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A Systematic Review towards Evolution of Interactive Storytelling and Audience Engagement in Films

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Abstract

This systematic review explores the evolution and impact of interactive storytelling in films on audience engagement. Research questions probed into how interactive storytelling in films has been discussed in literature, the role of technology in shaping narratives, and the influence of audience physiological and emotional responses on storytelling outcomes. The research objectives centered on identifying key themes and the interplay between technology, narrative innovation, and audience interaction in contemporary storytelling. Through a comprehensive selection process, 163 articles were reviewed, resulting in three significant themes: interactive narrative and media convergence, the impact of technology on storytelling, and audience engagement and interaction. Each theme explores the dynamic relationship between technology, diverse narrative structures, and audience participation. Methodologically, an integrative approach was employed to analyze varied research designs, culminating in thematic categorization. The findings call attention to the transformative influence of technology on storytelling and the shift from passive to active audience participation. Future research endeavors could focus on creating a comprehensive framework

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for an interactive film and ways to implement interactive films into broader mediums such as cinema.

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Introduction

Traditional storytelling has been an integral part of human culture for millennia, serving as an entity for transmitting knowledge, culture, and emotions. Typically, storytelling is experienced by readers and viewers as an organic whole (Smiley & Bert, 2005). With the advent of digital technology, storytelling has transcended its conventional boundaries, evolving into interactive films such as Kinoautomat (1997), and Late Shift (2016), offering audiences new ways to engage with narratives. The digital age has brought forth an era where stories are no longer confined to static pages or passive viewing but instead have become dynamic and participatory experiences. Understanding the theoretical underpinnings of interactive storytelling is essential for comprehending its significance and potential, especially in the evolution of interactive films. Concepts from fields such as narratology, ludology, and human-computer interaction have all contributed to shaping the theoretical frameworks that underlie interactive storytelling (Stern & Mates, 2005). Examining how these theories intersect and inform the creation and analysis of interactive narratives is crucial for researchers and creators alike.

The development and proliferation of technology have played a pivotal role in enabling interactive storytelling to flourish. From the early text-based adventures to the cutting-edge virtual reality experiences of today, technology has continually expanded the possibilities for interactive narratives. Along with the development of software and hardware, hypertext evolved into hypermedia, where interactive fiction is now just as interested in the interlinking of lexias as it is in combinations of media modalities (Pope, 2020). The phrases hypermedia and hypertexts are frequently used synonymously in everyday speech, but in precise terms, hypermedia comprises more than just connected texts—it also contains other types of media including pictures, video, and audio (Dillon & Jobst, 2005).

This review will delve into the technological innovations that have facilitated the growth of interactive storytelling, focused on movies and films. While technological advancements have flourished, they have significantly influenced the way stories are told in films. This evolution prompts questions: How has storytelling changed through centuries, and what does the future hold for storytelling and narratives, especially in terms of audience engagement?

Interactive Storytelling was defined as computer-based interactive entertainment media that allows users to intentionally influence a non-linear narrative, mediated by a storytelling engine (Roth, 2015). Interactive storytelling, which can include text, audio, video, computer graphics, and virtual reality rendering systems, explicitly refers to the capability of changing the tale that underpins the material independently from the visual medium used to deliver the narrative (Guerrini et.al., 2017). Interactive storytelling encompasses a vast spectrum of creative expressions, including video games, interactive films, choose-your-own-adventure narratives, and interactive installations. Each of these forms offers unique challenges and opportunities for creators. Interactive cinema allows the audience to influence or alter certain aspects of the film, allowing their experience to be unique from others (Kirke et. al., 2018). Examining how artists and storytellers harness the interactive medium to convey their narratives and elicit emotional responses will be a key focus of this review.

By systematically reviewing the existing body of literature, this study aims to identify recurring themes, emerging trends, and areas where research gaps persist. Such an analysis will provide a holistic view of the current state of knowledge in interactive storytelling, offering insights into both well-established concepts and areas that require further exploration.

This review is driven by three main research questions:

1. What academic discussions have taken place concerning interactive storytelling?
2. How does technology influence interactive storytelling?
3. How do interactive elements within interactive storytelling affect audience responses and emotional engagement?

This systematic literature review seeks to advance our understanding of the new era of interactive storytelling. It will contribute to the ongoing discourse surrounding this transformative medium by synthesizing existing knowledge and highlighting avenues for

future research. By comprehensively examining the landscape of interactive storytelling, researchers hope to inspire further innovation and collaboration in this dynamic field.

Literature Review

Storytelling has been an integral part of human life for centuries. From the tales of folklores such as Moby Dick, to the vast lore of Lord of The Rings, it all began with stories. Storytelling is one if not the most basic qualities of human understanding (Yilmaz & Cigerci, 2018). Humans since the beginning of time gain knowledge and find entertainment in stories told by others. Storytelling also holds great potential as a great teaching-learning tool in the form of graphics and communication (Yahya & Baki, 2018). In its most basic form, storytelling is a process in which a person (the teller) interacts with the audience by using vocalization, narrative structure, and mental imagery. The audience responds to the teller by primarily communicating through body language and facial expression (Roney, 1996). Through time, storytelling has developed into many styles and forms. As humans evolved and technologies became more advanced, the nature of storytelling also changes, driven by human needs. According to past research, it was stated that there are four types of storytelling which are visual storytelling, video storytelling, oral storytelling, and digital storytelling (Narawi et.al., 2020).

In this era of digitalization, digital storytelling became more prominent and eventually sought as primary entertainment especially through cinemas, internet and social media. The practice of digital storytelling encompasses the use of diverse digital multimedia, such as images, audio, animation, text, and video, to convey narratives creatively (O'Byrne et al., 2018). This includes movies, films and animated films where storytelling is highly important in delivering the message and engaging with audiences. Digital storytelling also aids in making abstract or conceptual subjects more intelligible, therefore teachers who utilize it may find it to be a useful approach to engage with their pupils (Choo et al., 2020). It is found that the interaction of pre-school children with Digital Storytelling seems to promote their imagination and creative thinking, as well as fostering early literacy skills and metalinguistic awareness (Sylla, Coutinho & Branco, 2014). With digital storytelling, the traditional style of storytelling can be changed and improved in many ways resulting in the emergence of

interactive storytelling. Interactive storytelling is defined as a method in which readers create their own tales by adhering to pre-established narrative lines and using interactive technologies (Bostan & Marsh, 2012).

Interactive storytelling has the capabilities to enhance audience engagement. The goal of interactive storytelling is to create media that allows users to actively shape how a story is presented and develops in real time. The narrative creation process is essential to this endeavour. (Porteous, Cavazza, & Charles, 2010). It is believed that interactive videos help draw students' attention to instructional content because they encourage interaction between the viewer and the video content (Zhang, Zhou, Briggs, and Nunamaker, 2006). Researchers also found that interactive video has the potential to boost learning in massive open online courses (Kolås, 2015), (Onah, Sinclair & Boyatt, 2014). This interactive engagement can also be seen in the unique narrative experience through Wikipedia interactive interface, where users use different narrative paths, moving from one article to another with the use of hyperlinks (Mavridis, 2020).

One of the famous interactive storytelling types is the Choose Your Own Adventure book series. Players progress through a storyline by making choices at pivotal moments represented on a plot graph. (Edward et al., 2020). In 2016, CtrlMovie produced a game-movie hybrid titled ‘Late Shift’, which became the first successful interactive film produced (Elnahla, 2020). The latest great example of interactive storytelling was demonstrated by Netflix in their 2018 interactive film called Black Mirror: Bandersnatch. This film utilizes a new interactive technology introduced by Netflix, where the audience can make a choice for the main character in the film that would shape the ending of the film, creating active audiences that are actively involved in the film narrative. This kind of filmmaking has made room for novel narratives that call for user engagement and interpretation as part of the enjoyment (Daly, 2010), and arguably shows possibilities for audience engagement, immersion, and attention more than non-interactive narratives (Hoydis, 2021). The success of the interactive contents produced by Netflix proves that interactive storytelling is a powerful tool in enhancing audience engagement and level of immersion which brings us to the question, how do one take advantage of interactive storytelling into their contents to improve

their audience engagement and how does technology play their role in shaping the course of interactive storytelling.

Methodology

Identification

The process of selecting appropriate papers for this study consists of three main steps within the systematic review process. In the first phase, researchers identify keywords and explore related terms using resources like thesaurus, dictionaries, encyclopedias, and previous research. Subsequently, once relevant keywords are determined, researchers create search strings for the Scopus and ERIC databases, as depicted in Figure 1.

In the first phase of the systematic review procedure, researchers retrieved 3,407 papers from the Scopus database and 258 from the ERIC database used in this research. This phase involves conducting a comprehensive search for scholarly resources relevant to the established research topic. The keywords used include "interactive" and "films." In this stage, researchers identified keywords and searched for similar phrases in previous scholarly studies. Then, researchers formulated all relevant terms and search queries for the Scopus and ERIC databases, as shown in Figure 1. Consequently, during the initial stage of the advanced search process, this study obtained 111 publications from Scopus and 52 articles from ERIC.

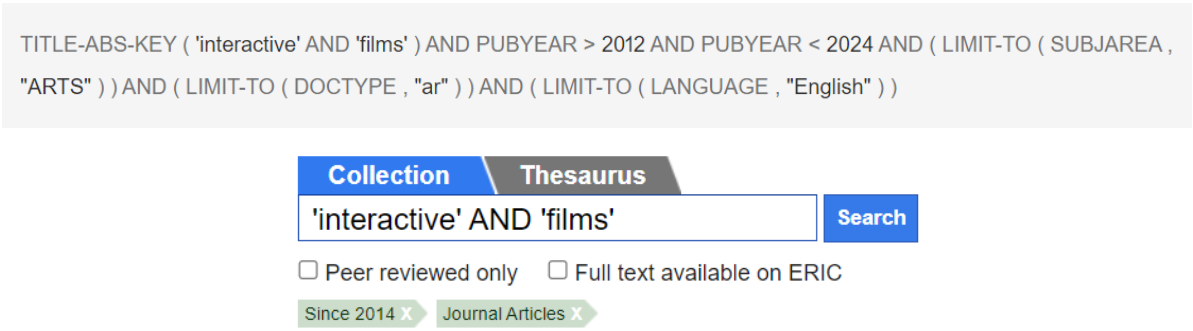

Fig.1 Identification of Keywords and the Exploration of Associated Terms in Scopus and ERIC Databases

Screening

Researchers begin the screening phase by detecting duplicated papers to be excluded. One article was detected as a duplicate and was removed. In the initial stage, 3,665 documents made the first round, followed by the subsequent phase where 163 papers were extracted. Both phases of the selection process involved the application of specific criteria for inclusion and exclusion, which were devised by the researchers (see Table 1 for details). The primary criterion for selection was research articles, as they provide the main source of practical information. Additionally, this study excluded publications such as systematic reviews, reviews, meta-analyses, meta-synthesis, book series, books, chapters, and conference proceedings. Furthermore, our analysis focused exclusively on scholarly articles written in the English language. It is important to note that the chosen time frame covers a period of ten years, specifically from 2013 to 2023. The final selection comprised 163 research articles.

Table 1 The selection search criteria

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2013-2023	>2013
Literature Type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press

Criteria for eligibility

From the total of 163 articles filtered through the screening phase, researchers move on to the third phase which is called the eligibility phase. At this stage, each publication's titles and primary material were thoroughly examined to see whether the inclusion criteria had been met and whether the study's research goals were being met. As a result, 128 articles were excluded from the overall analysis due to incompatible inclusion criteria. These articles were removed due to duplicates (n=1), the title does not significantly relate to the research objectives (n=59), and the abstracts do not align with the research purposes (n=69). A final total of 35 articles are now available for review, as shown in Fig.2.

Data Abstraction and Analysis

A variety of research designs, including mixed-method, quantitative, and qualitative ones, were examined and combined as part of the study using the integrative analytic assessment

technique. The competency study set out to find and examine important themes and subtopics, beginning with collection and extraction of data in the initial phase. Fig. 2 depicts the researchers' systematic approach to analyzing a corpus of 3,665 articles to find claims or material relevant to the current study's research goals. The author conducted a comprehensive analysis on the latest articles and publications associated with interactivity and films. Eventually, the author collaborated with another co-author, namely Suraya binti Md Nasir, an expert in comics and animation technology, with more than 10 years in the comic industry and a PhD in manga and anime from Kyoto Seika University.

The aim of this collaborative endeavor was to gather valuable insights, and create thematic categories based on data in the realm of design thinking and creative technology education, with the purpose of addressing any issues concerning the trustworthiness and precision of the research results. During the expert review phase, the focus is on assessing the consistency, significance, and appropriateness of each sub theme by defining its scope.

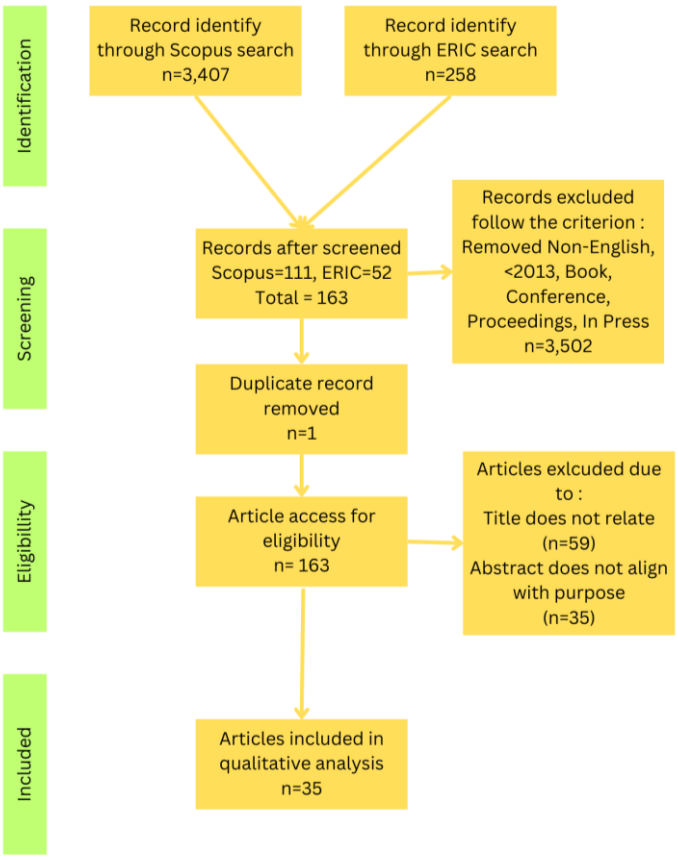

Fig. 2 Flow Diagram of the Research Study

Results

The results of comprehensive analysis on the selected research papers prove that the new era of interactive storytelling is a prominent discussion throughout the abstracts. The following three themes came to light:

Interactive Narrative and Media Convergence

In the rapidly evolving landscape of contemporary storytelling, the concept of interactive narrative and media convergence stands at the forefront of innovation. In the post-digital era, new artistic styles (post-media aesthetics) are emerging due to the convergence of different forms of media where these styles involve a mix of developments over time and at specific moments in time, and they allow filmmakers to manipulate visual and auditory elements in their work. Additionally, traditional artistic techniques are being adapted into software for use in this context (Boczkowska, 2021).

"Many visual storytellers would like to produce something interactive but do not know how to do so" (Gaudenzi, 2017). One key research question arises: How can researchers develop comprehensive analytical models that effectively capture the unique qualities of interactive narratives that merge elements of film and video games, enabling a deeper understanding of their impact on storytelling and audience engagement? This question highlights the need for robust analytical models that can accommodate the multifaceted nature of contemporary narratives. As audiences engage with stories that offer branching paths and multiple outcomes, researchers must grapple with the challenge of assessing the narrative potential of such interactive experiences. These models should consider factors such as narrative structure, player agency, and the impact of choices on the unfolding story.

Moreover, the theme of interactive narrative and media convergence emphasizes that storytelling is no longer a passive experience. Instead, it becomes a collaborative venture where audiences actively participate in and co-create narratives. This blurring of boundaries between media forms has led to the emergence of transmedia storytelling, where a single story unfolds across multiple platforms, allowing audiences to engage with different facets of the narrative through diverse media channels. An excellent example of this theme can be found in the exploration of interactive films or series where viewers make choices

influencing the plot's direction. One notable instance is the Netflix film "Black Mirror: Bandersnatch," released in 2018. The plot follows young Stefan, a programmer, as he attempts to turn the adventure novel "Bandersnatch" by Jerome F. Davies into a video game. Stefan has to make critical judgments all of the time since he has a significant mental disorder and an impending deadline. Depending on the future the audience chooses for him, he will either successfully complete the programme or overcome his delusions. For example, the movie stops for ten seconds and shows multiple choice questions on the screen each time Stefan must make a decision. The choices that viewers must make for the protagonist at this point might have an impact on how the plot develops and how the movie ends. This narrative format represents a fusion of cinematic storytelling and video game interactivity, pushing the boundaries of traditional linear narratives (Shiyu, 2019).

This convergence of media forms presents both opportunities and challenges for storytellers. On one hand, it allows for deeper audience engagement and immersion as viewers actively shape the story's progression. On the other hand, it requires storytellers to adapt to new narrative structures and account for the diverse pathways that the story can take. In summary, the theme of interactive narrative and media convergence highlights the dynamic and ever-evolving nature of storytelling in the digital age. It underscores the importance of adapting to new narrative forms and understanding the complex relationship between storytellers and their audiences in an era where storytelling extends beyond the boundaries of a single medium.

Impact of Technology on Storytelling

The impact of technology on storytelling is a theme that underscores the transformative potential of digital advancements in shaping narratives. These articles delve into how technology is not merely a tool but a driving force behind narrative innovation. They demonstrate how various technological developments, such as virtual reality (VR), augmented reality (AR), and interactive technologies such as game consoles, are reshaping narrative structures and providing opportunities for immersive storytelling experiences that were previously unimaginable. Technology has made it possible to incorporate new techniques in the representation of information (Sagri, 2018). The emergence of the console

as a primary means of disseminating interactive drama has expanded literature while simultaneously obfuscating the line between film and video game (Powell, 2020).

A significant research question within this theme is: How does technology impact the evolution of storytelling, and how can storytellers balance the potential for deeper audience engagement with the responsible use of these technologies in narrative experiences? This question delves into the potential capabilities of storytelling as technology continues to push the boundaries of storytelling. Immersive technologies, such as VR and AR, have the potential to create deeply engaging and emotionally resonant narrative experiences. Predictions are that if the idea of VR-based, interactive movies is extended, films could actually become like video games (Schulz et.al., 2021).

The impact of technology on storytelling extends beyond immersive experiences to encompass various facets of narrative creation and distribution. With the advent of digital platforms and the internet, storytellers can reach global audiences and experiment with new narrative forms. For instance, interactive documentaries (i-docs) utilize digital platforms to engage audiences in exploring complex social issues, such as urbanization, environmental concerns, or cultural diversity. These i-docs invite users to interact with multimedia content, encouraging them to participate actively in the narrative (Mundhenke, 2020). I-docs can function as hybridized media in a variety of ways, fusing journalism with online games and documentary filmmaking traditions to advance progressive causes related to race, the environment, reproductive rights, war, immigration, and religion (Dowling, 2022).

Furthermore, the theme emphasizes that technology is not limited to visual or auditory elements but extends to the physiological and emotional responses of audiences. Technology allows for the measurement of physiological markers like heart rate, muscle tension, and emotional arousal. These responses can provide valuable insights into audience engagement and guide the design of more impactful narratives.

In conclusion, the theme of the impact of technology on storytelling showcases the dynamic interplay between technological advancements and narrative creation. The key is to make sure that each interaction and media element contributes to the unfolding story, and that

the story itself is written and plotted just as well as it would need to be in any other, non-digital, non-interactive medium (Pope, 2020). It underscores the need for storytellers to strike a balance between embracing innovative technologies and addressing the ethical considerations that arise in this ever-evolving landscape of storytelling.

Audience Engagement and Interaction

The theme of audience engagement and interaction highlights the transformative role of contemporary storytelling, where audiences are no longer passive recipients but active collaborators in the narrative experience. Interaction experiences are a crucial part of interactive media and thus of interactive storytelling systems (Roth, 2015). An interactive video is a video built to enable engagement beyond viewing (Preradovic, Lauc & Panev, 2020). Interactivity is described as where one is not merely a passive observer in a film, the viewer, for example, makes inferences or has expectations during the viewing, the content of the film is generally not about the viewer. In some ways, the spectator is given a peek at the events taking place in the imaginary world, yet they remain alienated from it (Gimbel & Roman, 2019).

One pertinent research question within this theme is: How do different physiological and emotional responses of audiences (e.g., heart rate, emotional arousal) influence the design and outcomes of interactive narratives, and how can these responses be effectively integrated into storytelling to enhance audience engagement and immersion? This question underscores the significance of understanding and harnessing audience responses in the design of interactive narratives. By measuring physiological and emotional markers, storytellers can adapt the narrative in real-time to create more engaging and immersive experiences. The integration of audience responses adds a layer of interactivity that enhances the connection between the narrative and the audience.

Audience engagement and interaction have become central to contemporary storytelling, as they allow audiences to have agency and influence over the narrative's direction. This shift in the traditional storyteller-audience relationship is evident in various forms of storytelling, such as interactive films, video games, and transmedia narratives. The term hyper-narrative interactive cinema was introduced, which was defined as “hyper-

narrative structures, interaction and audio-visual design [that] should manage the multi-tasking split-attention problems these constructs engender and—most importantly—use this multi-tasking to enhance rather than reduce engagement" (Shaul, 2008). Moreover, the theme emphasizes that contemporary storytelling is no longer confined to a single medium but exists within a web of interconnected media. Transmedia storytelling, for instance, extends a narrative across different platforms, such as films, television series, books, games, and social media. Audiences are encouraged to engage with various media elements to gain a comprehensive understanding of the story's intricate world. This approach not only broadens the narrative but also enables deeper audience engagement as they explore different facets of the story.

The fusion of technology and storytelling, particularly in video games, takes audience engagement to new heights. Video games offer not only agency but also a dynamic relationship between players and the narrative. Players make choices, solve puzzles, and influence the story's outcome, making each playthrough a unique experience. This level of interaction and engagement distinguishes video games as a form of storytelling that goes beyond traditional linear narratives. Black Mirror: Bandersnatch plays between the classical narration and the videogame; in fact, the movie is not only thematically about video games but acts as one. It presents itself as a blend of a video game and a film (Marmol, Pintor & Morales, 2023). Additionally, the articles within this theme recognize that technology plays a vital role in facilitating audience engagement and interaction. Virtual reality (VR) and augmented reality (AR) provide immersive environments where audiences can become active participants in the narrative. VR, for example, places audiences within the story's world, allowing them to explore and interact with the environment. AR augments the real world with digital elements, offering new layers of engagement and interaction.

The theme of audience engagement and interaction underscores the evolving relationship between storytellers and their audiences. Storytelling is no longer a one-way communication but a dynamic exchange. The audience's role is elevated from passive observer to active co-creator of the narrative. Understanding audience responses, whether emotional, physiological, or interactive, is pivotal in crafting narratives that deeply resonate with viewers and participants. In summary, the theme of audience engagement and

interaction reveals that contemporary storytelling has entered an era of collaboration between storytellers and their audiences. This partnership between creators and participants results in narratives that are not only immersive and engaging but also responsive to the diverse choices and responses of the audience.

Conclusions

In conclusion, this systematic review has analysed the evolution of interactive storytelling and its influence on audience engagement in films. Through the comprehensive literature reviews, three core themes emerged: Interactive Narrative and Media Convergence, Impact of Technology on Storytelling, and Audience Engagement and Interaction. These themes underline the dynamic relationship between storytelling, technology, and audience participation, illustrating the transformative potential of interactive storytelling formats.

As interactive storytelling progresses, ethical considerations must be integrated into its development and practice. Concerns regarding audience privacy, consent, and manipulation necessitate careful attention. Future research and implementation efforts should prioritize the establishment of ethical guidelines and frameworks to ensure responsible and inclusive storytelling practices that respect audience autonomy and diversity.

Furthermore, the exploration of collaborative storytelling platforms presents a promising avenue for enhancing inclusivity and boosting audience engagement. By empowering diverse voices and perspectives, these platforms can democratize the storytelling process and amplify marginalized voices. Initiatives such as co-creation workshops and digital storytelling communities hold the potential to cultivate richer storytelling experiences while promoting social connection and cultural exchange.

Despite the advancements made in interactive storytelling, the challenge of evaluating audience engagement persists. Solid measures and methodologies are needed to accurately assess the effectiveness of interactive storytelling experiences. Future research endeavors should concentrate on identifying measurable indicators of engagement, such as immersion, emotional resonance, and narrative comprehension. By refining evaluation frameworks, researchers and practitioners can enhance the design and assessment of interactive

storytelling initiatives and explore ways of applying interactive storytelling into broader media such as cinema.

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