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Environmental crisis communication in Cerro de Pasco: the role of digital media

Comunicación de crisis ambiental en Cerro de Pasco: el rol de los medios digitales

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Abstract

The environmental crisis in Cerro de Pasco, exacerbated by mining and its effects on health and the environment, calls for more effective public communication. Although digital media play an important role, their coverage is limited and fragmented. The study sought to design a training plan for journalists to improve the reporting of the environmental crisis and the dissemination of existing guidelines. A qualitative approach was applied under the naturalistic paradigm. A total of 130 messages in nine local digital media outlets were analyzed, and ten experienced journalists were interviewed, using documentary analysis, semi-structured interviews, and Atlas.ti processing. The results show occasional coverage focused on immediate events, such as forest fires or water pollution. Informative and opinion-based genres predominate, while interpretive genres are absent. The causes are mainly attributed to mining companies and unscrupulous actors, without recognizing citizen responsibilities. Solutions are presented ambiguously, as ongoing efforts rather than concrete actions. In addition, the use of digital tools—links, multimedia formats, interaction, or live broadcasts—is scarce. In conclusion, journalists need to be trained in environmental approaches, responsible narratives, and digital tools to improve the quality of information and promote greater social awareness.

Keywords: information processing, content analysis, environmental journalism.

Resumen

La crisis ambiental en Cerro de Pasco, agravada por la minería y sus efectos en la salud y el entorno, exige una comunicación pública más efectiva. Aunque los medios digitales cumplen un papel relevante, su cobertura es limitada y fragmentada. El estudio buscó diseñar un plan de capacitación para periodistas, a fin de mejorar el tratamiento informativo de la crisis ambiental y la difusión de las guías existentes. Se aplicó un enfoque cualitativo bajo el paradigma naturalista. Se analizaron 130 mensajes en nueve medios digitales locales y se entrevistó a diez periodistas experimentados, mediante análisis documental, entrevistas semiestructuradas y procesamiento con Atlas.ti. Los resultados muestran una cobertura ocasional y centrada en hechos inmediatos, como incendios forestales o contaminación del agua. Predominan los géneros informativo y opinativo, mientras que el interpretativo está ausente. Las causas se atribuyen sobre todo a empresas mineras y actores inescrupulosos, sin reconocer responsabilidades ciudadanas. Las soluciones se exponen de forma ambigua, como gestiones en curso más que acciones concretas. Además, el uso de herramientas digitales —enlaces, formatos multimedia, interacción o transmisiones en vivo— es escaso. En conclusión, se requiere capacitar a los periodistas en enfoques ambientales, narrativas responsables y herramientas digitales, para mejorar la calidad informativa y promover mayor conciencia social.

Palabras clave: tratamiento informativo, análisis de contenido, periodismo ambiental.

Introduction

The current environmental crisis poses a significant challenge for journalism, which is aimed at fostering social awareness of the consequences stemming from inaction across various sectors—consequences that may be potentially irreversible (González, 2024). In this context, the extraction of minerals such as zinc, lead, and copper has resulted in the dispersion of contaminating particles into the atmosphere, adversely impacting air quality and posing serious risks to human health. Chronic exposure to heavy metals and other toxic substances leads to substantial adverse health effects (Centro de Cultura Popular Labor, 2023).

Digital media and social networks play a critical role in disseminating information related to environmental issues, both positive and negative, especially in mining areas. Platforms such as digital television, radio stations, websites, blogs, and social media—including Facebook, Twitter, Instagram, YouTube, and TikTok—serve to inform the public about environmental crises and the grievances of affected communities.

According to Vélez-Villavicencio and Párraga-Muñoz (2022), digital media enable local communities and environmental activists to share images, videos, and testimonies in real time, thereby enhancing visibility and raising awareness regarding pollution. Furthermore, these platforms promote interaction and debate concerning the importance of preserving the environment, intersecting with the fields of information and communication technologies.

The environmental situation in Cerro de Pasco is critical and has been a source of concern for decades. Mining activities have led to severe ecological impacts such as the release of heavy metals and pollutants into the air, water, and soil. The most frequently reported effects include dermatological and respiratory illnesses, as well as hepatic toxicity, renal failure, and neurological disorders, with irreparable consequences in the medium to long term (Cabral & Garro, 2020).

In response to these challenges, measures have been implemented to mitigate mining-related pollution in the area. It is anticipated that authorities, companies, and environmental organizations will collaborate, enhancing corporate social responsibility, improving waste management, and adopting cleaner and safer technologies.

This raises critical questions: Are these environmental issues covered by the media in Cerro de Pasco? In what ways are they communicated? How are they explained to the public? Such inquiries highlight gaps in research within the field of communication sciences and underscore the necessity for scientific studies that analyze this regional reality.

The rationale for this study lies in the fact that the mining environmental crisis represents a historical problem with severe implications for the environment, public health, and ecosystems. In this context, digital media play a crucial role by facilitating the dissemination and access to environmental information, thereby shaping public perception of the issues at hand. Accordingly, the objective of this study was to develop a training plan focused on the informational treatment of the environmental crisis in Cerro de Pasco.

Methodology

This research is characterized as basic because it generates theoretical knowledge regarding the informational treatment of the environmental crisis without manipulating reality to address practical issues. Within the field of social communication, such studies are important as they allow for the exploration of social problems from multidisciplinary research perspectives through theoretical and analytical methods (Ramos, 2023).

The study was conducted under a naturalistic paradigm, the epistemological foundation for qualitative approaches, with the aim of understanding the phenomenon and identifying patterns that enhance comprehension of the informational treatment of the environmental crisis in digital media. The qualitative approach seeks to interpret and understand the phenomenon from the perspective of social communication in relation to the studied environmental crisis (Pérez, 2024).

The research focused on the Cerro de Pasco region, located in the central Andean area of Peru, covering an area of 25,319.59 km², comprising both rural and urban population centers, with a predominance of rural residents. The main economic activities in this region are mining, agriculture, and livestock production. This context was deemed pertinent for study due to the various factors contributing to the environmental crisis that have increased over time.

According to Mucha-Hospinal (2021), the unit of analysis consisted of both written and oral sources. Written sources included messages or informational units published in digital media, adhering to the following inclusion criteria: (a) issued from Cerro de Pasco, (b) websites with a distinct domain, (c) social media with over ten thousand followers, and (d) publications between January and October 2024. The oral sources consisted of journalists with more than ten years of experience in digital media and residing in Cerro de Pasco. The sample included (a) nine digital media outlets, from which 130 messages or informational units were extracted, and (b) ten participating journalists.

Regarding the oral sources, following Alegre (2022), interviews were employed as a means to gather information through formal, in-person, or virtual conversations. Journalists provided insights based on their lived experiences. An interview guide, consisting of guiding questions, was developed based on a qualitative instrument matrix and was adjusted as needed during the interviews (Gallego, 2021).

For the written sources, Sánchez et al. (2021) suggest employing the technique of documentary analysis, a systematic process that includes: (a) theme selection, (b) research, (c) processing, and (d) information drafting.

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Based on this framework, a data recording sheet for written information was developed (Brítez, 2022). **Table 1** presents the emerging categories, subcategories, and indicators.

Table 1

Emerging categories and subcategories

Category	Conceptual definition	Subcategories	Indicators
Training plan for informational treatment of the environmental crisis in Cerro de Pasco.	A formal document that outlines actions aimed at enhancing informational treatment, defined as the manner in which journalists select topics or events related to the environmental crisis in Cerro de Pasco, transform them into images and texts, position them within media spaces, and disseminate them. In other words, it reflects how topics or events are presented in digital media (Castelo, 2023).	Topics related to the environmental crisis.	Climate and natural events
			Water
			Waste
			Socio-environmental issues
			Management, oversight, and citizen participation
			Environmental health
		Coverage of topics related to the environmental crisis.	Frequency
			Space
		Journalistic genres used to communicate the environmental crisis.	Informative
			Interpretive
			Opinion-based
		Announcers of the environmental crisis.	Journalists
			Authorities
			Local residents
		Types of digital media.	Generalist
			Specialized
		Sources used to communicate the environmental crisis	Specialized governmental organizations
			Transformative third parties
			Contributing third parties
		Indicators of the media agenda related to the environmental crisis in digital media.	Frames
			Substantive attributes
			Affective attributes
		Indicators to consider when communicating the environmental crisis.	Hypertextuality
			Multimedia
			Interactivity
			Simultaneity

For the data analysis, the following process was followed: (a) review of background, theories, and concepts; (b) definition and categorization of the topic; (c) coding of consulted and interviewed sources; (d) development of instruments; (e) selection of informative units; (f) application of interviews; (g) analysis of information using Atlas.ti 8 software, employing quotes, word clouds, and conceptual networks; (h) data export to Excel for matrix creation; and (i) drafting of results and discussion.

Results

Topics prioritized by digital media.

The topics prioritized by digital media in Cerro de Pasco included: (a) climate and natural events, encompassing forest fires, hurricane-force winds, torrential rains, floods, and frosts; (b) water, documenting contamination issues affecting lagoons and rivers, and the associated health risks; (c) waste, particularly concerning heavy cargo vehicles that transport toxic products and news related to landfill operations; (d) socio-

environmental issues, highlighting social conflicts between mining companies and local populations; (e) in management, oversight, and environmental citizen participation, citizen claims such as the declaration of environmental emergency in the region; and finally, (f) in environmental health, information regarding lead presence in the blood of local residents.

Coverage of topics related to the environmental crisis.

During the study period, digital media sporadically or occasionally covered events related to the environmental crisis in Cerro de Pasco. There was no extensive, in-depth, or systematic coverage, nor did it include any fixed sections. Furthermore, the coverage of environmental events was unequal; reports on climate and natural events dominated, while coverage related to water contamination was minimal. News concerning waste, environmental health, socio-environmental issues, management, oversight, and citizen participation was nearly non-existent.

Journalistic genres used.

An analysis of the content across the informative units revealed that the predominant journalistic genres observed in the digital media of Cerro de Pasco were informative and opinion-based. The informative genre consisted solely of news reporting, while the opinion genre included both radio and written critiques. The interpretive genre was notably absent, indicating a lack of comprehensive investigation or analysis of events related to the environmental crisis. In interviews with ten journalists, all acknowledged the need for more investigative reporting, indicating that the interpretive genre is not utilized.

Announcers of the environmental crisis.

The main sources of messaging were journalists, authorities, and local residents. Notably absent as announcers were micro-celebrities, eco-celebrities, eco-influencers, eco-activists, or eco-professionals. Journalists positioned themselves alongside the local population that was raising concerns, generally adopting a critical stance toward mining activities. They portrayed themselves as the voice of the people, representing those who protest, the marginalized, and the victims.

Digital media communicating the environmental crisis.

The digital media addressing the environmental crisis in Cerro de Pasco are primarily generalist, covering a variety of topics simultaneously, including police, economic, political, social, and environmental issues. There was a lack of specialized media focused on environmental topics. The digital outlets in Cerro de Pasco that report on the environmental crisis operate primarily within specialized online spaces or on social media platforms like Facebook. Journalists interviewed indicated a preference for Facebook, with four of them maintaining their own websites.

Sources used to communicate the environmental crisis.

The most frequently utilized sources by digital media included transformative third parties. The Emergency Operations Center, part of the National Institute for Civil Defense, was cited most often. This governmental agency operates at the district, provincial, and regional levels. Additionally, the Provincial Municipality of Cerro de Pasco and the Regional Government of Pasco were mentioned. Specialized governmental environmental entities, such as the Environmental Assessment and Oversight Agency or the National Water Authority, appeared infrequently. Similarly, regional environmental and energy and mines directors were rarely cited, and contributing third parties, including experts in the field or professional institutions, were nearly absent. Specialists and experts were notably lacking.

Indicators of the media agenda

An important aspect of studies related to informational treatment is the media agenda and its framing. In this regard, two attributes have been examined: substantive and affective attributes. From the identification of these attributes, corresponding frames have been established. The substantive attributes of the digital media agenda consist of existence, effects, and solutions.

Regarding the attribute of existence, all 130 analyzed messages affirm the existence of the environmental crisis and acknowledge that anthropogenic causes are involved. None of the messages claim that the environmental crisis does not exist or that humans do not contribute to it. However, the anthropogenic contributors identified are limited to legal and illegal mining companies, unscrupulous individuals who cause forest fires, and the greed of mining foremen for minerals. Factors such as human presence, activities unrelated to mining, daily

life activities, waste generation by the general population, and excessive consumerism that leads to waste are not presented as causes.

Table 2 presents the substantive attributes and frames of the digital media agenda in the Cerro de Pasco region.

Table 2

Substantive attributes and frames of the digital media agenda in Cerro de Pasco

1	Forest Fires	Forest fires are occurring in the warmer areas of Pasco. The causes are unknown, although there are suspicions of unscrupulous individuals.	Loss of biodiversity; loss of homes and crops.	State authorities are investigating the causes and assessing the damage.
2	Contamination of Lagoons and Rivers	Rivers and lagoons are contaminated due to waste disposal by ambitious mining companies. The Patarcocha lagoon was once clean but is now fully contaminated due to corporate greed.	Health risks to humans and animals; in the case of Patarcocha, a foul odor in the city.	State authorities are investigating the exact causes. The Regional Government is implementing a project to clean Patarcocha lagoon, but progress is slow.
3	Hurricane Winds	Hurricane winds are occurring, and their causes are unknown.	Destruction of homes for the poorest residents.	Authorities are assessing the damage.
4	Torrential Rains and Floods	Torrential rains and floods are occurring in the warmer area of Pasco, with unknown causes.	Damage to homes, roads, and crops of the needy.	Authorities are assessing the damage.
5	Frosts	Frosts are occurring in the high areas of Pasco, with unknown causes.	Death of animals and health risks to people, animals, and plants.	Authorities are assessing the damage.
6	Contamination of Drinking Water	The drinking water in Cerro de Pasco is contaminated due to mining waste entering sources.	Poses health risks to the population.	The water company is conducting decontamination projects.
7	Transportation of Contaminated Products	Irresponsible and abusive mining companies transport toxic products, leaving waste as they pass through the city.	Poses health risks to the population.	Political authorities have prohibited transport through the city, but judicial authorities allow it.
8	Legal Mining Exploitation	Large, formal mining companies also contribute to contamination due to the ambition and irresponsibility of their managers.	Health risks to animals, plants, and humans.	No solutions exist, as the Regional Directorate of Energy and Mines lacks jurisdiction over large-scale mining, only small-scale operations.
9	Conflicts Between Mining Companies and Locals	Locals protest against mining companies for their failure to meet commitments.	Health risks to animals and humans.	Authorities must intervene to ensure commitments are met.
10	Landfills	Plans are underway for the construction of a landfill for the city.	Improvement of public health.	Authorities are managing the construction process.
11	Illegal Mining Exploitation	Illegal mining companies are polluting the environment due to managerial irresponsibility.	Health risks to animals and humans.	Authorities (police, prosecutors, mayors) should intervene with unannounced operations.

12	Lead Contamination	Individuals have lead in their blood due to mining companies' activities.	Illnesses among the population.	Compensation should be sought.
13	Emergency Declaration	An environmental emergency has been declared in Pasco, but it is not being enforced.	Not observable in reality.	The central government should be held accountable to enforce the emergency declaration.

The analysis of the 130 messages revealed that all acknowledge the existence of the environmental crisis and, directly or indirectly, attribute its causes to human actions. Both legal and illegal mining companies are mentioned, as well as individuals who cause forest fires out of greed or negligence. Additionally, daily habits such as excessive consumption and poor waste management are noted. However, these latter causes are not presented as civic responsibilities; rather, they are portrayed as elements of the everyday landscape.

Regarding effects, the messages focus solely on immediate consequences: burned houses, destroyed pastures, and loss of flora and fauna. There is little exploration of medium- or long-term impacts, nor ecological consequences such as biodiversity loss or the time required to restore ecosystems.

As for solutions, the messages convey vague or incomplete actions. Authorities are depicted as "doing something," but most often they are evaluating damage, coordinating aid, seeking blame, or managing budgets. Concrete mitigation measures or sustained actions are not communicated. The prevailing narrative suggests a search for potential actions, rather than indicating that real solutions are already being applied.

Emotional components are also present. The messages convey feelings such as fear, frustration, or anger when addressing the causes and effects of the crisis. However, the supposed solutions evoke neutral emotions when they should inspire hope or relief. This indicates a disconnect between the problem and the means of mobilizing the public.

Concerning the use of digital tools, there is a very limited exploitation evident. Hypertextuality is nearly absent; there are no links to research, experts, or relevant documents. Links only connect to personal social media accounts of journalists.

Multimedia integration is also weak. Texts, images, and videos do not complement each other to better explain events. On platforms like Facebook, lengthy radio programs are transmitted without adaptation for more accessible digital formats. Although journalists claim to use multimedia resources, this is not reflected in practice.

In terms of interactivity, users can comment, react, or share content, but media outlets do not respond or foster spaces for dialogue, surveys, or debates. Content is not segmented, which hampers focused discussions on environmental issues. Lastly, simultaneity is minimal. Only Facebook generates immediate notifications, and live broadcasts are infrequent. Real-time coverage is scarce.

Discussion

The results of this study align with the findings of Palacios Chavarro et al. (2024), who analyzed comments on environmental publications by CNN on Instagram. These authors observed that opinions are predominantly neutral and polarized stances represent a small percentage. They also identified an increase in environmental coverage following the pandemic, particularly on topics that were not addressed timely. Similarly, in Cerro de Pasco, digital coverage of the environmental crisis was sporadic and superficial, lacking sustained follow-up or permanent sections. Coverage favored information on climate and natural events, while topics such as water pollution, waste management, environmental health, oversight, or citizen participation were scarcely covered.

Furthermore, González (2024) also reported deficiencies in the media treatment of environmental issues. In her analysis of Radio Palmar, she found that only basic coverage is provided, which limits the potential to raise public awareness. In contrast, this current study allowed for the disaggregation of content into subtopics, revealing that nearly half of the coverage centered on forest fires. Contamination of the Patarcocha lagoon was another significant topic, likely due to its central location and direct impact on nearby schools and neighborhoods. In contrast, issues such as lead contamination, landfills, socio-environmental conflicts, or frost were sidelined.

These findings highlight deficiencies in journalistic training and specialization. As noted by Palacios Chavarro et al. (2024), environmental journalism requires its own approaches, routines, and narrative frameworks, as the manner of communication can even produce counterproductive effects, such as increased denialism. A lack of specialized treatment diminishes public understanding and limits its capacity to respond to critical situations.

Citizen participation also serves as an indicator of adequate treatment in crisis contexts. Lázaro Aquino (2024) argues that mobilization largely depends on the credibility of information, risk perception, and the

functioning of environmental and health oversight mechanisms. Thus, how the conflict is narrated influences public acceptance, social pressure, and institutional response.

In this context, the general objective of the study was to design a training plan aimed at journalists to disseminate existing guidelines and improve the informational treatment of the environmental crisis. Consequently, the proposal is intended for professionals in environmental, ecological, and digital journalism and is envisioned as a comprehensive training process adapted to the specific needs of the region. This plan will be developed under the following framework:

First, a combination of theory and practice is proposed. Journalists must understand key concepts such as environment, sustainable development, biodiversity, climate change, and Peru's environmental policies. They will then apply this knowledge through workshops where they draft news articles, reports, and real coverage of environmental topics. Training will be continuous and specialized, including courses on current matters such as fact-checking, the use of open sources, and investigative journalism. New narrative forms, such as podcasts and contemporary audiovisual formats, will also be included.

Another crucial axis is interaction with experts. Meetings will be organized with specialists and ecologists to exchange experiences, resolve doubts, and enrich journalistic perspectives. Additionally, critical thinking will be developed to recognize biases in sources and comprehend the complexity of environmental issues. Finally, the plan will include practical evaluations and certifications, requiring participants to demonstrate their learning by creating journalistic content on the topics addressed.

Conclusions

The topics addressed by digital media in this region include climate and natural events, water, waste, socio-environmental issues, environmental health, management, oversight, and environmental citizen participation. Digital media have covered events related to the environmental crisis in Cerro de Pasco sporadically or occasionally. There was no extensive, in-depth, or systematic coverage that included fixed, permanent sections.

The two predominant journalistic genres in the digital media of Cerro de Pasco were informative and opinion-based. Adequate training for journalists and institutional support are essential to transforming the informational landscape and effectively addressing the environmental challenges faced by this community.

The announcers of the messages were journalists, authorities, and local residents of Cerro de Pasco. The digital media communicating information about the environmental crisis are generalist in nature; no specialized digital media focusing specifically on the environmental crisis were found. However, digital media have the potential to become powerful tools for awareness and social mobilization, though they require a more committed and specialized approach.

The most frequently used sources are transformative third parties, as well as contributing third parties such as experts interviewed about the issues addressed in this research, along with professional institutions. Digital media acknowledge that the environmental crisis exists and recognize its anthropogenic causes. Thus, the predominant framing is that the environmental crisis exists, originating from mining activities, unscrupulous individuals, or negligent public officials.

Digital media exhibit limited use of the characteristics of digital messages: hypertextuality, multimodality, interactivity, and simultaneity. Regarding hypertextuality, the messages lack sufficient internal and external links to deepen and better understand the discussed topics. In relation to multimodality, the messages do not present versions adapted for social media. Concerning interactivity, while publications allow for comments and opinions on news articles, there is no response from the issuers, nor are surveys or questionnaires utilized. Lastly, with respect to simultaneity, the immediacy of the news is only occasionally evident on social media platforms.

References

Alegre Brítez, M. Á. (2022). *Aspectos relevantes en las técnicas e instrumentos de recolección de datos en la investigación cualitativa: Una reflexión conceptual. Población y Desarrollo*, *28*(54), 93–100. https://doi.org/10.18004/pdfce/2076-054x/2022.028.54.093

Brítez, M. Á. A. (2022). *Relevant aspects of data collection techniques and instruments in qualitative research: A conceptual reflection. Revista Científicas UNA.* https://revistascientificas.una.py/index.php/RE/article/view/2408

Cabral, E., & Garro, M. (2020). *Los niños con plomo de Cerro de Pasco esperan justicia. Ojo Público.* https://ojo-publico.com/2282/los-ninos-plomo-cerro-pasco-esperan-justicia

Centro de Cultura Popular Labor. (2023). *Evaluación de la contaminación ambiental en Cerro de Pasco* (Vol. 1). Source. https://n9.cl/63wj7

Gallego Menéndez, A. (2021). *Ecosocial journalism: Journalistic project reporting on the climate crisis.* Universidad

de Valladolid. https://uvadoc.uva.es/handle/10324/51530
González Villega, A. L. (2024). *Tratamiento informativo y el periodismo ambiental para impulsar el conservacionismo en la comuna Palmar: Caso Radio Palmar* [Tesis de licenciatura, Universidad Estatal Península de Santa Elena]. Repositorio UPSE. https://repositorio.upse.edu.ec/handle/46000/10687
Lázaro Aquino, T. G. (2024). *Las comunidades campesinas en el Perú: Organización, conflictos y acción colectiva, Junín, 1959–2017. Desde el Sur*, *16*(2). https://doi.org/10.21142/des-1602-2024-0025
Mucha-Hospinal, L. F., Chamorro-Mejía, R., Oseda-Lazo, M. E., & Alania-Contreras, R. D. (2021). *Evaluación de procedimientos empleados para determinar la población y muestra en trabajos de investigación de posgrado. Desafíos*, *12*(1), 50–57. https://doi.org/10.37711/desafios.2021.12.1.253
Palacios-Chavarro, J. A., Marroquín-Ciendúa, F., & Palacios-Chavarro, S. (2024). *Instagram como escenario para el análisis de polaridad y subjetividad en comentarios respecto a contenidos ambientales: Caso CNNClimate. Profesional de la Información*, *33*(3), e330315. https://doi.org/10.3145/epi.2024.0315
Pérez Ripossio, R. N. (2024). *Validez y confiabilidad en la investigación cualitativa: Una propuesta de interpretación teórica-empírica. Questión.* https://doi.org/10.24215/16696581e904
Ramos Guachalla, C. E. (2023). *La investigación básica como propuesta de línea de investigación en psicología. Investigación Psicológica (La Paz, en línea).* https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1521074
Sánchez, M. J., Fernández, M., & Díaz, J. C. (2021). *Técnicas e instrumentos de recolección de información: Análisis y procesamiento realizado por el investigador cualitativo. Revista Científica UISRAEL*, *8*(1), 107–121. https://doi.org/10.35290/rcui.v8n1.2021.400
Vélez-Villavicencio, R. P., & Párraga-Muñoz, S. M. (2022). *Tecnologías de la información y comunicación desde la gestión pedagógica y las competencias digitales docentes. Polo del Conocimiento*, *7*(5), 457. https://doi.org/10.23857/pc.v7i5.3973