15

IMMERSIVE JOURNALISM AS WITNESSING¹

Lars Nyre and Joakim Vindenes

VR is nothing if not spectacular. It may be difficult to envision that, instead of getting mobile news via written text, photos and videos, and phone-size screens, you would get the news in the perceptual richness of head-mounted displays that allow a 360-degree visual and auditory sphere in which the body of the user is immersed. Technologies are launched in improved versions, and the skillsets and creativity of content producers are also growing.

What's in it for journalism? It is established knowledge that VR narratives are effective for creating first-person perspectives, or what we propose to call "witnessing" (Peters 2001). In the context of immersive journalism, de la Peña et al. (2010, 299) write that "virtual reality systems are uniquely fitted to deliver first-person experiences of stories that appear in the news", and that "immersive journalism offers the opportunity of a uniquely different level of understanding contrasted to reading the printed page or passively watching audiovisual material".

Witnessing seems to be a storytelling technique with potential in a still emerging journalistic practice. In their 2015 report on VR Journalism, the Tow Center writes how VR "represents a new narrative form, one for which technical and stylistic norms are in their infancy" (Owen et al. 2015) and where audience behavior is undecided. For example, traditional visual aesthetics are oriented to the rectangular frame. In 360-degree video it is a striking storytelling dilemma that there is no rectangular frame for the photojournalist in which to place the motif and action. Another example is that 360-degree video makes the journalist/cameraperson visible in the footage unless steps are taken to avoid it by placing the camera on a tripod, or having a cameraperson wear it on their head. There is a need for conceptualization and analysis that would help to clarify things and give audiences a more directed and meaningful experience. Otherwise VR stories may risk feeling empty and shallow, and therefore unable to engage audiences in a proper way. The Knight Foundation's 2016 report on Virtual Reality in Journalism states that the expressive

novelties may be a “challenge to journalistic storytellers more familiar with taking the audience along a single narrative ride” (Doyle et al. 2016).

The media industry will no doubt continue to explore storytelling possibilities by trial and error, regulated by their rate of market popularity and technological developments. And in addition to journalistic innovation there is room for more education-driven design experiments. We believe that higher education institutions (HEIs) should explore VR journalism at the bachelor and master level, so that students could contribute with genuinely valuable skillsets and techniques that will have been developed under more open, self-critical, and reflective conditions than what the hectic media industry is able to provide.

In this chapter we report on a design experiment where VR stories were made as mandatory coursework. Four quite different journalistic stories are analyzed in light of two theoretical traditions. Phenomenology explains the experience of being present at the scene and helps to describe what witnessing means in this context. Narrative theory shows the importance of the position that is implied for the user in the narrative. We apply these theoretical perspectives in an analysis of the VR stories scene by scene and show what type of witnessing they should be characterized as being. At the end, there is a discussion of the journalistic value or appropriateness of such types of witnessing.

Method: a pedagogical design experiment

The material we analyze in this article was created in a pedagogical design experiment conducted in 2018. In the learning sciences there is a longstanding tradition of doing design experiments with student groups, trying to teach them new skills and techniques (Brown 1992) and design-based research (Barab & Squire 2004; Collins, Joseph, and Bielaczyc 2004). Such studies involve making interventions in existing educational settings by introducing new technologies, and they are intended to create positive changes in the learning practices and at the same time allow researchers to study the implications of the intervention. Teachers want to make changes to the mediating technologies involved in coursework, such as introducing 360-degree video where the course previously used 16:9 frame video, and to the organizing of learning activities inspired by a given pedagogical goal, like challenging the students to narrate in VR while simultaneously adhering to established journalistic values. In an earlier design experiment, Nyre, Guribye, & Gynnild (2018, 82–83) combined innovation pedagogy with drone-flying and 3D-modelling for journalism. Building on experience from the former study, the method for the present design experiment was as follows:

- 1) Students were given plenty of time to use the technology and develop new skills. Students needed to acquire the necessary motor skills for dealing with the creative possibilities of using the novel technology. The students had to use the equipment provided by the university. For each group, this comprised a Samsung GEAR VR Head-Mounted Display, a Ricoh Theta V 360 camera,

and a monopod stand. The students were also required to attend mandatory technical training, wherein they were taught VR programming, principles of 360-video production (such as placement of camera, editing, and tips and tricks), and 3D modelling through photogrammetry. The students also attended sessions on storyboarding and visual aesthetics for each separate scene.

- 2) Teachers made a working definition of journalism. The students were supposed to create genre-consistent journalism with the new tools. A working definition of journalism was formulated in communication with the students: 1) use proper sources for all information presented, 2) no use of hidden microphones or cameras, and 3) be careful not to violate people's right to privacy. 4) Realistic reconstructions are allowed. Notice that the concept of "witnessing" was not central to the design experiment, but emerged analytically after the fact.
- 3) Students storyboarded, shot, and edited everything themselves. Principles from innovation pedagogy say that students should make as many decisions as possible, while teachers should make as few as possible (Darsø 2011, 15). The presumption is that students will learn more intensely under conditions where they are responsible for exploring the uncertain terrain. We accomplished this by asking the groups to present their productions five times during the semester, with specific requirements and deadlines for each. They received criticism and technical feedback from lecturers, media industry guests, and fellow students. At the end of the course there was a public demo in Media City Bergen attended by around a hundred people who could all trial the VR stories.

The team of researchers and teachers was aware of an ethical dilemma with our approach. The primary author of this text was the main lecturer on the course, and the second author was the main VR instructor. There was a risk of blurring the boundary between teaching and research, so that the students could see us as powerful graders and collegial researchers. We needed to make clear demarcations between our roles. At the beginning of the course we informed the students about the design experiment governing the course, and they attended several research events where VR journalism was discussed. In order not to confuse the student productions with empirical material generated by researchers, we made sure that their VR stories were presented as autonomous productions with due credit given at a public event and on the ViSmedia website. Students and lecturers are all thanked in an afterword to this chapter to further emphasize their contribution. The following analysis was conceived and conducted several months after the course had been completed, and our considerations therefore did not influence the production of the stories.

Four VR journalism stories

Eighteen students were divided into four groups and given the following design challenge: Create a journalistic narrative in the medium of virtual reality, using sound, 360-degree video, and animations. The end product should be a three-minute experience tested by members of a live audience. This design experiment

resulted in four original VR stories. Since these stories are integral to our argument in this chapter, they are summarized below:

“Plastics” is a factual, documentary story told to children around 8–12 years old. The topic is the environmental crisis, with plastic waste in focus. The story is based on journalistic research into pollution, recirculation, and other environmental issues. There is an explicit narrator hovering above the 360 universe, with a calm, friendly, authoritative, adult voice. “Plastics” belongs to the genre of educational program or enlightenment.

“Cryonics” is a factual, documentary story told to young adults. Four different human avatars present their opinions about cryonically freezing your body when you die. The program offers no conclusions. The information is based on research with a priest, ethical philosopher, medical doctor, and cryonics enthusiast. “Cryonics” tentatively belongs to the genre of science journalism or infotainment.

“Drug Addict” is a socially realistic, dogmatic, rough aesthetics documentary. A series of quick scenes pulls us into the dramatic overdose of an average drug addict. The story is based on research and conversations with drug addicts and is filmed on location. The group had to handle ethical issues regarding identification and used actors to recreate the life of a drug addict. “Drug Addict” belongs to the genre of “social documentary” that has existed for decades on television and film.

“Schizophrenia” is an educational first-person simulation of the reality-shattering disorder of schizophrenia, giving the user an experience of visual and auditory hallucinations suffered by patients of this mental disorder. It is based on interviews with doctors and patients, and stages a three-part dramatization of the psychiatric disorder. “Schizophrenia” also belongs to the genre of “social documentary”, but the first-person perspective makes it particularly striking.

Theories that explain witnessing

Media phenomenology considers that there is an intimate relation between human perception and media technology. Perceptual phenomenology describes the general features of individual bodily experience, and it argues that perception is an active search for information about the environment. Individuals apply their bodily skills and explorative strategies toward the object in question (Merleau-Ponty 1945). Merleau-Ponty stresses that your body has a temporal horizon – past, present, future – and a spatial horizon – near and far away. While being present you are at all times also in the middle of an experience.

During interactions with media our human perception becomes mediated or augmented by technical means. As Carr (1995) puts it: “taking virtual reality seriously means understanding the process by which technology can fool our

perceptions” by “creating a synthetic environment” (3). He argues that virtual reality can be understood as “the stimulation of human perceptual experience to create an impression of something which is not really there” (5). The experience that is stimulated must be a very complex one if it is to fool perception.

Witnessing is an established reporting technique in radio and television. The speaker acquires authority because he is present at the scene of an important event, and the public gets a realistic description of it (Nyre 2008). When someone witnesses an event it is in a sense the event itself that speaks. It demands a realistic description of its properties, and the speaker is in what Erving Goffman (1981, 233) calls a “slave relation” to it. To witness something has two aspects: the passive one of seeing and the active one of saying. Witnessing in the rhetorical sense is therefore “the discursive act of stating one’s experience for the benefit of an audience that was not present at the event and yet must make some kind of judgment about it” (Peters 2001, 709). The listener is in no position to challenge the truth claim of the story and is likely to trust it. Peters (2001, 710) says that witnessing presumes a discrepancy between the ignorance of one person and the knowledge of another.

On the basis of this explanation of witnessing, we can conceptualize a first-person witness that experiences the event by being placed in a synthetic, 360-degree audiovisual version of it. Instead of a journalistic reporter recounting what happened, the user experiences it first-hand. Nash (2018, 119) uses the concept of “immersive witness” in a way that fits with Peters’ description: “The notion of immersive witness underpins much of the exploration of virtual reality (VR) by journalists and humanitarian organisations. Immersive witness links the experience of VR with a moral attitude of responsibility for distant others”. Damiani and Southard (2017) argue that:

Presence in VR is the sensation of being in the space of a given experience, of sharing that space with characters, of *being there*. [...] Your audience will feel an increased sense of responsibility [...] *Why am I here?* and *What should I do?*

Damiani & Southard 2017

To make good witnessing, the producers need to create more than a realistic feeling of presence; there must also be a story with an address and a plotline. Chatman (1978) shows how a story is directed towards the users to persuade them to take up the desired subject position. First, the implied author is “reconstructed by the reader from the narrative” (148). In our case it is the institution of news journalism, and the requirements for trustworthiness, truthfulness, and relevance. Second, the implied reader is written into the narrative as a subject position that the reader can take up to varying degrees. Iser (1978) points out how “The text must therefore *bring about* a standpoint from which the reader will be able to view things that would never have come into focus as long as his own habitual dispositions were determining his orientation” (Iser 1978, 35).

Analysis: witnessing in various shapes and strengths

The first part of our analysis consists of a description of the qualities that create an implied witness in various shapes and strengths in the four journalistic stories made by students. We point to the many different structural and material organizations that allow a VR spectator to accept the idea that she is personally on the scene, even though she sits in a chair wearing a VR headset.

Learning like a child

In “Plastics” the implied reader is a witness in the passive sense. You are positioned as a child at the age of approximately eight to twelve years who is interested in learning about plastics pollution in the Norwegian environment. The child is positioned as listening to a kind of teacher. There is time to explore and orient oneself in the virtual environment as the narrator tells a story. The position is that you are interactively involved in exploring the factual information, which can generate learning. But the learner is not a particular person in the story.

Scene 1: You are at a beach on the Western coast of Norway. The beach is apparently spotless, but as you turn your head around you see pieces of plastic. A voice gives an introduction to the plastic problem and the damage it does to sea and wildlife. The sound is recorded on location, and there are sounds of waves and seagulls. When the voiceover is complete, the user can move on to Scene 2.

Scene 2: You are at a football pitch. Modeled plastic objects slowly but surely fill the football pitch, giving you a feeling of being “locked in” by plastic – such as, presumably, the fish in the sea also feel. There is a locative sound indicating that a new object has popped up, and applause and ballpark shouts that gradually diminish as more plastic piles up on the pitch.

Scene 3: You are at a big recycling station with noisy factory sounds, bright lights, and things moving around on conveyor belts. You can fix your gaze on different objects in the factory space, and click on them with the hand controller to hear and see more. You can click and listen for around a minute before you have tried all the material.

Imagine being dead and cryonically frozen

In “Cryonics” the implied reader is also a witness in a rather passive sense. You are supposed to lie on a reclining chair to have the best starting position. First you are positioned as an adult lying on an operating table dying, and after your death you are addressed by four explicit narrators with strong opinions about cryonics. You are obviously involved, since you are supposedly dead and in the cryonic tube, but nevertheless you only overhear or witness the statements from the speakers.

Nothing happens to you along the way, and you cannot act beyond launching the different speeches.

Scene 1: You start the experience on an operating table. You see stressed doctors, an X-ray, a heart monitor, and a blood bag. The situation of the patient is critical and he is about to die. The scene ends by one of the doctors “closing your eyes”, an indication that you are dying. For a short while you are in a kind of “intermediate stage” floating through space before entering a mysterious tube.

Scene 2: You are in a tank of frozen liquid nitrogen. To create the mood in the tank, there are different sound effects. One is a constant, low-frequency drone sound, another is of dripping water. Sometimes you can also hear hydraulics pushing out air. The tank has a blue tint, and there are chilling smoke effects inside it. First you get an explanatory speech on why you are in the tank. Wherever a symbol appears, when you look at this, the symbol will be turned into a face. The information is presented in an abstract rather than realistic way. The symbols in the three-dimensional environment find their meaning as references to an outside world, comparable to the abstract role of imagery in VR Memory Palaces (Vindenes, de Gortari, & Wasson 2018). Each person will confront you with their opinion on freezing a human body. In total there are four persons spaced around the sphere: one with a positive view of cryonics, a priest, a philosopher, and a medical doctor.

Overdosing on heroin

In “Drug Addict” the implied reader is a first-person witness. You are moving from place to place in the city, scene by scene. Notice that the user does not have any real freedom to move in 3D space, but “moves” through the events in transitions between the scenes. You are a drug addict who buys heroin and shoots an overdose, probably eventually dying. This is a more active witnessing than in “Plastics” and “Cryonics”. The protagonist is also displayed as an explicit narratee in the story due to such features as seeing his arm instead of your own (or no arm). You are positioned as a full-bodied person with a subjective experience of the stress and unpleasantness. This is further accomplished by the use of realistic, cold filters, shabby, rundown locations, and visual disturbances that simulate a sense of losing consciousness. The group chose to make a sequence at the start where an explicit narrator explains what will come. While it heightens the journalistic seriousness of the piece, it also creates an initial distance from the person we are about to become.

Scene 1: You are sitting in a public square in the heart of the city. Here you are in one of the city’s most popular places, but without being able to establish eye contact with anyone.

Scene 2: You are on the Light Rail from the city park to the city bus station. During the tram ride you will notice that a passenger sits down in the seat

next to you, gives you a judgmental look and get up again to stand in the corridor for the rest of the trip. Outcast, subhuman.

Scene 3: You are in a pedestrian subway at the city bus station. Here you are greeted by an approaching person and you receive drugs in the form of heroin.

Scene 4: You are in a public toilet in the subway, where you shoot heroin into your arm. The arm and body are visible in the video. In this scene the colors turn more saturated, and you can hear your increasing heartbeat. Various clips from different parts of the city are presented with a few seconds' delay, each fading to black shortly after introduction. Then there is a dip to a black transition to the next scene.

Scene 5: You are lying in an alleyway. Your overdose may result in death. The video ends with text explaining more about drug addicts in Norway.

Suffering from schizophrenia

In "Schizophrenia" the implied reader is a victim of a mental disease. You are positioned as somebody in a neutrally furnished apartment, and you experience increasingly hallucinatory impressions in both visual and auditive forms. Depending on the degree of immersion, you can either feel like the sufferer does for a short while, and sense its impact on your body and mind, or you witness the condition over the shoulder of the sufferer without identifying as him/her.

Scene 1: You are at the kitchen table in an apartment. The first symptoms of the disorder begin to emerge. There is an auditory hallucination in that the radio host suddenly addresses your situation directly: talking about the bread on your plate. There is a visual hallucination in that, if you look directly at the slice of bread, the cheese will start to mold. You hear a low voice "inside your head" that is somewhat hard to discern.

Scene 2: You are in the laundry room. Now the voices are multiple and louder. An aggressive man shouts: "Did anyone say you're allowed to do this? You know who decides! End it there! Are you listening? I said STOP! Turn off the washing machine! You [...] now you listen to me, I'm the one who decides [...] turn it off!" A panicked woman screams: "Can you hear that sound? They know where you live, they are here now, they are coming to get you!" If you keep your eyes on the floor drain, spiders will start to come up through it. Someone is shouting and cranking the door handle, trying to get in.

Scene 3: You sit on the sofa in the living room. The voices are at their most intense in this scene, at one point urging and guiding the user to kill himself. Paintings on the wall come to life if you look at them. The prince depicted in a painting blinks to the user, and spits out a frog. Another painting shows a number of men, and they suddenly begin to move. Suddenly the phone rings. The scene fades into black and we hear a voicemail that is played on

the mobile. The voicemail is from a friend who wanted to check if everything was OK, and wanted to meet up soon. This was intended as a relief from the incessant voices, and to give closure for the user.

Discussion

We started from a question posed by Chatman (1978, 147):

By what convention does a spectator or reader accept the idea that it is “as if” he were personally on the scene, though he comes to it by sitting in a chair in a theater or by turning pages and reading words?

Chatman 1978

In this chapter we propose that for journalism an important part of the answer is the subject position called “witnessing”. The design experiment with bachelor students was productive in that it showed us a range of technical and narrative solutions that can be considered witnessing. The experiment helped us to make two important distinctions.

First, it is important to formulate the difference between a subject position, where the user becomes a listener, and the reporter-witness, where she instead experiences the events as one of a protagonist. Jones (2017, 180) has written about this issue. She argues that there are two distinct narratives that have evolved within immersive journalism: “reporter-led narratives and those led by characters or told in the first person”. In the reporter-led approach you work with the implied author and an explicit narrator. “You simply take on an ‘objective’, detached perspective (third-person POV)”, say Damiani and Southard (2017). “Plastics” and “Cryonics” belong to the reporter-led narrative with their voiceovers. In contrast, the narrative can be designed so that you “see things through a specific character’s eyes (first-person POV)”, as Damiani and Southard (2017) put it. This is the direction that two other productions take. “Drug Addict” and “Schizophrenia” both organize a first-person perspective where you are the victim of events happening to you. As a spectator you are placed alongside the victims, or perhaps even inside them.

Second, it is also important to distinguish between different degrees of embodiment of the subject position. Damiani and Southard (2017) make an interesting point relating to embodied position. “Will the viewers’ avatar have a body? In other words, if I look down, will I see a body?” “Drug Addict” has a scene where the first-person administers an injection into his arm. The arm is located just where your own arm is, and some spectators might almost feel that the injection goes into their own arm. In this sense we can talk about “embodied witness” in the victim position: feeling like you are inside the person’s body. Sánchez Laws (2017) refers to a VR story depicting harsh interrogation of prisoners, suggesting that the production team had been too ambiguous in positioning the user.

Whose role did participants take in the stress position scenario, did they enter a real other's skin, or were they themselves? One of the participants mentioned that he did not know whether he was the man crouching in the box or not, but he felt like he was meant to be him.

Sánchez Laws 2017

“Schizophrenia” also constructs a type of embodied presence in the story, but it feels more mental than physical. Instead of embodiment it is some kind of “enbrainment”, in which you are placed into subjective mental phenomena instead of physical bodily experience. The user can have a strong emotional attachment to a sufferer during and after seeing the production. The simulated hallucinations in the apartment give you a glimpse into an everyday life that you hope you will never experience, but you see its potential in your own life.

Conclusion

The material we analyzed in this article was generated in a pedagogical design experiment conducted in 2018. It is a follow-up to the drone journalism experiment conducted in 2016 (Nyre, Guribye, & Gynnild 2018). In both cases it was bachelor students in New Media who created all the narratives and their expressive nuances.

In this chapter we have used the material from the experiment to explore the reporting technique called “witnessing” in VR journalism. Beyond helping us to define this technique for immersive journalism, our analysis and discussion are also intended to show how rich and subtle the creativity among students can be. New skillsets emerge with the students’ exploration, and, if researchers are able to describe them constructively in publications afterwards, these novel skillsets are more likely to trickle out into the journalism profession in the long run. Skillsets for journalism may be discovered and formulated in academia, but their true value only emerges as user practices in the public sphere.

Along with these emerging skillsets for witnessing comes great responsibility for their ethical implications. It may not be controversial to create witnessing of current events such as an earthquake or a presidential press conference, but immersive journalism gives us access to so much more subjective experience too. What are the ethical ramifications of allowing anyone to witness the life of a schizophrenic person or someone being tortured in prison or dying in the street? Such powerful subject positions are sensitive, and must be used with care. Furthermore, they can also be used for propaganda and fake news exactly because they can be so emotionally powerful. As John Durham Peters (2001) reminds us, with witnessing comes a moral responsibility because the technique can be used to trick people into believing things based on “seeing it with my own eyes”. While he was referring to live news reporting on television and radio, his appeal to responsibility is even more needed in immersive journalism. When teaching students to make new and daring

journalism with VR tools, we also have to teach them a cautious attitude towards making stories that position the user as a subject in dramatic life experiences.

Note

- 1 This chapter is supported by ViSmedia, a research project funded by the Norwegian Research Council. We want to thank the following teachers and students from the INFOMEV1173 course on Journalistic Prototypes, spring 2018, at the University of Bergen: Zulfikar Fahmy, Audun Klyve Gulbrandsen, Erlend Skorpetveit Aga, Trym Røed Arvesen, Michael Fabregas Breien, Vemund Fjeld, Ingvild Vara Hagen, Mathias Dyrkolbotn Haukjem, Sindre Haveland, Stine Olsen Helland, Simen Larsen Johansen, Andrea Iversen Karlsen, Edvard Muli Langen, Jonathan Lindø Meling, Stian Holm Nordahl, Martin Norvoll, Preben Ørpetveit Solberg, Ida Charlotte Solvig, Helene Sofie Borthen Stenstadvold, and Malene Berg Sundsøy.

References

- Barab, S. & K. Squire. 2004. "Design-Based Research: Putting a Stake in the Ground." *Journal of the Learning Sciences* 13(1): 1–14. http://doi.org/10.1207/s15327809jls1301_1.
- Brown, A.L. 1992. "Design Experiments: Theoretical and Methodological Challenges in Creating Complex Interventions in Classroom Settings." *Journal of the Learning Sciences* 2(2): 141–178. http://doi.org/10.1207/s15327809jls0202_2.
- Carr, Karen. 1995. "Introduction." In: K. Carr & R. England (eds), *Simulated and Virtual Realities: Elements of Perception*. London: Taylor and Francis, pp. 1–10.
- Chatman, S. 1978. *Story and Discourse: Narrative Structure in Fiction Film*. Ithaca, NY: Cornell University Press.
- Collins, A., D. Joseph, & K. Bielaczyc. 2004. "Design Research: Theoretical and Methodological Issues." *Journal of the Learning Sciences* 13(1): 15–42. doi:10.1207/s15327809jls1301_2
- Damiani, Jesse & Dylan Southard. 2017. "Writing for VR: The Definitive Guide to VR Storytelling." *VR Scout*, 2 October. <https://vrscout.com/news/writing-vr-definitive-guide-vr-storytelling/> [Accessed 15 March 2020].
- Darso, L. 2011. *Innovationspædagogik: Kunsten at fremelske innovationskompetence*. Copenhagen: Samfundslitteratur.
- de la Peña, Nonny, Peggy Weil, Joan Llobera, Elias Giannopoulos, Ausiàs Pomés, Bernhard Spanlang, Doron Friedman, Maria V. Sanchez-Vives, & Mel Slater. 2010. "Immersive Journalism: Immersive Virtual Reality for the First-Person Experience of News." *Presence: Teleoperators and Virtual Environments* 19(4): 291–301.
- Doyle, Patrick, Mitch Gelman, & Sam Gill. 2016. *Viewing the Future? Virtual Reality in Journalism*. Knight Foundation. <https://knightfoundation.org/reports/vrjournalism/> [Accessed 15 March 2020].
- Goffman, Erving. 1981. "Radio Talk." In: *Forms of Talk*. Philadelphia: University of Pennsylvania Press.
- Iser, Wolfgang. 1978. *The Act of Reading. A Theory of Aesthetic Response*. Baltimore, MD: Johns Hopkins University Press.
- Jones, Sarah. 2017. "Disrupting the Narrative: Immersive Journalism in Virtual Reality." *Journal of Media Practice* 18(2–3): 171–185. doi:10.1080/14682753.2017.1374677

- Merleau-Ponty, Maurice. 2001. [1945] *Phenomenology of Perception*. Trans: Colin Smith. London: Routledge Classics.
- Nash, Kate. 2018. "Virtual Reality Witness: Exploring the Ethics of Mediated Presence." *Studies in Documentary Film* 12(2): 119–131. doi:10.1080/17503280.2017.1340796.
- Nyre, Lars. 2008. *Sound Media: From Live Journalism to Recorded Music*. London: Routledge.
- Nyre, Lars, Frode Guribye, & Astrid Gynnild. 2018. "Taking Risks with Drones: Responsible Innovation Pedagogy for Media Education." In: A. Gynnild & T. Uskali (eds), *Responsible Drone Journalism*. Abingdon: Routledge Focus, pp. 71–85.
- Owen, T., F. Pitt, R. Aronson-Rath, & J. Milward. 2015. "Virtual Reality Journalism." Columbia Journalism School, Tow Center. <http://towcenter.org/research/virtual-reality-journalism/> [Accessed 15 March 2020].
- Peters, John Durham. 2001. "Witnessing." *Media, Culture & Society* 23(6): 707–723.
- Sánchez Laws, Ana Luisa. 2017. "Can Immersive Journalism Enhance Empathy?" *Digital Journalism* 5. doi:10.1080/21670811.2017.1389286
- Vindenes, J., A.O. de Gortari, & B. Wasson. 2018. "Mnemosyne: Adapting the Method of Loci to Immersive Virtual Reality." In: L. De Paolis & P. Bourdot (eds), *Augmented Reality, Virtual Reality, and Computer Graphics*. AVR. Lecture Notes in Computer Science 10850. Cham, Switzerland: Springer.