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Evaluating perspectives of virtual and mixed reality for the performing arts in the U.S. and Canada

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Abstract

What are the current trends of virtual and mixed reality in the performing arts? In this study, semi-structured interviews were conducted with a convenience sample of academics and professionals in the performing arts who are using virtual and mixed reality. Grounded Theory was used to analyze the themes that emerged over the course of the interviews. This study found that this technology is already fitting into entertainment within both the performance aspect and the design process. Many challenges exist for innovators in AR/VR such as lack of common knowledge, lack of structure needed for innovation, and difficulty finding financial backing. Finally, this study found that this technology has a future within entertainment through young audiences as well this technology fulfilling an important role in adapting entertainment to a changing audience. Implications are discussed.

Keywords: Entertainment; Performing Arts; Virtual Reality; Mixed Reality; Technology; Education.

1. Introduction

The capabilities of virtual and mixed reality technologies are growing exponentially and providing valuable new tools for production and storytelling. These technologies are increasingly financially accessible, but have been vastly underutilized in the performing arts, especially in the United States. Increasingly it is the case that innovators within entertainment in the U.S. are beginning to use mixed and virtual reality in this industry, but these pioneers' research projects are largely disconnected. The purpose of this study was to gather the disparate information on how virtual and mixed reality are being used in the performing arts, especially in the United States and Canada. Thus, this study proposes the following research questions:

R1: How does this technology fit into the performing arts?

R2: What are the challenges facing the adoption of this technology in the performing arts?

R3: In what direction is the technology heading in the performing arts?

2. Methods

This study was conducted using a convenience sample of academics and professionals in the performing arts who are using virtual and mixed reality. These terms were left undefined, but explicitly inclusive of related terms such as

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augmented reality, 360 video, and extended reality. Participants were recruited through their work in AR/MR, and were found through national organizational membership and snowballing recruitment techniques. The population of practitioners that this study initially reached out to was N=10, and this study was able to interview N=7. Participants were located both in the U.S. and in Canada.

Using a semi-structured interviewing format, the participants were primarily interviewed through video chat, but also over the phone. The interviews were then analyzed using Grounded Theory (Frey et al., 1999), which is a systematic inductive process of analyzing emerging categories and broader themes from a data set. In order to reduce subjectivity, two coders (including the author of this article) analyzed an interview together for emerging themes before dividing the interviews for categorization.

3.   Results

3.1   How does this technology fit into the performing arts?

The academics and professionals interviewed for this study all saw a great deal of opportunity in virtual and mixed reality. In answering R1, two major themes emerged: using the technology within performances and using the technology within the design process. First, one participant stated, "there is a big potential for the performing arts to take a center stage when it comes to virtual reality, which hasn't happened yet." virtual and mixed reality finds a natural home in performing arts especially with the growing trend of immersive experiences. One participant noted that within the broad category of immersive entertainment "we're all sort of dealing with ultimately the same core concerns of presence and agency within a narrative environment that we're creating for somebody." Another participant said "in some ways I think that that's where we're losing audiences as theatre artists, is that we are expecting people to be passive, to sit in the seat and watch the show." virtual and mixed reality can add to a performance by personalizing it, and giving audiences this active experience.

Some participants use virtual reality as a production tool within the design process of entertainment. "What it does is it allows for me now to take the director during the designing phase and pop them directly into the set wherever it may be, or once it's designed take it to the cast into the set so they're not just peering at the model and kind of extrapolating to see how it works they can actually move through the space pretty efficiently"

3.2   What are the challenges facing the adoption of this technology in the performing arts?

In answering R2, participants identified three major concerns for the adoption of this technology: the lack of knowledge about the technology in the entertainment industry, the lack of community structures needed for innovation, and finding financial backing. First, the lack of common knowledge about the technologies use within entertainment makes it difficult to understand the entertainment created with this technology without experiencing it. As one participant put it; "our biggest challenge within working in this way is that until somebody actually experiences it, they rarely have an idea of exactly what we're talking about, which is difficult."

 Second, without the common knowledge about the technology, the innovators in this technology find it difficult to continue researching and innovating. "I don't think many organizations are prepared to embrace the technology. They don't have the staff or the organization, but most importantly many classical performance venues don't even want to take that risk."

Finally, the lack of knowledge and structures available make it difficult for these participants to find financial backing for their research. One participant described his experience, "I have to say that unfortunately I've emptied out my personal savings account. It all happened organically so I didn't plan ahead of funding the project. It was really helpful when the companies sponsored our projects with their hardware and technology, but I definitely struggled for cash."

3.3   In what direction is this technology heading in the performing arts?

In answering R3, two major themes emerged: young audiences are most willing to adapt the technology, and that the field of entertainment is changing and the performances must change with it. First, young people were seen as being

more willing to adopt the technology. "We talk endlessly about how we're losing audiences and our audiences are getting older but you look at immersive theatre and the people that are into these shows and they're just exploding they're exploding in popularity, because these people want to interact they want to have agency and be present in the show". Another participant took this even further and used children as the gateway into larger audiences. "Our target audience is not technology people, its regular audiences, so we chose to start with a children's play where kids are already using AR, VR, and mixed reality in gaming so they use them […] and they go with their parents and grandparents."

Second, there was a distinct sense among participants that the performing arts are changing. As one participant stated, "Technology is becoming more and more immersed within our lives." Another participant extended this imagery by saying, "I think in general theatres are becoming more movie based and more cinematic, which is interesting, not necessarily good [...] In a way things are becoming a little less theatrical and more cinematic, and that completely blurs the line between what's virtual reality and what's augmented reality and what's cinema and what's live theatre." Another participant noted the need for practitioners to change with the industry. "We're getting into an age where you either need to be an artist and an engineer or have both on hand, and I think that's going to be even more so in virtual and augmented reality."

4. **Discussion**

The participants interviewed in this study all saw the possibilities for this technology as a storytelling and communication tool. It is perhaps not surprising that people find value in the work that they do, but it was a common theme that once their audiences had experienced the use of this technology, many were excited by it.

The importance of academia for this work was very noticeable. All but one of the surveyed participants work for universities. While some of the people surveyed work for professional companies in addition to their academia jobs, most found benefits to being in academia. Academia often allows time to be spent doing research, as well as more opportunities to get funding for that research. There is something of a learning curve and a heavy time commitment to applying this technology within the performing arts, and there is equipment required that would be difficult to fund outside of academia and expensive to buy personally. Working in academia also has the added benefit of being surrounded by younger and more open minded students, which is a great place to test and introduce this technology.

One of the greatest benefits of this technology is the possibility of reaching new audiences. Kids born today have never known a world without screens and have come to expect interactive technology. The integration of virtual and mixed reality in the performing arts has the potential to reshape the traditional performance experience. Through means such as spherical video, an audience member can choose what portion of the experience they want to see, making the experience an active one, rather than a passive one. Using mixed reality, it is possible to add an interactive digital component on top of the live element, giving the audience member the feeling of agency.

This study ultimately establishes the current perspectives and views of virtual reality and mixed reality technologies, and explores this technologies future place within the industry of entertainment. In addition, many limitations to innovation within the field of entertainment are discussed. Ultimately, these new techniques require new combinations of skills, and we much teach students to learn more diverse skillsets, and how to better work collaboratively with more diverse teams.

References

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