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FROM THE 360° PHOTO TO THE METAVERSE:

conceptual and technical evolution of virtual and immersive journalism from Spain



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ABSTRACT – Immersive journalism has evolved as technological resources have evolved. The same has happened with the media, journalists, and audiences and their interest in the format. This research focuses on a review of the literature, terminology, and state-of-the-art of immersive journalism between 2015 and 2022 in Spain, which has made it clear that there is robust academic research by Spanish research groups that contrasts with the reduced journalistic production, i.e., there is an asynchrony between technological innovation, professional practice, and academic research. It is noticeable the abandonment of the format as soon as the first moments of innovation passed, without leaving time for the digital literacy of audiences, and meanwhile, researchers in this field in Spain quantified and experimented with the phenomenon, without achieving feedback from the professional field, and therefore, without real impact on the development of the format for the sake of new virtual experiences now increasingly directed towards the metaverse.

Key words: Immersive journalism. Virtual reality. Metaverse. Digital communication. Emerging narratives.

DA FOTO 360° AO METAVERSO: evolução conceptual e técnica do jornalismo virtual e imersivo da Espanha

RESUMO – O jornalismo imersivo evoluiu à medida que os recursos tecnológicos evoluíram. O mesmo aconteceu com os media, os jornalistas e as audiências e o seu interesse por este formato. Esta investigação centra-se em uma revisão da literatura, terminologia e estado da arte do jornalismo imersivo entre 2015 e 2022 na Espanha, que demonstrou que existe uma investigação académica robusta por parte dos grupos de investigação espanhóis que contrasta com a reduzida produção jornalística, ou seja, existe uma assincronia entre a inovação tecnológica, a prática profissional e a investigação académica. É notório que o formato foi abandonado assim que passaram os primeiros momentos de inovação, não deixando tempo para a literacia digital das audiências, e, entretanto, os investigadores deste campo na Espanha quantificaram e experimentaram o fenómeno, sem obter feedback da esfera profissional e, portanto, sem impacto real no desenvolvimento do formato em prol de novas experiências virtuais que agora se aproximam cada vez mais do metaverso.

Palavras-chave: Jornalismo imersivo. Realidade virtual. Metaverso. Comunicação digital. Narrações emergentes.

DE LA FOTO 360° AL METAVERSO: evolución conceptual y técnica del periodismo virtual e inmersivo desde España

RESUMEN – El periodismo inmersivo ha evolucionado conforme lo han hecho los recursos tecnológicos. Lo mismo ha ocurrido con los medios, periodistas y audiencias y su interés por el formato. Esta investigación se centra en una revisión de la literatura, terminología y estado de la cuestión del periodismo inmersivo entre 2015 y 2022 en España, lo que ha dejado en evidencia que existe una robusta investigación académica de los grupos de investigación españoles que contrasta con la reducida producción periodística, es decir, hay una asincronía entre innovación tecnológica, la práctica profesional y la investigación académica. Es apreciable el abandono del formato tan pronto como pasaron los primeros momentos de innovación, sin dejar tiempo para la alfabetización digital de las audiencias, y mientras, los investigadores de este campo en España cuantificaron y experimentaron el fenómeno, sin lograr una retroalimentación desde el ámbito profesional, y por tanto, sin impacto real en el desarrollo del formato en aras de nuevas experiencias virtuales ahora cada vez más encaminadas hacia el metaverso.

Palabras clave: Periodismo inmersivo. Realidad virtual. Metaverso. Comunicación digital. Narrativas emergentes

1 Introduction

The impact of the internet and digital tools has been so profound that it has brought about important changes in the way messages are produced and distributed. As Casero (2010) points out, this has allowed new communication models, narratives, and audiences to continuously appear consequently.

The digital sphere has fostered a closer and more interactive relationship between the sender, the message, and the public.

This has allowed the public to acquire the category of “user” (Murray, 1999). Users today are active about messages through multi-screen and multi-device consumption habits (Scolari, 2013), which represents a transcendental revolution in all phases of story construction, redefining these categories of sender, message, and receiver (Fernandez, 2011).

This audience, far from being passive, assumes an interactive role with the message, appropriating it and replicating it. If the focus is on journalism, the success of a publication on digital platforms is expressed through the commitment that the user community makes manifest with the media/journalist’s publications. This has imposed a “logic of likes”. Therefore, to a certain extent, the media has lost control, monopoly, and vertical hierarchy of information, which has led to a process of mutual adaptation between journalism and audiences (Gómez, 2019; Manfredi et al., 2019).

Faced with this ongoing digitization of all areas, the content is achieving greater projection and success in the vast scenario of “infocination”, provided that the values and professional practices of communication are maintained and applied by the message creators (Alexander et al., 2016). One of the main consequences of this process is that we are witnessing the increasing segmentation of audiences and the development of narrative options. This situation has favored the appearance and development of virtual reality and multimedia content in 360° and 180°, as well as other formats and multimedia products. The present research attempts to visualize, after a bibliographic and documentary review, the conceptual and technical evolution of immersive journalism in Spain under the current technological transition toward the so-called metaverse.

1.1 360° multimedia content with immersive capacity and virtual reality

Since 2015, big technology companies have experienced not only a resurgence but also a new evolution of virtual reality and multimedia content with 360° and 180° immersive capacities. And although these may become confusing, they are different concepts, even though they can be run and enjoyed on the same devices.

Virtual reality involves an interactive and immersive viewing experience where the audience can achieve the sensation of being

transferred to another stage or “dimension” (Mütterlein, 2018) through a device with a screen placed on the user’s head (Vásquez & López, 2017). Some claim that this experience should be consumed and enjoyed through devices that ensure an experience with six degrees of freedom (6DoF) (De la Peña, 2010; Pavlik, 2019; Pryor, 2000); that is, where users interact with the content not only through sight – as occurs with 360° content – but also by involving their limbs. Another notable difference is that while virtual reality refers to content designed with 3D design programs (artificial or synthetic content, with only three degrees of freedom – 3DoF), in many cases it can be created from captures and recordings made by specific photographic equipment and therefore, from real experiences.

Virtual reality implies immersion and therefore requires a device that, through the user’s vision, seeks the said experience by abstracting from its real environment. In the case of 360° content, this is not decisive, since it can be consumed semi-immersively through devices such as mobile phones, tablets, or computers. The development and evolution of specific headsets to enjoy these experiences allowed the concept of virtual reality to move towards the above considerations. At the beginning of the 21st century, there were referents of this type of technology and content, such as the social platform *Second Life*, to reference one. This platform was a 3D environment where the user was digitally represented in the form of an avatar and established a dialogue with other users in real-time while being able to buy real or virtual products and enjoy recreational activities.

Given the evolution of the concept of virtuality, we should reference Barroso (2019) who specifies that virtual reality and truth are two closely linked concepts. As this author points out, although the virtual sphere involves an illusion (because of the artificial nature of its design), it is produced by a medium and its interpretation depends on the level of the individual’s involvement, a factor that Debord (1995) describes as the “accumulation of spectacles” of modern societies. In other words, the experience involves a stimulating spectacle that can be interpreted as true (if it is not) depending on the degree of user involvement.

In short, it entails the intermediation or representation of life through images, beyond the authentic experience, although it is a vision that attempts to approach it. In general, it can be a way of reinterpreting reality. It is the illusion that something is happening (Slater, 2009), implying a change in spatial presence, and modifying the sense of being in a certain place (Kober et al., 2012); in addition to

allowing greater user involvement concerning the content consumed (Serino & Repetto, 2018; Ventura et al., 2019).

Today, many professional fields use virtual reality and multimedia content with the immersive capacity to generate greater proximity between the user and the content, and higher levels of empathy and involvement on the part of the audience with what they are seeing (Shin & Biocca, 2018; Hendriks et al., 2019). Likewise, it is a technology that allows professional fields to develop controlled and interactive training and practice scenarios and try to provide relief to patients undergoing tortuous treatments and treat mental pathologies. Even in NGOs, studies such as Archer and Finger (2018), Seinfeld et al. (2018), and Kandaurova and Lee (2019) show that this type of content, and narratives seek higher levels of empathy on the part of users concerning the content to which they are exposed, thereby increasing the chance that members of the public will involve themselves, donate and volunteer.

1.2 Virtuality and metaverse

The term “metaverse” is a compound word: “meta” means transcendence while “universe” refers to a three-dimensional virtual world where individuals can interact or develop various recreational, productive, and commercial activities (Changhee, 2021). However, Abbott (2007, p. 126) specifies that in the virtual world, “the characters adopt cybernetic identities” to chat, conspire, have fun, etc.

However, as with 360° content, the metaverse may or may not be immersive. It is not homogeneous and is comprised of various platforms and spaces that are not yet interconnected, allowing different levels of immersion (according to desire or strategy) while it can be consumed through a range of screens and devices that give it a multiscreen character (Sidorenko, 2022).

Castronova (2001) indicates that not every virtual reality experience or platform meets the conditions necessary to be considered part of the metaverse. These are (1) interactivity, that is, the possibility that individuals can maintain communication/interaction in real-time between themselves and the elements of the environment; (2) corporeity, since individuals assume three-dimensional representations (avatars) beyond a simple username or an identifying photograph, as occurs on many digital platforms; and (3) persistence, since the virtual

scenario maintains an evolution and development regardless of the users that are connected at a given moment.

According to Barnes and Mattson (2011), the metaverse materializes in interactions and experiences that digital platforms seek in a 3D open-world mode, allowing users to use tools and resources and act freely. In other words, it is about individuals being able to determine in a virtual environment (as they do in real life) the conditions and times for their progress.

Its recent consideration followed two announcements between 2021 and 2022 by different technological players: the change of Facebook Corporation's corporate name to Meta to accelerate the design and development of virtual worlds (Rodriguez, 2021) and the investment of 2 billion dollars by major world companies for the construction of a metaverse the responsibility of Fortnite developers Epic Games (Webster, 2022).

However, the main benchmarks for these types of virtual environments are, firstly, Second Life, The Sims, or more recently Animal Crossing New Horizon, Fortnite, or Minecraft. In all cases, these are semi-immersive and multi-screen experiences – except in the last one –, where users, based on an *a priori* gamified aesthetic or logic, establish various types of dialogues and encounters through avatars.

Nevertheless, technological progress, and therefore virtual reality, has allowed platforms such as Spatial, AltSpace VR, VR Chat, Population One, or Horizon World, among others, to provide similar experiences but immersively through specific headsets. All this is nothing more than a paradigm shift in the digital society and the media because of the constant technological revolution that the world is undergoing (Anguí et al., 2019).

Users and creators of a very diverse content flock to these platforms to explore a new dimension of communication, establish new relationships, adapt to new segments of the public, and develop emerging narratives in this technologically changing environment.

In short, the metaverse is apparently presented as the natural evolution of virtual reality, although this is not completely accurate. As already explained, the metaverse is composed of immersive or non-immersive virtual experiences, but the main variable that defines it is the participation of users in real-time through artificial and “representative corporealities”. In other words, everything that is metaverse is virtual, but not everything virtual is susceptible to be cataloged as the metaverse.

2 Methodology

The concept and practice of immersive journalism have evolved, as have the technology and the level of involvement and interest of the media, journalists, and audiences. The main goal of this paper is to review the literature, terminology, and state-of-the-art of immersive journalism and technologies. On the one hand, there has been profuse academic research in this area by Spanish research groups – despite the meager attention given thereto by the press – but, in contrast, technology, media practice, and academic research have evolved asynchronously. This contribution will not only highlight the transformation of immersive journalism from a conceptual and technical point of view but will also provide keys to a better understanding of how to improve the format and have elements of a prospective nature.

In line with Rubio's (2019) proposal, this study aims to show how this transformation process has been developed from conceptual and technical perspectives, determining the state of this manner of articulating journalism and providing elements that might allow these aspects to be explored. Authors like López et al. (2022) or Sidorenko et al. (2020) have specifically noted a decline in this narrative form in recent years, while Rodríguez and Paíno (2022) point to it as a specific evolution in storytelling. For this reason, a bibliographic review (Codina, 2020) has been carried out on the approach to the subject in Spain, given that according to the Ipsos report (2022) for the World Economic Forum, this is the European country most familiar with Extended Reality (XR) and the metaverse. The 21st century is taken as the point at which virtual reality first acquired the technological and market conditions to become widespread.

The documentary sample includes those Spanish authors with a scientific production of more than five works, published on the subject between 2015 and 2022. The specificity of research is nothing more than a record indicating a constancy and commitment to developing a line of research on the subject. The works of the research groups of the universities of Santiago de Compostela, Salamanca, Carlos III of Madrid, and Castilla-La Mancha have been taken into consideration. Additionally, the original studies of De La Peña et al. (2010) and Domínguez (2010) have been taken as starting points, as they were the first authors to rethink the concept of immersive journalism at an international level, as well as research it in Spain.

A review has also been conducted of the main milestones

of the global technology industry around this process of the development of specific hardware and software, including social networks, important catalysts of digital journalism and therefore, of immersive journalism (García-Avilés et al., 2018; Rodríguez et al., 2020). This review has been carried out through internet searches, with special attention to the media coverage and advertisements of the technology companies themselves until the first quarter of 2022.

For its part, the document verification process has been carried out through the Google Scholar search engine and the online scientific network ResearchGate. In total, 66 documents have been obtained from the selected authors that make up the works on the subject from 2010 to the first quarter of 2022, that is an enormous amount of evidence of scientific work on this subject in a relatively short period. From this sample, the first works to address each concept or milestone have been taken into consideration for the construction of the analysis tables. It is not the intention of this paper to show an exhaustive or systematic bibliographic review but to show how immersive journalism has evolved in conceptual, technical, and professional terms, with emphasis on the Spanish scientific work, which has made a great contribution to the subject in Spanish.

3 Results

3.1 The concept of virtuality without devices 2003-2011

At the beginning of the 20th century, the concept of virtuality seemed to be more associated with 3D representations derived from computer design programs without any pretense of immersion through specific equipment. However, cases such as Morton Heilig's 'Sensorama' prototype sought to interweave these images with other sensory elements such as scent, vibrations, and air effects, for example (Rheingold, 2002). De la Peña et al. (2010) or Domínguez (2010) began to relate the discipline of journalism with this type of format from the academic field, thus giving shape to a new concept of "Immersive Journalism", although with few similarities between both approaches (see table 1). On the one hand, the thesis of the avatar interacting with a virtual environment that recreates the news is defended, while, on the other hand, it is specified that true immersion stems from the maximum visual detail achieved in a 360° image. In terms of format, this is a period characterized only by semi-immersive virtual experiences, and access to these is determined by computers.

Table 1

Literature, terminology, and state-of-the-art of immersive journalism and technologies in 2003-2011

Year	Conceptual contribution and academic debate on immersive journalism	Technological milestone	Development of media and/or journalists – Content
2003		The ‘Second Life’ and Dubit open virtual world is created.	Peter Ludlow edits the first ‘Second Life’ newspaper: Second Life Herald.
2005			Robert Bloomfield (U. of Cornell) develops “Metanomics” in ‘Second Life’.
2006		The Roblox virtual online platform is launched.	
2010	De la Peña et al. (2010) and Domínguez (2010) propose the concept of “Immersive Journalism”.		Nonny De La Peña uses ‘Second Life’ to present his journalistic work “Gone Gitmo”.

3.2 The technological rise of virtual reality 2012-2014

In 2012, the technology industry began to innovate in this field, proposing not only viewing equipment but also tools able to capture real content to be experienced by internet users in first person, just as they would in real life. Domínguez (2013) warns that the term immersion should not be used when the devices’ screen for the reproduction of the content does not allow users to interact beyond passive observation.

There is a greater expansion in the possibilities of consuming the content: viewers such as the Oculus Rift offer a sensation of immersion with six degrees of freedom (connected to a computer, visual immersion, and involvement of the hands),

the semi-immersive 360° format has begun to be used for photos and videos, and smartphones allow immersive products to be played through the Google Cardboard viewer, with freedom of vision only.

Table 2

Literature, terminology, and state-of-the-art of immersive journalism and technologies in 2012-2014

Year	Conceptual contribution and academic debate	Technological milestone	Development of media and/or journalists – Content
2012		Google introduces augmented reality glasses: "Google Glasses".	Nonny De La Peña develops the "Hunger in LA" virtual experience.
		Palmer Luckey created the virtual reality company "Oculus VR".	
2013	Domínguez (2013) reviews and contrasts the concept of immersive journalism.	Oculus introduces developers to the first version of the Oculus Rift PC-connected VR headsets.	
		Google allows 360° photos to be uploaded on Google Maps with Google Street View.	
		The RICOH Theta, the first 360° photo and video recording camera for mainstream users, is introduced.	
2014		Google presents its "Google Cardboard" VR headsets.	Des Moines Register (USA Today Group) publishes "Harvest of Change".
		Facebook buys the Oculus VR company.	
		Samsung presents the brand's first generation of "Gear VR" viewers for mobile devices.	

3.3 The rise and development of immersive journalism: academia, media, and Journalists 2015-2016

Since 2015, there has been a greater development around virtuality, multimedia formats, and technologies that seek a sensation of immersion. There is an evident interest on the part of the media and journalists to explore these alternatives, as well as carry out projects in this regard. This has allowed the academy to obtain new analyses and studies, as well as the involvement of new researchers. Concerning the field of immersive journalism, Domínguez (2015) highlights the importance of the audience's free will when consuming content and exploiting the resource of ambient sound to enhance the experience. Jiménez et al. (2016) and Pérez (2016) agree that the 360° format involves a passive viewing experience and that immersion is only achieved through content that allows the audience to become involved and interact to a greater extent.

This is a period in which technological activity contrasts with a proper understanding of formats and alternatives by the media and journalists, forcing the academy to establish concepts and ideas. However, in the United States, considerable progress can be seen where media such as The Wall Street Journal, The New York Times, and TIME magazine not only develop specific content but in the case of the latter, there is a specific mobile app and a website: The Daily 360.

In Europe, Euronews and The Huffington Post are the pioneers in engaging in this type of content. In the specific case of Spain, between 2015 and 2016, conventional and digital media such as El Español (generalist with national reach), El País (generalist with national reach), Antena 3 (conventional TV) and RTVE (public corporation) resort to this format to broadcast interviews, informative or documentary content. Even at the regional and local level, progress has taken place at La Vanguardia and El Faro de Vigo. Similarly, the format's development has been encouraged through the 1st Immersive Journalism Workshop for media in Spain—The App Date (Madrid).

Table 3*Literature, terminology, and state-of-the-art of immersive journalism and technologies in 2015-2016*

Year	Conceptual contribution and academic debate	Technological milestone	Development of media and/or journalists – Content
2015	Domínguez (2015) refines the concept of immersive journalism and highlights various essential narrative elements.	HTC unveils its first generation of PC-connected VR headsets: HTC 'VIVE'.	The Knight Foundation begins working with FRONTLINE and Emblematic Group to develop immersive journalistic narratives with the media.
		GoPro and Nokia develop accessories and recording equipment in 360°.	Conventional media begins to experiment with the immersive format: The New York Times and TIME magazine in the USA and El Español, El País, El Mundo, Antena 3 and RTVE in Spain.
		Google presents its "Cardboard Camera" mobile app to capture 360° images from smartphones and incorporates the 360° format into YouTube.	
		The "PICO Immersive" company begins operations.	
2016	For Jiménez et al. (2016) and Pérez (2016), immersive formats allow the audience to achieve a greater understanding of the news, even if this involves only passive observation.	Oculus Rift headsets officially go on sale as Google introduces its "Daydream" VR ecosystem and Daydream View headsets.	The newspapers La Vanguardia and El Faro de Vigo become the first regional and local Spanish media, respectively, to publish a 360° audiovisual piece with an immersive capacity.
		LG, Samsung and VUZE present their first 360° video and photo recording cameras for conventional users.	The first Immersive Journalism Lab is promoted in Spain, sponsored by media and technology companies such as Telefónica. The App Date project enabled a specific app and several audiovisual projects.
		YouTube and Periscope support 360° streaming and Facebook adds the function of viewing and sharing 360° photos.	
		HTC 'VIVE' headsets and Sony PS VR headsets officially go on sale, while LG and Samsung introduce theirs for mobile devices.	

3.4 Global uneven development of immersive journalism 2017-2018

This is a period where once again the remarkable growth of the virtual and immersive format is associated more with the technology industry than with the academy or the media. In particular cases, there is beginning to be a sense of exhaustion in the production of multimedia content in this format and the differentiation of 360° initiatives with immersive capacity from those that are purely virtual seems to be becoming larger and more noticeable. Only 29.63% of European public media have a specific section to organize and promote immersive content, according to a study by Pérez et al. (2018).

While local and regional Ibero-American media increase their 360° immersive production, the mainstream media distance themselves from the format (Cantero et al. 2018). In contrast, in Spain, there is a notable growth in the production of this type of content (Benítez & Herrera, 2018). Most proposals for recording and consuming content are oriented toward the 360° semi-immersive format. Only Facebook and HTC work on the idea of six degrees of freedom (6DoF). Likewise, Facebook announces its advances in what they now call the metaverse.

Table 4*Literature, terminology, and state-of-the-art of immersive journalism and technologies in 2017-2018*

Year	Conceptual contribution and academic debate	Technological milestone	Development of media and/or journalists – Content
	Sidorenko, & Herranz (2017) focus on the difference between virtual reality and 360° content and propose the concepts of RVR and RV2.	Google proposes the VR180 concept: 180° photos and videos.	The New York Times ends publication of 360° reporting through 'The Daily 360'.
	Domínguez (2017) highlights empathy as the added value of immersive journalism.	Insta360 presents its first 360° camera for smartphones – 'Insta360 Nano' – and Samsung presents its second 360° video and photo recording camera for conventional use.	Antena 3 makes the first 360° live show in Spain through the Periscope social network and Movistar celebrates the first edition of the Barcelona 360 Virtual Reality party.
2017		Facebook unveils 'Facebook360' for the Samsung Gear VR and Oculus headsets, announces the Oculus Go VR headsets: the brand's first all-in-ones and the beta version 'Facebook Spaces'.	Euronews announces the technical collaboration of Samsung for the development of 360° content with immersive capacity through Facebook, YouTube, and VeeR.
		HTC introduces its first all-in-one VR headsets, Vive Focus, and Adobe Premiere lets you edit virtual and 360° content.	
2018	Pérez and López (2018, p. 285) propose a definition of immersive journalism as "recreations with virtual reality and static or moving images in 360°".	Facebook announces the "Quest" all-in-one VR headset and HTC releases the second generation 'VIVE' VR headset, while Google introduces its "Tour Creator" online virtual tour creation platform.	

3.5 Decline of immersive journalism in the media in the face of the technological and investigative evolution of virtual reality 2019-2020

In this period, the remarkable advance of viewing gadgets for virtual reality is significant. Similarly, the strategies of the technology industry show a determination to prioritize virtual gamified and interactive experiences in contrast to the 360° multimedia format, which experiences a notable decrease in its interest on the part of audiences and production on the part of the media and journalists.

The first radical covid-19 lockdowns made it possible to think that this last format would have a greater role to broadcast certain news. However, the media prioritized other digital alternatives more associated with the consumption habits of younger audiences. Sidorenko et al. (2020) note a considerable abandonment of immersive journalism by Spanish media from 2018 to 2020. At the same time, Cantero et al. (2020) highlight that only 10% of the Spanish regional media offer careful and well-crafted immersive content.

Table 5

Literature, terminology, and state-of-the-art of immersive journalism and technologies in 2019-2020

Year	Conceptual contribution and academic debate	Technological milestone	Development of media and/or journalists – Content
2019	The development of immersive journalistic content has allowed new journalistic genres to emerge (Paino & Rodríguez, 2019), and this makes it necessary to redefine the role of the journalist (Herranz et al., 2019).	Facebook promotes the “VR for Good” initiative as a Communication for Development Strategy.	The immersive documentary “Marshall from Detroit” is released as an app for the Oculus ecosystem.
		Google announces the cessation of its Daydream mobile VR platform, and “Google Cardboard” becomes open source.	
		Nintendo launches a virtual reality kit for the Switch video game console while HTC introduces the second generation of the “VIVE Focus” VR viewers.	
2020	Caerols et al. (2020) warn that immersive journalism must be reviewed narratively, thereby adapting to the demands of increasingly digital audiences.	Facebook unveils the second generation of its “Quest” VR headsets.	The “Home After War” interactive experience debuts as an app for the Oculus virtual ecosystem.

3.6. Redefinition of virtual reality and birth of the metaverse 2021-2022

As of 2021, the technological field begins to point towards interactive virtuality, often gamified, where journalism seeks to redefine its role and actions. In the specific case of immersive journalism through 360° content, the format does not seem to be of much importance compared to a metaverse that is still in its infancy and concerning which there are still doubts, especially regarding the interoperability of the different platforms.

Experimentation becomes crucial in this regard, and we can highlight the reporting of *El Economista* in the virtual and interactive sphere (Lorenzo, 2021), a BBC undercover investigation into sexual harassment and abuse in the metaverse through the VRChat platform (Katwala & Williams, 2022), an interview conducted by two journalists from *China Daily* in the metaverse with He Chao, Secretary General of the Industry Committee of the metaverse of the Mobile Communications Association of China (Cheng, 2022), and the fact that VICE media installed its virtual headquarters in the Decentraland metaverse (Kane, 2022).

However, the optimism of Rodríguez and Paíno (2022) points to the current relevance of the immersive journalism format for specific cases and events. In contrast, industry and the media focus their efforts on 3D virtual territories that seek greater socialization in real-time. Likewise, the reconfiguration of actors in this area is clear, but not the continuous development of gadgets, computer programs, and digital platforms for consumption.

Table 6

Literature, terminology, and state-of-the-art of immersive journalism and technologies in 2021-2022

Year	Conceptual contribution and academic debate	Technological milestone	Development of media and/or journalists – Content
2021	Benítez and Herrera (2021) warn that creating 360° audiovisual content with immersive capacity is still complex and expensive.	ByteDance (TikTok) buys virtual reality company PICO while Google cancels its online virtual tour creation platform 'Tour Creator' and HTC announces the third generation of the 'VIVE Focus' VR viewers.	The Spanish newspaper El Economista announces its first reporting in the Metaverse with the journalist Antonio Lorenzo.
		Facebook changes the name of its virtual platform "Spaces" to "Horizon World" and announces the change of the company name to "Meta".	
2022	Rodríguez and Paño (2022) review the digital platform format and highlight aspects that still support the narrative validity of immersive journalism.	Meta announces the opening of "Horizon World" for Spain and France.	RTVE is the only Spanish media outlet that produces 360° immersive content while experimenting with the Metaverse for TV news broadcasts.
	García-Avilés (2022) reflects on the relevance of journalism to incur in the metaverse.		Different international media such as the BBC, VICE and China Daily venture into the metaverse with virtual offices and reports.
	Authors such as Baía and Ashmore (2022) or Sidorenko and Cabezuelo (2022) address communication in the metaverse from the performing arts or Public Diplomacy, giving indications of formats, narratives, and cases that can be applied to journalism.		The Metaverse <i>Post</i> is created to cover the global news on Web3 (metaverse, digital assets and cryptoeconomics).

4 Discussion

While De la Peña et al. (2010) suggest that immersive journalism consisted of the representation of the user through an avatar that “entered” the news (and that there could be a greater immersion through specific viewers), Domínguez (2010, p. 12) established the idea of a 360° image that will allow each detail to be enlarged to the maximum. In both cases, they value

the emotions and feelings that this can elicit in audiences as compared to other conventional formats. The concept of virtual reality and even prior immersion (without viewers, more by the degree of implication) can be found in “Second Life” (2003) with its video game aesthetic.

Academic analysis laid the foundations for some narrative considerations that sought to modify the paradigm of digital journalism, while it focused on emerging social networks such as Facebook and Twitter. However, despite the lack of technical elements that accompany the development of concepts and ideas concerning this evolution of online journalism at that time, Domínguez (2013) gave a first warning when considering that the intended immersion by the media, journalists, and users had as its main touchstone the headset device screen. But beyond some experiments with virtual reality and 360° multimedia content by privileged media with access to the beta version of Oculus devices (i.e., the beginning of the second decade of the 21st century), the true mainstream revolution came in 2015 with the popular “Google Cardboard”: a small box with two magnifying lenses that allowed the smartphone to be attached, this being the device that reproduced the content.

This was a revolution that did come from the social networks, in this case with YouTube as the flagship and a wide catalog of (mostly entertainment) videos that allowed users – by spending just five dollars (the cost of the headsets) – to understand the principles of immersion and the possibility of consuming digital content through a relative abstraction of reality and direct the 360° vision horizontally and vertically. This was the turning point, and the mainstream media and journalists soon committed themselves to a path of innovation related to this new format and narrative style. An intense phase of experimentation followed that led many to take the first steps, although this effort was not sustained, either due to lack of interest, ignorance, or financial reasons (Sidorenko et al., 2020).

In the strictly conceptual plane, an evolution of immersion from the narrative to the technical sphere is evident. In other words, from a perspective that invited the audience to become more involved with the news, we began to speak strictly of immersion through the mediation of virtual reality headsets. Apart from the technical and communicational aspects, this period also encouraged the academic field not only to return to the conceptual foundations but also to propose new theoretical considerations. At this time, everything was

determined by the speed and influence of technological development, which no longer only proposed headsets for mass consumption, but also began to flood the market with recording equipment to satisfy that incipient phenomenon of “content creators”. There were no longer any excuses because, with a little investment, anyone could be at the top of multimedia innovation at that time, provided they had the interest and perseverance to seek the content of better visual and sound quality.

However, notable technological progress seems to be constant in the face of the analytical backwardness of the Academy and the practical understanding of the media and journalists. Thus, with the scarce updated conceptual base, Sidorenko et al. (2017, p. 102) propose two categories for immersive audiovisual content with a journalistic character: “Real Virtual Reality” (RVR) about the content obtained through recording equipment and real experiences, and “Virtual Reality” (RV2) referring to content and virtual experiences developed through 3D design software.

But the apparent innovative hubbub did not last long, since as of 2018, a decrease in the production of journalistic content based on virtual reality and 360° narratives with immersive capacity can be observed. And this differentiation is necessary because, despite initially being put in the same bag, the technological fundamentals forced the academy and the professional sphere to respect such a dichotomy. After all, the efforts, budget, and audiences also depended on it.

Pérez et al. (2018) warn of a necessary, but scant determination on the part of European public media to differentiate immersive content in their digital windows, in a context in which Cantero et al. (2018) highlight the determination by local and regional media, especially in Central and South America, to incorporate immersive resources as innovative elements. For their part, Benítez and Herrera (2018) highlight that although in the case of Spain there is a notable increase in the production of immersive content (mostly concentrated on YouTube), the problem seems to arise in the way the media and journalists use recording crews, often with no apparent understanding of what they wish to convey.

The enormous amount of prior experimentation made it equally necessary to note the maintenance of journalistic rigor and attention to a specific ethic. Framing and imposed frameworks are dispensed with, which means that the media and journalists have

the final power to decide what and what not to record and how to edit it in post-production. This has been a concern for researchers such as Pérez and López (2018) and Benítez and Herrera (2021). Likewise, Paíno and Rodríguez (2019) highlight the existence of new journalistic genres derived from the specific development of the format. As part of this practical innovation, we can point to genres such as immersive-informative, testimonial, informative-testimonial, descriptive, dramatized, and experimental, while indicating that immersive journalism transcends mere technical references and can be determined by how a story or news is told.

This contribution coincides with the position of Herranz et al. (2019) who point out that it is necessary to redefine the role of the journalist as the immersive narrative is consolidated, thus proposing categories such as immersion journalist, actor journalist, narrator journalist, and scriptwriter. However, pertinent, and necessary reflections have been late on the scene or manifest an asynchrony between the academy and the profession, mainly due to the latter. The times of technology companies and newsrooms and agencies are not the same as those of universities and research centers.

This withdrawal pointed out by López et al. (2022) and Sidorenko et al. (2020) opened other niches. Since 2019, and thanks to the sustained development of the Oculus virtual ecosystem and initiatives such as “VR for Good”, it is possible to observe a transition towards the development of informative-documentary content in app format (independently and individually installable). This content is developed on the Valve and Oculus platforms, and among other examples, we can highlight the interview with rapper Eminem while taking a tour of the streets of Detroit (an interview conducted by Dr. Dre and not by a music journalist), or *After the War*, which actively engages the audience through various interactions. This reveals a notable contrast between the absence of conventional media or journalists – being more of an artistic experience or product not constrained by journalistic rigor – and in this specific case, immersive journalism.

It is the opinion of Caerols et al. (2020) that the 360° content with immersive capacity made to date was distributed in part through platforms where most digital audiences such as Centennials are not active, as well as through narrative models that do not connect and where such users are not identified. What seemed like a frank expansion of the narrative resource in 2018 was merely an increase

in the intention of experimentation. However, this did not include specific plans for the immersive format as one more resource in the range of options for the media and journalists to tell their stories and serve the greater segmentation of digital audiences. This is not the case with documentary and conceptual development, which requires more work to be done.

Benítez et al. (2021) warn that after almost a decade of development, 360° multimedia production is still expensive and complex. Recording scenes with recording systems only appears to be simple, since in practice there are a series of difficulties that do not arise in a conventional audiovisual recording, such as, for example, the fact that only one scene is recorded, preventing information from being excluded.

However, technology is the main variable for all involved and reality. The first quarter of 2022 is a time to rekindle interest and debate around virtual platforms with the ability to socialize in real-time through avatars, that is, the metaverse. There seems to be renewed interest in the experiences of the beginning of the 21st century in “Second Life” without the need for virtual reality headsets. Virtualization is being talked about again from semi-immersive consumption through computer equipment and especially mobiles.

The works of Baía and Ashmore (2022) and Sidorenko and Cabezuelo (2022) highlight the possibilities of communication and socialization offered by the metaverse from different fields and where journalism would presumably find a new interactive and direct way to connect with audiences, especially the youngest and most digital ones. Thus, not only is there a notable global discontinuation of journalistic productions in 360° or virtual reality with immersive capacity, but the Academy has devoted itself to reviewing and analyzing the reasons why what seemed to be one of the innovative manifestations in the multimedia field did not prosper while paying attention to this new virtual scenario. However, Rodríguez and Paíno (2022) defend the relevance of the 360° immersive format. Its success depends on the shorter duration of the reports, not exceeding two minutes, a preference for the 360° format instead of 3D content, making audio the main element of the narrative proposal, and for elements unrelated to the original content not to be included in post-production, such as graphics or inserted videos (Rodríguez & Paíno, 2022).

5 Conclusions

Journalism requires a willingness to innovate to engage new audiences. This context is inexorably determined by the technology industry that has impacted the information consumption habits of all segments of the public, especially those young people identified as Centennials and Alphas. The data shown in the article shows that the media's interest in new immersive formats has not kept pace with technological progress. Immersive hardware technology continues to advance while the media has abandoned the use of the format. The pandemic highlighted this issue.

As Sidorenko et al. (2020) point out, immersive journalism was a valuable resource to provide a closer look at the harsh reality of the beginning of the pandemic. A way for some less sensitized and aware sectors of society to achieve a greater degree of empathy in the first stage of the health emergency. However, the media opted for formats more associated with the ephemeral communication model and less conventional information formulas through satire, data simplification (headline journalism), or infotainment to connect more effectively with the public.

The media have always shown an interest in experimentation and innovation of formats, as has been evident over the years with immersive journalism, but without continuity. They have only achieved a primacy effect and in many cases, they abandoned this form of storytelling for the latest novelty, which is now in the Metaverse.

In addition to this, the concept of virtuality is still evolving with the metaverse. From the contributions and initial debates of De la Peña et al. (2010) and Domínguez (2010) on how to propose the idea of immersion in digital content where synthetic and real aspects are differentiated, the idea of metaverse today is more adapted to approaches such as that of Benítez and Herrera (2021) about an internet paradigm based on platformization and high levels of visual stimulation, entertainment, and socialization.

Studies on immersive journalism in Spain show an academic concern that has led to research from many perspectives: narration, format, content, audiences, ethics, or journalistic routines. The reflexive framework, promoted by groups from the universities of Santiago de Compostela, Salamanca, Carlos III, and Castilla-La Mancha, has made it possible to feed a very broad documentary and conceptual base.

The speed of immersive technology does not match its use by

the media and journalists. The latter stopped experimenting with the medium as soon as the first moments of innovation had passed, leaving no time for their audiences to adapt. In the same way, researchers in this field in Spain were able to quantify and experience the phenomenon, without achieving feedback from the professional field, which would have made immersive journalism grow and evolve at the same time towards the new virtual experiences offered by the metaverse in these moments.

At a time of reconsideration of the concept of virtuality from the metaverse, the technology industry, the media, and universities are facing the challenge of collaborating to experiment and lay the foundations for future virtual and immersive journalism. Likewise, there is a need to correctly differentiate the concepts so as not to define them as metaverse or any other type of virtual experience. Despite the trends and “fashions” in the academy, there is a need to duly specify these argumentative and conceptual considerations.

On the other hand, the media, and journalists, far from “mass” communication pretensions, need to explore the virtual possibilities of the metaverse due to its high socializing potential and the hyper-segmented digital context. However, shyness or reservations still prevail from the scientific field to approach the phenomenon rather than from the professional field where experimentation prevails – for the time being – as it already happened with immersive journalism.

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