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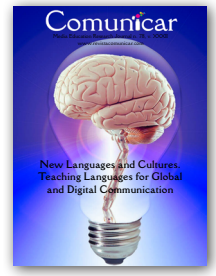

EduComR: Instrument for the Analysis of Museum Educommunication on Social Media

EduComR: Instrumento de Análisis de la Educomunicación de Los Museos en Redes Sociales

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ABSTRACT
Cultural institutions must use social networks to promote the empowerment of audiences and democratize knowledge through communication by emphasizing participatory and high-quality heritage education. This study aimed to create an analysis instrument (EduComR) that allows to identify and examine the educational-communicative strategies carried out by heritage institutions on social networks. The research followed a mixed methodology, where the predominant approach was qualitative, involving a content analysis of the publications shared in social media. The pilot test sample consisted of studying n=364,448 tweets from 72 institutional accounts in both American and European contexts published in Spanish, English, Portuguese and Italian. The results yielded a validated by expert judgement instrument composed of five dimensions of analysis: 1) Hypertext elements used by cultural institutions to share content, 2) Functions of language, 3) Procedures of heritage education, 4) The participatory dimension through the R-relational factor and 5) Suggested learning. The EduComR instrument represents a relevant contribution to the evaluative research of educational-communicative actions in the field of heritage and allows cultural institutions to identify key media actions to improve their planning, encourage engagement and promote hyper-connected audiences.

RESUMEN
Las instituciones culturales han de promover desde las redes sociales el empoderamiento de las audiencias y la democratización del conocimiento mediante una comunicación que ponga el acento en una educación patrimonial participativa y de calidad. El objetivo de este estudio ha sido la construcción de un instrumento de análisis (EduComR) que permite identificar y examinar las estrategias educomunicativas llevadas a cabo por instituciones del ámbito patrimonial en las redes sociales. Para su diseño se ha recurrido a una metodología mixta donde el enfoque predominante ha sido el cualitativo, a través de un análisis de contenido de las publicaciones en medios sociales. La muestra de la prueba piloto ha sido de n=364.448 tuits de 72 cuentas institucionales de los contextos americano y europeo publicados en lenguas española, inglesa, portuguesa e italiana. El resultado es un instrumento validado por juicio de expertos compuesto por cinco dimensiones de análisis: 1) los elementos que componen el hipertexto utilizado por las instituciones culturales para compartir contenido, 2) las funciones del lenguaje, 3) los procedimientos de la educación patrimonial, 4) la dimensión participativa a través del factor R-elacional y 5) el aprendizaje sugerido. El instrumento EduComR supone un aporte relevante a la investigación evaluativa de las acciones educomunicativas en materia de patrimonio y permite a las instituciones culturales identificar claves de actuación mediática para mejorar su planificación, fomentar el engagement y promover las audiencias hiperconectadas.

KEYWORDS | PALABRAS CLAVE
Educommunication, Social Network Analysis, Twitter, Heritage, Cultural Pedagogy, Virtual Communities.
Educomunicación, Análisis de Redes Sociales, Twitter, Patrimonio, Pedagogía Cultural, Comunidades Virtuales.

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1. Introduction and State of the Art

With the emergence of communication technologies, a social debate has unfolded between pessimistic viewpoints that predicted a decline in interpersonal interaction and those who believed in the capacity of technology to expand and complement traditional forms of communication (Christakis et al., 2010). Digital media, and thus, social networks, have created a media universe to which institutions have had to adapt on the fly, recognizing the need to be present online and connected with society. However, promoting multiple communicative practices does not necessarily ensure their quality, as traditionalist practices may persist in a different setting, leading to disconnection or a lack of interaction with their followers, resulting in hyper(dis) connected audiences. Therefore, within our field of work, heritage education, we have been monitoring the media practices of several museums, paying special attention to educommunication and engagement -understood as the extent and nature of interactions through which their followers respond- in order to comprehend how this educommunication is unfolding.

To improve the quality of educommunication through social media must be an imperative goal for any field of study, since these digital spaces represent new learning contexts that enable the engagement and awareness of the subject matter to society, exchange and learning.

So far virtual media universe research has focused on the analysis of marketing (Abeza et al., 2018; Clifton-Ross et al., 2019; Suh, 2022) and tourism, leaving the education dimension aside. This absence originated a first approach to social media in the museum field from the need to analyze educommunication practices that institutions promote. Nevertheless, preliminary studies nor tools were detected that allowed to identify the strategies with which this mediation combined the educational and communicative aspect, and that allowed us analyze as well as which of them were more effective to consolidate those audiences and achieve our goals of making heritage content more accessible, as well as empowering and promoting participative dynamics fostering the creation of cyber communities.

So, the main contribution of this study and, therefore, its objective, is the development of a concise and objective analytical tool that allows for the use of a common standard in analyzing educommunication practices by institutions. With this tool, we will be able to understand their strategic trends and goals as an institution and analyze audience responses based on the type of communication they create, identifying formulas and patterns that generate high engagement. These objectives are aimed at achieving a more participative, loyal and hyper-connected audience generating co-creative cyber communities sharing interests and that participate and collaborate with the institution and contents within the constructive paradigm of the media universe.

1.1. Theoretical Framework

A long journey driven by a paradigm shift in museums strategies and designs was required to reach the emergence of the social museum of Museum 2.0, which we must place in the second half of the 20th century, when conscious and empowered mass society demanded access to culture, originating the new museology and critical museology (Lorente, 2022). This paradigm shift entailed the search for new cultural, museological and critical museology trends, facing a new educational, communicative and socializing role for knowledge (Claes & Deltell, 2014; Serrano Moral, 2014), to the point of becoming, at the dawn of the third millennium, spaces for social development and progress, extending from a physical plane to a virtual dimension (Paz, 2022).

With the arrival of Web 2.0 and technological democratization, museums chose to center their communication on the visitor's experience, establishing bidirectional relationships to obtain feedback and responses from the audience (Jodar & Sanz, 2011). The term 'Museum 2.0' was thus adopted to define the action of an institution seeking to expand the visitor's experience beyond the physical space and create a participatory environment that aimed to transform its context (Capriotti & Losada-Díaz, 2018). It positions itself under a Feirean dialogical approach and, by being present on social networks, assumed the role of 'emirics', accepting the equality structures imposed by Web 2.0. spaces (Aparici & García Marín, 2018), in contrast to the 19th-centruty vision of the museum.

To conduct this study, we initially carried out a theoretical review, which revealed a predominant research focus in communication led by marketing and tourism (Clifton-Ross et al., 2019), with a limited exploration of the use of social media from an educational perspective. Suh (2022) attempts to explain this

gap by highlighting that educational interaction does not directly generate economic benefits for institutions. It is a non-profit endeavor based on a commitment to culture and the implicit tools of institutions as non-formal educational environments.

In this review, studies related to the audience, visitor engagement, and online audiences were identified, exploring the ways in which they communicate their content (Capriotti & Losada-Díaz, 2018; Suh, 2022), as well as audience satisfaction or the role of networks in the digital experience. Some of them state the educational factor of social networks as the main channel for knowledge promotion, but most of them prioritize audience satisfaction, leaving aside the teaching and learning processes.

Some studies that defined evaluation instruments and served as relevant precedents for our research were those compiled by Calaf Masach et al. (2017), Fontal Merillas et al. (2019), or Martín Cáceres and Cuenca López (2015), who focus on heritage educommunication. Additionally, we found studies relevant to our research that center on specific experiences and delve into key aspects of educommunication quality by emphasizing proper planning of educational activities within the framework of Web 2.0, such as Clifton-Ross et al. (2019). Among them, we would like to highlight the work of Brown Jarreau et al. (2019), who conducted a quantitative content analysis, based on fundamental questions regarding museums' purposes for using Instagram, or that of Bex et al. (2019), which focused on the use of Twitter as a social network capable of bringing together users and experts in spaces for interaction, transmission, and debate, emphasizing horizontal communication in line with the emirec theory (Aparici & García Marín, 2018). The study by Baker (2016) was also noteworthy, where the author analyzed tweets from 27 science museums to understand what types of posts they produce and which ones have the greatest impact on their audiences.

In no case was the educational experience on social networks being analyzed as a relevant factor in achieving the common goal of engagement or, simply, to understand or evaluate the online education provided by museums. Therefore, the research direction being pursued represents a significant contribution to the field of study. Most articles provided quantitative results regarding publication and interaction metrics, but none allowed for an assessment of the quality of their content, the strategies being employed, or the models that were achieving better interaction responses. Instead, they focused on which museums had more followers or were more active on social media.

Based on this absence, an analytical instrument for the educational communication of museums was designed, according to the five dimensions found in educommunication processes of heritage on social networks: multimedia, language, heritage, R-elational factor, and education.

2. Materials and Methods

This research is part of the genealogy of didactic-contextual research through a mixed research methodology, with a predominant qualitative approach (Burke Johnson & Christensen, 2014), in which quantitative methodologies or techniques, such as statistical-descriptive analysis are used as supporting methods. The ad hoc design of the EduComR instrument was carried out through four phases of work, of which three are addressed in the present study:

Ph1.Systematic Literature Review: This corresponds to an analysis of the scientific production published in the WoS -'Web of Science'- and SCOPUS databases (1900-2022), using the thematic descriptors 'educommunication', 'social media', and the roots: 'museum', 'communic', 'educa'. This yielded a total of n=684 results. Refining the sample to remove duplicates from different searches resulted in n=334 documents, on which an initial bibliometric analysis was performed using the VOSviewer tool to track production evolution and create association maps for keywords and researchers in the field.

To develop a suitable instrument for our specific area, this research was grounded in references from the encompassing field of educommunication (Aguaded Gómez & Romero Rodríguez, 2015) and related areas such as the pedagogy of interactivity (Aparici & García Marín, 2018; Aparici & Silva, 2012) and communication pedagogy. After this initial analysis, a thematic affinity-based selection was carried out, excluding the most dissimilar studies through a qualitative content review based on title and abstract, resulting in the exclusion of n=132 studies unrelated to the current topic. From the remaining sample, n=202, detailed full reading was conducted, in which only n=27 publications constituted prior studies of contributions specifically addressing the term 'educommunication' in museum spaces. These studies contributed significantly to the theoretical framework and the design of the EduComR instrument (Aso Morán, 2021).

Ph2. Participant observation and non-participant scientific observation (Fontes de Gracia et al., 2020). Within this analysis, on the one hand, searches and monitoring of publications and user-museum-user interactions were carried out in a total of 30 institutions nationwide. This was carried out among three of the researches, whose assessments were triangulated after 3 months of observation. On the other hand, through participant observation, we dialogued with the institutions and interacted with their proposals. This phase of approaching the field of study allowed us to learn about the trends and proposals most used by museums to attract digital users and make them participants of their cultural contents. In this phase, each of the researchers made incursions into the social networks through comments, proposals, mentions to third parties, among other interactions, in order to learn about the responses/reactions of the institutions and their followers.

Ph3. Instrument design, validity and reliability: This phase corresponds to the process of designing an initial instrument composed of three dimensions: 'heritage,''R-elational,' and 'learning,' to which two more dimensions, 'multimodality' and 'language function,' were subsequently added. Once it was created, it was submitted for review by expert judgement with parity criteria. Twelve specialists from different public universities participated in this assessment -2 Portuguese, 4 Spanish, 2 Italian, 1 American, 1 Chilean, 1 Brazilian, 1 Argentine -with knowledge areas directly or indirectly related to heritage educommunication, including Didactics of Social Sciences, Communication and Journalism, Computer Engineering, Education Sciences, Didactics of Language and Literature, Education Sciences, and Heritage Sciences and Techniques.

Throughout the research process, all ethical aspects were considered. experts, contacted via institutional email, received specific information about the overarching research project, the instrument's objectives, and the dimensions and items to be evaluated with their four level of compliance. The items were accompanied by a brief description and an example of an online publication corresponding to each of them. Each item had to be assessed using four indicators based on the categories of sufficiency, clarity, coherence, and relevance, proposed by Escobar-Pérez and Cuervo-Martínez (2008) on a 4-point scale. Given the ordinal nature of the measurement scale, medians of the scores assigned by the judges were calculated, along with their concordance, allowing for the consideration of the heterogeneity and diversity of the indicators and their relative contribution to the overall evaluation of the instrument.

Ph4. Instrument Calibration Sample: this fourth phase corresponds to the pilot test of the instrument on Twitter using various institutional profiles of national and international museums. In this phase, content analysis of discourse is employed as a qualitative approach (Raigada, 2002). This approach is based on Glaser and Strauss's 'Grounded Theory' (1967), where the tweet-publication is considered the minimum unit of meaning and serves as the basis for the EduComR Tool analysis, making it applicable to different sample sizes. It involved analyzing all potentially educommunicative hashtags from a selection of museums, totaling 364,448 tweets from 72 official museum accounts in the American and European context, published in English, Spanish, Portuguese or Italian and or local-regional and national character, with various collection typologies. The specific content of this calibration sample has been detailed in various scientific articles published in recent years (García-Ceballos et al., 2021; Navarro-Neri et al., 2021).

2.1. Objective

The main objective of this study was to design, construct and validate, through expert judgement, an analytical tool enabling the identification and examination of educommunication strategies and processes employed by museum institutions on social media concerning heritage. This initial objective led us to a second one, which involves improving these strategies to increase engagement with their audiences.

2.2. Channel/s of Communication Subject to Analysis

The EduComR instrument was designed to be used for educommunication analysis on social media, preferably on Twitter. This does not mean it cannot be used on other platforms, as long as the specific characteristics of each social space are taken into account. In this sense, the pilot study and calibration of the instrument were conducted on Twitter, to be used afterwards in the analysis of other social networks, such as Facebook and Instragram (Aso Morán, 2021).

3. Analysis and Results

The results obtained in the expert judgement phase yielded median scores of 4 in all cases: coherence (Md =4), relevance (Md = 4), clarity (Md = 4), and sufficiency (Md = 4). The mean scores obtained for each of

the dimensions were significantly high, all above 3, with a 'moderate level of reach' or 'high level' achieved: multimediality (X = 3.8), language (X = 3.7), heritage (X = 3.5), relational (X = 3.7), and educational (X = 3.6); and each of them is broken down in the evaluation of their items by indicators (see Table 1). Based on the results of this phase, the language used in some descriptors was simplified, redundant items were eliminated, and items that represented further subdivisions of certain items were combined, while new items were added to the first and second dimensions.

Table 1: Means of the Items that Constitute EduComR.

Items	Coherence	Relevance	Clarity	Sufficiency
1.1	3.8	3.8	3.8	3.8
1.2	4	4	4	3.8
1.3	3.8	3.7	3.8	3.7
1.4	3.8	3.7	3.8	3.8
1.5	3.7	3.3	3.7	3.7
1.6	4	3.8	3.8	3.8
1.7	3.8	3.8	4	3.7
1.8	4	3.8	4	3.8
1.9	3.8	3.8	4	4
1.10	4	4	4	4
2.1	3.8	3.7	3.8	3.7
2.2	3.7	3.2	3.8	3.2
2.3	4	3.8	3.7	3.7
2.4	3.8	4	3.7	4
2.5	3.7	3.8	3.7	3.7
3.1	3.3	3.3	3.2	3.3
3.2	3.5	3.8	3.7	3.7
3.3	3.3	3.5	3.3	3
3.4	3.7	3.7	3.7	3.5
3.5	3.7	3.8	3.8	3.5
3.6	3.2	3.2	3.5	3.2
4.1	3.5	3.5	3.8	3.3
4.2	3.7	3.7	3.8	3.8
4.3	3.8	3.7	3.7	3.7
4.4	3.5	3.5	3.7	3.7
5.1	3.5	3.5	3.5	3.5
5.2	3.5	3.7	3.2	3.3
5.3	3.7	3.7	3.8	3.5
5.4	4	4	3.8	4
5.5	3.3	3.3	3.2	3.5

3.1. Dimension of Multimediality

Multimediality is understood as 'the joint use of basic forms of information; that is, text, sound, still images, and animation in the same environment, whether juxtaposed or integrated' (Abadal & Guallar, 2010, p. 42). Therefore, this variable refers to how content is presented or organized in each post or tweet. In this field of study, it is considered that the sender has adapted to the content and language of the platform when components of multimediality, such as hypertextuality and interactivity, are identified in their discourse (Odriozola-Chené et al., 2015). The function of hypertextuality is, on one hand, to capture the attention of potential receivers and, on the other hand, to facilitate the expansion of information through links to videos, audios, or images. In addition, multimediality also refers to the expression of two different languages in the same content (Deuze, 2004), a convergence of languages that may not necessarily improve communication processes but can contribute to the relevance of the content by making them more attractive and interesting to the public. Finally, interactivity can be understood as the capacity of the sender to allow its users to choose content - selective interactivity - as well as to express and communicate - communicative interactivity (Rost, 2014).

This dimension is present in social media across all means when publishing news, so it doesn't become specific to the content that museums can share. This is the dimension that least connects with the quality

of educommunication or online learning, but it is a contributing factor. Therefore, this multimedia aspect must comply with hypertextuality, as it is the basis for knowledge creation on the internet, since the 2.0 space allows for the discussion of any shared content; the combination of several languages, because it facilitates flexible and open sequences of content and formats, and finally, interactivity, as it enables reciprocal communication (Rico, 2004). The items cover all possibilities of multimedia, having added 'survey' and 'other' after the pilot study.

Table 2: Dimension of Multimedia. EduComR Analysis Too.

Dimension	Id	Item and Description
1.Multimedia	1.1	Only text: self-created text, a response to other content, or simply sharing content from another account without adding anything.
	1.2	Text and Link: self-created text and link to another URL address
	1.3	Only image: just an image with no explanatory text
	1.4	Text and image: self-created text and image in the text box
	1.5	Text, image, and link: self-created text accompanied by an image in the text box and a link to another URL
	1.6	Video: the body of the message is only a video, without explanatory text
	1.7	Text and video: text and video integrated in the text box
	1.8	Text, video, and URL: text, video and link to another URL address, all in the text box
	1.9	Survey: the body of the message is a survey where the recipient must choose one or several options
	1.10	Others: none of the above

3.2. Language Dimension

For the development of this dimension, the predominant language function was taken into account based on the proposals developed by Eguren-Gutiérrez (1987) and Jakobson (1985). Jakobson's theory of language starts with the ideas of the three language functions: referential or representative, expressive or emotive and poetic or aesthetic, which he later expands to six: referential, expressive poetic, conative or directive, phatic or contact and metalinguistic.

After validation by expert judgement, the phatic and metalinguistic language functions were discarded because they only refer to aspects related to language itself or the validation of the channel, and the ludic function proposed by Eguren-Gutiérrez (1987) was added to refer to the use of memes, comics, gifs, etc.

Table 3: Language Dimension. EduComR Analysis Instrument.

Dimension	Id	Item and Description
2.Lenguage	2.1	Expressive/emotive: the sender expresses feelings, uses the first person singular or plural
	2.2	Appellative/conative: an attempt is made to get the receiver's attention, interjections, use of the 2nd person
	2.3	Referential/representative: academic discourse, neutral language, or even purely technical or scientific language
	2.4	Poetic: beauty is sought using metaphors, poems, etc.
	2.5	Ludic: use of memes, jokes, cartoons, jokes etc.

3.3. Heritage Dimension

To define the heritage dimension, we based our approach on the procedural sequence proposed by Fontal Merillas (2003) for fostering awareness and establishing a symbolic connection with heritage, as well as articles referring to key factors integrated into the theory of heritage educommunication (Martín Cáceres & Cuenca López, 2015) and the guidelines outlined in the National Plan for Education and Heritage (Carrión, 2015).

This sequence, consisting of 7 procedures leading to awareness, was grouped into five distinct items: 1) Transmissive [Inform], where only information and objective data about a piece are provided; 2) Participative [Engage], when the institution proposes participatory or collaborative activities among its followers; 3) Comprehensive-Reflective [Understand], when the institution accompanies an image, news, or video with thought-provoking questions or reflections that invite the reader to develop a critical idea, arousing their interest and interaction; 4) Valuation [Respect, Value, Care], focusing

on awakening attitudes of care and respect, material and immaterial value of endangered heritage, sustainability, and social questioning; and finally, 5) Enjoyment and Transfer [Enjoy and Share], when the institution involves its followers in the feelings that an image, video, or news can evoke, promoting enjoyment and encouraging sharing.

After validation by expert judgement, the concept of heritage in conflict or redefined was included in items 3.3 and 3.4. The items related to valuation and those related to enjoyment and transfer were merged, with the participatory aspect being more prominently featured, thus associated with participatory awareness.

Table 4: Heritage Dimension. EduComR Analysis Instrument.		
Dimension	Id	Item and Description
3.Heritage	3.1	Purely transmissive, to inform: the goal of the content is to provide information about a piece by providing data, context, etc.
	3.2	Participatory and interactive proposals: the content aims to engage and involve the audience
	3.3	Provides keys to understanding: the publication offers reflective content
	3.4	Promotes values of ownership, care, and respect: it seeks the involvement of the recipient in understanding heritage as an active part of society
	3.5	Enjoyment and transfer: the content aims to involve the recipient in the museum's activities, its projects, etc. By appealing to the enjoyment in the process of being a part of it.
	3.6	Not applicable: the content refers only to day-to-day information such as schedules or upcoming exhibitions

3.4. R-Elational Dimension

The R-elational Factor is the term created and developed by Marta-Lazo and Gabelas over the last decade to define the axis that connects the use, consumption, and interaction among participants in the network (Marta-Lazo & Gabelas-Barroso, 2023) enabling the transition from ICT (Information and Communication Technologies) to TRIC (Technologies of Relationship, Information, and Communication).

Thus, the R-elational dimension corresponds to the type of participation or interaction promoted by institutions, where four possibilities can be distinguished: 1) that interaction has solely been sought through question-response, such as surveys, open or closed questions, etc.; 2) that reflection is encouraged, where readers are asked to contribute their point of view through questions, with the institution serving as a catalyst for these reflections; 3) the richest yet most challenging possibility to recognize: co-creation, where the institution proposes a transformative, creative and collaborative activity, the final result of which is a new product arising from the collective input - for example, when the institution requests photographs from its users' visits or suggests that internet users send photographs and videos from their homes recreating some of its works of pieces (digital creations, creative interventions, reinterpretations, among others); and 4) that there is no promotion of institution-person connection.

Table 5: R-elational Dimension. EduComR Analysis Instrument.		
Dimension	Id	Item and Description
4.R-elacional	4.1	Interaction (demonstrative): this type of interaction is based on behaviorist question -response dynamics - information is only obtained if one responds to the interaction -such as quizzes, trivia, word games, etc.
	4.2	Reflection (interpretative): the interaction is through open-ended, reflective questions, which help promote the critical dimension, and interpret heritage.
	4.3	(Co) Creation (constructive): the interaction seeks transformation, creativity, generating a new construct through collaboration between sender and receiver(s).
	4.4	Not applicable: the content does not seek direct participation from the recipient.

3.5. Educational Dimension

The educational dimension aims to identify the predominant teaching-learning approach in each social media post. To do this, contributions from Siemens (2005) within the connectivist theory and classical learning theories -behaviorism, cognitivism and constructivism - were taken into account.

The first of the items that make up the dimension corresponds to 1) behaviorism, which aims to detect the organism's response to the stimulus it receives. The learner must know how to execute the appropriate

response and understand the circumstances from which the response operates (Marta-Lazo & Gabelas-Barroso, 2016).

2) Cognitivism, on the other hand, focuses its study on cognition, that is, on the processes of the mind related to knowledge, integrating studies that encompass the human mind to understand its structure and functions.

As for 3) constructivism, this item directly engages users; learning starts from their own experiences, where new knowledge is added to what they already know, thereby generating the creation of what is learned through new experiences (Marín Fernández, 2015). In this case, the sender must act as a companion and facilitator or experiences that allow the receiver to develop their own paths of discovery and meaning construction (Marta-Lazo & Gabelas-Barroso, 2023).

Finally, 4) connectivism arises from a theory about learning in the digital environment formulated by Siemens (2005). Connectivism is defined as chaotic because the formation of networks and connections, as well as their outcomes, cannot be predicted. It is also co-creative as it facilitates collective constructions through cooperation among people of all kinds. Lastly, it is complex because in connectivism, there are no enduring certainties; ambiguity and uncertainty are always present in every learning process (Siemens, 2005). In this sense, connectivism aligns with the theory off the pedagogy of uncertainty (Aso Morán, 2021) and interactive pedagogy (Aparici & Silva, 2012).

Table 6: Educational Dimension. EduComR Analysis Instrument.

Dimension	Id	Item y Description
5.Educational	5.1	Behaviorism: there is an unknown that remains unresolved 'without a response' from the readers. It is a question-response dynamic (like a quiz).
	5.2	Cognitivism: the content itself indicates where the answer is located.
	5.3	Constructivism: it directly engages users. The activity invites participation. It appeals to socialization, dialogue, and debate.
	5.4	Connectivism: it joins another institution's initiative while connecting with a current topic using an educational element from its collection. An example of this is mentioning another institution, using a hashtag that appears briefly (a topic of the day, nothing schedules or periodic), etc.
	5.5	Not applicable: the content provides information related to schedules, fares, or closures on holidays, etc. The content does not contribute to meaningful learning.

4. Discussion and Conclusions

The systematic review suggested that, just as sports institutions or advertising brands adapted and diversified their communication on social networks to reach a larger number of people and social sectors, museum spaces should also do the same (Abeza et al., 2018), with the ultimate goal of internalizing the message by the 2.0 visitor. This internalization of the message, combined with the educational factor, is closely in line with the heritage processes established by Fontal Merillas (2003), whose ultimate aim is to make citizens identify with and take ownership of heritage for its preservation, management, dissemination and education. This transposition to the digital space is necessary through communicative strategies; however, despite the fact that social media has revolutionized communication, little is known about how museums are engaging audiences through these new spaces (Brown Jarreau et al., 2019).

Regarding educommunication planning, some studies like Baker's (2016) indicated that most museums maintain active Twitter accounts, but few institutions use it productively or successfully. However, participant observation has allowed us to conclude that this paradigm is changing, although far from desirability. If we take Claes and Deltell's initial studies (2014) as a reference, where they pointed out the 'lack of communicative programming with specific objectives', we find that almost ten years later, most of the museums analyzed have moved away from such improvisation. It is worth noting that within this new planned strategy with more educommunication content, 'institutionality' still prevails, with formal language aimed at sharing technical content (García-Ceballos et al., 2021; Navarro-Neri et al., 2021). This type of communication aligns with a more communicative than dialogic intention, as identified by Capriotti and Losada-Díaz (2018), which shows little readiness for dialogue in response to debates among internet users (Claes & Deltell, 2014). Despite this, there are benchmark museums that opt for a true, open, participatory, and current heritage educommunication, as demonstrated by Aso Morán (2021), Cordón Benito and González González (2016), or Suzić et al. (2016). These examples reflect a genuine interest in planning and carrying out dynamics that involve all their followers and interact with their audiences

on a horizontal level (Aso Morán, 2021), following the 'everyone-everyone' model proposed by Aparici and Silva (2012).

The observation and implementation phases allowed to explore the educational possibilities of Web 2.0 and the interaction between users and institutions, as well as to identify the educommunication strategies that obtain greater interactions. In these explorations, we observed some premises stated by authors such as Bex et al. (2019), who pointed out the significant scientific contribution that anonymous users can make when interacting with professionals and educators as peers on an open platform or those gathered in the work of Brown Jarreau et al. (2019), where they identify different types of engagements on social networks.

The objective of this study was the design and construction of an analysis tool that maintains an appropriate balance between precision and brevity and can be used by both institutions and external researchers. The use of the EduComR instrument[1] can be useful for evaluative research on educommunication actions related to heritage. It allows institutions to: 1) verify whether there is a genuine commitment to activating spacers for horizontal participation, and 2) test whether a quality educational sense is promoted. In addition to this, institutions can observe which factors involved in the message generate greater social interaction. Therefore, in addition to the content analysis of these tweets and publications, the tools allow 3) to identify optimal action keys for creating better content, producing educommunication that responds to social demands and changes, and enhancing their media competence. All of this enables institutions to achieve social profitability by incorporating new audiences into their socio-digital sphere, increasing engagement, favoring hyperconnected audiences, and promoting the creation of virtual communities, which represents a decisive commitment to educommunication.

In conclusion, the EduComR represents a significant contribution that enhances the rigor of planning, facilitates the operationalization of the quality level of promoted actions, and allows for the extraction of information on areas that can be improved. It does not aim to offer a formula where the use of certain factors guarantees successful heritage educommunication, but its implementation will provide, in each case, keys to optimal indicators for creating favorable scenarios with their communities, promoting audience empowerment, democratization, and the development of critical audiences.

The observation of Twitter activity and the implementation of the EduComR instrument allowed us to confirm how institutions where educommunication is constant, planned and seeks the participation of their followers -breaking the classic sender-media-receiver paradigm - are capable of gathering audiences. It enabled us to identify initiatives of a participatory nature (García-Ceballos et al., 2021; Navarro-Neri et al., 2021) and define optimal action keys, revealing greater interaction when working with heritage assets close to the community from emotional and affective connections, which increases audience loyalty and the creation of cyber communities.

In contrast, considering the deficiencies and weaknesses found, low engagement with audiences is associated with the use of only textual or text-with-image publications, purely transmissive content, or publications whose language lacks an emotional component, relying instead on excessively academic and technical discourse. In many cases, the R-elational component is not explored, so there is no direct appeal to the emirec, which makes an adequate interaction back and forth impossible. The above features appear associated with a non-existence of the educational component or, in the case of being registered, they are linked to behaviorism.

This study is not without limitations. The absence of instruments with similar characteristics prevents its validation. Additionally, not all dimensions impact the quality of educommunicative actions; multimediality is a less significant factor than the other four, but it is still a variable to consider. Furthermore, the data do not allow us to understand the learning that occurs in online users. However, the level of participation, the increase in users and interactions -especially in the form of comments- do provide indicators of social activity, which indicates an approximation to heritage, knowing it or participating in it.

Finally, the quality of educommunication should involve factors such as participant satisfaction or achieved learning goals, which are not integrated into the EduComR instrument which implies lines of research to be explored. Despite its limitations, this study is the first to focus on constructing an objective instrument that emphasizes the educational potential of social networks in heritage education. We hope it contributes to advancing research and improving online educommunicative practices.

Notes

[1] Analysis Instrument EduComR: https://doi.org/10.6084/m9.figshare.23056919.v1

Authors' Contribution

Idea, P.R.; Literature review (state of the art), B.A., I.N., S.G.; Methodology, B.A., I.N., S.G.; Data analysis, B.A., I.N., S.G.; Results, I.N., B.A.; Discussion and conclusions, S.G., I.N.; Writing (original draft), I.N., B.A.; Final revisions, P.R., B.A, S.G.; Project design and sponsorship, P.R.

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