘smiling’ element of the short name descriptors – as a way to extend the analysis presented here. We only analysed positive key items for each sub-corpus, but considering negative key items may highlight what kinds of content were absent at different stages of the data. We offered some preliminary discussion on the reduced usage of the 🎓 emoji in Section 4.1.2, for example.

Our analysis benefitted from annotation that recorded emoji content, which was shown to be both quantitatively (in that 67+% of posts each year included emoji characters) and qualitatively meaningful (in realising aspects of the CHV). The use of emoji in these social media posts provides further demonstration of the more general functions of emoji documented in Escoufflaire’s (2021) taxonomy. In this way, we have highlighted some of the limitations of studies that do not incorporate emoji into their analyses. *#LancsBox X* does not automatically compute frequency lists for non-word types, so additional coding was required to compute frequencies for all emoji which could subsequently be used for keyness analysis in *#Lancsbox X*. Nevertheless, we have shown some of the potential of our simple and XML annotation and suggested areas where further thematic or pragmatic annotation could be beneficial. Ultimately, our annotation provides a demonstration of how researchers can facilitate analysis of the multifunctionality of emoji and the ‘intermodal coupling’ (Zappavigna and Logi, 2021) of emoji and text. We encourage readers to extend this kind of annotation to other studies of data where emoji have relevance.

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