December 2020

Creative Industries
Policy & Evidence Centre
Led by nesta

Beyond the early adopter: widening the appeal for virtual reality

How the cultural industries can increase the adoption of immersive technologies for mainstream audiences

When it comes to creative tech experiences, a large proportion of the public still face significant barriers to entry. This report outlines some key principles for overcoming these. It draws on Limina Immersive's four years of audience research and its successful public virtual reality programme, which reached over 15,000 audience members from 2016-2020.

Written by Catherine Allen, CEO of Limina Immersive

Foreword by Dr Jenny Kidd and Dr Eva Nieto McAvoy from the School of Journalism, Media and Culture (JOMEC) at Cardiff University and the Creative Industries Policy and Evidence Centre (PEC).

Foreword

Dr Jenny Kidd and Dr Eva Nieto McAvoy, School of Journalism, Media and Culture at Cardiff University, and the Creative Industries Policy and Evidence Centre (PEC)

In our research as part of the Creative Industries Policy and Evidence Centre (PEC), we have been exploring the appeal of discourses about immersion, and of practices that foreground engagements with and through creative technologies.

Creative technologies are an important area of research at the PEC. 'The Creative Digital Skills Revolution' study shows how important the intersection of creative and digital skills for the future of work is (Bakhshi, Djumalieva, and Easton 2019), a finding supported by the PEC Industry Champions who recommend in 'The value of creative higher and further education' that Universities and FE institutions collaborate with businesses to understand which specific digital skills are needed in the creative industries (Easton 2019). Nesta researchers call for the UK to exploit 'the synergies from its strength in both AI and the creative industries' (Davies et al. 2020, 1) in the PEC's most recent report The art in the artificial.

Immersive practices lie right at the centre of this intersection of art and technology (Davies and Ward Dyer 2019) and are an important driver of creative innovation and the creative economy (Mateos-Garcia, Stathoulopoulos and Thomas 2018). Their perceived value has not gone unnoticed by policymakers. The Industrial Strategy (2017) and the Creative Industries Sector Deal (2018) underscore the importance of the advancement of immersive technology and content to the UK's economy. Government-funded initiatives like Audiences of the Future and StoryFutures focus on developing and researching innovative storytelling for immersive experiences. The Department for Digital, Culture, Media and Sport (DCMS) also highlights the potential of British cultural institutions to 'play an influential role in positioning the UK as a global leader in content creation for immersive technology' (DCMS 2018: 12).

As a follow-up of our evidence review 'Immersive Experiences in Museums, Galleries and Heritage Sites' (Kidd and Nieto McAvoy 2019), we have been in conversation with many creatives, researchers and policy makers who are keen to understand more about the kinds of audience behaviours and interactions that are enabled in such experiences, and their impacts in the short and longer term.

In the UK context there are few more qualified to speak to these interactions and impacts than the team at Limina Immersive. In recent years their bold and imaginative interventions – not least in the space of VR – have been observed keenly by many in the cultural sector. Limina VR Theatre has demonstrated that there can be strong demand for VR experiences, and that, contrary to the overall gender gap in digital cultural participation, a majority-female audience can be secured.
As they have begun to make sense of the data emerging from their own research and experiences, Limina have shared their findings through a number of events. The Policy and Evidence Centre was due to host one such event at Cardiff University in March 2020, but as with so much activity at that time, it had to be cancelled due to the unfolding Covid-19 global health emergency. We decided instead to work with Limina to create other opportunities to share that research, and so the idea to publish this report was seeded.

As we have worked in collaboration to bring this report to fruition, it has become clear that the world it will be released into is a fundamentally changed one, in the short to medium term at least, and in all likelihood longer. The pandemic has sent shockwaves through our social, political, and cultural lives. Most – if not all – cultural institutions in the UK had to shut their doors and are having to do so again as we face the second wave. Their short recovery time saw some venues and institutions opening their doors briefly in extremely challenging economic circumstances, which will probably worsen before the end of the year, in many cases irreversibly. Their priorities may well have shifted. Are the creation of dynamic immersive experiences and innovative uses of technology viable or desirable within this context?

At the same time there has been talk of a 'pivot to digital' within the cultural sector during the pandemic, and what its impacts might be. There is some hope that an acceleration of digital skills might have been an unanticipated consequence of this heartbreaking health crisis. But we know that this will not have been experienced evenly, and that access and literacy will continue to be critical challenges to adoption. If we wish to promote the use of creative technologies in the months and years to come, it is vital to acknowledge and better understand those challenges. The research presented in this report can help us to do just that.

Introduction

Catherine Allen, CEO of Limina Immersive

Britain's cultural sector is great at creative technology R&D, but public adoption is in decline.

About a decade ago, I remember stumbling across Arthur C. Clarke's now legendary third law of technology – that 'any sufficiently advanced technology is indistinguishable from magic' (1973, 21). To say this idea inspired me is an understatement. The possibilities for arts, heritage and the creative industries felt boundless and exciting. If, like me, you work at the intersection of creativity and technology you've probably felt this too. Even something seemingly as simple as a new plugin or API can feel like a 'superpower'.

Over the past ten years we have seen a whirlwind of new 'superpowers' present themselves. These include AI, augmented reality, wearable tech, virtual reality (VR), location-tracking, voice recognition, 3D printing, live-streaming, haptics, projection mapping, 5G and many more. Emerging technologies like these have been used, and often combined, to create some incredible audience experiences. This report focuses on lessons learned from creative immersive technology, but with an awareness that these learnings can be applied to the wider creative technology field.

As a sector we have become good at innovation in 'cutting-edge' technology and the UK is now internationally renowned for its innovation in creativity. The Centre for Economics and Business Research's World Economic League Table 2018 identifies our particular blend of creativity and technology as the key positive driving force behind the UK's economic prospects over the long term (DCMS 2018, 4).
Creative tech is also a significant Government policy priority, with substantial investment being made in cutting edge R&D. For instance, the 2018 Industrial Strategy invested £33 million in its Audience of The Future strand.

The sector clearly has the talent, know-how and government backing to make digital cultural experiences that feel like magic. However, there is a problem that is fast creeping up on us. Britain hits a stumbling block when it comes to the public adoption of these creative technology experiences. Public engagement with cultural organisations' digital content has steadily decreased since 2012. According to the DCMS (2019), in 2012-2013, 44% of people reported that they had engaged with a cultural organisation's digital content in the previous 12 months. While figures still remain high, digital cultural participation has come down every year since then, and by 2016 it was 37%, a downward trend that has continued through to 2019. With increased tech knowledge and experience in the cultural sector, one would expect an increase in audience numbers too. However, with audience numbers trending downwards, the 'magic' is clearly not reaching the mainstream in any sustained way.
Mainstream audience adoption of creative tech is essential if we are to become a serious subsector of the British economy. If this doesn't happen, we risk losing a return on investment of all the time and money that has gone into building this capability. From both social and commercial perspectives, we have to reach beyond those very important early adopters, and convince broader audiences that these magical, enriching digital experiences are simply too good to miss out on.

With this in mind, some urgent questions now need to be addressed. For instance, how can we make these digital experiences so that the public no longer feel they sit in the 'futuristic', 'experimental' or 'novelty' category?

This report will share Limina's experience of bringing emerging creative tech to broader audiences, gained through four years of 'normalising' one of the most exhilarating, but strangest, new forms of tech there is – virtual reality. The following pages will take you through the barriers faced by non-early-adopter audiences, focussed around the two key themes of Time and Identity.[1]

Data Sources

Our research has consisted of a combination of work with universities, the analysis of audience data, publicly funded Limina-led studies, and our own informal observations. This report draws from five university partnership research projects, three publicly funded audience studies and three years of audience, sales, and social media data. Key elements are listed below:

- Audience research partnership with Dr Laryssa Whittaker and Dr Chloe Preece at Royal Holloway University/Storyfutures Academy, 2019. Focus: mood change in VR audiences

[1] Variables that might factor into audience consideration before participating in or purchasing immersive experiences are also suggested in the latest report by Audiences of the Future (2020). We observe some useful overlap - if not always consensus - in discussions in this report, for example, about technology acceptance, location and pricing.

- Case study focus group research for 5G in [Smart Tourism: Turning on the Lights] report with Bristol Futures Global and Digital Catapult, 2019. Focus: audience response to the application of 5G
- Audience research partnership with researcher Emily Knoll at Kings College, 2019. Focus: How actual VR audience experience reflects the creators' vision
- MBA research dissertation with Elizabeth Khorrami at University of the West of England, 2019. Focus: Wellbeing applications of collective VR
- Kickstart VR at Warwick research programme, Dr Robert O'Toole at The University of Warwick, 2017-2019. Focus: Duty of care in exhibition and VR for learning
- Immersive Content Formats for Future Audiences study, funded by Digital Catapult and Innovate UK, 2018. Focus: Taxonomy of immersive content genres and formats, plus audience study into the most popular
- Vision for Women and VR action research project with Dr Sarah Atkinson at Kings College and Helen Kennedy at The University of Brighton, 2018. Focus: Gender and VR creation and adoption
- Virtual Reality Sessions: Lessons learnt for the cultural cinema sector, report and research with Watershed Bristol, funded by the BFI, 2017. Focus: how cultural organisations can successfully programme VR for their audiences
- Audience observation logs from VR theatre staff
- Circa 150 customer focus group sessions held after most performances involving 8-12 people per show
- Three years of sales data from Limina VR Theatre audiences
- Three years of social media response from Limina VR audiences
- Advertising click-through data from Limina VR Theatre

Dissemination has taken place at dozens of universities across the UK and Australia including UCL, Monash University Melbourne, The Royal College of Art, Cardiff Metropolitan University, Sheffield Hallam University, DeMontfort University, The University of Leeds, Royal Holloway College London University, Plymouth University, Brighton University, University of the West of England, The University of Warwick, Coventry University, Salford University and more.

The UK's current state of digital culture participation

To set the scene, here are some current statistics, taken from DCMS's most recent Taking Part survey, Ofcom's Technology Tracker 2020, Arts Council England and Nesta's Digital Culture 2019 report and Lloyds Digital Consumer Index 2020[2].

[2] Please note that most of these statistics relate to online digital content; there is very little available data on location-based digital experiences. Also please bear in mind that this information predates the 2020 COVID-19 pandemic.

Although internet consumption is increasing in the UK in general, including creative content such as online video, there is a downward trend in cultural consumption of digital content produced by cultural institutions. The gaps in digital cultural consumption (including VR) are evident across demographics in terms of class, ethnicity and gender.

The big picture

- **The proportion of UK people using the internet is steadily increasing.** According to ONS, in January to February 2020, 96% of households in Great Britain had internet access, up from 93% in 2019 and 57% in 2006 when comparable records began (2020a, 2).
- **The number of people who engage with creative content generally online is also increasing on a range of measures.** For instance, according to ONS (2020b), in 2020 66% of UK adults watch online video content from services such as YouTube. In 2016 this was 47%.
- **Almost half of the population do not have the digital skills required to participate in emerging-tech-driven experiences at home.** 46% of the UK population consider they have 'low' or 'very low' digital skills (Lloyds Bank 2020, 11).

Online consumption and production of content published by UK cultural institutions

- **In the latest Taking Part survey 30% of people in England had engaged with a cultural organisation online in the 12 months before being interviewed.** While not low, it is not as high as one could have expected a decade ago. Engagement was defined in this context as experiencing content online published by organisations in arts, heritage, museums, galleries or archives. This does not include practical tasks like checking opening times or purchasing tickets (DCMS 2019).
- **Despite technological advancement, public online engagement with cultural organisations in England has steadily decreased since 2012**. In 2012/2013, 44% of people had engaged with a cultural organisation digitally in the previous 12 months. Participation has come down every year since then. As referred to above, in 2019 it was at 30% (DCMS 2019).[3]
- **The number of British arts and culture organisations engaging in experimentation and taking risks with new technology has also declined.** The proportion of organisations stating that they 'engage in experimentation and take risks with

[3] Changes in the Taking Part survey as of 2016/2017 mean that these two sets of data are not directly comparable. However, the downward trend is still there. Digital participation went down from 44% in 2012/2013 to 37% in 2015/2016. Data collection changed that year, but still, digital participation had gone down from 32% in 2016/2017 to 30% in 2018/2019. Covid-19 might be changing this trend. While data for the Taking Part survey for 2020 is still not available, the PEC/IPO online consumption in the UK tracker during Covid19 shows that during week 1 (9 to 19 April 2020) about half of people surveyed (n= from 1,111 to 3,693) reported increased consumption of art online or streamed performances (47% for art and 51% for theatre, with 24% and 27% having done it for the first time, respectively) (PEC and IPO 2020a).

digital technology' has fallen from 33% in 2014 to 27% in 2019 (ACE/Nesta 2019, 33).

- **Digital engagement with cultural organisations' content in England is not evenly distributed across demographics.** For instance, a 60-year-old man is twice as likely to experience culture digitally as a 75-year-old woman. 4 in 10 people from 'upper socioeconomic groups' accessed culture digitally vs. 2 in 10 people from 'lower socioeconomic groups' (DCMS 2019). In 2019, Black people had significantly lower rates of digital participation than white or mixed race people – 21% compared to 31% and 39% respectively (DCMS 2019).

Immersive experiences

- **VR headset ownership has increased. 6% of UK households now have a VR headset** (Ofcom 2020, 93–97). Similar to cultural participation online, headset ownership is not evenly distributed. 'Upper socioeconomic group' households are almost twice as likely to own a VR headset than 'lower socioeconomic group' households. In terms of experiencing VR, rather than owning a headset, according to the Global Web Index 2019, 16% of women have tried it whereas 30% of men have done so in the UK and the US (Buckle 2018). Audiences of VR are also disproportionately younger, with only 18% of users over 45.
- **Gender imbalances in tech and VR don't only affect uptake.** They impact production e.g. in 2018 only 14% of UK VR companies had a woman director (Vision of Women and VR 2018), and even the technology itself e.g. VR headsets are designed with a narrow IPD range that negatively affects women (Stanney et al. 2020).

As we have argued elsewhere (Limina 2018), in order to cross the technology adoption chasm and go beyond catering only for 'early adopters' (Moore 1991), VR needs to broaden its appeal and challenge these inequalities in its production and consumption.

'Early adopters' of VR have been mostly male and young, but this does not have to be the case going forward. In Limina's experience, marketing strategies aimed at attracting a young male audience are not helping, as we repeatedly heard in our audience feedback[4]. In fact, once we started to open (and promote) our Limina VR Theatre to a wider audience, over two thirds of audiences were women and non-binary users.

The next section highlights our findings about this process of moving beyond the 'early adopter'.

Barriers to entry

[4] Vision for Women and VR – research partnership with Brighton University and King's College.

Barrier 1: Time

One of the most significant barriers to participation we found was quite simply the audience member's perceived lack of time.

In common with the arts and cultural sectors generally, Limina was vying for their leisure time.
One might assume that this is actually quite a straightforward problem to solve, and so does not warrant a whole section of this report. If time was an issue, then why not just make the overall VR experience shorter?

Figure 1: *from 20Twenty*

It turns out it is more complex than this. Talking to our audience members in post-show focus groups, and in more informal post-show chats, it was clear that many viewed their spare time as a precious resource. For example, one couple told us there were:

'A million and one things we should be doing right now. We don't get much quality time together really, just the two of us. Tonight we just decided to find childcare and take a punt'.[5]

We found that resource planning factors like perceptions of risk versus perceptions of reward played significant roles in the participants' decision making.[6]

The average British person has 40.5 hours of leisure time per week (ONS 2018b). However, there are major variations in who has significant money to spend on leisure and who does not. For instance, women get five hours less leisure time per week than men. Two of the extra hours men get are spent on 'computing and hobbies' (Gershuny and Sullivan 2017, 8). Women's leisure time also tends to be more frequently interrupted (Beck and Arnold 2009; Wajcman 2015, 81).

Career is also a factor. People in skilled trades get almost eight hours less leisure time than the average. Age makes a big difference too - If you are between 25 and 34, it is likely you will be getting less leisure time; six hours 24 minutes less than the average, to be precise (Gershuny and Sullivan 2017, 15–16, 9).

5 Post-VR show focus groups at Watershed VR sessions (May 2017) and Bristol (April 2019).
6 Interviews with VR box office supervisors about audience barriers (June 2019).

Limina ticket prices were between £10 and £20, so whilst money was a consideration and barrier for some audience groups, we found that time was more significant an issue across all demographics. At the VR Theatre in Bristol we frequently ran promotions with online discount codes and flyers with vouchers, however it came as a surprise to us that these codes were rarely used. For instance, on launch we offered hundreds of Bristol's creative tech industry community 50% off their tickets, but only 3 coupons were used. Another example is when we offered a £5 discount per ticket during [Bristol's Festival of Nature] weekend in summer 2019, which was widely publicised. In the end, the VR Theatre almost sold out all weekend. However, out of around 250 ticket sales, only 7 were using the discount.

If you are an organisation bidding for people's leisure time and you would like your audience to spend it engaging with an emerging technology then you should be aware that one barrier for certain major audience groups could be risk - the risk of spending precious leisure time in a way that is rewarding. As we know from the ONS leisure time survey, women in general and people with children on average get less leisure time per week. If you want your project to reach a broad audience, you have to bear people's leisure resource in mind.

Figure 2: *photographer Natalia Lebedinskaia*

This played out at Limina. In our focus groups we noticed a trend: the less leisure time people said they had, the more barriers there were to booking a ticket, and the perceived risk of not enjoying the experience was a factor in their decision making. For instance, in September 2019, one female focus group member in her 40's with young children told us:

'I wanted to know what to expect from the [VR theatre] experience. When you go to the cinema, you know how long the experience is, you know what to expect, what you're gonna get in terms of the quality'.

Another audience member told us:

'With the cinema there is less chance it could be a waste of time'[7]

We might speculate that with new, tech-driven experiences audience members are less likely to have experienced anything similar before. Therefore, there is less certainty

7 Both quotes from Limina focus group members (September 2019).

they will enjoy it. There's a chance it might go wrong. They might not really even know what 'it' is. This may well help to explain the gender gap in digital participation with cultural organisations. Although women have consistently higher real-life engagement with arts and culture, they engage less, digitally, than men. 29% of women reported having digitally participated in culture in the last 12 months whereas 32% of men reported having done so (DCMS 2019).

In contrast to experimental creative tech experiences, going to see a Disney film at the Odeon or having a meal in a favourite local restaurant is a much safer bet. When time is precious, mainstream audiences may not be prepared to risk it on new and strange digital things.

Barrier 1: How can cultural industries overcome this?

After analysis of our audience discussions and advertising data, we developed three key principles for tackling the time barrier.

a) Create pleasurable gateway experiences

'I want to relax and enjoy'
'I just want a really nice experience that makes me think'
'I think it will be an awkward situation if people get an unpleasant experience when they first come somewhere like this and try VR, cause, you know, it will put them off.'[4]

Not all creative emerging tech content needs to be pleasant. Challenging, even harrowing moments that push people out of their comfort zone can be an important part of personal growth. However, we found that for people's first time engaging with an emerging tech, they usually want it to be pleasant.

We found between April and July 2019 that Facebook and Instagram adverts using positive language were 11x more effective than neutral or negative language.[8] Positive words used included 'beautiful', 'wonder' and 'fantasy'. We found that for our audience, tickets were sold when the experience was marketed as a way of spending your leisure time that you will enjoy.[9] This helps weigh on the reward side of their 'risk versus reward' decision making process.

8 Facebook PPC advertising platform data (April-August 2019).

[9] Facebook PPC advertising platform data (April-August 2019).

Figure 3: *Examples of positive language used in our marketing from August 2019, plus audience reaction*

Audience members for our 2020 Cirque du Soleil in Virtual Reality show tour to venues in the UK often told us that although this was a new, strange thing for them to do, it was well worth the oddity of it all – as they got to 'go on stage' with their favourite circus troupe.[10] One user shared on Instagram after his visit in July 2019:

'Tried Cirque du Soleil in VR at Limina. Maybe it's not just a gimmick after all - we were blown away. Totally worth it'

After a pleasurable welcome into tech-driven experiences, there is a whole world of content that awaits. It is important, however, that broader audiences are offered that first pleasurable gateway experience.

b) Include as much familiarity in these gateway experiences as possible

The tech may be new and weird, but you can still de-risk the experience for your audience by adding other elements of familiarity. You could borrow an established 'pocket of time', for instance by advertising it as the perfect 'date night' for couples, or promote it as something to do on a Sunday afternoon 'hobby slot'. You could also work with a familiar platform (for online experiences) or venue (for location-based experiences), for example, a digital immersive theatre piece that happens on Zoom, or an artistic wellbeing experience that happens in a popular local yoga studio.
In July 2019 we made the decision at Limina to programme only known content brands for our August/September 2019 programme. This had a dramatic influence on ticket sales; our VR theatre ticket sales increased by 63%. We even needed to increase the number of seats in the VR theatre to accommodate demand.

10 Post-show social media analysis and discussions with VR host staff (December 2019).

In regard to familiarity with the context & time slot, in between 2017 and 2019, 78% of our audience said they wanted to experience VR again as part of an 'evening out' (the primary time slot we were targeting). A known 'pocket of time' that already had social norms around it worked well for us, and for our audience.

c) Create experiences that can be shared with others

If you are bidding for that precious leisure time, it helps to know how your audience likes to spend it. One consistent finding is that over the age of 24 people prefer to spend leisure time with others, not on their own (ONS 2018a). For gateway experiences, it will therefore help your mainstream 'sell' if you cater to this. This does not necessarily mean everything has to be for multiple players or involve virtual avatars; it could just mean creating a sense of an event that others do at the same time, either physically or virtually.

In a focus group in Summer 2019, audience members told us:

'I did like the in-headset introduction and outro. I felt it was really good to set the scene, and a sense of cohesiveness with the group, which was so nice'

'Sitting in a circle with others was great. It helped me feel less alone when I had the headset on'.[11]

Doing 'weird' new things together also helps with self-consciousness. Which brings us to the next key barrier, and section on this report.

Barrier 2: Identity

Figure 4: *photographer Alex Salcedo*

11 Responses from focus group members (June 2019).

When talking to our audience members, the sense of how new technology can make you feel about yourself came up again and again:

'Technology can make you feel stupid'
'I was worried I might feel like an idiot'[12]

This sentiment was echoed on a daily basis to Limina's VR Hosts and box office team by people attending the shows. [13] Customers, especially women and older people, would often come out of the VR theatre and say:

'Wow, I didn't think this was the sort of thing I would do, I didn't think I was techie enough to use VR, but it is for me, and I want to come again'.[14]

Our sense of self comes from all sorts of places, but the way we spend our leisure time is a major contributor to how we feel about who we are. Choosing to participate in an emerging tech experience can be perceived as the sort of thing that actually just a narrow group of people do.[15] The best-selling and most used stock photos available to represent high tech users tell us something about who that perceived demographic is.

Here are some of those images:

Figure 5: *the sixth most downloaded image on Photocase.com stock library in 2018. Most popular image for 'virtual reality' search term on Photocase.com 2018. Photographer: rclassen*

12 Responses from Limina focus group members (Summer 2019).

13 Host end-of-shift questionnaires and interviews (April-August 2019).

14 A running theme in host questionnaires and interviews (April-June 2019).

15 Host end-of-shift questionnaires and interviews (April-August 2019).

Figure 6: *Current most popular image for 'immersive' search term on PhotoDune.net. Credit: stevanovicigor*

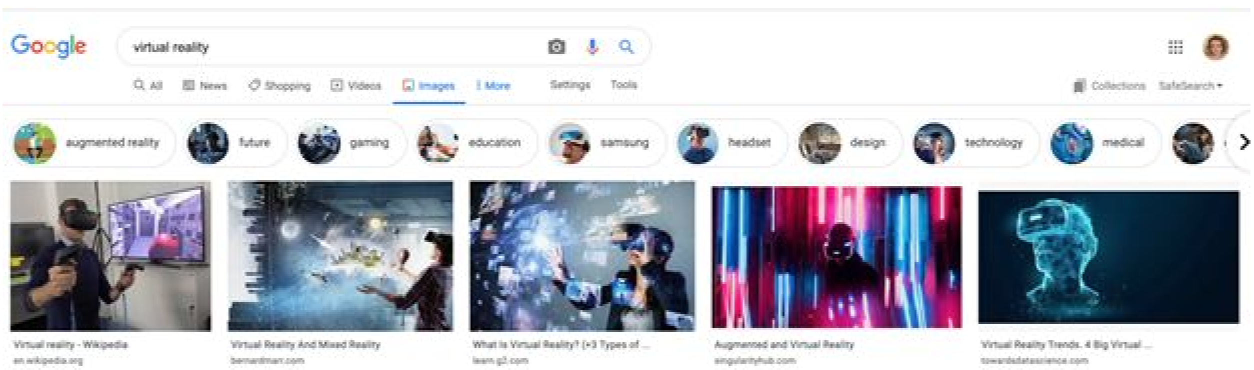

Figure 7: *Top images on Google images for the term 'virtual reality' (Search September 2020)*

These well-known stereotypes of technology 'early adopters' (Vision of Women and VR 2018) are also embedded right into popular culture from films like Johnny Mnemonic (1995) to Ready Player One (2018).[16] It becomes clearer why so many people might subsequently feel like innovative new tech is not their thing – often, the people portrayed through VR storytelling and its promotion do not seem to be like them.

At Limina VR Theatre we observed several ways that identity perception could be a barrier.

Perceived digital skills

We were commonly asked at Limina before ticket purchase 'if you need to do anything', or 'if you need any specific experience' to take part.[17]

'Looking like a wally' in public

[16] This might be yet another factor to influence audiences' expectations (Audiences of the Future 2020, 53).
17 Host end-of-shift questionnaires (April-August 2019).

Audience members were often concerned they would be made fun of, that people would photograph them whilst in VR, that they might fall over, or that strangers would see them in a vulnerable situation, wearing a VR headset, and think negatively about them.[18] Being seen publicly wearing a headset was for many, a deal breaker.

It was nerve-wracking to share the experience with friends

There was a fear some focus group members expressed that participating in VR might negatively impact their reputation. Even sending the Limina website link to a friend was sometimes seen as a risk. This was especially the case if the experience was 'not the sort of thing you would do'.[19]

Barrier 2: How can cultural industries overcome this?

a) Privacy

Do not make audiences doing the experience a spectacle for strangers. Focus on the content. It is not fair to put people through a new experience they are likely to be nervous about and then expect them to simultaneously be a photo opportunity for strangers. Limina's focus groups often said this from the start. In Limina's 2017 VR Sessions programme in Watershed, a well-known Bristol arts-centre and cinema, audience members consistently said that if the sessions had been in the public café/bar, they just would not have participated. A few even said they would have asked for a ticket refund.[20]

Privacy concerns even apply to online home content too; explaining what you are doing to your housemates or family can be tough. Recommendations on the type of home space to experience the content in can really help.

b) Shared experience

With that said, it is okay for other participants to be present; in fact, a shared experience is a really good thing.[21] This echoes the value of shared experiences for leisure time reasons discussed above. The group do not necessarily need to know each other already; what is needed is a social contract of trust. This can be created through onboarding, facilitation and elements of ritual (e.g. sitting in a circle, or all starting the experience at the same time).

---

18 Post-show focus groups as part of Watershed VR sessions (2017) and dress rehearsal user testing feedback (April 2019).

19 Post-show discussions with audience members at Warwick Arts Centre (February 2018) and notes from informal discussions with audience members during Cirque du Soleil VR tour (London 2020).

20 Post-show focus groups as part of Watershed VR sessions (2017).

21 For example, Kidd et al. (2018) have written about how powerful social interactions can be during immersive experiences in a heritage context.

We have found that ‘weird’ things can become quickly normalised through socialisation. Doing things in a group feels less weird – yoga classes, for instance, singing, or going on roller coasters:

‘I was worried I might feel like an idiot, so the hosting and ritual is really lovely. The shared experience helps’[22]

c) Reassure people that you don’t need to be a ‘techie’ in order to participate. And deliver on that!

Be clear in the experience’s marketing materials whether or not any particular digital skills are required to participate in the activity. If it does require digital skills, that is ok, but you need to be clear beforehand – and make sure to avoid jargon or high-tech language and imagery that could make it feel inaccessible to the target audience. When designing and building your experience do bear in mind the audience’s likely level of digital skills; what may be intuitive to you and your team may well not be intuitive to others.

Conclusion and recommendation

Emerging technology clearly has vast potential for the cultural industries, placing them firmly on the global stage. But for that potential to be realised, as we have seen, these experiences must find a place in people’s lives. Industry professionals commonly perceive the main barriers to the mass adoption of creative emerging technology as high prices and clunky hardware (Laurell et al. 2019; Jenkins 2020).[23] Our extensive research at Limina did not find these issues to be the biggest barriers. Time and identity were far greater issues for our audience members.

Through our practice and research, we have consistently found that perceptions of risk versus perceptions of reward played significant roles in participants’ decision-making processes. In order to overcome this, we recommend creating pleasurable, familiar and shared gateway experiences to attract a wider audience.

Perceived digital skills and embarrassment also feature as key factors in the public’s willingness to engage with creative tech. Privacy, reassurance and clear instructions have gone a long way in our VR Theatre to attract a diverse audience.

22 Response from a *Limina* focus group member (September 2019).

23 For more on what factors might influence users’ adoption of VR hardware, see Manis and Choi (2019) adaptation of the technology acceptance model (TAM). Audiences of the Future have suggested using this model for understanding audience considerations of immersive experiences more broadly (2020, 57-58)

The ultimate goal in developing concepts and distribution plans is to create an experience that your target audience has the motivation to partake in. In Lloyds Bank's 2020 *Digital Consumer Index*, motivation was found to be the main factor in why digitally excluded people don't engage (2020, 7). Motivation, as a reason not to do digital experiences, is likely a combination of all the other barriers this report has explored – plus the compounding element of peer influence. If your friends are all doing something, you're more likely to try it out yourself (and it has been de-risked, from a leisure time perspective). As we noted at the start of this report the Covid19 global health crisis has impacted the cultural sector significantly. But there has been some speculation that demand for – and investment in – social VR experiences in particular may have been on the rise during this period. Perhaps this will provide potential users with that motivation to participate, but only time will tell.

In order to build these new communities of people who have the motivation to spend their precious leisure time on emerging cultural tech, we must get to know them. The sector, funders and policy makers must understand the place the medium might hold in people's lives. How can we know the nature of future mainstream demand without taking the time to understand these people first?

Making high quality experiences that the non-early adopter public wholeheartedly want to do *must* be prioritised in order to build a solid audience foundation. A menu of strong "gateway" experiences will build habit and trust. Once that foundation has been built, a myriad of wild and wonderful digital magic awaits.

Acknowledgements

Catherine Allen, Co-founder and CEO, Limina Immersive

As Limina's CEO, I am incredibly grateful for the contributions, support and encouragement of the external people the Limina team and I have worked with, from Limina's inception in 2016 to today. Without external partnerships and support, this research and learning would not have been possible. With thanks to:

Dr Robert O'Toole
Verity McIntosh
Mandy Rose
Clare Reddington
Marcus Gilroy Ware
Dr Sarah Atkinson
Helen Kennedy
Rich Warren
John Gore
Mark Ellis
John Holmes
Anne O'Leary
Victoria Mapplebeck
Dr Laryssa Whittaker
Dr Chloe Preece
Emily Knoll
Elizabeth Khorrami
Tim Powell
Isabelle Croissant
Julia Carruthers
Dr Tim White
Dr. Jodi Nelson-Tabor
Bill Thompson
John Cromie
Steve Brewer
Tessa Ratuzynska
Piers Elliott
Irwyn Shepherd
Liz Rosenthal
Dan Tucker
Agnieszka Wlazel
Carrie Wootten
Dr Judith Aston
Mitch Turnbull
Richard Knockles
Mark Atkin
Tom Millen
Alex Ruhl

About Limina Immersive

Limina's expertise is based on our experience of screening creative VR to audience members who would generally not consider themselves early adopters. Between 2016 and 2020 we delivered over 160 different VR experiences to more than 15,000 people in our own VR theatre screening format.

Our goal with the live screening format was to find a commercially viable formula for mainstream VR adoption. The model's main source of revenue was ticket sales rather than public subsidy. This involved synchronised small group viewings, with significant customer focus and attention to duty-of-care. VR became part of a night out by bringing a themed and mood-altering immersive experience to an existing space that audiences were already familiar with.

Whilst primarily taking our VR theatres to UK locations, we also toured internationally, bringing our style of VR to places including Paris, Madrid, Adelaide, Melbourne, and Dublin. Venues ranged from theatres to high-end department stores to our own 6-month venue with Watershed, the leading independent cinema in Bristol. Experiences we screened included, for example, coral reef diving with David Attenborough and stepping on stage with Cirque du Soleil.

Our audience was very different to the average VR user. While the average VR user is a man in his 20s (Buckle 2018), Limina VR Theatre had a majority female audience aged 30+. Many of these audience members said they would never have experienced VR otherwise and would be happy to do so again.

Since 2016 we have had a running programme of research so that we can begin to understand what audience members make of those experiences, and what they want from VR content and the way it is screened. In 2017 we carried out 84 focus groups with more than 450 people[24] , and in 2018 we ran our own in-depth study with audiences on various immersive genres and formats, with the results published in our Immersive Content Formats for Future Audiences report. Over the years we have also surveyed thousands of audience members.

In 2018 we began to partner with universities who could offer advanced research techniques and analysis. University partners have included The University of the West of England, Monash University in Melbourne, The University of Warwick, and Royal Holloway. We found throughout our research process that audience members were keen to talk to us after a show, in fact we were often told that the post-show chat formed a key part of the whole experience. Fostering critical discussion has remained one of our most important objectives.

[24] The detail of some of this work was featured in The Bookseller (Allen 2017).

In late 2019 and early 2020 we began sharing our findings in a tour - called the Limina Creative VR Audiences Summit. We took the one-day event to London, Bristol, Warwick University and Melbourne. Discussions at the summits have subsequently shaped analysis and understanding of our findings, which have followed through into this document.

Due to COVID-19, the company is now no longer able to run VR Theatres, however we feel it is vital that our learnings about reaching non-early adopter audiences are shared. The core principles we learned about how to get technology to broader audiences feel more relevant than ever.

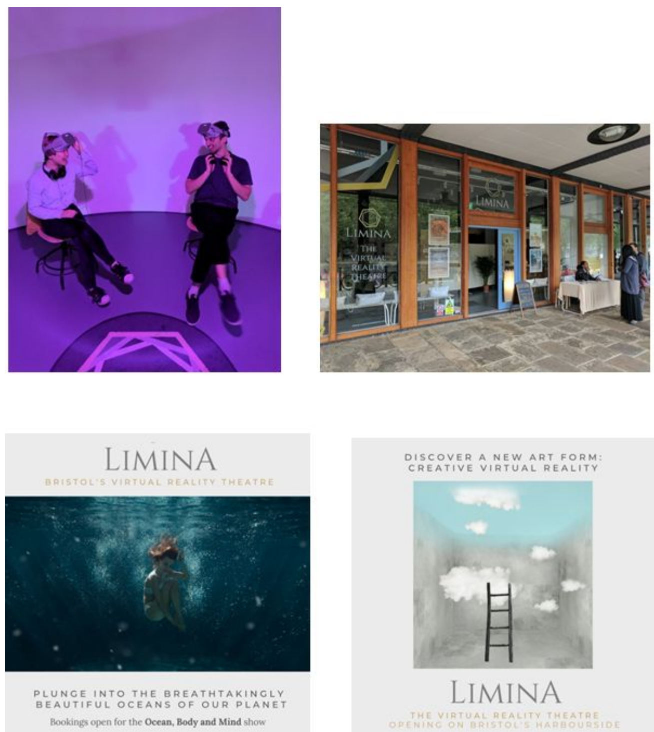

Figure 8: *Examples of Limina's marketing and PR imagery, 2017-2020*

About the Creative Industries Policy and Evidence Centre (PEC)

The Creative Industries Policy and Evidence Centre (PEC) works to support the growth of the UK's creative industries through the production of independent and authoritative evidence and policy advice. Led by Nesta and funded by the Arts and Humanities Research Council as part of the UK Government's Industrial Strategy, the PEC comprises a consortium of universities from across the UK (Birmingham, Cardiff, Edinburgh, Glasgow, Work Foundation at Lancaster University, LSE, Manchester, Newcastle, Sussex and Ulster). The PEC works with a diverse range of industry partners including the Creative Industries Federation.

References

ACE/Nesta. 2019. 'Digital Culture 2019'. https://media.nesta.org.uk/documents/Digital-Culture-2019.pdf.

Audiences of the Future. 2020. 'The Immersive Audience Journey: An Overview of Audience Insights and Perspectives on Immersive Art, Culture, and Entertainment'.

Allen, Catherine. 2017. 'Virtual Reality Sessions: Lessons Learnt for the Cultural Cinema Sector'. *Pervasive Media Studio* (blog). 18 September 2017. http://www.watershed.co.uk/studio/news/2017/09/18/virtual-reality-sessions-lessons-learnt-cultural-cinema-sector.

———. 2017. I spoke to 300 VR audience members over 48 hours - here's what they want. *The Bookseller*. https://www.thebookseller.com/futurebook/i-spoke-300-vr-audience-members-over-48-hours-and-here-s-what-i-learned-about-what-they#

Bakhshi, Hasan, Jyldyz Djumalieva, and Eliza Easton. 2019. 'The Creative Digital Skills Revolution'. London: PEC.

Beck, Margaret E., and Jeanne E. Arnold. 2009. 'Gendered Time Use at Home: An Ethnographic Examination of Leisure Time in Middle-class Families'. *Leisure Studies* 28 (2): 121–42. https://doi.org/10.1080/02614360902773888.

Bellaar Spruijt, Vanessa. 2017. 'VR Sessions at Watershed. Research Methods Implementation'. https://www.watershed.co.uk/studio/sites/default/files/VRSessionsAtWatershed_ResearchMethodsImplementation.pdf.

Buckle, Chase. 2018. 'AR vs VR: The Challenges and Opportunities in 2019'. *GlobalWebIndex* (blog). 19 November 2018. https://blog.globalwebindex.com/chart-of-the-week/augmented-virtual-reality/.

Cebr. 2019. 'World-Economic-League-Table-Report-2020-Final.Pdf'. Cebr. https://cebr.com/wp-content/uploads/2019/12/World-Economic-League-Table-Report-2020-Final.pdf.

Clarke, Arthur Charles. 1973. *Profiles of the Future: An Inquiry into the Limits of the Possible*. Harper & Row.

Davies, John, Joel Klinger, Juan Mateos-Garcia, and Kostas Stathoulopoulos. 2020. 'The Art in the Artificial: AI and the Creative Industries'. London: PEC.

Davies, John, and Georgina Ward Dyer. 2019. 'The Relationship between Artistic Activities and Digital Technology Development - Think Tank'. Brussels: European Union. http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_STU(2019)634440.

DCMS. 2018. 'Culture Is Digital'. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/687519/TT_v4.pdf.

DCMS. 2017. 'Taking Part. Adult Report: 2016/2017'. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664933/Adult_stats_release_4.pdf.

———. 2018. 'Taking Part. Adult Report: 2017/2018'. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740242/180911_Taking_Part_Adult_Annual_Report_-_Revised.pdf.

———. 2019a. 'Taking Part 2018/19: Digital Participation (Data)'. https://www.gov.uk/government/statistics/taking-part-201819-statistical-release.

———. 2019b. 'Taking Part Survey. Adult Report: 2018-19'. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/879725/Taking_Part_Survey_Adult_Report_2018_19.pdf.

'Easter Rising: Voice of a Rebel'. 2017. *Watershed* (blog). Accessed 24 June 2020. https://www.watershed.co.uk/whatson/8179/easter-rising-voice-of-a-rebel.

Easton, Eliza. 2019. 'The Value of Creative Higher and Further Education - Insights from the PEC Industry Champions'. https://pec.ac.uk/assets/publications/PEC-Industry-Champions-Insights-Value-of-Creative-Higher-and-Further-Education.pdf.

Gershuny, J., and O. Sullivan. 2017. 'United Kingdom Time Use Survey 2014-2015'. UK Data Service. https://doi.org/10.5255/UKDA-SN-8128-1.

Gurner, Kieron . 2019. 'Equal Realities: Addressing the Gender Gap in VR'. *Calvium* (blog). 18 June 2019. https://calvium.com/equal-realities-addressing-gender-gap-vr/.

HMG. 2018. 'Creative Industries Sector Deal'. https://www.thecreativeindustries.co.uk/media/462717/creative-industries-sector-deal-print.pdf.

'Industrial Strategy: Building a Britain Fit for the Future'. 2017. Department for Business, Energy & Industrial Strategy.

Jenkins, Aric. 2020. 'The Fall and Rise of VR: The Struggle to Make Virtual Reality Get Real'. *Fortune* (blog). https://fortune.com/longform/virtual-reality-struggle-hope-vr/.

Kidd, J., Huws, S., John, A., 2018. Evaluating the affective dimensions of Traces-Olion: a subtle mob at St Fagans National Museum of History, Wales. IEEE, San Francisco. https://doi.org/10.1109/DigitalHeritage.2018.8810117

Kidd, Jenny, and Nieto McAvoy, E.. 2019. 'Immersive Experiences in Museums, Galleries and Heritage Sites: A Review of Research Findings and Issues'. *PEC Discussion Papers*.

https://pec.ac.uk/assets/publications/PEC-Discussion-Paper-Immersive-experiences-Cardiff-University-November-2019.pdf.

Laurell, Christofer, Christian Sandström, Adam Berthold, and Daniel Larsson. 2019. 'Exploring Barriers to Adoption of Virtual Reality through Social Media Analytics and Machine Learning – An Assessment of Technology, Network, Price and Trialability'. *Journal of Business Research* 100 (July): 469–74. https://doi.org/10.1016/j.jbusres.2019.01.017.

Lawrie, Eleanor. 2020. 'What Went Wrong with Virtual Reality?' *BBC News*, 10 January 2020, sec. Business. https://www.bbc.com/news/business-50265414.

Limina Immersive. 2018. 'Immersive Content Formats for Future Audiences'. Digital Catapult. https://www.immerseuk.org/wp-content/uploads/2018/07/Immersive_Content_Formats_for_Future_Audiences.pdf.

Lloyds Bank. 2020. 'UK Consumer Digital Index 2020'.https://www.lloydsbank.com/assets/media/pdfs/banking_with_us/whats-happening/lb-consumer-digital-index-2020-report.pdf.

Manis, Kerry T., and Danny Choi. 2019. 'The Virtual Reality Hardware Acceptance Model (VR-HAM): Extending and Individuating the Technology Acceptance Model (TAM) for Virtual Reality Hardware'. *Journal of Business Research* 100 (July): 503–13. https://doi.org/10.1016/j.jbusres.2018.10.021.

Moore, Geoffrey A. 1991. *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers*. HarperCollins.

Ofcom. 2019. 'Technology Tracker 2019'. https://www.ofcom.org.uk/__data/assets/pdf_file/0026/143981/technology-tracker-2019-uk-data-tables.pdf.

———. 2020. 'Technology Tracker 2020'. https://www.ofcom.org.uk/__data/assets/pdf_file/0037/194878/technology-tracker-2020-uk-data-tables.pdf.

ONS. 2018a. 'Brits Spend 29% of Their Leisure Time Alone - Office for National Statistics'. 2018. https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/britsspend29oftheirleisuretimealone/2018-06-22.

———. 2018b. 'Men Enjoy Five Hours More Leisure Time per Week than Women'. 2018. https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/menenjoyfivehoursmoreleisuretimeperweekthanwomen/2018-01-09.

———. 2020a. 'Internet Access – Households and Individuals, Great Britain: 2020'. https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteris tics/homeinternetandsocialmediausage/bulletins/internetaccesshouseholdsandindividuals/2020.

———. 2020b. 'Internet Access – Households and Individuals, Great Britain: 2020. Data'.

O'Toole, Robert, and Catherine Allen. 2017. 'Kickstart VR at Warwick'. https://warwick.ac.uk/services/its/servicessupport/academictechnology/projects/kick-start-vr/vr_project_report.pdf.

PEC, and IPO. 2020a. 'Digital Culture. Consumer Tracking Study (Week 1)'. https://www.pec.ac.uk/assets/publications/PEC-and-IPO-cultural-consumption-study-week-1.pdf.

———. 2020b. 'Cultural Consumption Study - Week 7'. https://pec.ac.uk/assets/publications/PEC-and-IPO-cultural-consumption-study-week-7.pdf.

Roose, Kevin. 2020. 'This Should Be V.R.'s Moment. Why Is It Still So Niche?' *The New York Times*, 30 April 2020, sec. Technology. https://www.nytimes.com/2020/04/30/technology/virtual-reality.html.

Stanney, Kay, Cali Fidopiastis, and Linda Foster. 2020. 'Virtual Reality Is Sexist: But It Does Not Have to Be'. *Frontiers in Robotics and AI* 7. https://doi.org/10.3389/frobt.2020.00004.

'Turning on the Lights: A Report in to 5G and Smart Tourism'. 2019. Bristol Futures Global. Accessed 24 June 2020. https://www.bristolfutures.global/turning-on-the-lights-a-report-in-to-5g-and-smart-tourism.

VWVR. 2018. 'A Vision for Women and VR'. http://www.vwvr.org/wp-content/uploads/2018/10/vwvr_download.pdf.

Wajcman, Judy. 2015. *Pressed for Time: The Acceleration of Life in Digital Capitalism*. University of Chicago Press.

'Why Virtual Reality (VR) Headsets Failed to Woo the Masses'. 2019. 22 July 2019. https://www.livemint.com/technology/gadgets/why-virtual-reality-vr-headsets-failed-to-woo-the-masses-1563767531378.html.