Analysing the influence of Universities’ content strategy on the level of engagement on social media

Abstract
Social media have become a key tool in the institutional communication of universities to disseminate content and establish interaction and dialogue with their publics. Content strategy in social networks is a relevant aspect to inform their audiences about their daily activities and position universities in the digital sphere. This article studies the influence of the different types of content posted by universities on their social networks on the level of engagement of their publics. We conducted a content analysis of more than 90,000 posts by 70 universities in three regions (Europe, the United States and Latin America) on their institutional profiles on three social networks (Twitter, Facebook and LinkedIn). The results show that the level of engagement achieved by the universities' posts is very low. Universities clearly prioritize institutional content over functional content, and organizational topics are the most published on social networks. Institutional content achieves a higher level of engagement than functional content, and posts on organizational topics have the best level of engagement. Our study might refute the hypothesis that “functional content will generate a higher level of engagement than institutional content on social networks.” Thus, it can be concluded that the combination of content on social networks suggests that universities mainly use social networks to develop an institutional positioning strategy on social media.

Keywords
University, higher education, institutional communication, digital communication, social media, content strategy.

1. Introduction
Universities are decisive social actors and are among the main drivers of progress in their immediate environments (Camilleri, 2019; Kisiolek et al., 2020). To accomplish this task, universities need to maintain close relations with their environment and, to this end, institutional communication is a fundamental tool. Within the realm of institutional communication, much research has highlighted the importance of digital tools and social media (Camilleri, 2019; Ebrahim & Seo, 2019; Gori et al., 2020; Jadrić & Kovačević, 2018; Kisiolek et al., 2020).
This research recognizes the importance of social media content strategy as a key factor for universities to inform their publics about their daily behaviour, by selecting their most relevant information and the appropriate combination of the various content they offer (Bélanger et al., 2014; Brech et al., 2017; Peruta & Shields, 2016). In addition, social media allow universities to establish a fluid exchange with their publics through dialogue, interaction, participation and bonding with them (Albanna et al., 2022; Mesquita et al., 2020; Melewar et al., 2018; Marino & Presti, 2018).

The main aim of this article is to analyse the influence of the different types of content posted by universities in their social networks concerning their followers’ degree of engagement (reaction, viralization and conversation). The results will enable assessing the social media content strategy topics that are of greatest interest or relevance to users. This will help universities adjust their digital communication strategy on social platforms to improve their interaction with their publics.

2. Theoretical framework

2.1. Digital communication of university content

The digital dimension of institutional communication enables the university community and society as a whole to learn about the different activities of higher education institutions (Camilleri, 2019; Kisiolek et al., 2020; Marino & Lo Presti, 2018). Thus, universities’ digital communication contributes to meeting the information needs of their publics (Marino & Lo Presti, 2018; Kimmons et al., 2017) and enables institutions to become a source of information for all those interested in university issues (Fähnrich et al., 2020; Kisiolek et al., 2020; Marino & Lo Presti, 2018; Rojo-Vela & Hünermund, 2016; Kimmons et al., 2017), which helps to promote their visibility and differentiate themselves (Jadrić & Kovačević, 2018; Vetrova et al., 2019; Eger et al., 2021). In addition, on the internet and on social networks, universities find suitable channels to disseminate their various activities among their stakeholders (Atarama-Rojas & Vega-Foelsche, 2020; Fähnrich et al., 2020; Ferrer-Serrano et al., 2020; Oliveira, 2020; Peruta & Shields, 2016).

Depending on the activity of the universities, five main types of thematic content can be identified: teaching, research, social commitment, organizational, and context (Oliveira, Capriotti & Zeler, 2022). This content can be grouped into two large blocks of information about universities: Functional and Institutional.

An initial general block of content, fundamental in nature, which we call “Functional,” refers to all information on the activities carried out related to the three main roles of universities (Atarama-Rojas & Vega-Foelsche, 2020; Di Nauta et al., 2020; Fähnrich et al., 2020; Oliveira, 2020; Marino & Presti, 2018; Simancas-González & García-López, 2017): teaching, research, and social commitment.

- Teaching content: issues dealing with academic life, training programmes and teaching activity (Di Nauta et al., 2020; Ebrahim & Seo, 2019; Fähnrich et al., 2020; Oliveira, 2020). This group would encompass information relating to undergraduate and postgraduate training activities, teacher and student mobility, internationalization, etc.

- Research content: information relating to the university’s research projects and activity, as well as the research outcomes themselves (Atarama-Rojas & Vega-Foelsche, 2020; Di Nauta et al., 2020; Ebrahim & Seo, 2019; Fähnrich et al., 2020; Oliveira, 2020). It includes issues related to R&D&I projects, doctorates and publications resulting from research.

- Commitment content: information focusing on the institution’s “third mission”: its integration, links and social engagement, as well as its USR and sustainability projects and activities (Atarama-Rojas & Vega-Foelsche, 2020; Di Nauta et al., 2020; Ebrahim & Seo, 2019; Gori et al., 2020; Marino & Lo Presti, 2018; Oliveira, 2020).
The second general block of content would be "Institutional" in nature, relating to the management and governance of the university itself, as well as on the relevant aspects of its environment (Atarama-Rojas & Vega-Foelsche, 2020; Simancas-González & García-López, 2017; Marino & Presti, 2018; Lee, 2019; Ebrahim & Seo, 2019): it would include organizational content and context content.

- Organizational content: information that promotes and explains the general running of the university, as well as the daily performance of its managers, to render its administration transparent to its publics (Atarama-Rojas & Vega-Foelsche, 2020; Ebrahim & Seo, 2019; Fähnrich et al., 2020; Jadrić & Kovačević, 2018; Oliveira, 2020).
- Context content: topics on issues or events of the general (social, economic, technological, cultural, etc.) and sectoral environments (educational and university), as well as the university’s position with regard to them (Atarama-Rojas & Vega-Foelsche, 2020; Ebrahim & Seo, 2019).

The appropriate selection and combination of each of the different contents will define the universities’ social media content strategy. This will contribute to strengthening a certain communicative positioning of university institutions, strategically outlining the presence of the issues that will define their particular and differential aspects. This may influence their publics’ perceptions of them, improving the universities' reputation.

2.2. From content dissemination to interaction
The role of communication in the digital context should seek to promote relations with stakeholders through dialogue. Some authors (Taylor & Kent, 2014; Losada Díaz & Capriotti, 2015; Wang & Yang, 2020; Wissen, 2017) relate the basis of communication management on social networks to the principles of dialogic communication. Social networks provide an appropriate channel to foster interaction to achieve a relationship of mutual benefit between organizations and their publics (Wissen, 2017; Wang & Yang, 2020). Through digital platforms, organizations can better understand their publics, get to know users’ opinions and feelings, promote their activities; but also, users are encouraged to communicate with greater proximity, ease, and fluency, and they can engage directly and personally in conversations (Capriotti, Zeler & Camilleri, 2021; Pereira et al., 2014).

Effective exchange of communications within social networks involves interactions between the organizations and the online users to generate reactions, promote content sharing or engage in conversations through comments (Brubaker & Wilson, 2018; Santos et al., 2022). Thus, Engagement represents interaction in social networks and it could have significant effects on building relationships between organizations and their publics (Capriotti, Zeler & Oliveira, 2021; Santos et al., 2022). The engagement between the organizations and their publics is based on three forms of interaction: likes, shares and comments. Together, they are commonly referred to as “social media engagement” (Fähnrich et al., 2020).

- Likes suggest that the individuals are (somehow) reacting towards the posted content, albeit in a basic or minimal manner (Abitbol & Lee, 2017; Cho et al., 2014). This also includes other features such as ‘love’, ‘care’, ‘wow’, ‘sad’, ‘celebrate’, ‘angry’, etc. ‘Likes’ on social media would clearly indicate online users’ reaction to the posted content (Anderson et al., 2016; Macnamara, 2014).
- Shares allow users (or third parties) to become volunteer spokespeople since they promote the content of organizations (Abitbol & Lee, 2017; Cho et al., 2014). ‘Shares’ show the virality obtained on social networks by the digital content of the institutional communication (Anderson et al., 2016; Macnamara, 2014).
- Comments are the most genuine expression of the online users’ interaction on social networks, since organizations and publics may engage in direct conversations (Abitbol & Lee, 2017; Cho et al., 2014). They require far more commitment than likes and shares. The
conversation usually manifests through ‘comments’ on social networks (Anderson et al., 2016; Macnamara, 2014).

These three forms of interaction, jointly, represent an organization’s General Engagement in the social networks (Capriotti & Zeler, 2020; Mesquita et al., 2020; Voorveld et al., 2018). Publics may exhibit different levels of interaction towards the organizations’ posts through social media platforms (Breech et al., 2017; Guzmán & Del Moral, 2013; Peruta & Shields, 2016). The level of engagement allows organizations to evaluate the volume or quantity of effects (likes, shares, comments) achieved on the posts disseminated by entities. According to several recent studies (Dixon, 2022; Feehan, 2022; Martínez, 2022), the average level of engagement on Facebook is between 0.06% and 0.18%, on Twitter it is between 0.04% and 0.07%, and on LinkedIn it is between 0.25% and 0.5%. These results are much lower than the degree of interaction in social networks recommended by the experts (Dixon, 2022; Feehan, 2022; Martínez, 2022), who suggest that the optimal level of engagement on Facebook should be higher than 1%, on Twitter it should be higher than 0.5%, and on LinkedIn it should be above 2%.

One of the main objectives of universities’ digital communication through their social networks is to improve their general engagement with the university community (Jadrić & Kovačević, 2018) and with their social surroundings (Fähnrich et al., 2020; Gori et al., 2020; Guzmán et al., 2013), seeking to create a fluid conversation (Atarama-Rojas & Vega-Foelsche, 2020; Eger et al., 2021; Kimmons et al., 2017; Marino & Lo Presti, 2018) and enhancing the construction of solid relationships with them (Gori et al., 2020; Kimmons et al., 2017; Eger et al., 2021; Melewar et al., 2018).

Universities’ engagement has been studied by various authors (Atarama-Rojas & Vega-Foelsche, 2020; Eger et al., 2021; Fähnrich et al., 2020; Gori et al., 2020; Soares et al., 2019). The results, with their nuances, indicate that content dealing with academic issues and social aspects generates a high degree of interaction, and so topics related to universities’ functional activity (teaching, research and social commitment) would be of greater interest to their publics than issues related to institutional and contextual matters. Based on these approaches, a general hypothesis could be posited: $H_1$: functional content (teaching, research and social commitment) generates a higher level of engagement than institutional content (organizational and context) on social networks.

Having a proper social media content strategy can significantly boost universities’ engagement with their publics, through the appropriate choice and combination of the content disseminated (Capriotti, Zeler & Oliveira, 2021; Atarama–Rojas & Vega–Foelsche, 2020; Eger et al., 2021; Fähnrich et al., 2020; Gori et al., 2020; Soares et al., 2019; Jadrić & Kovačević, 2018).

3. Methodology

The universities were selected based on their position in the three most prestigious international rankings: the ARWU Ranking of World Universities, THE Times Higher Education Rankings and QS World University Rankings. In order to obtain a broad geographical representation of the universities, the following areas were defined: The United States (due to the number and relevance of its universities in the rankings and its geographical dimension), Europe (because it is a reference on an international level), and Latin America (due to its high university development). The institutions of the United States and Europe were selected from among the top 100 institutions in these rankings. Those of Latin America, as they are not present among the top 100 positions, were chosen based on their general position in the global rankings and by regions. In the case of Latin America and Europe, priority was given to geographical diversity to achieve greater representativeness of the different countries. On this basis, 70 universities were selected: 20 from the United States, 25 from Europe, and 25 from Latin America (Appendix 1).
Three of today’s most important social networks were chosen (Kemp, 2022), which are extensively implemented in universities’ digital institutional communications: Facebook (with the highest number of active users in the world), Twitter (one of the favourites for the search and dissemination of information), and LinkedIn (specializing in professional relationships). The official institutional account of each university was identified.

In order to test the general hypothesis posited and to achieve the general objective, the following research questions (RQ) were defined:

RQ1. What types of content do universities disseminate on their social networks?
RQ2. What level of engagement do universities achieve in their social networks?
RQ3. Do the different types of content influence users’ Level of Engagement on universities’ social networks?
RQ4. Are there significant differences between regions and platforms?

A content analysis of the posts by the universities in their institutional profiles on social networks was conducted. Two categories of analysis were defined: “content type” and “level of engagement,” which have already been developed and tested in prior studies (Capriotti, Zeler & Oliveira, 2021; Capriotti & Zeler, 2020; Losada Díaz & Capriotti, 2015).

“Content Type” establishes the relevant topics dealt with by universities on their social networks. To this end, five main themes were identified (Oliveira et al., 2022): (1) Teaching: information concerning everything related to undergraduate and postgraduate training activity, teaching activities, academic outcomes, teaching methods, evaluations of faculty, teaching publications, etc.; (2) Research: information related to the research activity of the university (R&D&I projects, doctorates, research, scientific publications, etc.); (3) Commitment: information related to the university’s sustainable actions, as well as its social activity and its link with the community; (4) Organizational: information on the general running and governance of the university (positions, roles, structure, appointments, etc.); and (5) Context: information related to general (social, economic, cultural, etc.) or sectoral (educational and university) issues that are not directly linked to the university. For an example of each type of content, see Appendix 2.

From these five topics, two large groups or blocks of content were defined: The first three (teaching, research and commitment) make up the “Functional” block (referring to the three essential functions of the institution), while the last two (organizational and context) constitute the “Institutional” block (related to the general management of the entity).

“Level of Engagement” determines users’ degree of interaction with social media posts (Abitbol & Lee, 2017; Capriotti & Zeler, 2020; Cho et al., 2014), analysing the volume of likes, shares and comments obtained in the posts published by the institutions, in relation to the number of posts published and the volume of followers. Four engagement indicators were developed: the reaction rate (RR), the viralization rate (VR), the conversation rate (CR) and the general engagement rate (GER) (Capriotti & Zeler, 2020; Fähnrich et al., 2020), which will allow analysing the Level of Engagement of posts by universities, as well as the influence of content types on engagement. They are measured as follows:

- **Reaction Rate** (RR): the total number of likes divided by the total number of posts; divided by the number of followers; multiplied by 1,000.
- **Viralization Rate** (VR): the total number of shares divided by the total number of posts; divided by the number of followers; multiplied by 1,000.
- **Conversation Rate** (CR): the total number of comments divided by the total number of posts; divided by the number of followers; multiplied by 1,000.
- **General Engagement Rate** (GER): the sum of the three rates.

The study was carried out over six months during 2021. Three months were chosen in the first semester (13 weeks, 91 days, from March 15 to June 14) and three months in the second (13 weeks, 92 days, from September 15 to December 14). The same dates were selected for all universities throughout the entire academic year (to avoid the influence of a specific situation,
such as a special event or date or a specific crisis), trying to exclude possible biases caused by
the main public holidays or vacation periods. In total, 26 weeks and 183 days were included.
The unit of analysis were the posts by universities in their official profiles on the social
networks selected during the established time period. The study sample was made up of all
the publications (90,241 in total; 27,356 Facebook posts, 9,439 LinkedIn posts, and 53,446
Twitter tweets), both their own and shared, that the selected universities made on their social
media accounts. The total period enabled intensive information gathering to obtain highly
reliable data on the volume and intensity of universities’ communication activity.

Information was collected and processed via the platform and mass data and information
collection and management system of the company Noticias Perú (www.noticiasperu.pe). To
this end, a three-member work team was set up (one supervisor and two technicians) to
retrieve posts, and another team of three people (one supervisor and two analysts) for the
initial data extraction and analysis.

To evaluate intercoder reliability and the agreement of the method used, the two analysts
carried out a test on a sample of 300 posts using a random procedure. This sample is highly
satisfactory for evaluating agreement and reliability between two analysts (Lombard et al.,
2002). Using 2×2 contingency tables as a basis for their statistical analysis and with a 95%
confidence interval, the percentage calculation of agreement between the two analysts is
established, to find out if both observations obtain similar results. Cohen’s kappa coefficient
(k) is also calculated to assess the reliability of the categorical variables. To interpret the
results of Cohen’s kappa coefficient, the measurement ranges proposed by Landis and Koch
(1977) are applied. For the interpretation of the results of the level of agreement, the equivalent
percentages are applied. A very high degree of agreement was obtained for the criteria of the
tool, so it can be concluded that the measurement is valid: the overall agreement between
analysts was 90.5%. Each of the posts analysed could be categorized into a maximum of two
different topics. 91% agreement (Kappa value of .83) was obtained for “Topic 1,” and 90%
(Kappa value of .80) for “Topic 2.”

The data were recorded in an Excel template specifically designed for this research and
subsequently analysed using the IBM SPSS Statistics 25 software package for processing and
to obtain the results. The statistical tests used in the analysis are non-parametric. In the case
of contrasts on the average engagement rates by type of content, the Mann-Whitney U and
Kruskal-Wallis H tests were chosen. To determine the impact on engagement rates by
information blocks and content types, a correspondence analysis was used.

4. Results
In the period under analysis, the 70 universities disseminated a total of 90,241 posts via the
three social networks studied, but two topics were recorded in 9,765 posts, which leads to an
increase in the number of posts analysed to 100,006 units.

4.1. Types of content posted by universities on their social networks
Results show that functional posts account for 30.7%, and institutional posts 69.3%. The higher
proportional weight of institutional posts at the general level is also observed by regions,
although with some differences: in North American universities (78.1%), it is higher than in the
rest, above the general average; in European universities (69.6%) it is close to the general
average and the score for Latin American universities (64.6%). In this sense, Latin American
universities are more predisposed to generate functional posts.

By types of thematic content, differences are also observed: organizational content is, by
far and in all three regions, the most commonly present (66.4%); the North American
universities rank first (77.0%), the European universities are close to the average (68.6%), and
the Latin American ones fall short of 60%. Teaching content accounts for 19.7%, and Latin
American universities (24.6%) display comparatively greater activity in respect to the other
two regions. Research content is low, and the European (10.9%) and the US (8.6%) institutions almost double the score for Latin America (5.6%). Commitment and context content have a marginal weight in the North American and European institutions, while in the Latin American ones they reach around 3% in both topics. As for social networks, Twitter is the network most used (52.1%) by universities to disseminate their posts, followed by Facebook (36.0%), and LinkedIn (11.9%).

By content blocks, no major differences are observed in their internal distribution: on Twitter, the weight of institutional content (53.3%) exceeds functional content (48.5%); on Facebook, the weight of functional content (39.9%) is higher than institutional content (34.5%), and on LinkedIn, both blocks record practically the same weight of dissemination (institutional, 12.2% and functional, 11.6%).

By type of content, there is also a homogeneous distribution by social networks: Twitter has more weight in all types of content, followed by Facebook and, at a considerable distance, LinkedIn. The data show that the topics that stand out on Twitter are organizational content (53.4%) and research (52.3%), although there is a significant presence of other topics: context (52%), commitment (49.7%) and teaching (46.5%). On Facebook, commitment (44.8%), teaching (43.3%) and context (43.1%) stand out, with a difference of more than ten percentage points, over the rest of the topics. On LinkedIn, despite their lower activity, research (16.4%) and organization (12.8%) are distanced from the low presence of context (4.9%), commitment (5.4%) and teaching (10.2%).

Thus, it can be seen that institutional information predominates over functional information. The majority of institutional posts are organizational and are more present in universities in the United States, followed by European universities and, lastly, universities in Latin America. By social networks, Twitter stands out for institutional posts (with organizational content being the most present), while Facebook and LinkedIn are used more for functional content, with content on commitment (in Facebook) and research (in LinkedIn) predominating.

4.2. Level of Engagement of universities in their social networks

In the set of data analysed (Table 1), the universities’ total general engagement rate (GER) is above .300 with high dispersion (above .450) due to the breadth of the ranges observed (minimum = .001; maximum = 2.99). The reaction rate (RR) achieves the most prominent averages (above .250) but also with high dispersion (around .399), while for viralization (VR) and conversation (CR) rates, the averages, below .05, are significantly lower.

In the contrast analysis of the mean of interaction rates by regions and social networks (Table 2), statistically significant differences are found in all of them.

By regions, the European universities have higher average interaction for the reaction (.331) and general engagement (.395) rates. The viralization rate of both European (.072) and Latin American (.051) universities is significantly higher than for the North American (.028) ones. Regarding the conversation rate, the European (.012) and North American (.011) institutions record a higher average than the Latin American (.008) ones.

By social networks, LinkedIn records higher average interaction for the reaction (.483) and general engagement (.406) rates; on Twitter, a higher average is observed for the viralization (.036) rate, while on Facebook, higher values are found for the conversation (.016) rate.
Table 1. Contrast analysis of averages of engagement rates by regions and social networks.

<table>
<thead>
<tr>
<th>Rates</th>
<th>Regions</th>
<th>( \bar{x} )</th>
<th>( \sigma )</th>
<th>( H^* )</th>
<th>Social networks</th>
<th>( \bar{x} )</th>
<th>( \sigma )</th>
<th>( H^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
<td>EUR</td>
<td>.331</td>
<td>.418</td>
<td>3,320.8</td>
<td>Twitter</td>
<td>.186</td>
<td>.303</td>
<td>6,347.5</td>
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<td></td>
<td>USA</td>
<td>.288</td>
<td>.432</td>
<td></td>
<td>Facebook</td>
<td>.301</td>
<td>.426</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LAT</td>
<td>.228</td>
<td>.376</td>
<td></td>
<td>LinkedIn</td>
<td>.483</td>
<td>.561</td>
<td></td>
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<tr>
<td></td>
<td>Total</td>
<td>.265</td>
<td>.402</td>
<td></td>
<td>Total</td>
<td>.262</td>
<td>.399</td>
<td></td>
</tr>
<tr>
<td>VR</td>
<td>EUR</td>
<td>.052</td>
<td>.102</td>
<td>425.7</td>
<td>Twitter</td>
<td>.056</td>
<td>.097</td>
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<tr>
<td></td>
<td>USA</td>
<td>.028</td>
<td>.052</td>
<td></td>
<td>Facebook</td>
<td>.045</td>
<td>.099</td>
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<tr>
<td></td>
<td>LAT</td>
<td>.051</td>
<td>.103</td>
<td></td>
<td>LinkedIn</td>
<td>.000</td>
<td>.010</td>
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<tr>
<td></td>
<td>Total</td>
<td>.045</td>
<td>.093</td>
<td></td>
<td>Total</td>
<td>.046</td>
<td>.093</td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>EUR</td>
<td>.012</td>
<td>.040</td>
<td>1,977.4</td>
<td>Twitter</td>
<td>.005</td>
<td>.025</td>
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<td>.036</td>
<td></td>
<td>LinkedIn</td>
<td>.012</td>
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<td></td>
<td>Total</td>
<td>.009</td>
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<td>Facebook</td>
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<td></td>
<td>LAT</td>
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<td>.458</td>
<td></td>
<td>LinkedIn</td>
<td>.496</td>
<td>.575</td>
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<tr>
<td></td>
<td>Total</td>
<td>.321</td>
<td>.468</td>
<td></td>
<td>Total</td>
<td>.318</td>
<td>.466</td>
<td></td>
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</tbody>
</table>

*Kruskal-Wallis H: Sig. < .001

\( RR = \text{Likes/Followers/Posts}*1,000; \)
\( VR = \text{Shares/Followers/Posts}*1,000; \)
\( CR = \text{Comments/Followers/Posts}*1,000; \)
\( GER = \sum \text{likes, shares, comments/} \sum \text{followers/} \sum \text{posts}*1,000 \)

Source: Own elaboration.

Thus, European universities are positioned with better engagement: they have a higher reaction rate (RR), viralization rate (VR) and conversation rate (CR) than the rest of the institutions. By social networks, the reaction rate (RR) and general engagement rate (GER) are higher on LinkedIn, Twitter has a higher viralization rate (VR), and Facebook stands out for the conversation rate (CR).

4.3. Influence of content types on user interaction levels

A contrast analysis of the average interaction rates by blocks (functional and institutional) and content types (teaching, research, organizational, commitment and context) included in the posts was carried out, attending to their dichotomization (contains content/does not contain content) (Table 2).

Depending on the type of content block, the probability of generating a higher rate is inverse: posts that do not contain functional content (\( \bar{x} = .348; \sigma = .496 \)) obtain a higher average value than those that do (\( \bar{x} = .256; \sigma = .392 \)), compared to institutional ones whose posts with this type of content (\( \bar{x} = .337; \sigma = .485 \)) increase their interaction compared to those that do not (\( \bar{x} = .244; \sigma = .377 \)).

By content types, the inclusion of organizational content increases the average rate, while not including teaching, commitment and context content generates a higher average. In research posts, no differences (inclusion or not) are observed in the average value.
Table 2. Contrast analysis of averages of interaction rates by blocks and content types.

<table>
<thead>
<tr>
<th>Content types / blocks</th>
<th>RR</th>
<th></th>
<th>VR</th>
<th></th>
<th>CR</th>
<th></th>
<th>GER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{x}$</td>
<td>$\sigma$</td>
<td>$\bar{x}$</td>
<td>$\sigma$</td>
<td>$\bar{x}$</td>
<td>$\sigma$</td>
<td>$\bar{x}$</td>
<td>$\sigma$</td>
</tr>
<tr>
<td>Teaching</td>
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<td></td>
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Source: Own elaboration.

It should also be noted that in 15.8% of the posts two different types of content were recorded, and in 11.6%, two different types of blocks were recorded. In this sense, to find out the existing relationship and the impact of the blocks and types of content on the interaction rates by regions and social networks, a multivariate factorial technique was used: correspondence analysis. To do so, three new categorical variables were constructed. Two of them were related to the combination of contents: the first one was the combined blocks of content, with three categories (Institutional—with 65.6% of the posts—, Functional—with 22.8%—, and Functional-Institutional—with 11.6%—). The second variable was the combined types of content, with twelve categories (Organizational—with 60.1% of the posts—, Teaching—with 16.5%—, Research-Organizational—with 5.5%—, Contextual—with 4.0%—, Research—with 3.1%—, Teaching-Organizational—with 3.0%—, Teaching-Contextual—with 1.7%—, Teaching-Commitment—with 1.7%—, Organizational-Contextual—with 1.4%—, Organizational-Commitment—with 1.4%—, Teaching-Research—with 1.0%—, and Commitment—with 0.5%—). The third categorial variable was the combined interaction rate (CIR) of five homogeneous categories with closed intervals of average rates: Low (0.0029-0.048); Moderate-Low (0.049-0.091); Moderate (0.092-0.195); Moderate-High (0.196-0.440), and High (0.441-and above).

A correspondence analysis between the combined blocks and the combined types (Figure 1) in relation to the combined interaction rate (CIR) reveals the existence of a relationship of each combination between the two variables with a significance value <.001 in all cases.

In the analysis by combined content blocks ($X^2 = 837.976$), the first dimension records inertia of 0.11 and collects information of 99.2% of the total inertia, with posts concerning the institutional field being most strongly related to high rates of combined interaction, functional-institutional with moderate-low rates, and functional with low rates.
By content types, the first dimension achieves inertia of 0.24 and collects information of 87.9% of the total inertia. However, when analysing the contributions to the inertia of each of the categories based on average inertia (0.083), it is observed that the categories that provide the greatest inertia, as well as their quality of representation, are: teaching, organizational, teaching-context, teaching-commitment, organizational-context and organizational-commitment. From this perspective, posts with organizational content are more strongly related to high and moderate-high interaction rates; commitment with moderate rates; research, research-organizational and teaching-organizational with moderate-low rates and the rest of the categories with low rates.

By social network and region in reference to the combined blocks and to the combined types of content, the existence of the relationship of each combination between both variables with a significance value <.001 in all cases is also observed, but heterogeneous trends are observed by social network and region.

- On Twitter, the following results were obtained for each of the regions. In Europe, by content blocks ($X^2 = 8.357$), the first dimension includes 97.5% of the total inertia and institutional posts are more strongly related to high and moderate-high interaction rates, functional-institutional ones with moderate rates, and functional ones with low and moderate-low rates. By content types ($X^2 = 171.620$), the first dimension includes 62.3% of the total inertia and, taking into account the mass and the distances of the point in the first dimension inertia, posts with organizational-type content are more strongly related to high interaction rates, and research-organizational and teaching-organizational and teaching-research with moderate-high rates, research and teaching-organizational contents with moderate rates, and teaching with moderate-low rates. In the United States, by content blocks ($X^2 = 174.939$), the first dimension includes 80.8% of the total inertia and institutional posts are more strongly related to moderate-high interaction rates, functional-institutional ones with moderate rates, and functional ones with low rates. By content types ($X^2 = 245.473$), the first dimension includes 70.7% of the total inertia, and organizational content is more strongly related to high and moderate-high interaction rates.

Source: Own elaboration.
interaction rates, teaching-organizational and context with moderate rates, and research-organizational with moderate-low rates. In Latin America, by content blocks (X² = 80.489), the first dimension includes 90.3% of the total inertia and institutional posts are more strongly related to high and moderate interaction rates, functional ones with moderate-high rates, and functional-institutional ones with low rates. By content types (X² = 439.848), the first dimension includes 79.5% of the total inertia and research-organizational content is more strongly related to high interaction rates, teaching-organizational and organizational with moderate-high rates, and research with moderate rates.

- On Facebook, the results for the regions were as follows. In Europe, by content blocks (X² = 174.474), the first dimension includes 95.8% of the total inertia and institutional posts are more strongly related to high interaction rates, functional-institutional ones with moderate-high and moderate rates, and functional ones with low and moderate-low rates. By content types (X² = 256.926), the first dimension includes 82.3% of the total inertia and posts with organizational and organizational-context content are more strongly related to high interaction rates, research and research-organizational content with moderate-high rates, and teaching-research with moderate rates. In the United States, by content blocks (X² = 120.224), the first dimension includes 93.3% of the total inertia and institutional posts are more strongly related to high and moderate-high interaction rates, functional ones with moderate rates, and functional-institutional ones with low rates. By content types (X² = 273.910), the first dimension includes 60.7% of the total inertia and organizational content is more strongly related to high interaction rates, teaching and context with moderate-high rates, teaching-organizational with moderate rates, and research-organizational with moderate-low rates. In Latin America, by content blocks (X² = 356.207), the first dimension includes 99.1% of the total inertia and institutional posts are more strongly related to high and moderate-high interaction rates, functional-institutional ones with moderate-low rates, and functional ones with low rates. By content types (X² = 725.318), the first dimension includes 88.1% of the total inertia and research content is more strongly related to high interaction rates, organizational with moderate-high rates, and research-organizational with moderate rates.

- On LinkedIn, the results were obtained by regions, as presented below. In Europe, by content blocks (X² = 58.507), the first dimension includes 90.4% of the total inertia and institutional posts are more strongly related to high interaction rates, functional-institutional ones with moderate-high rates, and functional ones with moderate-low rates. By content types (X² = 160.186), the first dimension includes 81.3% of the total inertia and posts with and organizational and context content are more strongly related to high interaction rates, research and teaching-research with moderate-high rates, and research-organizational with moderate rates. In the United States, by content blocks (X² = 75.210), the first dimension includes 95.5% of the total inertia and institutional posts are more strongly related to high interaction rates, functional-institutional ones with moderate-high rates, and functional ones with moderate-low rates. By content types (X² = 186.293), the first dimension includes 88.1% of the total inertia and research content is more strongly related to high interaction rates, organizational with moderate-high rates, and teaching-research with moderate rates. In Latin America, by content blocks (X² = 92.688), the first dimension includes 97.7% of the total inertia and institutional posts are more strongly related to high interaction rates, functional-institutional ones with moderate-high rates, and functional ones with low rates. By content types (X² = 336.108), the first dimension includes 64.6% of the total inertia and research-organizational and commitment content is more strongly related to high interaction rates, research and context with moderate-high rates, and teaching-organizational and teaching-research with moderate rates.
Therefore, in relation to the general types of content, *institutional* posts are related to high engagement rates, the combination of *functional-institutional* with moderate-low rates and *functional* ones with low rates. Regarding specific topics, the contents of universities that generate better engagement are *organizational* and *commitment* content, and to a lesser extent, *teaching-organizational* and *research-organizational* combinations. In the three social networks, *institutional* content is related to high interaction rates and *functional* content to moderate-low rates in all regions. *Organizational* topics obtain the highest engagement rates in the three regions on social networks.

5. Discussion and conclusions

The results obtained allow us to propose a series of reflections and draw some relevant conclusions concerning the content strategy of universities in social media.

Universities prioritize *institutional* content (*organizational* and *context*) over *functional* content (*teaching*, *research*, and *commitment*), which allows us to affirm that universities are developing a social media content strategy aimed at promoting the dissemination of the institutional activity to its publics. The combination of content developed in their profiles suggests that they are using social networks mainly as institutional positioning instruments. *Organizational* topics are, by far, the ones that are most disseminated on social networks, which reaffirms the universities’ institutional positioning strategy in social media.

The level of engagement achieved by the posts by universities is very low. By social networks, some significant differences are noted, since LinkedIn and Facebook have a higher level of engagement (with a slight difference in favour of LinkedIn), while Twitter has a clearly lower level. Between regions, there are no very significant differences. Individually, although there are specific cases of entities that have high interaction in their posts, the vast majority of entities have lower average rates than those obtained by other sectors in several studies (Dixon, 2022; Feehan, 2022; Martínez, 2022), and are well below the averages recommended by the experts (Dixon, 2022; Feehan, 2022; Martínez, 2022). Thus, it could be said that, in general, the institutions are not adequately identifying the information that is relevant to the interests of their followers and neither are they taking advantage of the interactive and dialogic resources provided by social networks to promote and enhance interaction with their publics. With reference to content blocks (Figure 2), on a general level, it can be stated that the *institutional* content disseminated by universities has a higher level of engagement than *functional* content, although with no significant differences among regions.
In the social networks analysed, some significant differences can be observed. On Twitter, in addition to having the lowest level of engagement of the three networks, it is also where the most balanced situation is observed between the level of engagement of institutional and functional content (with a slight difference favouring institutional content). On Facebook, the level of engagement is better than on Twitter, a more marked difference is seen in the interaction obtained by institutional content in relation to functional content. LinkedIn shows a very significant difference in interaction in favour of institutional content over functional content. Thus, the content disseminated (or the way it is disseminated) on LinkedIn and Facebook is more effective at obtaining better user interaction. This may be related to the specific profile of each social network, since LinkedIn and Facebook are more relationship-oriented (professional and social, respectively), whereas Twitter is rather focused on the dissemination and distribution of information (IAB Spain & ELOGIA, 2022).
With regard to the specific types of content (Figure 3), in general terms, posts on organizational topics have the best level of engagement, and research content obtains better interaction than context and teaching content. Commitment content clearly enjoys the least interaction. Thus, by relating specific topics to content blocks, organizational posts contribute most to the engagement of “institutional” content, while research posts contribute most to the interaction of “functional” content.

In relation to the social networks analysed, the same trend noted above is observed, where Twitter is the least interactive, while Facebook and LinkedIn have better levels of engagement. Again, organizational content achieves the best interaction results. At a lower level are the topics of research and teaching, which obtain good results mainly on Facebook and LinkedIn. Context themes perform well in a small group of universities, although with low interaction in a very broad set of institutions across the three social networks. And commitment content has the lowest interaction, mostly on Twitter.

Thus, we can assert that the institutional issues disseminated by the universities (organizational and context) generate a higher level of engagement than functional content (teaching, research and commitment). These data can be reaffirmed, considering that the organizational content (of the institutional block) is also the content to achieve the greatest interaction. Among the functional contents, research posts have medium-low interaction, commitment posts enjoy moderate-low and low interaction, and teaching posts achieve low interactivity. Among institutional content, organizational issues achieve high or moderately high interaction, while context issues enjoy moderate-low or low interaction.
On this basis, the hypothesis posited (H1 = functional content generates a higher level of engagement than institutional content on social networks) could be refuted (Figure 4). These results differ, in some respects, from previous studies (Atarama-Rojas & Vega-Foelsche, 2020; Eger et al., 2021; Fähnrich et al., 2020; Gori et al., 2020; Soares et al., 2019), mainly in terms of the interaction generated by social commitment posts (USR, ESG and sustainability) and, although they reaffirm the importance of teaching and research topics, at the same time they show the growing importance of universities’ institutional information.

Hence, it is proved that the universities are disseminating and prioritizing their institutional content over functional content, as well as organizational topics, mainly developing a content strategy of institutional positioning in the social networks, since these topics are the ones that generate the best interaction among their followers. However, the low engagement results achieved allow us to suggest that universities should investigate their online users in more depth to better understand their interests and thus better design their content.

Therefore, this article proposes a model for evaluating the impact of institutions’ social media content strategy on the level of engagement. This methodology could be applied by other researchers to analyse other kinds of organizations, sectors and social networks. It could also be used by professionals to measure and improve their communication activity on social platforms. In addition, in future research, it would be advisable to integrate into the evaluation other aspects that may influence or be relevant to interaction, such as the level of activity in profiles (Jadrić & Kovačević, 2018) or the application of interactive resources in posts (Fähnrich et al., 2020; Peruta & Shields, 2016), which allows obtaining a holistic or integral vision of the management of communication in social networks.
This article is part of the competitive R&D&I project on “La Comunicación Institucional Digital 2.0 de las Universidades” (Digital Institutional Communication 2.0 of Universities) (PID2019-106053GB-I00), funded by the Spanish Ministry of Science and Innovation.

References


## Appendix 1. Universities

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Appendix 2. Types of Contents: links to the examples

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**Research**: MIT (USA)
https://twitter.com/MIT/status/13316495153993506

**Commitment**: University of Minnesota (USA)

**Organizational**: University of Alicante (Spain)
https://twitter.com/UA_Universidad/status/1146026739640033286?s=20

**Context**: UNAM (Mexico)