

# Immersive Media as a New Multimedia Experience: Prospects and Risks

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## Abstract

The impact of the world wide web has led to global changes in the world information and communication market, which have led to major changes in the media in general. The transition to a post-industrial society is helping to find new, more effective means of collecting, processing, and disseminating information. The formation of a new information culture is being discussed in various scientific fields, both humanitarian and technical.

This article considers the development of immersive media applications in the context of the acquisition of new multimedia experience of information transmission. Immersive media platforms refer to online - platforms based on various advanced reality technologies - MR, VR, AR- and metauniverses. It is noted that the development of immersive media has led to an understanding of the need to rethink the future of the Internet and its rapid transformation in terms of prospects and possible risks.

The article is aimed at studying the peculiarities of metauniverses development and tools of immersive content creation. The scientific significance of the article is determined by the study of the specificity of immersive content as an innovative approach to information transmission. The methodology of the study includes both systemic and disciplinary approaches, methods of analysis and synthesis. The result of the study is to update the new model of journalistic education and the competencies of digital media professionals. There are already examples of high-quality digital media on the Internet, forming the basis of immersive journalism and successfully implementing multimedia projects. This allows positive assessment of the prospects of immersive media development in the digital age. The practical significance of the article lies in the possibility of using its conclusions in the study of technological tendencies of immersive media, journalistic education, and modern media technologies. In addition, the practical importance lies in the real possibility of implementing the results of research in the process of training at the faculties of journalism of the Republic of Kazakhstan.

## Keywords

Immersive media, immersive journalism, media communication, multimedia, metauniverse, media platforms, augmented reality, extended reality, immersive communication, IoT, information and communication technology.

## 1. Introduction

The relevance of the study is determined by the fact that today digital technologies are rapidly modernizing the structure and quality of journalistic education in Kazakhstan. These changes are caused by the introduction of innovative technologies, which are now applied in all sectors of society. The IoT world technology shapes the future of the manufacturing industries, using the opportunities of flexible and intelligent production, provide revolutionary productivity growth. Blockchain has all the prerequisites to make a great contribution to the process of creation, preservation, and transparency of information. Big-data and widespread availability of communication are some of the factors on which the “economy of sharing” is based, spreading globally at an accelerated rate. President of the Republic of Kazakhstan Kassym-Jomart Tokayev in “Economic course of a Just Kazakhstan” State of the Nation Address dated September 1, 2023, paid special attention to the issues of digitalization and innovation [1]. Kazakhstan should

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become a developed IT country, and in this context the Republic demonstrates dynamic and qualitative development.

The subject of the study is immersive media technology and mechanics of digital content creation with immersive effect on the example of modern immersive platforms and metauniverses. The thesis of the article is that the development of immersive media follows the path of traditional media's evolution, updating and modernizing the ways of information transmission. Such tendencies indicate that IM will become part of traditional media when technologies allow the implementation of a new medium.

## **2. The foundations of immersivity**

Immersivity mainly depends on visual experience in a mixed reality scenario in which participants interact with each other in semi-real and virtual environments. The idea of immersive media is based on two basic concepts: presence and immersion. The structure of presence has long been studied in the interdisciplinary field of human factor research. Although some aspects are still unclear, it is generally accepted that the main value of "presence" can be expressed as "virtual presence" [2].

It is interesting to note that immersive systems have their roots not in telecommunications but in stand-alone applications such as cinemas, theme parks, air simulators and other virtual learning systems; A popular example is the move from mainstream to IMAX. The introduction of immersion in telecommunications and broadcasting is a new and challenging task for image processing, computer graphics and video coding.

Innovations in computer hardware, networks, and 3D video processing technologies provide adequate support for algorithms to solve this problem. So, a new kind of capability emerges - immersive presence. The user of immersive presence system feels part of virtual or mixed reality in interactive situations such as videoconferencing. This feeling is mainly determined by visual signals, such as high-resolution images, realistic visualization of 3D objects, the transfer of color and light through raytracing, low latency, parallax motion, smooth combination of artificial and live video content, as well as acoustic signals such as correct and realistic 3D sound.

An extended reality or cross-reality (XR) is a generic term that includes several immersive technologies; electronic, digital environments in which data are presented and projected. XR includes virtual reality (VR), augmented reality (AR) and mixed reality (MR) [3]. In all the above aspects of XR, people observe and interact in a fully or partially synthetic digital environment created by technology.

VR is an alternative, separate, digitally created artificial environment. Users feel in virtual reality that they are immersed, in another world, and act in the same way as in the physical environment. With specialized multisensory equipment such as immersion helmets, virtual reality headsets and all-purpose treadmills, this experience is amplified by the modes of vision, sound, touch, movement, and natural interaction with virtual objects [4,5].

AR uses a different approach to physical spaces; it embeds digital inputs, virtual elements into the physical environment to improve it [6]. It combines in space the physical world with the virtual [7]. The result is a spatially projected layer of digital artifacts mediated by devices such as smartphones, tablets, glasses, contact lenses or other transparent surfaces [8]. Moreover, augmented reality can also be implemented in virtual reality headsets with the possibility of end-to-end mode by displaying input data from built-in camera sensors.

MR is a complex concept and its definition has changed over time, reflecting modern technological trends, dominant linguistic meanings, and narratives [9]. MR is sometimes presented as an extended iteration of AR in the sense that the physical environment interacts in real time with projected digital data [10]. For example, a pinned-down non-player character in MR recognizes a physical environment and hides under a table or a sofa. Like VR, MR requires special glasses.

Virtual reality technologies initially offered single-user experience, as network computing was in its infancy. Computer networks have made it possible to create collective social immersive

virtual reality spaces called virtual worlds. A virtual world is a permanent computer network environment in which users meet and communicate with each other in the same way as in the common space [11]. In the early years of network computing, in the late 1970s, the first generation of social virtual reality systems was text-based. They were called multi-user dungeons (MUD), fantasy-setting role-playing games, where players select avatars from different classes to develop certain skills or abilities, explore or complete quests [12]. MUD was inspired by the role-playing board game Dungeons & Dragons and Tolkien's popular fantasy novels *The Hobbit* and *The Lord of the Rings* trilogy [13]. The third generation of virtual reality social environments offering sensory immersion include VRChat, AltSpaceVR, Engage VR, Rec Room, Virbela, Sansar, High Fidelity, Sinespace, Somnium Space, Mozilla Hubs, Decentraland, Spatial and Meta (formerly known as Facebook) [14]. These platforms offer embodied user experience and a range of tools for online learning, entertainment, and remote meetings. Some of them, for example, Rec Room and Virbela, allow access and participation through multiple devices, such as desktop systems and mobile applications.

The sense of spatial awareness and telepresence, which is carried out with IM, allows to use new opportunities in education and enlightenment. The spatial component of IM can be directly extrapolated to educational applications that have a spatial component, such as geography, geometry or anatomy. However, telepresence, which is achieved by IM, provides a higher level of interaction than can be achieved by traditional media. This increased participation can have educational benefits, even for non-family content, especially when attention or engagement is difficult to maintain through established media. Although it is difficult to be sure about the future of IM in these areas, certain reasonable forecasts can be made. According to historical reports, the adoption of various teaching tools has traditionally followed a similar path. In the case of radio and educational television, it was predicted that these media would revolutionize education. The development of modern TV training programs and podcasts supports this thesis. Thus, television and radio have had a significant impact on modern learning technologies.

The invention of each traditional media added more and more sensory stimuli. For example, radio provided sound. Then cinema/television allowed viewing visual content. Later, video games enriched audio and visual impressions with interactivity. A pattern can be found with the development of each media, there is an additional possibility that is based on a previously established possibility. IM can contribute to traditional media with its sound, visual and interactive functions; that is an unprecedented sense of immersion in IM.

By IM people often mean "being there" concept, rather than observing or doing something. This has a profound impact on the audience's relationship to the environment. The novelty of IM is also connected with technical progress: the combination of available touch technologies with closer proximity of the screen than ever before opens new possibilities for users. Nevertheless, the most discussed topic in this area is the massive introduction of this new environment. Most users have a deep understanding of traditional media, and in this regard further introduction of IM as a new information environment can work only with theoretical and practical knowledge about media. This includes not only technical aspects, but also perception issues, including automated creation of an information product based on machine learning and artificial intelligence.

If the implementation of IM is like traditional media, then IM will be more accessible to users. Modern media editorial work is based on current models using existing app stores, platforms, websites, social networks, and messengers. This facilitates access to instant messages. While instant messaging can follow established patterns, instant messaging telepresence is a key factor opening several opportunities to create and experience presence, empathy, and immersion.

Based on the exciting characteristics of virtual reality (VR), augmented reality (AR) and mixed reality (MR), these three concepts can be combined into a common concept of "immersive media" (IM). IM are often considered as new concepts that can be true in their integrated, holistic forms. However, the technological and psychological aspects of IM have long been studied both in the media industry and in education. By analyzing the evolution of established media, i.e. cinema, television, radio and video games, this article studies the extension of past processes in the development of traditional media, which resemble the current trajectory of IM evolution.

Traditional media allow content to be viewed through passive television/film viewing, listening to radio or interactive video games. The appearance of IM changed the perception of content. Instead of just watching something on the screen, IM users get the impression that they are built into the scene. An additional feature is that IM can enrich photographic or synthetic images with data and metadata that add various features and options to the viewer's scope.

The sense of spatial awareness and presence that comes with IM, allows you to potentially use new opportunities in journalistic education. Training in immersive computer graphics and 360-degree video is currently in use. Both approaches have their advantages and limitations for immersive journalism. How effectively immersive journalists will use them will ultimately determine the future standards.

In general, it can be argued that immersive media are following the same path of development as traditional media. However, trends show that the rate of IM distribution in the general population is much higher than in previous media because many elements of the expanded reality are gradually integrated into the gadgets already distributed among the audience (computers, smartphones, portable gaming stations).

It should also be borne in mind that most of the content is based on established forms of media, such as cinema, television, and games with only one difference, which is the great ability of immersive media to create a simulation with a full immersive effect, including the effects of both physical and social telepresence. In the implementation of which the main role is played by technologies of expanded reality, including virtual, augmented, and mixed reality.

## **2.1. Empirical studies of immersive journalism**

Research on immersive media was carried out by Western and Russian researchers. "Immersive Journalism: Immersive Virtual Reality for the First-Person Experience of News" by Nonny de la Peña is considered as a classic immersive technology book, which analyzes the future of television news with VR effects [15]. Charlie Fink's "Metaverse - An AR Enabled Guide to AR & VR" discusses the technologies of using augmented reality in media communications [16]. Understanding the main trends in the evolution of immersive media and the formation of metauniverses is described by J. Blascovich and J. Bailenson [17], Schmitz Weiss [18] and M. Slater [19]. Ethical problems of using virtual reality in education and information are discussed in the article of W. Steptoe "The Ethics of Realism in Virtual and Augmented Reality" [20].

The research of immersive journalism was scientifically contributed by the works of western scientists, such as Robert Hernandez in the book "Introduction to Immersive Journalism: Virtual Reality & Video 360" [21], E. Sirkkunen and P. P. Rezaei [22], S. Pérez Seijo "Immersive journalism: from audience to first-person experience of news" [23]. Russian researchers A.V. Zamkov and M.A. Krasheninnikova considered the features of "robotic" journalism technologies in the profile media education [24]. In Kazakhstan the issues of immersive journalism development discussed in article by Zh. Ibrayeva "Immersive Journalism as a New Digital Media Communication Platform" [25] and by B. Nurumova in the research "Immersive Journalism: creativity, technology, industry" [26]. It is obvious that the use of virtual reality tools in journalism carries, in addition to innovative approaches, certain risks, both psychological and manipulative. This issue is discussed in an analytical article "Immersive journalism: will VR kill news media? And will "virtual" news become a tool of manipulation?" [27].

## **3. Second life. New era of immersive journalism**

American journalist Nonny de la Peña and her colleagues used virtual reality technologies (VR) - such as head-mounted displays to allow people to enter virtual worlds and scenarios that represent real news. However, long before that, in the 1990s, virtual reality researchers Frank Biocca and Mark Levy [28] were already discussing the potential of using virtual reality devices for journalistic purposes. They believed that virtual reality would allow journalists to the realization of "the longest dream of a journalist - to conquer time and space", creating "a feeling

of presence in remote, deserving coverage of places and events at part of the audience". This is also the main point of view of narrative translation theory, which suggests that the thought process, attitude, and beliefs of a person can change when "a person is transferred from the real world to the narrative world" through "integrative fusion of attention and images" into narrative and feelings [29]. Second Life, "the alternative reality generated by the computer" opened the next important era of the evolution of immersive journalism. Although the virtual desktop platform did not provide full immersion due to the third-person view, it provided users around the world with a virtual world for avatar navigation and interaction. Second Life has spawned three online newspapers: Alpvillage Herald, Metaverse Messenger и Second Life Newspaper [30]. In addition to these virtual world newspapers, Second Life organized a weekly interview program on Metanomics (Metauniverse and Economics).

Around the same time, Nonny de la Peña explored the use of Second Life as an opportunity for interactive journalism. Her first journalistic work in Second Life was *Gone Gitmo*, a virtual recreated incident at Guantanamo Bay Prison in which a user is portrayed as an avatar who is unexpectedly detained and imprisoned in an X-ray camp. The Second Life experience also introduced the audience to documentary footage from the United States Department of Defense about real prisoners.

Her next work at Second Life was *Cap and Trade*, which explored markets of restriction and trade, suggesting users first choose the aspect of their lives, they intended to change to compensate for their annual carbon emissions: their cars, transcontinental flight by plane or heating your home for a year. Then the audience will be presented "virtual copies of real projects in which human rights implications, financial waste and questionable practices allow you to see beyond the opaque system" [31]. User avatars were also followed by a personal carbon cloud to emphasize their individual responsibility in addressing the larger pollution problem.

Following her work on Second Life, de la Peña led the use of immersive virtual reality technology and simulations using computer graphics to place the audience in the playback of real first-person events. Her first notable work was an adaptation of *Gone Gitmo*, which used a tracking system to match the head turns of a Guantánamo prisoner to the physical movements of the user's head. It was through research of this work that it was determined that body possession was an important aspect of immersive journalism.

Besides de la Peña, other professionals are beginning to experiment with immersive computer journalism. In an early experiment in 2014, a daily newspaper in Des Moines (Iowa), *The Des Moines Register* developed a mixed reality (MR) product called *Harvest of Change* that combined a 360-degree video and a virtual computer farm. Exciting interactive experience accompanied a series of published articles on the condition of American agriculture [32]. In 2015, the data and data visualization departments of the *Los Angeles Times* developed computer graphics that allow viewers to explore the virtual crater on Mars. The Associated Press now has its own news channel AR Digital Products, which includes various immersive journalistic experiences using computer graphics, presented in a 360 °video format, like a virtual journey into the brain to study scientific theories about changes that are thought to contribute to Alzheimer's disease. "Remembering Pearl Harbor" is an immersive journalistic experience created for HTC Vive HWD by Deluxe VR and presented by TIME's LIFE VR.

Fascinating computer graphics allow the viewer to see the unexpected Japanese air attack on Pearl Harbor in 1941 and its consequences for Lieutenant Jim Downing, one of the oldest living American veterans to witness the attack. The work was based on Downing's memories of serving as postmaster on the aircraft carrier "West Virginia" and resources provided by the National Museum of World War II and the Library of Congress.

Although journalism is now present in many interactive formats, from interactive maps to news games, in practice the most common approach to immersive journalism is to use low-cost HWD such as the Google Cardboard, and 360-degree videos to immerse the audience into the news scene.

In addition to immersing the audience into the visual effects of the venue news, de la Peña et al. argued that what is even more important is that "the actual body of the viewer can be transformed, becoming a central part of the news itself". To do this, they tracked the user's head

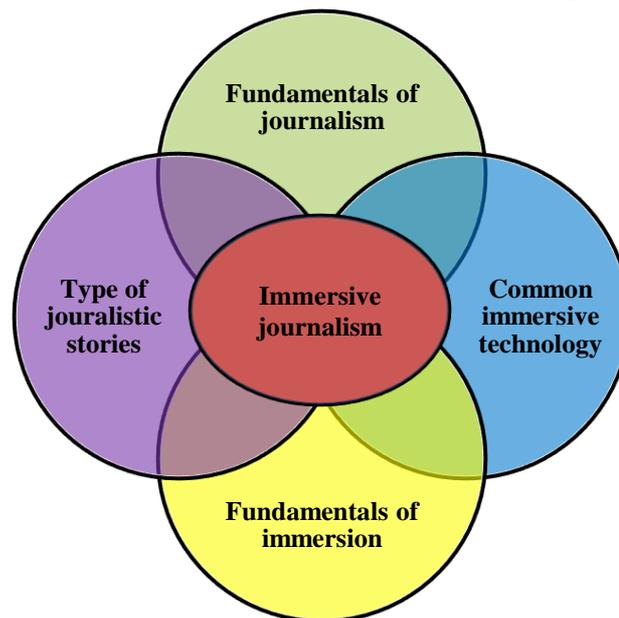
rotations and then applied the same turns to the head of a virtual avatar reminiscent of a Guantanamo prisoner who could be seen from both the first and the third person. They used this approach to make viewers feel like they own the avatar of a virtual detainee.

However, the concept of the main character's body ownership was not accepted by many journalists. Instead, audiences are often offered an immersive experience that lacks any visual representation of the viewer's real or virtual body and a low level of interactivity. For example, in Kazakhstan immersive project is called audio performance with immersion effect with headphones [33]. The goal of the project is to get acquainted with the iconic places of Almaty. Participants in black robes and headphones moved around the city, experiencing the thrill of immersion in the history of the city. The immersion effect was only partial, and interactivity was absent. Such experience is embodied in another creative project "Your Top", when participants make an ascent on Medeo also in headphones [34].

This practice illustrates a serious discrepancy in the current state of immersive journalism. Many journalists need to better understand the opportunities and limitations of immersive technologies to create impressive stories, while developers need to better understand the requirements of journalism regulation and the basic types of journalistic narrative.

### 3.1. FIJI, FIVE, 360 video and Portable AR

To fill these gaps and help journalists and developers unfamiliar with immersive journalism, professors at University of Texas at Dallas Gary Hardee and Ryan P. McMahan created "A Framework for the Immersion-Journalism Intersection" - FIJI (Figure 1) [35].



**Figure 1:** FIJI concept's demonstration

As numerous journalistic organizations are beginning to experiment with immersive technologies, FIJI's theoretical framework is designed to take a step back and remind both journalists and developers of the various fundamental requirements, which intersect in the process of creating immersive journalism. FIJI considers the fundamentals of immersion and how they affect various aspects of user interaction. Closely related are the capabilities and limitations of conventional immersive technologies that journalists could currently use, such as 360-degree video, mobile virtual reality-based computer graphics (CG), virtual reality on a room scale, portable augmented reality (AR) and headgears. FIJI is also attentive to the fundamentals of journalism, including the requirements that define the profession of journalist and regulate journalism. FIJI identifies four types of journalistic material - breaking news, public reporting, investigative reporting, and explanatory reporting - and their main journalistic requirements.

These four areas of knowledge and their intersection have been used in FIJI to formally identify four types of immersive journalism that are suitable for public dissemination.

M. Slater and S. Wilbur based and developed “A Framework for Immersive Virtual Environments: Speculations on the Role of Presence in Virtual Environments” also known as (FIVE). The authors explain that immersivity or in other words “immersion” is a description of the “degree to which computer displays are able to create a comprehensive, extensive, surrounding and vivid illusion of reality for human participant’s senses”. They further define inclusiveness as the “degree to which physical reality is closed” [36]. For example, most modern HWD, such as Oculus Rift and HTC Vive, are inclusive, completely closing the user view of the form factors. M. Slater and S. Wilbur used the term “environment” to denote the panorama of immersive experience, and the term “vivid” to denote the “resolution, accuracy and diversity of energy modeled within a particular modality”.

The objective qualities of immersive virtual reality systems mentioned earlier have been repeatedly demonstrated as triggering internal subjective reactions such as presence, body possession, involvement, emotions, and cyber-disease.

Presence is a term used to describe the psychological and phenomenological experience of being in a virtual environment and experiencing a computer-created world or simulation from the first person. Presence is the “state of consciousness” experienced during the sensation of being there in the virtual world. In its optimal communicative state, presence is the product of the place’s illusion and plausibility. The illusion of a place is the sensation of an incarnated virtual transformation into an experience of virtual reality, while the illusion of plausibility is the belief that events occur, even though the user knows that these events are not real.

Body possession is a “special perceptual status of one’s own body, due to which bodily sensations seem unique to oneself” [37]. Studies show that body possession can play a crucial role in the somatosensory nervous system, which processes internal signals from the body. However, researchers have demonstrated that immersive virtual reality systems can be used to create the illusion of owning the body when “healthy subjects feel the artificial body as if it were their own physical body”.

Like presence, involvement is a state of consciousness, but one in which the user’s attention is attracted, engaged, and occupied by a user interface or multimedia element. Involvement is “the quality of user experience, which depends on several factors, including aesthetic attractiveness, novelty and usability of the system, the user’s ability to pay attention and be involved in the process, as well as the user’s overall appreciation of the visibility of experience”. Thus, involvement is certainly important for immersive journalism. To “provide people with the information they need” [38], news and its delivery must attract the attention of the audience, otherwise the information will not be coded, but will be lost.

Cyber-disease is a physical discomfort caused by immersive technology [39]. It is also often called a simulation disease or just motion sickness. Primary symptoms of cyber disease include disorientation, difficulty concentrating, nausea, blurred vision, dizziness, etc.

Even with publicly available technologies, several factors limit the production and dissemination of immersive journalism. First, to use such technologies, journalists need to expand their skills or establish new relationships with researchers or developers who can create and use such technologies. Second, news organizations will need enough money to cover the currently high development costs. Third, while such unique technologies may provide a more realistic experience that optimizes the impact of journalistic narrative, dissemination may be extremely limited to an audience, which has the physical and financial capacity to access technology. We see immersive journalism in its current state as a form of narrative that can complement other forms of presentation, so it is worth focusing on technologies that are now more accessible to journalists and a wider audience. Now, there are several available immersive reality technologies that can be used in journalism.

The 360-degree video is the most common technology currently used to create immersive experiences. One of the reasons for this is that the video 360° does not require computer visualization or virtual 3D objects to create a video, unlike other technologies. Computer graphics

effects are only required for 360 viewing videos if information or infographics are added during post-processing.

Another advantage of using 360° videos is that they can be viewed in several ways. Almost any HWD, from the inexpensive Google Cardboard to HTC Vive, can immerse the viewer in 360-degree videos. Using the same inertial tracking technology, the 360° video can be viewed on almost any smartphone, moving the device as a window to the virtual world. Video 360° can also be viewed in most web browsers by dragging to change the way the current FOV is displayed to 360° FOR. This wide range of viewing options makes 360° videos the most affordable immersive technology for a wide audience. The 360° video can also be viewed in most web browsers by controlling the camera with the mouse button to change the way the current FOV is displayed to 360° FOR. This wide range of viewing options makes 360° videos the most affordable immersive technology for a wide audience.

The only problem with this technology is that it lacks interactivity. Because video 360° is nothing but 2D pixels wrapped around the viewer, the worlds visible in the video cannot be changed (at least without complex computer vision algorithms and advanced processes). Consequently, users cannot capture or manipulate the objects they see in the news world. The first notable 360-degree video journalism material was “Clouds over Sidra” - the story of a 12-year-old girl named Sidra in Zaatari, a Syrian refugee camp in Jordan [40]. The video was created by Chris Milk in collaboration with the UN and Samsung. In 2015, he won the Interactive Award at the Sheffield International Documentary Film Festival.

In November 2015, The New York Times released its first 360-degree video, The Displaced. As described in the introduction, the mini documentary focused on the stories of three children forced to leave their homes due to the crisis in Lebanon, South Sudan, and Ukraine. Around the same time, The New York Times hired a street artist to create the cover of its magazine and published “Walking Around New York” - a 360-degree video showing the process of the artist’s work [41]. Since 2015, the New York Times has published over 100 videos in 360° format and launched its news channel The Daily 360. Other news agencies have also started producing their own 360 °review videos, including ABC, BBC, Vice, and The Verge.

While the use of immersive computer graphics and 360-degree video continues to grow, it will be interesting to see if they will survive soon. Both approaches have their advantages and limitations for immersive journalism. How effectively immersive journalists will use them will ultimately determine what will become the standard (Fig.2).

360° video				
3D objects	Different ways of immersivity	Inertial tracking technology	Portability	Interactivity
				

**Figure 2:** Summary of the capabilities and limitations of 360° video

As for Kazakhstan, 360° format is used mainly in commercials of tourist destination [42, 43]. News journalism does not yet use this technology, despite the active introduction of digital standards in media production.

Portable AR is another technology, which was used for immersive journalism. It is a portable augmented reality, the same technology used in Pokémon GO. When using portable augmented reality, a smartphone or tablet with a camera is directed to a predefined 2D image, and then this image is superimposed with a video or virtual 3D-object. In fact, a smartphone or tablet becomes a pocket window into the world, consisting of the surrounding real world and virtual objects. For example, The New York Times used a portable AR to transform its banner into a 3D animation of New York City [44].

Because augmented reality relies on the user's physical environment, it provides a high level of interactivity with real objects, as the user can interact with these objects as usual.

Handheld AR can be used with almost any smartphone or tablet, as the functionality is provided by software, not hardware. This makes immersive journalism with a portable augmented reality accessible to a wide audience, as many people today have smartphones. Journalists and developers can use ARToolKit, Vuforia, and Aurasma to create the necessary software.

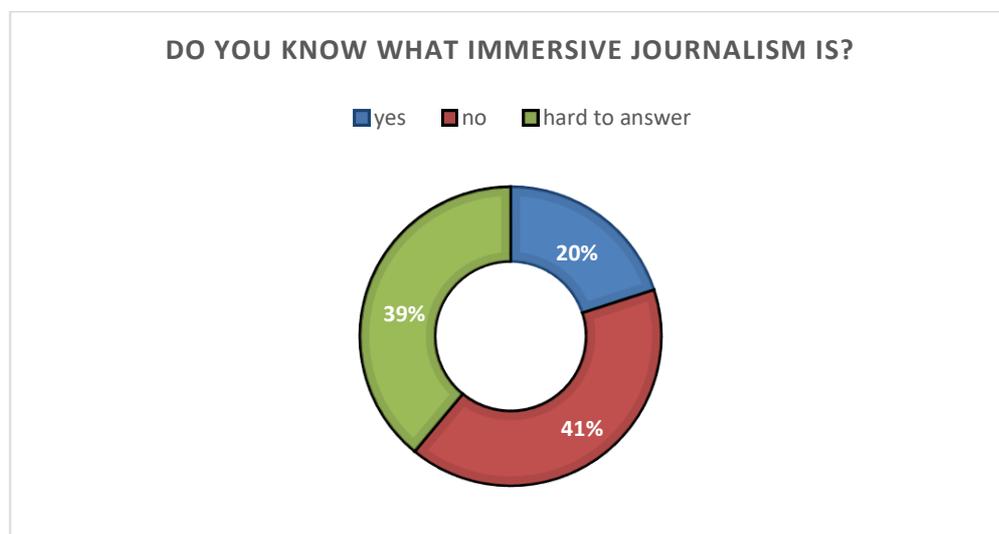
### 3.2. Survey results

As journalists experiment with the development of immersive journalism - the interactive experience of first-person news events - recommendations are needed to help bridge the gap between the demands of journalism and the opportunities of new technologies.

As part of the research on the development of immersive journalism in Kazakhstan, the authors of this article conducted a survey in which students of Business, media and management Faculty of International Information Technology University took part; 85 people were interviewed.

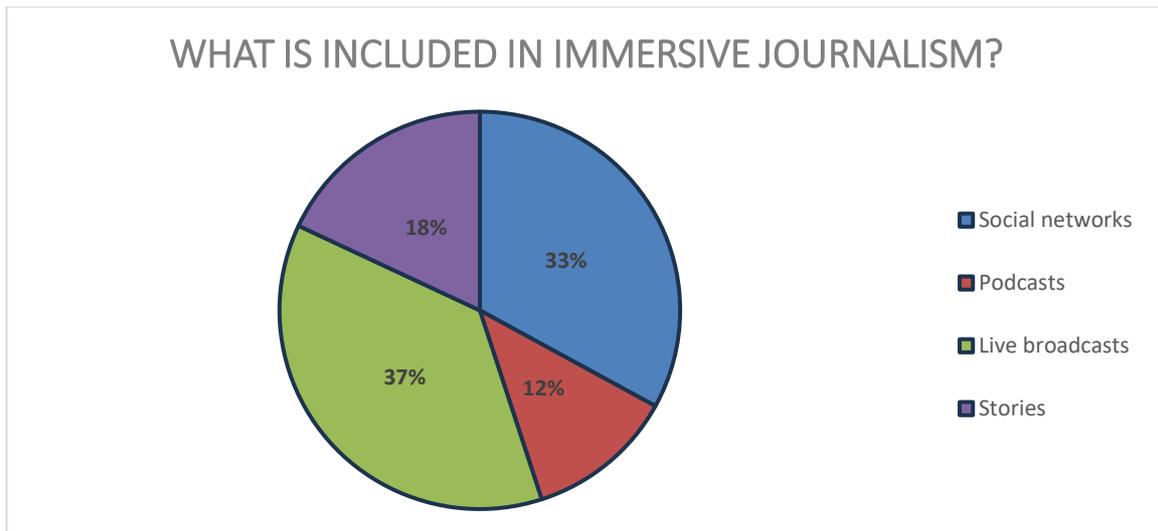
The main questions of the research were personal assessment of awareness in the concept of "immersive journalism", as well as the opinion on the need to introduce immersive journalism in Kazakhstan as a new multimedia experience.

The first question "Do you know what immersive journalism is?" most respondents (41%) answered negatively, 39% explained, that they heard about this phenomenon, but couldn't explain its meaning, another 20% were aware of immersive journalism with right explanation (Figure 3). In our opinion, this ratio is because even digital journalism students do not yet consider the introduction of immersive journalism technologies as a conscious necessity.



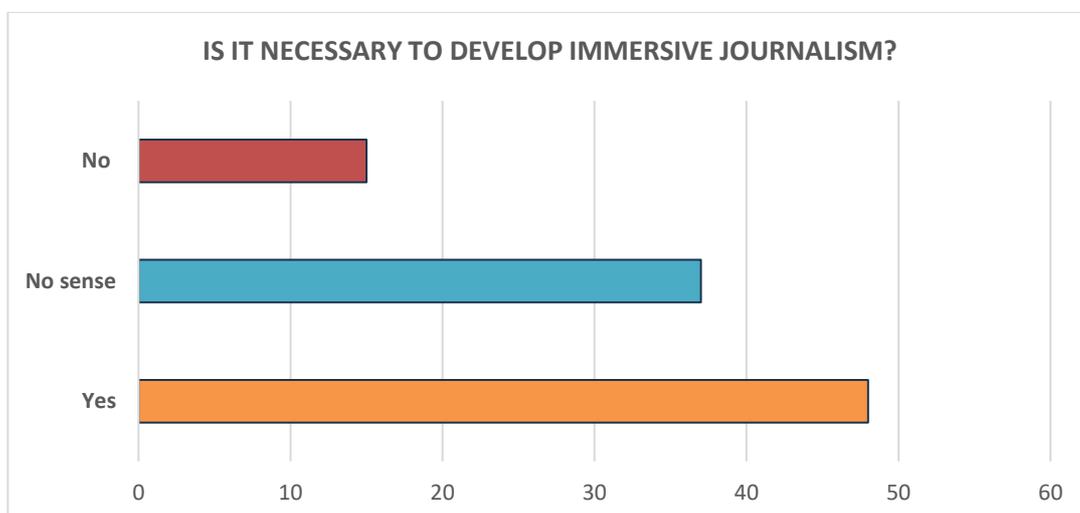
**Figure 3:** Awareness of immersive journalism

The students, who had troubles to answer about the definition of immersive journalism, suggested next points of immersive journalism's components (Figure 4).



**Figure 4:** Suggestions of immersive journalism

Unfortunately, a lot of respondents didn't see any sense to develop immersive journalism - 37%, 48% supported the idea of its growth, 15% was against it. By no sense to develop immersive journalism, students mostly refer to the point that Kazakhstan's society is not ready to accept such type of journalism, because of lack of any interest in this technological sphere. The respondents, who answered negatively, explained their choice by a fear to get under control of immersive journalism technologies, because of its manipulative influence on the person. But it is important to mention, that most of the students supported the idea of immersive journalism development. They named it as a relevant form of mass media, which should be provided and broadened (Figure 5).



**Figure 5:** Necessity of immersive journalism development

Thus, students of Business, media and management Faculty generally have a positive attitude to the introduction of immersive technologies into the educational process, but do not exclude the possibility of manipulation of information in this case, and consider immersive journalism technologies creative, but still difficult to reach much of the population in Kazakhstan.

There is an educational program "Immersive Technologies", providing the training of highly qualified specialists with skills for programming and prototyping of modern XR systems, in International Information Technology University. At the same time, there is a need to create a scientific laboratory of immersive journalism to develop creative experience in the production of high-quality information product for national media channels of the Republic of Kazakhstan.

### 3.3. Prospects and Risks

In general, it can be argued that immersive media are following the same path of development as traditional media. However, trends show that the rate of IM distribution in the general population is much higher than in previous media, since many elements of the expanded reality are gradually integrated into the gadgets already distributed among the audience (computers, smartphones, portable gaming stations).

However, immersive media still have a significant difference in the context of risks and shortcomings in the long-term development. There is a need for further research into the normative legal and ethical norms related to digital space and how they will operate on expanded reality platforms.

From a positive perspective, we can note the great potential for the development of journalism and the evolution of media through adaptation into a new media environment. It should be noted that it is necessary to train specialists who can create journalistic materials for IM. And that means expanding the convergence of media workers and the need to learn new technologies, such as 3D editors, that allow you to create 3D objects, scenes, and animations, but first and foremost to introduce the study of video game engines like Unreal Engine 4, allowing you to create simulations using both classic programming method and a new way of creating content through mechanic templates.

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