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A Collective Interdisciplinary Agenda for Immersive Storytelling: Editorial Analysis

Abstract

This article represents our editorial contribution to the exploration of immersive storytelling, broadly conceived in this Special Issue as a set of creative and design practices, audience experiences, a field of study and a toolkit of rapidly developing digital technologies. Herein we set out our motivation for collaborating as an interdisciplinary team seeking to interrogate and expand on celebratory industry-led discourses that (over-)emphasise the transformative potential of digital innovations for immersive storytelling without properly situating these as part of longer trajectories of creative and audience practice. We provide an account of this background context that purposefully shifts the focus from technologies of the moment – Virtual Reality, the Metaverse, Artificial Intelligence – to the underpinning storytelling that can give rise to, as well as make use of, these technologies to facilitate immersion. Having introduced the various perspectives on immersive storytelling presented in the articles collected in this Special Issue, we go on to draw out key themes, topics and approaches from the body of work as a whole. Our analysis encompasses definitional questions, interdisciplinary perspectives and the sharing of expertise. It highlights the role of users as the nexus of technology and narrative, including emotional and sensory interactions, which contribute to their agency within immersive experiences. The discussion of immersive storytelling moves beyond a focus on VR to consider the wider context, including the overlap between real-world locations and narrative content of experiences, and the importance of setting audience expectations. Because, taken together, the articles include multiple projects and case studies involving designing and making immersive experiences, its apparent that this is an expanded, rather than normalised, design space in which inclusion and exclusion are important considerations. From these findings we put forward a future agenda for the field of immersive storytelling, which revolves around issues of accessibility, ethics and audience research.

Keywords

Immersive; Storytelling; Interdisciplinary; Audiences; Creative Practice; Human-Computer Interaction; Virtual Reality; Artificial Intelligence; Metaverse.

Background to the Special Issue topic: immersive storytelling

Immersive storytelling is an expansive category not indicative of particular technologies, affordances or experiences. This was our starting point for putting together the Special Issue and is reflected in the plurality of articles we have selected. Through the collaboration between editors, authors and reviewers, we have reflected on a broad range of processes and practices implicated in immersive storytelling. Having done so, the purpose of this Introduction is not only to outline the Special Issue contributions, but to undertake the analytical work of identifying important themes, topics and approaches that have emerged from the overarching undertaking. Together these form a cross-cutting agenda that can scaffold a field that is inherently diverse and continues to grow as new narrative techniques are developed.

As an editorial team we share an interest in digital creativity inflected by our interdisciplinary approaches encompassing audience research, human-computer interaction and artistic practice. Our view is that a plurality of perspectives is an inevitable corollary of focusing on immersive storytelling because this description is so widely applicable. Our original invitation for contributions on this topic highlighted the 'astonishing variety' of storytelling that exists within the global immersive entertainment industry linked by qualities of liveness and collective experience. While rapid innovation of platforms, tools and techniques provides impetus and new creative opportunities, storytelling is underpinned by histories, partnerships, critical agendas, funding priorities, production contexts and modes of participation, all of which contribute to its immersiveness. That is why the papers in this Special Issue deprioritise digital mediation in favour of an emphasis on embodied experiences and wider frameworks of understanding.

In the touchstone book *Hamlet on the Holodeck* (2017), cited by half of the Special Issue contributors, Janet H. Murray identifies immersion as a key aesthetic feature of future computer-based narratives. The act of entering into and interacting with an illusory space blurs the boundary between real and imaginary, especially when multiple people can engage together in a 'Collective Creation of Belief' (Murray, 2017: 155). This is echoed by Gröppel-Wegener and Kidd (2019), who describe how 'many forms of immersive storytelling collapse the binary between physical and digital contexts, allowing holistic storyworlds to be constructed and inhabited' (1). In both cases the focus is on the creation and experience of immersion through participation and collaboration, rather than on the digital means by which that is achieved. Perhaps this is why some researchers take an approach that deliberately separates aspects of technical and narrative immersion in order to examine their interplay (Elmezeny, Edenhofer and Wimmer, 2018). After all, our understanding of immersion is also bound up in theories of narrative engagement, which consider 'a user's involvement or interest in the content independent of the medium' (Dow, 2007: 280) and extend across domains such as human-computer interaction (Doherty and Doherty, 2019) and audience studies (Evans, 2019).

This Special Issue points to consistencies between traditional and innovative approaches to storytelling, and to the role of imagination in facilitating immersion. This is very important at a moment in time when techno-determinist marketing rhetoric insists developments in virtual environments and generative AI will fundamentally alter cultural engagement and human creativity. Such claims need to be contextualised. Virtual Reality (VR), for example, has a long history of technical and interactional development, often described as a series of waves, which always involved more than perceptual absorption produced by wearing a headset. After the imaginary digital Wonderland of the 'ultimate display' envisioned by Ivan E. Sutherland in 1965, came VIDEOPLACE, an 'artificial reality' developed by Myron W. Krueger in which 'two fundamental cultural forces – television, purveyor of passive experience, and the computer, symbol of forbidding technology – have been married to produce an expressive medium for communicating playfulness

and inviting active participation' (Krueger, 1985: 145). As an artist and researcher, Krueger's work on VIDEOPLACE was explicitly interdisciplinary, reported both in the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Krueger, Gionfriddo and Hinrichsen, 1985) and the Art journal *Leonardo* (Krueger, 1985).

When Jaron Lanier (2017) recounts his journey through the development of VR over more than three decades he structures the book through a mixture of chapters focusing on storytelling interspersed with chapters offering science commentary, inviting readers to engage with either or both threads as part of this history. Back in 1992, Jonathan Steuer argued that 'device-driven definition of virtual reality is unacceptable' because it 'fails to provide a method for consumers to reply on their previous experiences with other media in understanding the nature of virtual reality' (73). Writing more recently about VR's third wave, Mike R. Heim (2017) concentrates not on the consumer hardware that has become more widely available, but rather on the metaphysical potential of these technologies as tools for mindfulness and personal development. Alongside the waves of technical development have come parallel waves of artistic engagement with VR, including early collaborations between practitioners and technologists such as *Desert Rain* (1999) by Blast Theory (Doyle, 2021; 2024), which laid the foundation for 25 years of 'performance-led research' (Benford et al., 2013) at the University of Nottingham's Mixed Reality Laboratory. It is these long traditions of imaginatively conceiving, and experimenting with, VR as 'a holistic form of expression' and 'shared lucid dreaming' (Lanier, 2017) that led to the moment of post-pandemic excitement about everyone becoming immersed in a digital twin of the real world known as the Metaverse.

It's worth remembering, of course, that the concept of the Metaverse originates in a story: the science fiction novel *Snow Crash* (Stephenson, 1992). In the book's Acknowledgements the author explains that he invented the word Metaverse 'when I decided that existing words (such as "virtual reality") were simply too awkward to use'. Interestingly, within the hyper-commercialised future imagined by Stephenson, the Metaverse functions differently from the privatised dystopia of the real world, because it is overseen 'by the computer-graphics ninja overlords of the Association for Computing Machinery's Global Multimedia Protocol Group' who operate a trust fund that reinvests the money earned back into the digital infrastructure. The Association for Computing Machinery really exists as the world's largest computing society, where the Global Multimedia Protocol Group is Stephenson's invention. Given the practical challenges of realising a standardised Metaverse that can traverse operating systems and corporate interests, perhaps the vision of a persistent virtual world populated by avatars that exists in parallel with the real world (Benford, 2021), will remain the preserve of storytellers and idealistic technology developers.

It's certainly striking that key ideas and concerns seem to be shared by these two groups. For example, Stephenson acknowledges that, having adopted the term avatar to mean digital embodiments of people in the Metaverse, he later discovered that this word had already been applied to the animated figures representing players in *Habitat* (1986). This 'many-player online virtual environment', created by Lucasfilm Games for the Commodore 64, explicitly ceded experiential control to the users by allowing them to interact with one another and the simulated world in real-time, and was itself 'inspired by a long tradition of "computer hacker science fiction", notably Vernor Vinge's novel, *True Names* (Vinge, 1981)' (Morningstar and Farmer, 2003: 665). What we learn by examining the history of the Metaverse as a concept is that the creation of immersive story worlds involves an interplay between storytelling and technical innovation to realise imagined possibilities.

Storytelling serves as a powerful means to think through the impact of advances in digital technology on processes of artistic creation and cultural engagement, whether that thinking is done

before the technology exists or while it is being implemented. This is very pertinent to current debates about generative AI, and the fear that uninterpretable black box systems will produce a definitive toolset that renders human ingenuity and imagination obsolete (Manovich 2018). Whilst the most commercially viable applications of generative AI have so far been in the creation of images and aesthetic environments, Thorne (2020) imagines the potential of AI storytellers that are 'simultaneously infinitely exploitable and quite unpredictable' (812). This is because a system trained on narratives produced by human authors will produce 'a distorted but recognizable rendering of its input' (Thorne, 2020: 813) and therefore 'AI stories challenge us to read and interpret in a new way' (814). Thorne argues that these alternative perspectives 'offer a kind of radical insight' (820) because they reflect unconscious desires embedded in human stories in ways that are uncanny and interesting.

Contrary to Thorne's view that AI is capable of creating unique and unexpected narratives, Gruner and Csikszentmihalyi (2019) argue that AI cannot produce creativity because it is a closed system, restricted by the limitations of its human creators, unable to draw on evolving cultural values generated collectively within human society, and therefore 'incapable of radically altering existing paradigms independently' (459). This correspond to the 'Lovelace objection', which Natale and Henrickson (2022) define as 'the claim that computers cannot originate or create anything, but only do what their programmers instruct them to do' (1909). These authors seek to shift the focus from computer capabilities to human perceptions of computers' creativity as something that 'can only be defined in relational terms', terming this the 'Lovelace effect' (Natale and Henrickson, 2022: 1910). Likewise, Atkinson and Barker (2023) argue that the role of AI in creative practice should be understood in terms of where and how these technologies are used by humans, and the impact on their process. Experiments undertaken by Messingschlager and Appel (2022) seem to support the Lovelace effect, as they demonstrate that when participants were presented with a human-authored contemporary fiction story, but told it was generated by AI, they reported reduced narrative transportation. Interestingly, however, they found that if 'participants were presented a science fiction story supposedly written by an AI, the fit between AI authorship and the setting of the narratives mitigated the negative effect on transportation' (Messingschlager and Appel, 2022: 7).

It is precisely these important nuances to meaning and knowledge-making brought to the storytelling table by different forms, genres, representations and interpretive processes, that we want to explore and champion in this Special Issue. Generative AI, VR and the Metaverse will each be its own kind of medium with its own kind of meanings, but their contributions to immersive storytelling will be as part of a much wider set of practices as presented in the articles summarised and analysed below. Given the current context of technical possibility alongside creative and audience uncertainty, it is timely that this Special Issue brings together work that both highlights established approaches to immersive storytelling and points to ways these can be applied and extended using digital technologies, but always with an emphasis on the human experience of creating and responding to the narrative.

Structured summary of articles in the Special Issue

Some of the work published in this Special Issue deliberately eschews the use of expensive, complex digital technologies for immersive storytelling entirely, focusing instead on the expertise of storytellers to capture and manage audience engagement in the narrative experience, and what we can learn from this practice-based knowledge. In the article 'Invisible, Aesthetic and Enrolled Listeners Across Storytelling Modalities', Judith Pintar (2023) argues that 'immersive preference' can be understood as a 'situated player type'. This article offers a new typology that has been

autoethnographically informed by the author's rich and varied professional storytelling career. Based on patterns observed among listener-players in schools and performance venues, Pintar elaborates nine player types according to different configurations of narrative engagement and embodied immersion, which vary independently from each another within an experience. Useful design recommendations are suggested alongside descriptions of the different categories. Players who interact individually rather than socially, who are disengaged from the story or seek to disrupt it, can respond to extra-diegetic activities like mini-games or puzzle solving. Opportunities to actively shape the experience can incorporate players into the narrative, while creating alternative spaces within the story world can serve to contain destructive behaviour. Safety infrastructures need to be included to protect those completely engrossed in role-playing and to prevent those who act antagonistically from causing harm to others. Pintar explains how the ethical design of options and choices within immersive experiences is important because players' preferences are influenced by contextual factors relating to emotion, environment and social relations.

In 'Making Immersive Storytelling Accessible', Kuznetcova et al. (2023) raise a number of critical points regarding the nature of the experiences afforded by technologically mediated narratives. They highlight how the very potential for technological immersion, of any kind, does not inherently translate into psychological immersion on the part of the user. They observe that much of the discourse and research emphasis surrounding immersive storytelling has emphasised its technological aspects, the nature and potential of the tools employed, while straightforwardly assuming that future users will inherently find the affordances of the system engaging and immersive. Moreover, there is occasionally a tacit assumption that ever-greater levels of technological sophistication will translate into ever-greater levels of immersion, and this is far from the case necessarily – leaving aside how feasible and affordable certain apparatus might be in contexts such as schools. In contrast to this Kuznetcova et al. put forward a case study of their own devising, implementing a simple, interactive storytelling architecture using Google slides, as an instance of an affordable, accessible, and familiar classroom technology. Drawing from Participatory Learning principles, the interactive story, told using Google slides and inviting whole class decision making, facilitates a sense of psychological immersion precisely through its solicitation of student participation within a shared, facilitated storytelling context – an experience that is markedly different from the potentially isolating qualities of highly technically mediated experiences, focusing on the agency of individual users.

Other authors in the special issue explore established approaches used in theatre and video games to highlight how these can be effectively employed in emergent forms of immersive storytelling that utilise less familiar media technologies such as VR headsets and real-time virtual production. In 'Mechanical Meaning', Gabrielle M Greig (2023) explores 'the relationship between game mechanics and story in ergodic theatre'. In this subgenre of immersive theatre, audience members take on the role of travellers through a story, who gain first-hand experience of the themes of the narrative through interaction. Greig's work provides theatre-makers with methods and mechanics that will support the traveller's meaning-making and emotional engagement, as informed by an analysis of three examples of ergodic theatre: *What Remains of Edith Finch* (Giant Sparrow, 2017), a digital walking simulator; *The Under Presents* (Tender Claws, 2019), a multipart VR experience; and *Dream*, a live online performance (Royal Shakespeare Company, 2021). Greig takes a model derived from game design – ludonarrative harmony loops – and applies this to specific narrative points in the three experiences. A loop is formed when a traveller's action is motivated by the storytelling, is meaningful in context and creates a satisfying emotion that encourages continued interaction. In contrast, ludonarrative dissonance occurs when there is disjunction between the narrative content or themes and the choices or actions that a traveller is asked to perform within the experience,

which disrupts immersion and enjoyment. Although dissonance can be employed deliberately as part of a creative approach, Greig points out unintended instances when it would be better avoided.

While the effectiveness of immersive storytelling relies on internal harmony, it is also important to ensure that transitions into and out of the experience are comfortable for participants. Laryssa Whittaker (2023), in 'Onboarding and Offboarding in Virtual Reality', develops a framework for assessing how VR deployments in the context of live experiences (performances, festival stands, arcades, immersive theatre, etc.) can best guide otherwise uninitiated audience members in the use of the equipment and the nature of the experience itself, before helping them to disengage subsequently. Whittaker observes that these 'onboarding' and 'offboarding' procedures are replete with technical, practical, and affective considerations, not least of which is that audience members will have their own prior knowledge, associations, expectations and skills towards VR equipment and the experiences it affords. Moreover, in the context of a public installation, VR systems will technically and aesthetically diverge from any 'at home' experience that can be afforded by consumer systems, necessitating an acknowledgement that even ostensibly 'experienced' users cannot be straightforwardly expected to engage with the experience successfully. The result is a need to consider not only the question of content design, the overall goals of the experience, and the practical affordances of the technology, but also the need to properly frame, prepare, and shape the agency of user, host(s), and other stakeholders in relation to an experience that is always a negotiation between interface cues and embodied experiences - taking a proactive approach towards the potential risks involved.

Whittaker grounds her framework in light of case studies that examine the transitional friction between physical and virtual worlds in public settings, and develops an approach that emphasises the need for 1) reducing technological friction; 2) explicit scene setting (the content itself and the levels of autonomy permitted); 3) expectation setting (a clear contract between users and hosts, the roles they will play, along with an equally clear set of tools for managing physical and emotional needs and safety requirements); and 4), acknowledging the structuredness of the experience in relation to narrative time and rituals, rather than being simply a technical demonstration. In so accounting for the vital, and largely understudied role of these processes of user engagement and disengagement, Whittaker's framework offers a set of critical design principles that can feed into future embodied narrative experiences that move beyond an emphasis on technological novelty alone.

In cases where authors in this Special Issue have oriented their research around particular technical and experiential affordances, this has been done to highlight the critical communicative potential of audio as a medium for immersive storytelling. Writing about 'Audio for Extended Realities', Justin Paterson and Oliver Kadel (2023) note that, while video games and VR share general approaches to spatialised sound design, as cued by 3D geometries, augmented and mixed realities introduce new opportunities and challenges, and the workflows involved are far from standard. In their 'case study informed exposition' they draw on first-hand insights from working on a portfolio of five projects, commissioned by BBC and Oculus TV to accompany David Attenborough documentary series, that could be accessed at home via a VR headset or smartphone app. The underlying goal of this work was to enhance the experiential and educational aspects of the content by delivering it in immersive virtual environments. In order to achieve this, it is important that the immersive experience avoids mismatch between visual and auditory cues and attendant localisation. This means supporting audio cognition: the way humans assimilate and synthesise multiple sounds, but then work to segregate them to identify them individually. Binaural audio recording, which reproduces the sensation of hearing, can be used to produce a more coherent environment. However, Paterson and Kadel

express some caution around the perceptual challenges of binaural audio synthesis in real time with head movement and highlight this as an area for future development.

Tahera Aziz's article ('Racism and the representation of the murder of Stephen Lawrence in audio: An analysis of audience experience of the immersive story environment', 2023) explores the potential of spatial audio as a medium for immersive storytelling. The paper presents and analyses the case study of [re]locate, a multi-channel spatial sound art installation that places audiences at the scene of the racially motivated murder of Stephen Lawrence in London in 1993. This powerful installation positions its audience as 'bystander as witness', beginning at the bus stop where the murder took place and presenting a reconstruction of the attack and its aftermath with only audio in an otherwise pitch-dark space. Through a reflexive thematic analysis of qualitative responses from school children who experienced the piece, considered through the lens of a new conceptual framework for understanding the audience experience of immersive storytelling also presented in the paper, Aziz articulates and reflects on how both sound as a medium and the spatial audio design of the installation holistically created a powerful experience that engaged and activated the young audience members' senses, feelings, emotions and mental images around the attack and the issue of racism. Through this analysis, Aziz shows us how immersive sound and sound design – including in its juxtaposition with a lack of visual stimuli common to much immersive work – can create experiences of presence and immersion that enhance cognitive and emotional perspective-taking around key societal issues.

Two articles in the Special Issue concentrate on VR as a vehicle for immersive storytelling, but their interest lies in the sensory and embodied elements of audience experiences, rather than digital transportation to, and presence in, virtual worlds. The article 'Expanding the magic circle: Immersive storytelling that trains environmental perception' was co-authored by artist-researcher Natalie Doonan and research assistants Luana Oliveira and Christopher Ravenelle (2023). In it they reflect on their creative research process in developing *VerdunReality*, a pervasive game for multigenerational audiences that integrates VR elements as part of a live participatory performance event in a waterfront park in Montréal. Instead of focusing on cognitive immersion through digital or narrative absorption, this experience was designed to support corporeal engagement with the immersive storytelling by overlapping the context (of physical outdoor location) with the content (of those same locations represented digitally in a headset). The interactive activities that took place in the digital environment were continued in the wider site-specific game together with other players, so that virtual and physical elements are facets of the same experience. The goals of this project were to increase participants' environmental perception in the space of the park, drawing their attention to specific elements of the environment, cultivating emotional connections through sensory engagement, motivating active, localized learning and social interaction through play, and changing user behaviour by linking it to their actions in the game. As such, the article argues for the wider potential of '(non)fictional storytelling in the spaces of everyday life' in relation to transformative activism.

Daniel Harley's (2023) article "Virtual Narratives, Physical Bodies: Designing Diegetic Sensory Experiences for Virtual Reality" presents an annotated portfolio of four research through design projects that challenge many norms and assumptions taken for granted in the field of immersive storytelling. Through the creation of diegetic objects, Harley questions what is overlooked when VR experience design converges around the use of standardised controllers designed for their generality. They then question the drive for increasingly complex mechanisms of sensory immersion in VR, instead proposing that low-tech, non-digital artefacts can potentially offer far more complex sensory experiences. A next case study challenges the assumption that smartphone VR is a less good

version of what really should be done with more advanced technology, exploring it as a compelling medium in its own right that should be viewed as such. The final work proposes VR design that begins with the physical world, rather than the consideration of the bounded space of possibilities posed by the complex, but equally inherently limited, simulations of reality offered by headsets and controllers. Though the discussion, analysis, and reflection on the four projects, Harley's work provokes the reader to ask what opportunities for creating enriching sensory immersive narratives might be missed as the field strives for normalization and standardization, in terms of not only hardware, but our assumptions about what it should be made to do and how design should harness it and why.

The diversity of work represented by this selection of articles – ranging from cutting-edge technical development, to creative practice and design-led projects, practical frameworks for storytelling and education applications – is exactly what we expected in response to our call on the topic and set out to showcase in this Special Issue. Having brought together this rich collection of examples and research findings, it is important that we undertake analysis of this as a corpus of work in order to identify the shared concerns that form the basis for our broad definition of, and collective commitment to, immersive storytelling. From this dialogic process emerge cross-cutting concerns, which we propose as a future agenda for this field of study to inform and stimulate additional projects and perspectives from practitioners, technologists and researchers.

Themes, topics and approaches in immersive storytelling

Because practices of immersive storytelling are emergent, authors in this Special Issue seek to **establish their own definitions** by drawing on existing theoretical frameworks as well as the processes involved. Whittaker argues that immersion in VR encounters should be understood as stemming from situated individual user experience rather than directly from the technology. In this context the user is 'incorporated' into a virtual world, but that virtual world is also 'incorporated' into the user's surroundings (Calleja, 2011), meaning that immersion involves interplay between physical and digital worlds as well as transportation to and absorption in virtual environments. Pintar and Kuznetcova et al. both point out that while immersive storytelling takes place in digital spaces such as VR, it is not exclusively confined to them. In their definitions the role of interactive technologies in supporting engagement is key, as these allow story worlds to be created in educational and public settings using physical, hybrid, asynchronous and transmedia elements. Aziz concentrates on the psychological effects triggered by narrative, which include emotional investment, construction of mental imagery and taking a perspective within the story world (deictic shift); all affective-cognitive processes that are anchored in the meaning of an immersive experience. Paterson and Kadel likewise emphasise the importance of embodied comprehension (the kansei effect of perceived presence, verisimilitude, realism, naturalness) as a means to enhance audio communication. It is exciting to see how the authors both draw on a wide range existing material about immersion but also extend our understanding of this concept beyond pre-existing definitions.

Beyond definitional questions, **emotional and sensory interactions** play a notable role in the immersive storytelling practices that are presented in the Special Issue. The immersive storytelling experiences and interventions that these authors have created with and for audiences are often described as 'holistic', signalling this concern for both mind and body. The designs in Harley's portfolio all foreground the ways that VR can be used to stimulate as well as simulate by using objects to navigate the threshold between tangible and illusory reality. Paterson and Kadel explain how sound can be used to stimulate emotions and even cross-modal sensations, and point to further

opportunities for multimodal immersive storytelling offered by haptics, olfactory stimuli, eye-tracking and facial-expression recognition. Smells and props feature in Doonan et al.'s work, which incorporates attunement activities within immersive experiences, which are designed to train the senses and forge a corporeal connection with the here and now. Their intention is that this sense of connection will raise environmental awareness in users, and Whittaker argues that sensory shifts can alter the user's internal state. Greig makes the point that, while the user's emotional fulfilment is key to achieving a positive relationship between interactions and story, their emotional experience doesn't necessarily need to be positive provided it is satisfying. Aziz's project demonstrates this principle in action, as immersive audio storytelling works as an ethical method of engaging young people with violent and traumatic events, eliciting shock and empathy. Much of the work in the Special Issue therefore goes against the normative privileging of visual communication fully within a virtual world by acknowledging that immersive experiences can utilise augmented virtuality by incorporating real-world components.

Whittaker describes how users 'actively invest their embodied consciousnesses' in immersive experiences; examining **the user as the nexus of technology and narrative** is a common theme of the Special Issue articles. Greig describes how the user forms their own path through the story world, deriving meaning from doing. Harley designs for this process of co-creation, deliberately introducing choice and opportunities for personalisation so that the storytelling is facilitated rather than mediated. **Audiences have agency** within immersive storytelling in ways that extend beyond what is possible in other interactive experiences, such as video games (Stang, 2019); their role is participatory and sometimes even performative. In Aziz's experience the user inhabits the position of bystander as witness to multiple socio-political perspectives, which inculcates social responsibility. Likewise, Kuznetcova et al.'s students reflect on their own cultural histories as active observers co-creating the historical stories they are learning about. In the course of Doonan et al.'s experience the participants transform into activists because they are conspicuous in public space and are therefore used to communicate the climate messages of the work to spectators. This capitalises on some general characteristics of VR, noted by Whittaker, that users may perceive a change in themselves as a trace of a memorable immersive experience, and that even the act of observing someone else experiencing an immersive narrative can be engaging.

Something very noticeable about the immersive storytelling research presented in this Special Issue is the wide range of technical and creative approaches discussed. It is very clear that, as these authors understand and define it, **immersive storytelling involves more than VR**. A couple of articles focus on the role of sound in immersive storytelling. The audio workflows developed by Paterson and Kadel can be utilised across extended reality, in augmented and mixed realities as well as VR. While these authors describe ways in which sound can reinforce veracity in immersive environments, the work of Aziz challenges the primacy of visual storytelling and positioning of audio as a supporting element. They point out that spatial sound pre-dates VR and 360° visual counterparts and demonstrate that immersing audiences in a binaural story world can generate powerful mental imagery as well as cognitive and emotional engagement with the narrative. The articles by Pintar and Kuznetcova et al. acknowledge digital technologies as tools for immersive storytelling but are more interested in techniques for scaffolding role playing, in order to facilitate embodied, empathetic interactive experiences. Their examples make the case that non-technologically immersive environments can still generate psychological immersion; and can side-step some of the challenges associated with the high financial and skills costs involved in working with a technology like VR.

Even the articles that feature or focus on VR demonstrate that the digital environment and content exist within a **wider experiential context**. Doonan et al. have developed a participatory performance that includes two points when VR forms part of the pervasive play, designed to grab and focus attention during a roaming exploration that also involves activities in, and encounters with, the site-specific outdoor location. Harley's design projects similarly prioritise multimodality within immersive storytelling that uses VR, through the introduction of interactive diegetic objects, non-digital sensory experiences, mediated encounters with real-world locations, and tangible manipulation of soundscapes using physical movement and props. Although Whittaker's study looks exclusively at VR experiences, the audience journey through the immersive story is understood as extending before and after their interaction with the platform, incorporating wider considerations related to prior experience (of genre, place) and practicalities (such as duration, time of day/year, user comfort and abilities).

Whittaker's article highlights the need to consider immersive experiences as a *process* of incorporation for users, rather than as a moment of technological immersion, and the possible frictions that occur during that process. **Setting audience expectations** plays a very important part in this, which can involve sensory cues in the environment and the design of the space as well as the introduction of guidelines and staff roles. Greig points out the importance of advertising in setting audience expectations and the possible friction when there are discrepancies between the immersion promised in advance and what's ultimately experienced. Such disappointments sit alongside risks of what Whittaker describes as jarring (and sometimes intentional) 'bleed' from immersive story worlds as the user returns to reality. Helping audiences navigate this transition is part of immersive storytellers' duty of care for users' psychological and physical safety. Pintar also stresses the emotional vulnerabilities involved in player enrolment and the ethical requirement to provide infrastructure and interventions that can respond to social contexts which constrain engagement and influence preferences.

The articles in this Special Issue repeatedly illustrate how the **overlap of (real-world) context and (narrative) content** in immersive experiences opens up creative opportunities for storytelling. For example, Doonan et al. have crafted a pervasive game performed in public space in which activities inside and outside the game are deliberately blurred and the real and virtual worlds are facets of one experience. Taking a contrasting approach, Aziz describes how the physical context of their experience was tightly controlled, creating a black box space to inhibit visual sense-making and destabilise their audience, heightening their unease, but also enabling them to imaginatively expand the dimensions of the narrative space.

In exploring the importance of designing for specific locations, authors also consider the politics of those spaces and the lived realities of users in them. **Inclusion (and exclusion)** is a recurrent, and important, theme in this Special Issue. The objective of Doonan et al.'s experience to raise environmental awareness in players is reliant on the fact that it occurs in a particular time and place; however, they evaluate the limits as well as the affordances presented by this choice. This includes the restricted distribution and reach of a site-specific work, only accessible to audiences who can be at that location for a scheduled performance, with an added element of seasonality when VR technology is used outdoors (this work was presented to the public in the summer). There are also challenges of designing for a range of ages and experience levels, with a facilitating guide and six supporting guides involved in not only staging the experience but also ensuring the comfort and safety of the group of six participants. Despite this close accompaniment, which included one-to-one monitoring during engagement with VR elements, Doonan et al. acknowledge that the physical environment central to their immersive storytelling is impassable for wheelchairs.

This example illustrates points made by authors across this Special Issue that immersive storytelling should be approached as **an expanded, rather than normalised, design space** that accommodates user diversity rather than assuming a 'mainstream' audience, which is especially important given the embodied and interactive nature of these experiences. This is what Harley describes as 'conscientious' creation for VR, which considers not only what social and environmental considerations might be excluded but also what technologies and sensory modalities might be overlooked. Whittaker usefully points out that if the goal of immersive technologies is to transport and incorporate a user into a narrative space then the experience needs to be 'attuned to the individual needs of audience members'. Paterson and Kadel offer examples of how perceptions of audio can be idiosyncratic, such as binaural techniques which can emulate head-related transfer functions (HRTFs) but work best if personalised. Pintar highlights the importance of technology meeting the needs of individual users because anyone excluded by the technology will experience narrative detachment. This is why, Kuznetcova et al. argue, immersive storytelling technologies and techniques need to be flexible and modifiable within their contexts of use, to best meet audience needs.

Decisions and rationales about usability and experience are central to the project Kuznetcova et al. document, which revolves around core principles of deliberately utilising low-tech tools for immersive storytelling because of their affordability, accessibility and familiarity (to storytellers and audiences alike). This is reflective of a **focus on designing and making** shared across articles in the Special Issue. Like Kuznetcova et al., Doonan et al. evaluate a complete process of creating and implementing immersive storytelling, including logistical issues involved in transporting and managing equipment, and the need to deliberately constrain interactions in order to prioritise the overall message. The audio-only immersive reconstruction created by Aziz as a form of practice-led school outreach was combined with qualitative research methods that used the experience as a prompt to probe students' senses, feeling, emotions and mental images about the murder it conveys. Contrastingly, the inquiry-based research through design projects elucidated by Harley are intentionally unfinished processes in order to continually question the decisions and rationales involved in making immersive experiences.

What Harley achieves by presenting a portfolio of four exploratory projects is the identification of overarching considerations about the range of sensory experiences possible within immersive storytelling and whether these are included. The bringing together of **multiple projects or case studies** in order to draw out lessons from them is another common feature of articles in this Special Issue, from the reflection on years of professional practice undertaken by Pintar, to the careful selection of illustrative case study examples by Greig and Whittaker, all of which allows these authors to critique a range of immersive storytelling approaches, highlight best practice and make recommendations. In the case of Paterson and Kadel, they have been able to synthesise their experiences developing state-of-the-art audio workflow for five different experiences to produce an outline taxonomy of 3TP encompassing the core audio-authoring areas of technologies, tools, techniques and perception. This taxonomy represents the whole immersive audio-ecology in order to give professional practitioners a strategic overview that extends beyond specific project goals or tool-dependent processes.

Of course, the relevance of Paterson and Kadel's taxonomy reaches beyond audio-authoring because it helps 'newcomers' – including designers, researchers and storytellers without prior knowledge of this area – to understand and navigate the role of sound, and its significance, within immersive experiences. The **utilisation and sharing of expertise across disciplines** is important to other authors featured in the Special Issue as well. Harley comments that small-scale design research projects

don't normally receive attention beyond the human-computer interaction venues in which they are published; but by reflecting on how these examples together demonstrate an extended design space of VR, Harley's argument reaches out beyond that academic community. Pintar explicitly advocates for sharing design insights across storytelling modalities and widening the field of observation and analysis in our research about narrative and embodied engagement, introducing player typologies as useful 'transdisciplinary boundary objects', which facilitate debates about immersive storytelling by discursively constructing ideals.

The applicability of concepts from a number of fields to immersive storytelling is demonstrated across multiple articles in the Special Issue, signalling the importance of **interdisciplinary perspectives** on the topic. Greig combines theatre studies and game studies in order to propose ergogic theatre as a subgenre of immersive theatre, which uses ludonarrative harmony between story elements and game mechanics in order to heighten engagement and emotional connection. When Doonan describes players not being able to pick flowers in the virtual environment so they don't try to pick flowers in the physical environment, this can be understood through the lens of ludonarrative harmony. Like Greig, Whittaker also explores the relationship between immersive theatre and other approaches to immersive storytelling, arguing that a 'contract of participation' associated with the process, ethics, politics of audience transitions into and out of live performances should also be put in place for VR experiences. Meanwhile Kuznetcova et al. use participatory theories of learning, pedagogical principles from the education domain, to inform their conceptual model for immersive storytelling; another example of the broad range of relevant theories that can inform, and be informed by, these creative practices.

Cross-cutting concerns: a future agenda for the field of immersive storytelling

Ultimately, then, we see that a rich blend of influences, which extend beyond traditional expectations of immersive storytelling projects, has coalesced around common themes and shared concerns in this Special Issue. As editors, we strongly believe from our own experience that there is much knowledge to be gained by combining insights from human-computer interaction, games studies, sound design, education, theatre studies, audience research, narratology and more. This is borne out by the clear thematic threads we have identified running through the diverse research represented in our selection of articles. What emerges from this productive combination of perspectives is an agenda for the next steps we need to take in our understanding of immersive storytelling as a set of practices, embodied experiences and field of study. This agenda encompasses a range of priorities revolving around: 1) accessibility, 2) ethics and 3) audience research.

Taking forward Harley's call for immersive storytellers to engage in 'conscientious' design by reflecting on the reach, limits and impacts of their choices, **accessibility** needs to be embedded within creative thinking. This means accounting for diverse lived realities, which includes ensuring that a variety of physical interactions with equipment, interfaces, facilitators and spaces are possible. Taking a user-centred approach, as advocated by Whittaker, involves careful attention to contextual considerations such as the safety and comfort of people who enter into a contract of participation when they engage with an immersive narrative. It is important to recognise that this contract cannot be standardised but needs to accommodate participants' individual identities and characteristics. Decisions about where, when and how to stage experiences, and which technologies to use in doing so, can exclude some potential audiences; awareness of these implications can open up opportunities to improve the scalability of immersive work in terms of reach and distribution.

The **ethics** of implementing conscientious design involve negotiating the tension between the storyteller's responsibility to their audience and their creative goal to surprise or challenge them. By combining insights from articles in this Special Issue we can see that, in order to achieve a compensatory trajectory that makes a lasting impact on audiences without alienating them, immersive storytelling needs to connect the mechanics and actions involved in the experience with participants' motivations and emotional responses. In doing so it is possible to utilise new digitally-enabled techniques to 'leverage the political power of immersive storytelling to evoke with affective force the privilege of certain bodies over others' (Ceuterick and Ingraham, 2021). Furthermore, the need for ludonarrative harmony extends beyond the story worlds themselves because, however much these transport participants, they are nevertheless enmeshed in wider social and environmental politics, imaginatively reflecting and exploring the concerns of lived reality. For this reason, it is increasingly pressing that immersive storytelling practice and scholarship engages with the sustainability of digital technologies often used to deliver experiences. This includes consideration of the unequal exploitation involved in a) extracting materials used to manufacture devices, b) purchasing expensive equipment and c) accessing processing power to generate content. Given this context, the low-tech approaches to immersive storytelling presented in this Special Issue offer alternatives.

The pervasive game developed by Doonan et al. is an interesting example of storytelling in a physical environment that incorporates some digital elements in order to raise awareness about issues affecting the physical environment. The authors end their article by outlining plans for future audience research, which will allow them to report on whether the combination of embodied and narrative engagement produces experiences of enchantment among participants. The importance of such **audience research** as part of the future agenda for studying immersive storytelling is something we want to underline in a Special Issue that concentrates on processes of designing and delivering experiences, as well as theoretical frameworks for making sense of them. There are many methods available to gather information about participants' responses, from in-depth qualitative observation and discussion through to automated system logging. Integrating these data into our analyses of immersive storytelling, will connect the embedded audience of theoretical conceptualisations and the implied audience of creative practice with the actual audience of lived experiences. As evidenced by the productive comparisons made possible by this Special Issue, it's important that audience research in this space doesn't just consider individual projects but draws on multiple case studies and examples to produce rich insights with broad applicability.

The overall takeaway we believe this Special Issue delivers is the importance of participatory agency within immersive storytelling. While technologies and design undoubtedly shape these experiences, participants choose their own psychological and embodied paths. Understanding how the needs of all audience members can be met through comfortable and safe, but also provocative and enchanting, interactions, without ethical and ideological compromises, is the challenge facing us in future research and development activities. The current moment characterised by technology dominance, especially the promotion of AI as the "solution to everything", results in crass, thoughtless technical deployments that give no heed at all to the user experience. The future of narrative, as informed by what we've seen in the Special Issue, can be an important signpost for what good practice in user-centred digital innovation should look like. In order to deliver this agenda, we need more dissemination spaces like these, which recognise the convergence of creative practice, technical innovation, design research and cultural theory within the study of immersive storytelling and enable insights from across disciplines and research approaches to be brought into dialogue.

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