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ORIGINAL ARTICLE

Impact of social networks on the dissemination of scientific journals in the Andean Community of Nations (2020-2024)

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ABSTRACT

Objective. Our goal was to analyze the use and impact of traditional and academic social networks on the visibility, dissemination, and impact metrics of scientific journals indexed in Scopus from the countries of the Andean Community of Nations during 2020-2024.

Design/Methodology/Approach. A descriptive, comparative, and cross-sectional study was conducted. The sample included 81 scientific journals from Colombia, Peru, Ecuador, and Bolivia, identified through various databases such as Latindex, SciELO, and national indexing systems. Their presence on both conventional (X, Facebook, Instagram, LinkedIn, and TikTok) and academic (ResearchGate) social networks was analyzed using content analysis, engagement metrics, sentiment analysis, and correlation with bibliometric indicators.

Results/Discussion. Eighty-nine percent of the journals are on X, 45.7% on Facebook, and 34.6% on ResearchGate. Colombia accounts for 55.6% of the journals, followed by Peru (22.2%), Ecuador (14.8%), and Bolivia (7.4%). A significant correlation was found between the h-index and followers on X ($r = 0.67$), as well as between mentions on social networks and traditional citations ($r = 0.71$). Instagram showed the highest level of engagement at 7.1%.

Conclusions. Social networks increase regional scientific visibility, with X being a major platform and academic networks closely connected to impact metrics. It is advisable to implement integrated digital strategies.

Originality/Value. The study presents an innovative approach by combining bibliometric and altmetric metrics and highlights the strategic role of social networks in the scientific communication of the Andean Community of Nations, while providing empirical evidence to support digital editorial policies.

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Keywords: social networks; scientific journals; altmetrics; bibliometrics; Andean Community of Nations; academic visibility.

INTRODUCTION

Scientific communication has undergone a major shift over the past twenty years, driven by the rise of digital technologies and new platforms for sharing knowledge (Bucchi & Trench, 2021). In this environment, social networks have become increasingly important as tools to boost visibility, disseminate information, and foster interaction in academia, transforming traditional methods of scientific communication and opening new opportunities to improve research impact (Hunter, 2020).

The traditional approach to evaluating scientific impact, which relies solely on bibliometric metrics like impact factor and citation count, has been criticized for its limited ability to measure the true influence of research on society (Priem *et al.,* 2010). In response to these shortcomings, alternative metrics or altmetrics have emerged, incorporating indicators from social media activity, media mentions, downloads, views, and other forms of digital engagement (Torres-Salinas *et al.,* 2013). These new metrics provide a wider and more dynamic perspective of scientific impact and enable the assessment of research influence beyond conventional academic citations.

In the scientific context, social networks can be divided into two main categories: traditional social networks, like X (formerly Twitter), Facebook, Instagram, LinkedIn, and TikTok, which enable reaching large and diverse audiences, and specialized academic social networks, such as ResearchGate, Academia.edu, and Mendeley, created specifically for the scientific community (Codina, 2009). Each platform type provides unique features and opportunities for sharing scientific knowledge, from broad dissemination to targeted collaboration among researchers.

The adoption of social networks by scientific journals has grown rapidly in recent years. Studies show that more than 70% of journals listed in international databases have an active presence on at least one social media platform (Zheng *et al.,* 2019). This trend highlights the increasing recognition of these tools' importance for boosting the visibility of publications, enabling interaction with authors and readers, and building academic communities around specific thematic areas.

In the Latin American context, research on how scientific journals use social networks has shown specific patterns reflecting the region's unique characteristics. The study by Spatti *et al.* (2021) on the SciELO network found that 58% of Latin American journals had articles with altmetric mentions, with X being the most used platform for this (73.8% of mentions), followed by Facebook (20.0%). These findings highlight both the potential and the challenges journals in the region face to boost their impact through digital channels.

The context of its scientific journals in the Andean Community of Nations

The Andean Community of Nations, consisting of Colombia, Peru, Ecuador, and Bolivia, represents a unique geographical and cultural area within the Latin American scientific landscape. These countries share common features regarding scientific development, research policies, and challenges related to the internationalization of their academic output (Gallardo *et al.,* 2019). However, they also exhibit notable differences in available resources, technological infrastructure, and scientific communication strategies, creating a diverse scenario that calls for specific analyses.

Analyzing the presence of scientific journals from the Andean Community of Nations on social networks is particularly important in regional efforts to enhance the international visibility of scientific work. Indexing in global databases like Scopus is a key milestone for regional journals, but simply being indexed does not guarantee increased visibility or impact (Delgado López-Cózar & Martín-Martín, 2019). In this context, digital communication strategies, including effectively using social networks, can play a vital role in expanding the reach and influence of regional scientific publications.

The scientific literature has documented several benefits of the strategic use of social networks by scientific journals. These benefits

include increasing the number of article downloads and citations (Ortega, 2017), reaching non-academic audiences (Robinson-Garcia *et al.,* 2018), enabling collaboration among researchers (Collins *et al.,* 2016), and building specialized thematic communities (Stewart *et al.,* 2013). However, it also highlights significant challenges, such as the need for dedicated human resources, managing content quality, and accurately measuring the return on investment in digital communication efforts (Fox *et al.,* 2021).

The period 2020-2024 is especially significant for analyzing how social networks are used in scientific communication, as it overlaps with the COVID-19 pandemic, an event that greatly sped up the adoption of digital technologies across all areas of scholarly work (Arroyo-Machado, 2023). During this time, many scientific journals boosted their presence on social networks in response to the social distancing restrictions and the need to stay connected with their scholarly communities (Erskine and Hendricks, 2021).

Altmetrics have proven especially useful for evaluating the impact of scientific journals in situations where traditional metrics may have limitations. For Latin American journals, which often struggle to achieve high levels of international citation, altmetrics can offer valuable additional indicators of their influence and societal impact (Costas *et al.,* 2015). This is particularly important for journals that publish research with a regional focus or that address issues specific to the countries of the Andean Community of Nations. Therefore, the goal of this study is to analyze the use and impact of both conventional and academic social networks on the visibility, dissemination, and impact metrics of scientific journals indexed in Scopus from the countries of the Andean Community of Nations during 2020-2024. Throughout this article, we will explore the following research questions:

1. What is the level of adoption and usage of social networks by scientific journals in the Andean Community of Nations?
2. Is there a relationship between social network metrics and traditional bibliometric indicators in the context of scientific journals in the region?

METHODOLOGY

A descriptive, comparative, and cross-sectional study was conducted with a timeframe covering 2020-2024. This period was carefully chosen to observe both earlier patterns of social network use and the changes caused by the COVID-19 pandemic, which significantly transformed scientific communication habits (Arroyo-Machado, 2023). The target population included scientific journals published in the member countries of the Andean Community of Nations (Colombia, Peru, Ecuador, and Bolivia), all of which were indexed in reputable databases. A stratified sampling method was employed, incorporating multiple indexing sources to guarantee a comprehensive representation of the region's scientific publishing landscape.

The indexing sources used were:

- Latindex: the main source for journals that meet established editorial quality standards, offering representative coverage of the region.
- SciELO (Scientific Electronic Library Online): a platform for open access journals with regional significance.
- National indexing systems: including Publindex of Colombia and specific databases from Peru, Ecuador, and Bolivia.

The distribution of the sample by country was as follows: Colombia (45 journals), Peru (18 journals), Ecuador (12 journals), and Bolivia (6 journals), totaling 81 scientific journals (See Appendix 1).

Country	Number of journals	Percentage
Colombia	45	55.6%
Peru	18	22.2%
Ecuador	12	14.8%
Bolivia	6	7.4%
Total	**81**	**100%**

Table 1. Distribution of scientific journals analyzed by country.

As part of the inclusion criteria, we required that the journals be published by institutions located in one of the four countries of the Andean Community of Nations, regardless of whether

they were co-published with institutions from outside the region. Additionally, they had to be actively indexed in at least one of the specified databases from 2020 to 2024. They also needed to have a verifiable presence on at least one social networking platform, whether traditional or academic, with documented activity during the study period. Journals that were discontinued during the period, those whose social media profiles only represented the publishing institution without journal-specific content, accounts inactive for more than six consecutive months, and journals whose indexing could not be verified through multiple sources were excluded.

The journal identification and selection process was conducted using a systematic search strategy that integrated multiple sources of information. The initial search was performed in the Latindex directory, applying filters by country for each of the member states of the Andean Community of Nations. This was supplemented with queries in the SciELO database and the national indexing systems of each country. For each journal found, its indexing status was checked, and its basic characteristics, such as subject area, publishing institution, and years of indexing, were recorded.

Presence on social networks was confirmed through direct searches on common platforms (X, Facebook, Instagram, LinkedIn, TikTok) and academic sites (ResearchGate). The username, creation date, follower count, and posting frequency were recorded. It was confirmed that the profiles specifically belonged to the journal and not to the publishing institution.

Data collection and definition of indicators

Data collection was structured in four main dimensions:

a) Bibliometric data: obtained using the Publish or Perish (PoP) tool, which included annual citations, h-index, number of articles published, and impact indicators derived from Google Scholar.
b) Altmetric data: collected from Altmetric.com, including mentions across social networks, blogs, media, and policy documents. These data were categorized by source type and analyzed over time.
c) Social network data: collected through official APIs (X API v2, Facebook Graph API, Instagram Basic Display API, LinkedIn API, TikTok API, and YouTube Data API) and ethical web crawling methods, following the terms of service and ethical principles of digital research (Franzke *et al.,* 2020).
d) Content analysis: conducted on a stratified sample of the 50 most recent publications from each journal. Variables such as content type (disclosure, promotion, or interaction), multimedia use, language, hashtags, and level of interaction were coded.

The indicators defined were as follows:

a) Engagement: defined as the interaction rate, which is calculated as the percentage of interactions (likes, comments, shares) relative to the number of followers.
b) Mentions: These are direct references to the journal or its articles in publications on social media, digital platforms, or academic sites.
c) Reach: total number of unique users who viewed the journal's content on social media.

Quantitative social media indicators included the number of followers, frequency of posts, "likes," "shares," mentions, comments, and reach (when available). Qualitative indicators considered the type of content, communicative tone, and visual elements. A standardized coding protocol was designed and implemented by a trained team.

Sentiment analysis was conducted using a hybrid approach that combined automated tools and human review. The VADER algorithm (Hutto and Gilbert, 2014) was employed, along with double manual coding on a 20% subsample of mentions and comments to ensure inter-coder reliability. The categories included positive, neutral, and negative.

Statistical analysis was conducted in the R environment (v. 4.3.0) using specialized packages such as bibliometrix, igraph, and tidyverse. Descriptive statistics, Pearson correlation analysis, nonparametric tests when needed, and analysis of variance (ANOVA) with post-hoc tests were used to compare differences between countries, subject areas, and indexing levels.

Multiple regression models were also developed to identify predictors of altmetric impact, including social network metrics, bibliometric characteristics, and contextual factors such as country and subject area as independent variables. The assumptions of linearity, homoscedasticity, independence, and normality of residuals were checked. Finally, a qualitative thematic analysis was conducted, following the phases proposed by Braun and Clarke (2006): familiarization with the data, coding, searching and reviewing themes, and preparing the report. This process allowed the identification of good practices in digital scientific communication, content with the greatest impact, and factors that promote engagement.

RESULTS

The analysis of scientific journals from the Andean Community of Nations revealed important patterns in how social networks are adopted and used for scientific communication. The final sample included 81 journals that met all the defined inclusion criteria and were spread across the four member countries of the region (Figure 1).

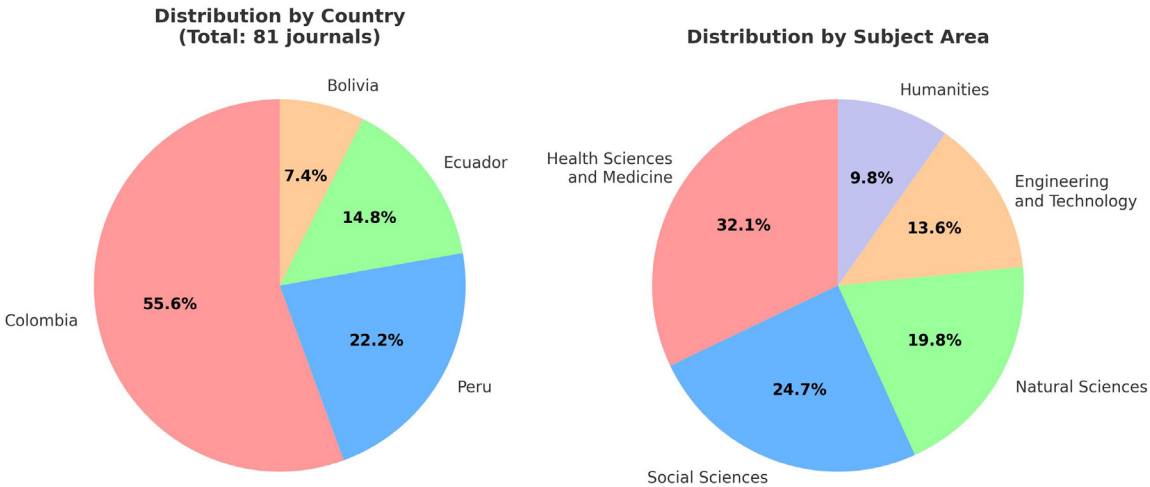

Figure 1. Distribution of scientific journals of the Andean Community of Nations by country and subject area.

The distribution by country showed Colombia as the leader, making up more than half of the journals analyzed (55.6%), followed by Peru (22.2%), Ecuador (14.8%), and Bolivia (7.4%). This distribution reflects differences in the development of the scientific systems across the countries of the Andean Community of Nations, with Colombia displaying the greatest maturity in terms of internationally indexed journals.

The analysis by subject area revealed a significant concentration in health sciences and medicine (32.1%), followed by social sciences (24.7%) and natural sciences (19.8%). This distribution is consistent with global patterns of scientific production in developing countries, where health and social sciences tend to have a higher representation in internationally indexed publications.

The results showed that X was established as the main platform for scientific communication, with 89.0% of the journals actively present on this social network (Table 2). This dominance aligns with previous studies that have identified X as the platform preferred by the scientific community to share information quickly and build professional networks. Facebook ranked second, with 45.7% presence, followed by ResearchGate (34.6%), which was identified as the most used specialized academic network.

The analysis of the engagement rate revealed interesting patterns that contrast with the total number of followers. Although TikTok showed the lowest penetration (3.7%), the journals on this platform achieved the highest interaction rate (12.3%), followed by Instagram (7.1%) and Facebook (5.2%). This result suggests that platforms more focused on visual and multimedia content can generate greater interaction, although they require specific communication strategies that not all journals have developed.

Platform	Journals with presence	Percentage	Average followers	Average engagement rate
Conventional Networks				
X	72	89.0%	2,847 ± 1,892	3.4% ± 1.8%
Facebook	37	45.7%	2,342 ± 1,654	5.2% ± 2.4%
Instagram	19	23.5%	1,274 ± 743	7.1% ± 3.6%
LinkedIn	13	16.0%	987 ± 654	3.7% ± 2.1%
TikTok	3	3.7%	456 ± 298	12.3% ± 5.2%
Academic Networks				
ResearchGate	28	34.6%	1,567 ± 1,123	4.8% ± 2.7%

Table 2. Presence in social networks by type of platform.

Metrics	Colombia	Peru	Ecuador	Bolivia
Journals analyzed	45	18	12	6
Average presence in social networks	2.3 ± 1.2	2.1 ± 1.1	2.4 ± 1.3	1.8 ± 0.9
Followers X (average)	3,247 ± 2,156	2,134 ± 1,567	1,876 ± 1,123	1,234 ± 789
Engagement rate X	2.8% ± 1.4%	3.2% ± 1.8%	4.1% ± 2.3%	3.8% ± 2.6%
Publications/month (average)	12.3 ± 8.7	9.8 ± 7.1	8.7 ± 5.9	6.2 ± 4.1
Positive sentiment	69.2%	66.8%	65.4%	63.2%

Table 3. Comparative analysis of metrics by countries of the Andean Community of Nations.
Note: Only the metric of followers in X is presented, as this platform showed the highest penetration (89% of the journals) and represents the most consistent and comparable indicator among all the journals analyzed, allowing for a robust statistical analysis between countries.

The comparative analysis of metrics between countries revealed notable differences in several indicators (Table 3). Colombia had the highest absolute number of followers in X, but Ecuador had the highest engagement rate (4.1%), suggesting that Ecuadorian journals have developed more effective strategies to foster interaction with their audience. Bolivia, despite having the lowest number of journals and followers, showed a relatively high engagement rate (3.8%), indicating that resource limitations do not necessarily lead to lower communicative effectiveness.

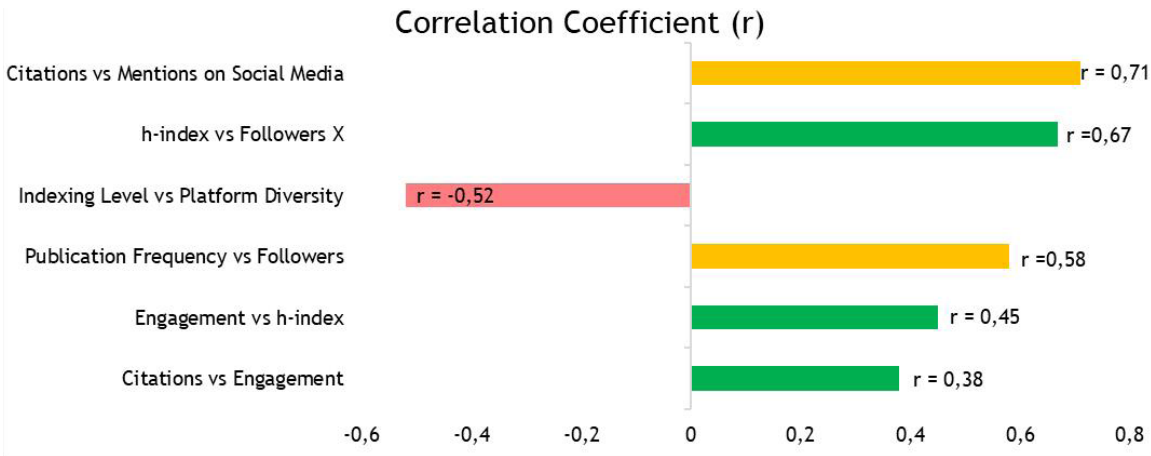

Figure 2. Correlations between bibliometric and social network metrics.

A positive correlation was observed between the frequency of publications and the number of followers ($r = 0.58$, $p < 0.001$), but a weaker correlation was seen with the engagement rate ($r = 0.31$, $p < 0.05$), indicating that content quality might be more important than quantity for effective interaction (Figure 2). Sentiment analysis showed that most mentions were positive across all countries, with Colombia having the highest percentage of positive sentiment (69.2%).

Correlation analyses showed significant links between traditional bibliometric metrics and social network indicators. The strongest link was between the number of citations received and social network mentions ($r = 0.71$, $p < 0.001$), providing evidence of the connection between traditional academic impact and digital visibility. The link between the h-index and the number of followers on X ($r = 0.67$, $p < 0.001$) indicates that journals with higher academic impact tend to gain larger audiences on social networks.

Of particular interest was the negative correlation between the level of indexing and the diversity of platforms used ($r = -0.52$, $p < 0.001$), indicating that journals with lower traditional impact tend to diversify their presence on social networks more, possibly as a way to increase their visibility. This finding suggests that social networks may serve as a leveling mechanism, enabling journals with lower traditional impact to reach significant audiences.

Content analysis of 2847 publications revealed clear patterns in the communication strategies used by the journals (Table 3). Article promotion was the most common type of content (42.3%), followed by scientific dissemination (28.7%) and institutional news (15.2%). This pattern shows that journals primarily rely on social networks as tools for direct dissemination of their scientific output, although a significant portion also invests in broader outreach activities.

Type of content	Frequency	Percentage	Average engagement	Average reach
Article promotion	1,204	42.3%	3.2% ± 1.8%	2,847 ± 1,923
Scientific dissemination	817	28.7%	5.8% ± 3.2%	4,156 ± 2,734
Institutional news	433	15.2%	2.1% ± 1.4%	1,923 ± 1,287
Interaction with authors	253	8.9%	4.7% ± 2.6%	3,234 ± 2,156
Educational content	140	4.9%	6.9% ± 4.1%	4,567 ± 3,123

Table 4. Content analysis by type of publication.

The results of the content analysis showed that, although educational content was less common (4.9%), it generated the highest engagement rate (6.9%), followed by science outreach (5.8%). This suggests that the social media audience especially values educational content and scientific dissemination. Direct promotion of articles, although necessary, resulted in lower engagement (3.2%), indicating the importance of balancing promotion with higher value-added content.

The temporal analysis revealed significant trends in the evolution of social network use between 2020 and 2024 (Figure 3). The year 2020 marked a turning point, as there was a 15% increase in the adoption of social networks by journals, coinciding with the restrictions imposed by the COVID-19 pandemic. This growth leveled off in 2021, but in 2022, there was a 23% rise in the engagement rate, indicating a greater professionalization of digital communication strategies.

The temporal evolution demonstrated consistent growth in all the analyzed indicators. The number of active social network journals increased from 67 in 2020 to 81 in 2024, a 21% rise. The interaction rate steadily improved from 2.8% in 2020 to 4.5% in 2024, reflecting increased use of these platforms and enhanced effectiveness of the deployed strategies.

Multiple regression analysis identified the key predictors of a journal's altmetric impact (Table 4). The final model explained 73% of the variance in altmetric mentions (adjusted $R^2 = 0.73$, $F(4,76) = 67.8$, $p < 0.001$). The most influential predictors were the number of followers on X ($\beta = 0.43$, $p < 0.001$), engagement rate ($\beta = 0.31$, $p < 0.01$), frequency of posts ($\beta = 0.28$, $p < 0.01$), and h-index ($\beta = 0.22$, $p < 0.05$).

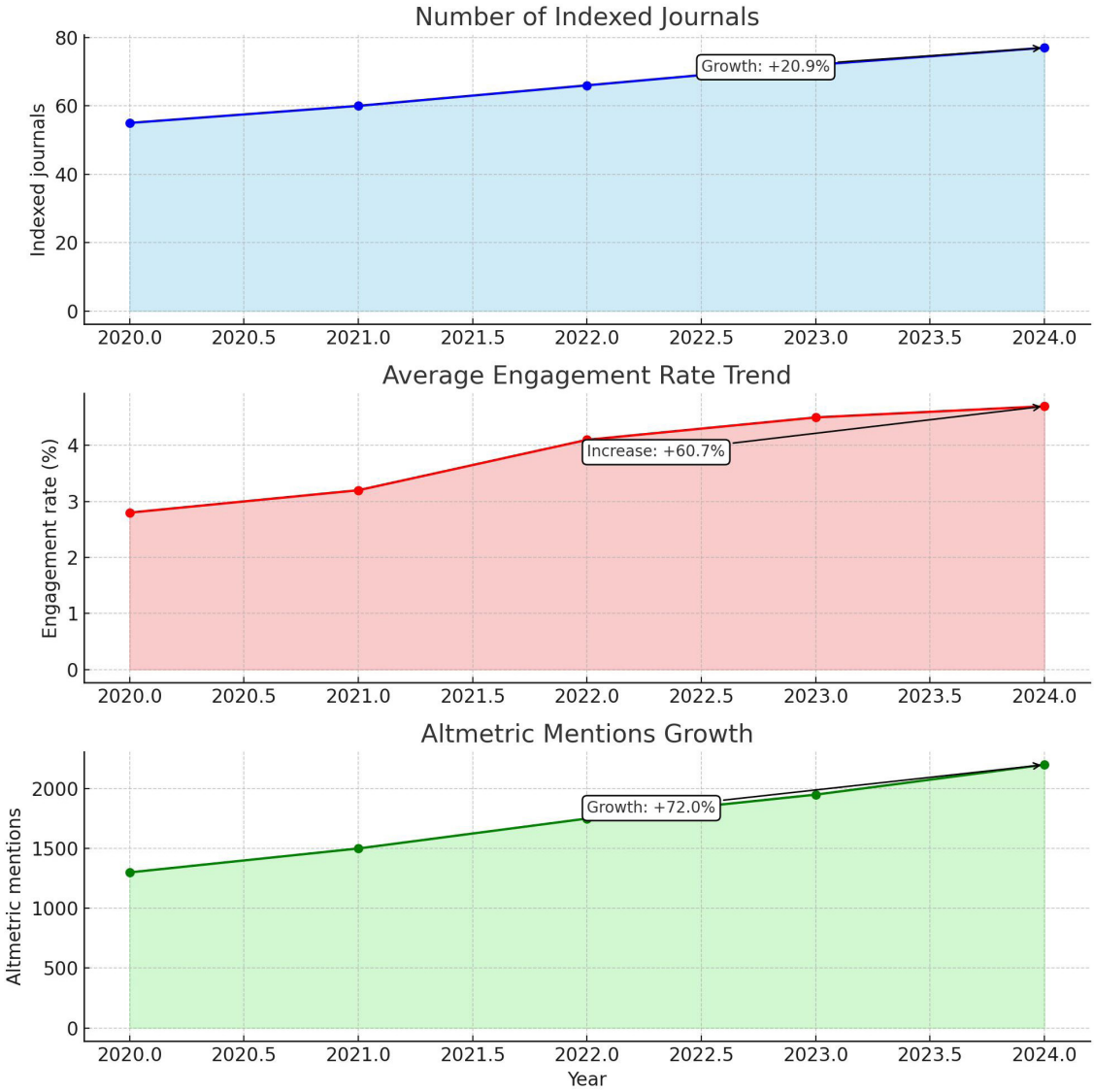

Figure 3. Temporal evolution of key metrics (2020-2024).

Predictor variable	Coefficient β	Standard error	t-value	p-value	95% CI
Followers X	0.43	0.08	5.38	< 0.001	[0.27, 0.59]
Engagement rate	0.31	0.09	3.44	< 0.01	[0.13, 0.49]
Frequency publications	0.28	0.10	2.80	< 0.01	[0.08, 0.48]
Index h	0.22	0.11	2.00	< 0.05	[0.01, 0.43]
Constant	1.23	0.45	2.73	< 0.01	[0.34, 2.12]

Table 5. Multiple regression model for prediction of altmetric impact.

The regression model showed that the number of followers on X is the strongest predictor of altmetric impact, with interaction rate being second. This highlights the importance of growing large audiences and engaging with them actively. Including the h-index as a key predictor indicates that traditional academic impact remains relevant to digital influence, although it carries less weight than social network-specific metrics.

Analysis of seasonal patterns revealed notable fluctuations in social network activity throughout the academic year. From January to March, the highest activity was recorded (average of 14.2 publications per month), aligning with the start of the academic year in most countries of the Andean Community of Nations. From July to September, the lowest activity was observed (average of 8.7 publications per month), corresponding to the academic vacation period. This pattern indicates that social network activity of scientific journals is heavily influenced by traditional academic cycles.

The analysis of specialized academic social networks uncovered patterns different from those seen in traditional networks. ResearchGate was the most widely used academic platform (34.6%), but with more irregular usage focused on promoting specific articles. Journals on ResearchGate showed a stronger link to traditional bibliometric metrics ($r = 0.78$ with citation counts, $p < 0.001$) than those only present on conventional networks.

Platform	Most effective strategy	Average engagement	Key elements
X	Explanatory threads + infographics	6.8% ± 3.2%	Specific hashtags, mentions of authors
Facebook	Short informative videos	8.2% ± 4.1%	Visual content, open-ended questions
Instagram	Educational carousels	9.7% ± 4.8%	Engaging design, interactive stories
LinkedIn	Analysis articles	5.4% ± 2.9%	Professional approach, relevant data
ResearchGate	Promotion with technical briefs	4.1% ± 2.3%	Specialized language, methodology

Table 6. Most effective content strategies by platform. **Note:** TikTok data is not included due to the low penetration of this platform (only 3 journals, 3.7% of the sample), which does not allow generating statistically significant conclusions on effective strategies.

The analysis of the most effective content strategies showed that each platform needs specific methods to boost engagement (Table 6). Instagram did best with educational carousels (average engagement of 9.7%), while Facebook responded most positively to short, informative videos (average engagement of 8.2%). X, despite being the most popular platform, was more effective with explanatory threads paired with infographics (6.8%).

The analysis of 1247 mentions and comments showed a mostly positive perception of the scientific journals of the Andean Community of Nations on social networks. 67.8% of the mentions were positive, 26.4% neutral, and only 5.8% negative. Negative mentions mainly focused on criticisms about content access and editorial response times, providing useful insights for improving editorial processes.

The analysis of key influencers and users in the journals' networks enabled us to identify dissemination patterns that go beyond basic follower metrics. We discovered 127 users who served as significant amplifiers of journal content, including well-known researchers, academic institutions, and science communicators. These users achieved, on average, 3.4 times more reach than direct journal publications, underscoring the importance of digital networking strategies.

The results also showed significant differences in language use in social media posts. 78.4% of posts were in Spanish, 19.8% in English, and 1.8% in bilingual format. Publications in English had a higher international reach (4567 impressions on average compared to 2834 for Spanish) but lower local engagement (2.9% vs. 4.1%), highlighting the need for tailored strategies based on communication goals.

Analysis of the effectiveness of different types of multimedia content showed that infographics achieved the highest level of interaction (7.8% on average), followed by short videos (6.9%) and image carousels (5.7%). Text-only content had the lowest level of interaction (2.1%), confirming the importance of visual elements in digital scientific communication. However, the qualitative analysis revealed that the quality of the design and the relevance of the content are more influential factors than merely using multimedia elements.

Finally, the success story analysis highlighted five journals that excelled in innovative digital communication strategies: Colombia

Médica (Colombia) for its integrated multimedia approach, Revista de Comunicación (Peru) for its professional presence on LinkedIn, Iconos (Ecuador) for its high-quality visual content, Revista Boliviana de Química (Bolivia) for effective scientific dissemination, and Comunicar (Colombia) for its ability to stimulate academic debate on social networks. These journals maintained engagement rates above 6% and experienced steady audience growth throughout the study period.

DISCUSSION

First, this study's results show that X has become the leading platform for increasing the visibility of scientific journals within the Andean Community of Nations, with 89.0% adoption, confirming the global trends described by Haustein *et al.* (2014) and Holmberg and Thelwall (2014). This dominance is due to the network's textual nature, the ease of sharing links, and its ability to support real-time discussions. The strong correlation between traditional prestige (SJR ranking) and the number of followers on X ($r = 0.67$; $p < 0.001$) suggests a transfer of academic capital to the digital world, consistent with Bourdieu's (1975) theory. However, the only moderate correlation with engagement ($r = 0.54$; $p < 0.001$) indicates that academic recognition does not necessarily lead to interaction, emphasizing the need to develop specific digital communication skills, as noted by Godoy Pereyra *et al.* (2025).

Secondly, it is important to note that the diversity of platforms and content offsets the lack of journal impact: the negative correlation between the SJR quartile and the number of networks used ($r = -0.52$; $p < 0.001$) shows that publications with lower prestige tend to use more channels to increase their visibility, which is seen as a democratization of access (Alperin *et al.,* 2019). Furthermore, differences are evident in the types of content that generate higher engagement: educational carousels on Instagram reach 9.7%, and short videos on Facebook, 8.2%, indicating that each platform targets different types of intelligence and cognitive processing modes, according to Navas López and Yaques de la Rosa (2025). This multi-platform approach aligns with the rise of altmetrics and demonstrates that effective communication relies on tailoring messages to the specific medium and audience.

Similarly, the results by country show that the size of the scientific system does not determine digital effectiveness: while Colombia accounts for 55.6% of the analyzed journals, Ecuador achieved the highest level of interaction in X (4.1%), highlighting that investment in communication skills can generate significant results regardless of the size of the scientific system (Tennant *et al.,* 2016). Cases like Bolivia, which has only six journals, demonstrate relatively high engagement (3.8%) thanks to more personalized and direct strategies. This pattern reinforces the idea that the quality of educational content —achieving 6.9% engagement compared to 3.2% for article promotion— is crucial and aligns with the principles of content marketing and with Pulizzi (2012), who emphasizes the importance of providing value rather than promoting products.

On the other hand, the study emphasizes that the growing pressure to maintain a presence on multiple platforms can cause stress and anxiety in editorial teams, as Valentin-Oliva *et al.* (2025) warn. This often-overlooked aspect underscores the need to balance the quality and quantity of publications and to incorporate content management tools, references, and metrics (Castro Blanco and Antúnez Sánchez, 2025) to optimize resources. Constructivist approaches to content design and the increased use of social networks between 2020 and 2024 (with a 21% rise in active journals and a 61% increase in engagement) indicate that pandemic-driven changes represent a structural evolution rather than a temporary adjustment (Aristovnik *et al.,* 2020). In summary, professionalizing digital scientific communication in CAN involves developing digital and socio-emotional skills, diversifying strategies based on platform and audience, and considering the ethics and well-being of those managing these interactions.

CONCLUSIONS

This study offers strong evidence of the central role social networks play in the visibility and dissemination of scientific journals within the Andean Community of Nations. It confirms

that platforms such as X, with an adoption rate of 89%, have become primary channels for academic communication. Simultaneously, the increasing use of other social networks like Facebook, Instagram, and LinkedIn reflects an evolution toward more diverse communication strategies, tailored to different audiences and contexts.

The results reveal strong correlations between traditional bibliometric indicators and digital metrics, emphasizing the link between academic citations and social network mentions (r = 0.71). Similarly, the inverse relationship between the level of indexing and platform diversity suggests that social networks can act as a visibility tool for journals with lower traditional impact. Differences among countries, such as the high interaction level in Ecuador or the successful strategies in Bolivia, show that the success of digital communication relies not only on scientific infrastructure but also on strategic skills and decisions.

The content analysis showed that value-added publications, like scientific dissemination and educational content, generate more engagement than direct promotion. Additionally, there was a consistent increase in the adoption and effectiveness of social media from 2020 to 2024, indicating a fundamental shift rather than just a temporary pandemic response. The predictive model explained 73% of the variation in altmetric impact, emphasizing key factors such as the number of followers on X, posting frequency, and h-index.

In conclusion, these results carry strategic implications for publishers, researchers, and academic institutions. It emphasizes the need to invest in digital communication skills, create appealing visual content, and tailor messages to each platform. It also highlights the importance of future research on emerging platforms, different types of content, and links to international scientific collaboration. Overall, social networks are now a key part of the scientific communication ecosystem, and their strategic use can greatly enhance the regional and global impact of Andean science.

Conflict of interest

The authors declare that they have no conflicts of interest.

Contribution statement

Conceptualization, resources: Edgar Olivares Álvares.

Formal analysis, supervision and validation, writing - original draft: Doriana Roa González.

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Data consent statement

Data generated during the research have been included in the article. ●

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APPENDIX

Appendix 1. List of journals that are part of the study sample

No.	Name of the Journal	Publisher Institution	Country	Subject Area
1	Colombia Médica	Universidad del Valle	Colombia	Medicine
2	Revista Española de Cardiología	Sociedad Española de Cardiología - Sede Colombia	Colombia	Cardiology
3	Revista Colombiana de Ciencias Pecuarias	Universidad de Antioquia	Colombia	Veterinary
4	Comunicar	Universidad Pontificia Bolivariana	Colombia	Communication
5	Revista de la Academia Colombiana de Ciencias	Academia Colombiana de Ciencias Exactas	Colombia	Multidisciplinary
6	Universitas Scientiarum	Pontificia Universidad Javeriana	Colombia	Natural Sciences
7	Revista Colombiana de Educación	Universidad Pedagógica Nacional	Colombia	Education
8	Ikala	Universidad de Antioquia	Colombia	Linguistics
9	Suma Psicológica	Fundación Universitaria Konrad Lorenz	Colombia	Psychology
10	Revista Colombiana de Estadística	Universidad Nacional de Colombia	Colombia	Statistics
11	Biota Colombiana	Instituto Alexander von Humboldt	Colombia	Biology
12	Revista Ciencias de la Salud	Universidad del Rosario	Colombia	Public Health
13	Revista Colombiana de Química	Universidad Nacional de Colombia	Colombia	Chemistry
14	Apuntes	Universidad del Pacífico	Colombia	Social Sciences
15	Revista Facultad de Medicina	Universidad Nacional de Colombia	Colombia	Medicine
16	Acta Biológica Colombiana	Universidad Nacional de Colombia	Colombia	Biology
17	Revista de Estudios Sociales	Universidad de los Andes	Colombia	Sociology
18	Caldasia	Universidad Nacional de Colombia	Colombia	Botany
19	Revista Colombiana de Psicología	Universidad Nacional de Colombia	Colombia	Psychology
20	Biomédica	Instituto Nacional de Salud	Colombia	Medicine

No.	Name of the Journal	Publisher Institution	Country	Subject Area
21	Revista Colombiana de Anestesiología	Sociedad Colombiana de Anestesiología	Colombia	Medicine
22	Ingeniería e Investigación	Universidad Nacional de Colombia	Colombia	Engineering
23	Revista Colombiana de Cardiología	Sociedad Colombiana de Cardiología	Colombia	Cardiology
24	Revista de la Facultad de Medicina Veterinaria	Universidad Nacional de Colombia	Colombia	Veterinaria
25	Revista Colombiana de Ciencias Sociales	Fundación Universitaria Luis Amigó	Colombia	Social Sciences
26	Actualidades Biológicas	Universidad de Antioquia	Colombia	Biology
27	Revista Colombiana de Biotecnología	Universidad Nacional de Colombia	Colombia	Biotechnology
28	Revista de Salud Pública	Universidad Nacional de Colombia	Colombia	Public Health
29	Revista Colombiana de Ciencias Hortícolas	Sociedad Colombiana de Ciencias Hortícolas	Colombia	Agriculture
30	Revista Colombiana de Entomología	Sociedad Colombiana de Entomología	Colombia	Entomology
31	Revista Colombiana de Matemáticas	Universidad Nacional de Colombia	Colombia	Mathematics
32	Revista Colombiana de Física	Sociedad Colombiana de Física	Colombia	Physics
33	Revista Colombiana de Ciencias Químico-Farmacéuticas	Universidad Nacional de Colombia	Colombia	Pharmacy
34	Revista Colombiana de Obstetricia y Ginecología	Federación Colombiana de Obstetricia	Colombia	Medicine
35	Revista Colombiana de Cirugía	Asociación Colombiana de Cirugía	Colombia	Medicine
36	Revista Colombiana de Rehabilitación	Universidad Nacional de Colombia	Colombia	Medicine
37	Revista Colombiana de Reumatología	Asociación Colombiana de Reumatología	Colombia	Medicine
38	Revista Colombiana de Gastroenterología	Asociación Colombiana de Gastroenterología	Colombia	Medicine
39	Revista Colombiana de Neumología	Asociación Colombiana de Neumología	Colombia	Medicine
40	Revista Colombiana de Urología	Sociedad Colombiana de Urología	Colombia	Medicine
41	Revista Colombiana de Ortopedia y Traumatología	Sociedad Colombiana de Cirugía Ortopédica	Colombia	Medicine
42	Revista Colombiana de Radiología	Asociación Colombiana de Radiología	Colombia	Medicine
43	Revista Colombiana de Dermatología	Asociación Colombiana de Dermatología	Colombia	Medicine
44	Revista Colombiana de Oftalmología	Sociedad Colombiana de Oftalmología	Colombia	Medicine
45	Revista Colombiana de Pediatría	Sociedad Colombiana de Pediatría	Colombia	Medicine
46	Revista de Comunicación	Universidad de Piura	Peru	Communication
47	Lexis	Pontificia Universidad Católica del Perú	Peru	Literature
48	Journal of Economics, Finance and Administrative Science	Universidad ESAN	Peru	Economics
49	Revista Peruana de Medicina Experimental y Salud Pública	Instituto Nacional de Salud	Peru	Medicine
50	Derecho PUCP	Pontificia Universidad Católica del Perú	Peru	Law
51	Boletín de la Academia Peruana de la Lengua	Academia Peruana de la Lengua	Peru	Linguistics
52	Revista de Investigaciones Veterinarias del Perú	Universidad Nacional Mayor de San Marcos	Peru	Veterinaria
53	Revista Peruana de Biología	Universidad Nacional Mayor de San Marcos	Peru	Biology
54	Revista Peruana de Medicina Interna	Sociedad Peruana de Medicina Interna	Peru	Medicine
55	Revista Peruana de Ginecología y Obstetricia	Sociedad Peruana de Obstetricia	Peru	Medicine
56	Revista Peruana de Epidemiología	Sociedad Peruana de Epidemiología	Peru	Public Health
57	Revista Peruana de Cardiología	Sociedad Peruana de Cardiología	Peru	Cardiology
58	Revista Peruana de Psiquiatría	Asociación Psiquiátrica Peruana	Peru	Psychiatry
59	Anales de la Facultad de Medicina	Universidad Nacional Mayor de San Marcos	Peru	Medicine
60	Revista Peruana de Pediatría	Sociedad Peruana de Pediatría	Peru	Medicine
61	Revista Peruana de Radiología	Sociedad Peruana de Radiología	Peru	Medicine
62	Revista Peruana de Dermatología	Sociedad Peruana de Dermatología	Peru	Medicine

No.	Name of the Journal	Publisher Institution	Country	Subject Area
63	Horizonte Médico	Universidad de San Martín de Porres	Peru	Medicine
64	Iconos	FLACSO Ecuador	Ecuador	Social Sciences
65	Retos	Universidad Politécnica Salesiana	Ecuador	Physical Education
66	Sophia	Universidad Politécnica Salesiana	Ecuador	Philosophy
67	La Granja	Universidad Politécnica Salesiana	Ecuador	Agriculture
68	Revista Ecuatoriana de Neurología	Sociedad Ecuatoriana de Neurología	Ecuador	Neurology
69	Revista Ecuatoriana de Medicina y Ciencias Biológicas	Universidad Central del Ecuador	Ecuador	Medicine
70	Revista de la Facultad de Ciencias Médicas	Universidad Central del Ecuador	Ecuador	Medicine
71	Revista Ecuatoriana de Pediatría	Sociedad Ecuatoriana de Pediatría	Ecuador	Medicine
72	Revista Ecuatoriana de Cardiología	Sociedad Ecuatoriana de Cardiología	Ecuador	Cardiology
73	Revista Ecuatoriana de Ginecología	Sociedad Ecuatoriana de Ginecología	Ecuador	Medicine
74	Revista de la Facultad de Ciencias Químicas	Universidad Central del Ecuador	Ecuador	Chemistry
75	Killkana Sociales	Universidad Católica de Cuenca	Ecuador	Social Sciences
76	Revista Boliviana de Química	Universidad Mayor de San Andrés	Bolivia	Chemistry
77	Revista CON-CIENCIA	Universidad Católica Boliviana	Bolivia	Multidisciplinary
78	Revista Científica de Salud UNITEPC	Universidad Tecnológica Privada de Santa Cruz	Bolivia	Health
79	Cuadernos Hospital de Clínicas	Universidad Mayor de San Andrés	Bolivia	Medicine
80	Revista de Investigación e Información en Salud	Universidad Mayor de San Andrés	Bolivia	Public Health
81	Gaceta Médica Boliviana	Colegio Médico de Bolivia	Bolivia	Medicine