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Science communication on websites of Argentinean research institutes

Comunicación de las ciencias en sitios web de institutos de investigación de Argentina

Comunicação científica nos sites de institutos de pesquisa de Argentina

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This paper describes the websites of 30 institutions dedicated to scientific research in Argentina. It analyzes the interface design and the forms and modalities of public science communication implemented by research institutes of different disciplines. The analysis reveals that the institutions with a better communication strategy are those that achieve a multimodal production of content, refer to topics with local relevance and promote a scientific culture.
KEYWORDS: Websites, scientific communication, institutional communication, Argentina.

Este artículo describe los sitios web de 30 instituciones dedicadas a la investigación científica en Argentina. Se analiza el diseño de la interfaz y las formas y modalidades de comunicación pública de las ciencias implementadas por los institutos de investigación de diferentes disciplinas. El análisis revela que las instituciones con una mejor estrategia comunicacional son las que logran una producción multimodal de contenidos, refieren a temáticas con relevancia local y promueven una cultura científica.
PALABRAS CLAVE: Sitios web, comunicación científica, comunicación institucional, Argentina.

Este artigo descreve os sites de 30 instituições dedicadas à pesquisa científica na Argentina. Analisa-se o design da interface e as formas e modalidades de comunicação pública da ciência implementadas por institutos de pesquisa de diferentes disciplinas. A análise revela que as instituições com uma melhor estratégia de comunicação são aquelas que conseguem uma produção multimodal de conteúdos, abordam temas com relevância local e promovem uma cultura científica.
PALAVRAS-CHAVE: Sites, comunicação científica, comunicação institucional, Argentina.

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Introduction

The contemporary era is characterized by an increasing mediatization of practices and organizations. The "communicational logic" expanded, based on an amalgamation and adaptation to other institutions (Krotz, 2017; Pentzold, 2018). This implies that the operating grammar of information and communication technologies interrelated and combined with the logics of social institutions (Krotz, 2022); scientific institutions were no exception.

In recent decades, scientific practices have undergone multiple transformations in their organization and interaction with the rest of society (Gibbons et al., 1997). One of these transformations was the deepening of mediatization, as they not only imported logics from information and communication culture (as happened with institutions in politics, religion, sports, and the arts), but also became oriented toward the communication and visibility of their productions.

Organizations and agents dedicated to knowledge production gradually incorporated this "communicational logic" into their practices, values, and forms of validation: they not only modified their internal communication among scientists and their communication with the public sphere, but also their relationships with the media and the ways in which their productions were disseminated and made visible (Polino & Castelfranchi, 2012). This was evidenced by an increase in the number of faculties, laboratories, and research groups that created or consolidated their institutional and scientific communication areas (communications departments, media relations offices, public relations offices, etc.) (Cortassa & Polino, 2015) and the launch of their own websites and official accounts on social media platforms (Vara, 2022).

In Argentina, various studies have been conducted on the science communication practices and strategies of scientific institutions. For example, research has explored communication departments within research organizations (Conforti & Legaria, 2022; Montes de Oca, 2016; Neffa, 2014); the forms of communication and interaction between universities and other social groups (Azziani, 2018; Cortassa et al., 2020; Dávila, 2019; Gasparri, 2016; Legaria, 2022; Wursten, 2022; Wursten et al., 2025); and the communication policies of the Centro Científico

Tecnológico de Comahue (Rey, 2012). Additionally, other investigations have analyzed the perceptions and attitudes of the scientific community regarding science communication and popularization (Cortassa & Rosen, 2020; Kreimer et al., 2010), as well as their interaction with specific audiences (Benialgo, 2018).

In this context of expanding communication areas for scientific institutions and the growing media coverage of expert knowledge on websites and virtual platforms, academic communities face the challenge of actively engaging in its dissemination and circulation outside the academic sphere.

Specifically, this article investigates the characteristics of the websites of institutes belonging to the National Council for Scientific and Technical Research (Consejo Nacional de Investigaciones Científicas y Técnicas, CONICET) of the Argentine Republic. The selection of this body is due to its being named the most important governmental science institution in Latin America in 2024, according to the 16th edition of the Scimago Ranking (SIR). The question that arises is: what are the characteristics and modalities of public science communication (PSC) carried out on the official websites of the institutes that make up one of the most important Spanish-speaking science institutions? To answer this, a descriptive analysis was conducted on the websites of 30 research and development centers under the CONICET, located in the province of Santa Fe (Argentina).

Institutional websites as an interface between science and society

The diverse forms of the science-society-culture interface have been explored by science, technology and society (STS) studies, the philosophy of science, scientific culture, and the design of science policies, among others (Guimarães Pereira et al., 2006). While some works delve into the semantic complexity of scientific communication –exploring processes of meaning encoding and translation between different social contexts–, others emphasize the importance of technological mediatizations in the construction of performative interfaces between science and communities (Leydesdorff, 2005; Ynnerman et al., 2018).

The policies, actions, and practices of academic and scientific organizations that seek to bridge the gap between science and society are varied. Public science communication is one of them. In this field, the skills, media, activities, and interactions postulate one or more of the following purposes: promoting awareness about the various aspects of science; generating enjoyment in audiences or recipients; deepening interest and voluntary involvement in science; forming and confirming opinions and attitudes related to science; and contributing to the understanding of its contents, processes, and social factors (Burns et al., 2003). In this way, PSC can involve science professionals, mediators, and other members of the general public, whether among peers or between groups.

In the context of growing contemporary mediatization, it is possible to conceive of PSC practices as part of an interface between scientific communities and the rest of society (Cortassa, 2019). These communication interfaces constitute complex spaces where meanings are negotiated, perceptions are constructed, and scientific knowledge is socially legitimized, and they are manifested in strategies that go beyond the dissemination of results (Arroyo-Machado et al., 2023).

The scientific and institutional communication of science organizations constitutes a key strategy to strengthen ties with various social actors. And institutional websites are fundamental for this, as they not only publish official information but also project the organizational identity and strengthen trust relationships with their audiences (Medina-González et al., 2021).

From a pragmatic communication perspective (Lemos, 2020), it is postulated that the websites of research institutes not only function as a space for disseminating institutional actions and research results but also have a performative capacity in the construction of social perceptions about scientific practice and production. On these websites –as interfaces between science and society– scientific knowledge is put into circulation, but narratives and meanings about scientists and lay people are also expressed. This is manifested in the site's design, the presentation styles of the research teams, the approaches and framing of the publications, the way of addressing the public, and the channels of interaction with the public.

METHODOLOGY

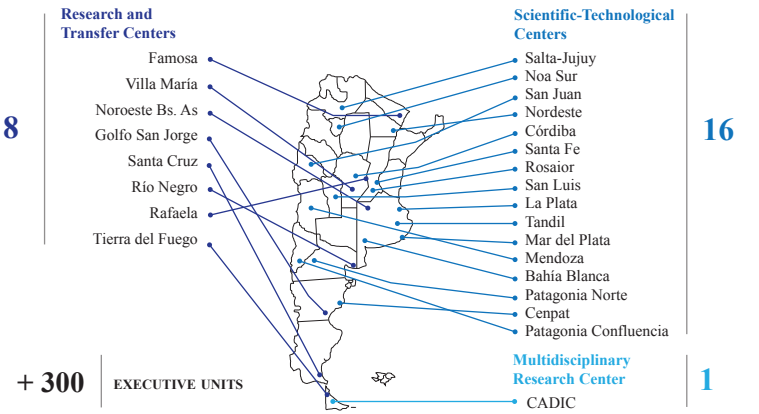
The methodological strategy was exploratory, descriptive, and synchronic. The websites of different research institutes were tracked and systematized, and they were analyzed during the period of March-June 2024 (to which a general review was added in December 2024).

Sample and units of analysis

CONICET is a decentralized, federal, and multidisciplinary organization created in 1958. It currently has around 28 000 professionals in four major areas of knowledge: agrarian, engineering and materials sciences; biological and health sciences; exact and natural sciences; and social sciences and humanities. It is organized into an extensive network that includes 16 Scientific-Technological Centers (Centros Científico-Tecnológicos, CCTs), eight Research and Transfer Centers (CITs), one Multidisciplinary Research Center, and more than 300 Institutes and Centers, distributed throughout the country.

FIGURE 1

COMPOSITION AND GEOGRAPHICAL DISTRIBUTION OF CONICET



Source: CONICET[2]

[2] See https://red.conicet.gov.ar/

To create the analysis corpus, the website of CONICET's central headquarters was chosen, along with the websites of the institutes located in the province of Santa Fe. This province was selected because it is one of the regions with the highest scientific output in the country due to having two CCTs within its territory (in the cities of Santa Fe and Rosario). As of December 2023, CCT Santa Fe had 16 institutes (not counting those in the province of Entre Ríos), which brought together approximately 669 researchers and 613 fellows.

Meanwhile, in May 2024, CCT Rosario had 12 research institutes, with 474 researchers and 400 fellows. Thus, between the two CCTs in the province, a total of 28 research institutes were accounted for at the time of the analysis (2024). As a result, the study corpus was composed of those 28 websites plus the ones belonging to the central headquarters of the CCTs of Santa Fe (1) and Rosario (1).

The 30 websites analyzed are detailed below:

TABLE 1
CCT SANTA FE

Center for Materials Research and Development: https://cimec.conicet.gov.ar	Institute for Technological Development for the Construction Industry: https://idical.conicet.gov.ar
Litoral Institute of Agrobiotechnology: https://ial.conicet.gov.ar	Litoral Institute of Veterinary Sciences: https://icivet.unl.edu.ar
Litoral Institute of Agricultural Sciences: https://iciagro.conicet.gov.ar	National Institute of Food and Nutrition: https://inali.conicet.gov.ar
Center for Research in Complex Systems: https://sinc.unl.edu.ar	Animal Health Institute: https://isal.conicet.gov.ar
National Institute of Industrial Technology: https://incape.conicet.gov.ar	Institute of Humanities and Social Sciences: https://ihucso.conicet.gov.ar
National Institute of Agricultural Technology - Rafaela Agricultural Experiment Station: http://www.ingar.santafe-conicet.gov.ar	Litoral Institute of Physics: https://ifis.conicet.gov.ar

National Institute of Limnology: https://inlain.conicet.gov.ar	Litoral Institute of Applied Mathematics: https://imal.conicet.gov.ar
Institute for Technological Development for the Chemical Industry: https://intec.conicet.gov.ar	Litoral Institute of Applied Chemistry: https://iqal.conicet.gov.ar

Source: The authors.

TABLE 2
CCT ROSARIO

Center for Photosynthetic and Biochemical Studies: https://www.cefobi-conicet.gov.ar	Rosario Institute of Physics: https://www.ifir-conicet.gov.ar
Franco-Argentine International Center for Information Science and Systems: https://www.cifasis-conicet.gov.ar/es	Institute of Experimental Physiology: https://www.ifise-conicet.gov.ar
Rosario University Center for Urban and Regional Research: https://curdiur.conicet.gov.ar	Rosario Institute for Agricultural Science Research: https://www.iicar-conicet.gob.ar
Rosario Institute of Molecular and Cellular Biology: https://ibr-conicet.gov.ar	Rosario Institute of Chemistry: https://www.iquir-conicet.gov.ar
Rosario Institute of Clinical and Experimental Immunology: https://www.idicer-conicet.gob.ar	Rosario Institute for Research in Education Sciences: https://www.irice-conicet.gov.ar
Institute for Critical Studies in the Humanities: https://iech.conicet.gov.ar	Regional Socio-Historical Research: https://ishir.conicet.gov.ar

Source: The authors.

Analysis criteria

Over the past two decades, website analysis has shifted from purely technical approaches toward multidimensional perspectives that integrate functional, experiential, and strategic aspects (Morales Vargas,

2022; Velasco et al., 2022). This change reflected the understanding that web design cannot be reduced to isolated attributes, as new models evaluate the site's structure and organization, as well as the various formats of the published information.

Based on the research question, the following analysis criteria were defined for the websites of science institutions:

a) Organization and structure

- Description of the organization and hierarchy of information.
- Description of formats used: written articles, images, podcasts, videos, etc.
- Description of production genres: informative, narrative, scientific, review, interview.

b) Forms of public science communication

- Description of the hierarchy and relevance of science communication productions.
- Description of formats used to communicate science: texts, images, podcasts, videos, etc.
- Description of genres of productions to communicate science: informative, narrative, scientific, review, interview.

Results

Website of CCT SANTA FE

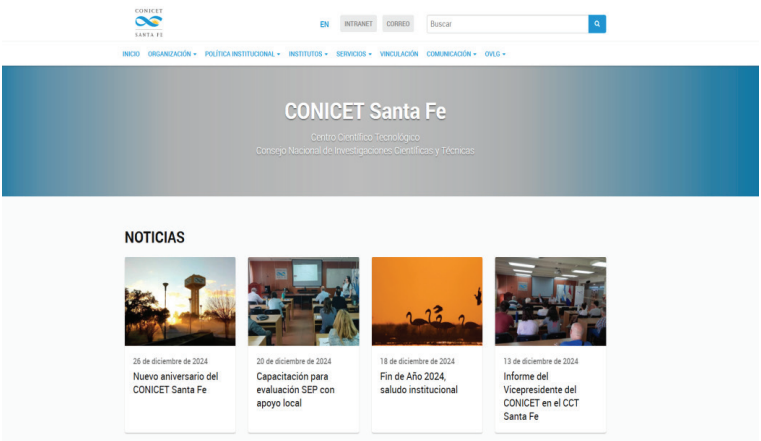
Organization and structure

The analysis of the organizational structure shows a division into seven main sections (Institutional, Scientific and Technological Development, Calls for Proposals, Outreach, Communication, Open Government, Programs) that does not prioritize science communication.

This distribution suggests an organizational strategy that fragments the complexity of the scientific institution into differentiated thematic units. This makes possible a systematic understanding of its various components and functions.

Institutional news, scientific documentaries, audiovisual productions, and educational resources are combined. This indicates a multimodal communication approach, which seeks to address different audience profiles and learning strategies.

FIGURE 2
HOMEPAGE OF THE WEBSITE OF THE CCT SANTA FE



Source: CONICET Santa Fe.[3]

The main sections are News, History, Communication, NotiConicet, and specific calls for proposals. The communication strategies aimed at the democratization of knowledge, with an emphasis on multimedia narratives and the socialization of scientific practice, do not, in principle, have a preponderant place.

The design of the website's interface is distinguished by an informational design that integrates multiple communication resources. The structure is characterized by segmented thematic navigation, multiple entry points for different audiences, and a modular organization that integrates various communication resources.

A significant diversity of content is evident, covering scientific, institutional, historical, educational, call for proposals, and event categories. The information formats include textual resources, photographs, historical archives, electronic newsletters, and documentary records, configuring a multidimensional information ecosystem. The resources used include institutional storytelling, visualization of scientific processes, and the promotion of scientific vocations.

[3] See https://santafe.conicet.gov.ar/

FIGURE 3
ORGANIZATION OF WEBSITE OF SANTA FE SCIENCE AND TECHNOLOGY CENTER

Source: CONICET Santa Fe.

Forms of public science communication

The productions are located in the communication section. Although it does not have a primary place in the structure, there is a large number of PSC productions. The communication modalities develop a multiplatform approach that integrates electronic newsletters, social media, a website, traditional media, educational proposals, contests, and interviews. An accessible language, pedagogical orientation, and inclusive narrative are highlighted, which broadens the channels of scientific dissemination.

Spaces for interaction with the public were identified, such as the BIOFOTO award,[4] the Semana Nacional de la Ciencia y la Tecnología,[5]

4 Professional and amateur photographers can participate in a contest by submitting photographs of flora, fauna, or any biological group, natural landscapes, different living beings, and anything else that reflects biodiversity. For more information, visit: https://santafe.conicet.gov.ar/biofoto

5 The Semana Nacional de la Ciencia y la Tecnología (National Science and Technology Week) is an annual meeting between the scientific community and the public for the popularization of science, technology, and innovation.

and school visits to the institutes. The processes of appropriation are characterized by the inclusion of multiple actors.

CCT SANTA FE Institutes

Organization and structure

There is a diversity of ways to organize the websites of the institutes. Variability is observed, ranging from sections dedicated exclusively to science communication to its integration within news sections. Most have news spaces that facilitate access to updated information, although with very heterogeneous levels of variety. PSC is denoted as a usual practice, although with different levels of development. There are many initiatives that seek to generate the institutional identity as a reference in their research areas.

A wide diversity of content is recorded, from news about ongoing research to materials developed, such as outreach articles, videos, podcasts, and educational resources. Some institutes prioritize audiovisual productions and interactive initiatives, while others focus on the dissemination of scientific articles and events.

Web interfaces vary in design, but are generally intuitive and easy to navigate. Most are accessible from mobile devices, using multiple communication formats including text, images, videos, audio, and interactive presentations, adapting to different audiences and channels.

Forms of public science communication

The proposals prioritize a multimodal approach. Social media platforms (Instagram, Facebook, and, to a lesser extent, X) are configured and presented as channels for amplifying content and connecting with young audiences. Additionally, events such as talks, workshops, exhibitions, and guided tours are organized. Interinstitutional collaborations that enhance outreach and popularization efforts stand out. The strategies are characterized by a search for audience diversity, from students and teachers to the "general community". Participatory activities like science cafés and workshops are promoted, fostering active interaction between scientists and the public.

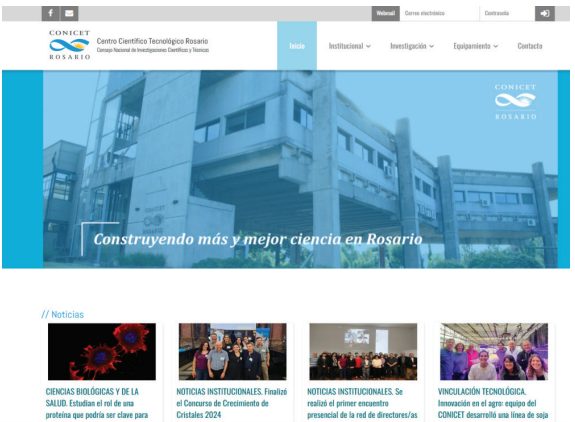
It takes place throughout the country during one week in September each year. More information at: https://www.semanadelaciencia.mincyt.gob.ar

Website of CCT Rosario

Organization and structure

The website's design is distinguished by a clear structure, thematic organization, and segmented content. It is specifically oriented towards outreach, implementing accessibility strategies such as free content, understandable language, and multiple communication formats. The information architecture allows for clear and organized navigation, segmenting scientific content into specific thematic spaces that facilitate access and understanding of institutional information. The website's structure is composed of five main sections: Home, Institutional, Research, Equipment, and Contact.

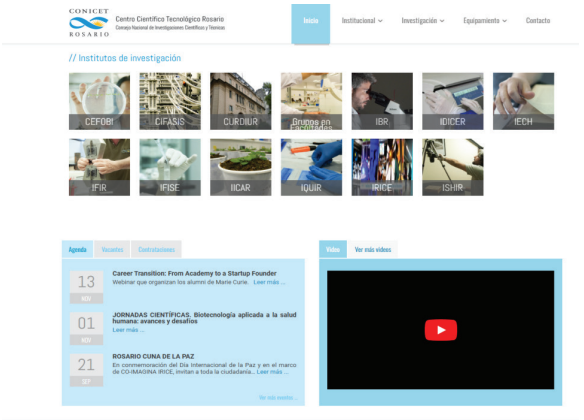
Figure 4
Homepage of the website of the CCT Rosario



Source: CONICET Rosario.[6]

6 See https://rosario.conicet.gov.ar/

FIGURE 5
HOMEPAGE OF THE WEBSITE OF THE CCT ROSARIO (CONTINUATION)



Source: CONICET Rosario.

Forms of public science communication

The communication modalities develop a multidimensional approach that combines in-person initiatives and descriptive narratives.

The interaction proposals combine in-person events, participatory contests, and school outreach programs. Social media platforms are configured as complementary communication channels, expanding the spaces for encounter between the scientific community and society. Free content is proposed with an understandable language across multiple communication formats. Emphasis is placed on didactic explanations and the visualization of scientific concepts.

There is a variety of content that combines institutional news and scientific dissemination. Three thematic sections are presented: "Science in everyday life", "Science in the productive sector", and "Science and its challenges". All three describe the objectives, activities, and public science communication content.

Programs like "Los científicos vuelven a la escuela" and the "ConcurSOL" contest stand out as devices for connecting the scientific community and society. Strategies that promote citizen participation were identified, including student contests, school outreach programs,

and open house events. The emphasis is placed on developing accessible narratives that make the social applications of scientific research visible.

FIGURE 6
LOWER SECTION OF THE WEBSITE OF THE CCT ROSARIO

Source: CONICET Rosario.

INSTITUTES OF CCT ROSARIO

Organization and structure

There is a heterogeneous configuration of web sections among the research institutes. Common elements were identified, such as news/updates sections,[7] some specific outreach sections,[8] and communication and press spaces, in which the explicit description of communication objectives at the Institute of Molecular and Cellular Biology (IBR) stands out. The analysis evidences a multidimensional under-

7 Present in the Center for Photosynthetic and Biochemical Studies (CEFOBI), Franco-Argentine International Center for Information Science and Systems (CIFASIS), Rosario University Center for Urban and Regional Research (CURDIUR), Institute for Critical Studies in the Humanities (IECH), Rosario Institute of Physics (IFIR), Rosario Institute for Research in Education Sciences (IRICE).

8 Rosario Institute of Molecular and Cellular Biology (IBR), Rosario Institute of Clinical and Experimental Immunology (IDICER).

standing of scientific communication, integrating institutional, journalistic, educational, patrimonial, and multimedia approaches.

They are characterized by a predominantly informative structure, with mostly static sections and a mainly informative orientation. It is observed that the site allows for a low level of interactivity. What predominates is a significant diversity of institutional news and information about scientific practices: descriptions of research lines, interviews with researchers, journalistic articles, multimedia productions, records of institutional activities, and historical documentation are integrated.

Forms of public science communication

The PSC strategies are, for the most part, developed in a multimodal way. Content is replicated on social media and audiovisual platforms like YouTube for event dissemination. Some initiatives are innovative, such as the Ciencia & Comunidad space at the Rosario Institute of Molecular and Cellular Biology,[9] which expands the traditional boundaries of science communication. Other types of strategies include school visits to laboratories, explanatory webinars, open-access platforms, and citizen participation in specific projects.

FIGURE 7
HOMEPAGE OF THE WEBSITE OF THE ROSARIO INSTITUTE OF MOLECULAR AND CELLULAR BIOLOGY

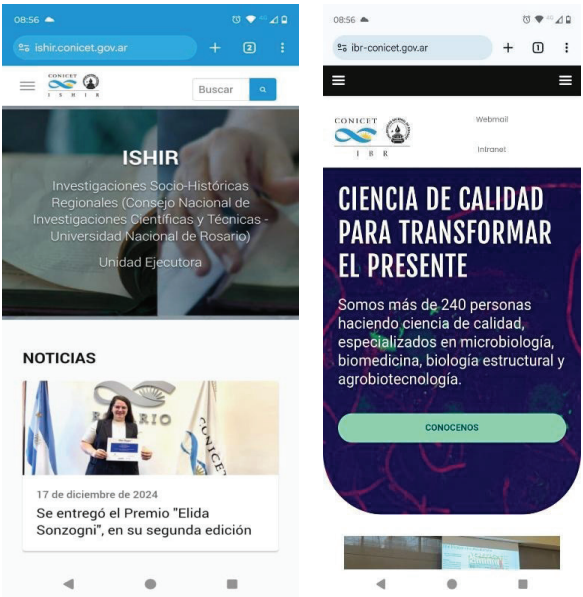
Source: Rosario Institute of Molecular and Cellular Biology.[10]

9 https://ibr-conicet.gov.ar/ciencia-y-comunidad

10 See https://ibr.conicet.gov.ar/

Finally, it is worth noting that on both the websites of the CCTs and on each institute's site, the interface design is adapted for viewing on personal computers, tablets, and smartphones. This means that the content and its structure are the same on each device, except for an automatic size adjustment. This layout makes interaction and access to the different menus available on each site more cumbersome.

FIGURE 8
MOBILE PHONE DISPLAY OF THE HOME PAGES OF THE REGIONAL SOCIO-HISTORICAL RESEARCH AND THE ROSARIO INSTITUTE OF MOLECULAR AND CELLULAR BIOLOGY WEBSITES

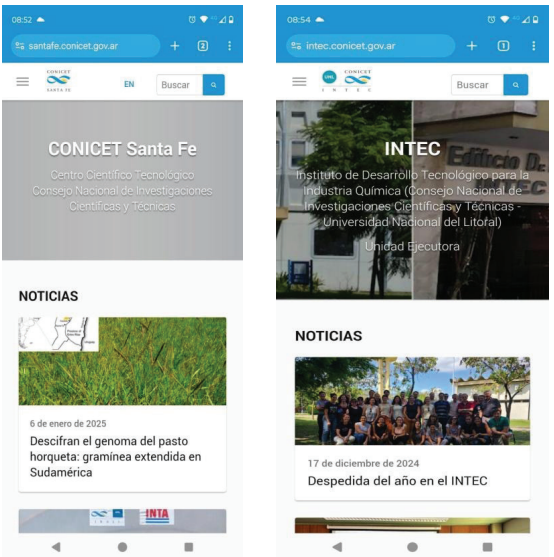


Source: Regional Socio-Historical Research[11] and Rosario Institute of Molecular and Cellular Biology.[12]

11 See www.ishir-conicet.gov.ar

12 See https://ibr.conicet.gov.ar/

FIGURE 9
MOBILE PHONE DISPLAY OF THE HOME PAGES OF THE SANTA FE SCIENCE AND TECHNOLOGY CENTER AND THE INSTITUTE FOR TECHNOLOGICAL DEVELOPMENT FOR THE CHEMICAL INDUSTRY WEBSITES



Source: CCT Santa Fe[13] and Institute for Technological Development for the Chemical Industry.[14]

COMPARISONS

The website of the CCT Santa Fe is organized into differentiated thematic units, a structure that facilitates a systematic understanding of the center's functions and components, but does not explicitly prioritize PSC. In contrast, the CCT Rosario presents a clearer and more segmented structure, with main sections specifically oriented towards dissemination.

13 See https://santafe.conicet.gov.ar

14 See https://intec.conicet.gov.ar

Regarding the content, the websites integrate a significant diversity, covering scientific, institutional, historical, educational, and event categories. They stand out for their multimodal approach that combines news, scientific documentaries, audiovisual productions, and educational resources, which suggests a communication strategy seeking to serve different audience profiles.

The greatest differences are found in the modes of communication. The sites belonging to the CCT Rosario propose communication strategies that explicitly seek to generate links between the scientific community and society, promoting a scientific culture. At the CCT Santa Fe and its institutes, a multiplatform approach that integrates electronic newsletters, social media, traditional media, and educational initiatives is developed. In both cases, there are concrete institutional science communication initiatives such as Libreciencia –a scientific literacy project–, activities for the Semana Nacional de la Ciencia y Tecnología, ConcurSOL and Biofotos –contests that involve scientific-technological contributions–, among others.

The different proposals offer multiple channels for participation, such as school visits, interaction on social media (X, Instagram, YouTube), and participatory activities. However, in the institutes of the CCT Rosario, more hyperlinks or embedded videos are visible, as well as explanatory webinars and open-access platforms.

Finally, of the total number of sites analyzed, those belonging to Exact and Natural Sciences and Biological and Health Sciences produce a greater quantity and diversity of formats for scientific communication, while Agrarian, Engineering and Materials Sciences, and Social Sciences and Humanities prioritize news.

In summary, on the website of the CCT Santa Fe and its units, scientific communication is developed through participatory and multiplatform initiatives. For its part, the CCT Rosario presents a clearer structure oriented toward dissemination, with explicit strategies for interaction and citizen participation.

TABLE 3
COMPARATIVE TABLE BETWEEN THE WEBSITES OF THE CCT SANTA FE AND THE CCT ROSARIO

Analysis categories	CCT Santa Fe and its institutes	CCT Rosario and its institutes
Information organization and hierarchy	The information is organized into thematic units that do not explicitly prioritize PSC. At the institutes, the organization is diverse, ranging from dedicated communication sections to integrating PSC within news items.	The structure is clear, segmented, and oriented toward outreach, which gives public science communications a higher hierarchy. Scientific content is grouped into specific thematic sections to facilitate access.
Formats used	It combines institutional news, scientific documentaries, audiovisual productions, and educational resources. Textual, photographic, and documentary record formats are used.	It emphasizes the visualization of scientific concepts from a multimodal approach. Formats include interviews, journalistic articles, multimedia productions and documentary record.
Genres of productions	Genres vary from informational (news, bulletins) to narrative (documentaries, stories) and educational (learning resources).	Informational genres (news, journalistic articles) and descriptive genres (thematic sections like "Science in everyday life") are identified. Initiatives that seek to promote PSC through educational language are detected.
Hierarchy and relevance of PSC	Although it does not hold a primary place in the structure, there is a large number of PSC productions, which indicates it is a regular and relevant practice, evidenced by the diversity of published productions.	Its relevance is high, as outreach strategies explicitly seek to generate connections with society. A communication strategy is highlighted through the publication of specific programs and thematic sections.

Source: The authors.

Discussion and conclusions

Websites are presented as mediating interfaces that act as devices for the circulation of scientific knowledge. Therefore, it is argued that they are not merely institutional spaces for dissemination, but technical agents that intervene in the production of meanings and perceptions about scientific practice.

The websites mediatize different systems of intelligibility: specialized scientific language, institutional narratives, and citizen comprehension, facilitating the transformation of complex content into accessible representations. The institutional scientific communication on these sites, similar to what was observed by Gómez López (2022), shows a tendency toward technical standardization, although with heterogeneous levels of development that reflect different degrees of organizational maturity.

The identified tension between the will to develop strategic scientific communication and its marginal place in the website's interface design is also linked to what Tejedor et al. (2022) emphasize: the importance of a holistic approach that integrates all significant dimensions of institutional digital communication. This comprehensive perspective is necessary to address the complexity of contemporary public science communication.

The communication strategies identified reveal a progressive transition toward more participatory and dialogic approaches. The incorporation of spaces for interaction, educational programs, and community engagement activities indicates a paradigm shift in the conception of institutional scientific communication. This trend toward more participatory and dialogic models at CONICET reflects an evolution similar to that documented by Medina González et al. (2021) in their analysis of university communication during the pandemic. This paradigm shifts –from unidirectional schemes to more interactive modalities– appear to be a general trend in contemporary institutional communication.

The territorialization of scientific communication identified in the regional CONICET centers resonates with the approach proposed by Biber et al. (2021) on the importance of adapting content to specific contexts. Their emphasis on the need for a "holistic view"

that considers pedagogical-didactic, technological-educational, and disciplinary aspects offers a valuable framework for strengthening these contextualization strategies.

The challenges in usability and web design identified in some CONICET centers are related to the observations of Gómez López (2022) on the importance of hierarchical structure and navigation on institutional sites. The variability in the implementation of these aspects suggests the need to establish more rigorous standards.

The integration of multimodal resources aligns with the trends showed by Tejedor et al. (2022) regarding the growing importance of new formats and visibility in the digital media ecosystem. Multimodality is presented as a fundamental quality in the communication strategy, although its implementation varies significantly. The institutes that are more developed in this aspect used different languages and formats, while others maintain a predominance of written text, underutilizing the potential of digital communication.

The disparities in the use of digital resources observed at CONICET are paralleled in the findings of Medina González et al. (2021) regarding the need to avoid information saturation on the websites of scientific institutions. This suggests that the optimization of digital resources is a shared challenge in the institutional sphere. The presence of multiple communication modalities, which include audiovisual, narrative, and multi-platform formats, express an institutional recognition of the need to diversify the channels and forms of communicating science.

The analysis reveals that the most effective institutions in their scientific communication are those that manage to balance multiple dimensions: accessibility, multimodality, interactivity, and local relevance. However, this level of development is not uniform throughout the system, which requires institutional policies that promote the professionalization and standardization of scientific communication.

In conclusion, while significant advances are observed in the institutional and scientific communication of the CONICET institutes located in the Santa Fe province, important challenges still persist in terms of standard homogenization, accessibility, and the use of digital resources. The heterogeneity of communication strategies expresses the need to strengthen institutional policies and training in digital scientific communication.

The findings of this study point to the importance of continuing to research institutional scientific communication practices in digital environments. For example, it would be pertinent to analyze the science communication strategies implemented by the institutes on their official social media accounts (such as Instagram or Facebook).

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