Creating Interaction: A Storytelling Framework for Arts and Design Referring Quantum Theories

Wenchang Lin, Fujian Jiangxia University, China

The Barcelona Conference on Arts, Media & Culture 2023
Official Conference Proceedings

Abstract
In art practices, the challenge of enhancing practitioner's creativity is the most important topic in the filed of arts and design. As once assumed, the creativity is the most vital ingredient as its appearance is unpredictable just like quantum leaps (Koyama and Niwase, 2017, p.3). Referring to the String Theory, the eleven dimensions of space-time might show similar patterns with information exchanges of interactions. The physicist "sets out to break nature down into its component parts while the artist synthesizes different features of reality" (Shlain, 1991, p.16). This deconstruction-reconstruction process is the core of structuring interactive stories, which might inform innovations for the art and design. I aim to apply trans-disciplinary thinking by bringing some insights from physics into art and design practices as inspirations for my research. To find opportunities that might encourage creativity in art practices, a storytelling framework for arts and design is developed and used as an interactive application to help create interaction. Therefore, I compare the "quantum entanglement" to the "information loop of interaction" as analogy between the physics and phenomena of art. By identify the eleven dimensions of interaction, a theoretical framework called Interaction Hyperspace is proposed, which helps create interactive stories and providing possibilities on innovated concept design. The research is also engaged with professional practices, including application programming, academic teachings, and interactive narrative design as case studies.

Keywords: Interaction, Quantum Theory, Storytelling, Creativity

iafor
The International Academic Forum
www.iafor.org

Introduction

In the realm of university education and the creative industry, students and practitioners often grapple with a common challenge: fostering creativity. While this issue is far from new, as countless educators and artists have devised their own methods, it continues to afflict students in the fields of art and design. These individuals frequently find themselves deviating from the ideal path aligned with their personal inclinations. In my pursuit of solutions to these challenges, I am in the process of developing a teaching tool and a novel mindset rooted in the construction of narratives, aimed at exploring a broader spectrum of possibilities within art and design. This journey commenced with my passion for delving into interactive design, and as I delved deeper into the intricacies of interactivity, my fascination with the essence of interaction in art and design grew.

Commencing with these inquiries, my initial research focus on interactive design has evolved into a form of meta-design, considering the interconnectedness within the realm of art and design as a whole, providing potential solutions for designers. In the quest to enhance creativity, the framework I have developed centers around the structuring of narrative elements, offering benefits to the core of design and delving into the psychological and philosophical aspects that underpin all forms of art and design.

The statement made by Koyama and Niwase (2017, p. 3) that "the sudden emergence of an idea is akin to a quantum leap" has profoundly shaped my perspective, linking the creative ideation process with principles drawn from quantum theory. In this research endeavor, I strive to adopt a multidisciplinary approach, drawing parallels between the worlds of physics and aesthetics. My exploration extends beyond the realm of interactive art and design, encompassing the establishment and nurturing of intricate connections. In the early stages of my research, certain concepts from quantum mechanics have been interwoven into the tapestry of interaction design. Furthermore, I have harnessed a narrative-driven framework called Interaction Hyperspace as a creative methodology to cultivate narratives and innovative concepts. In this article, I will elucidate the context that frames my research, its theoretical foundations, and a case study focused on the pedagogy of Animation Performance.

Background and Research Questions

John Polkinghorne (2002, p. 26) coined the phrase 'a world that is cloudy and fitful.' By extension, the various interpretations of narrativity, as seen through the diverse lenses of their readers, could be likened to the multitude of possibilities within the multiverse, a concept from the realm of physics.

Boje (2014, p. 201) introduced the concept of Quantum Storytelling, presenting a three-part model for the storytelling process: Empiric Stories, Epistemic Narratives, and Ontological Living Stories, all interconnected through the antenarrative progression. He explored the transformation of subjective experiences into narrative-based understanding, all while emphasizing his 11D's ontological approach.

According to Tang Li (2013, p. 11), transdisciplinary quantum narrative injects new dynamism into post-classical narratology and provides a fresh approach and cognitive framework for creating and understanding literature. Similar to the pivotal moment in Schrödinger's Cat thought experiment, where the narrative's outcome becomes clear, it's akin to the act of opening the metaphorical box. This doesn't entail the fabric of the universe

tearing apart but rather the observer gaining awareness of the universe within which the narrative unfolds.

Drawing inspiration from certain aspects of quantum theories, my operational definition of Interaction as Storytelling reveals parallels with patterns observed in information exchange. In this light, I draw a comparison between quantum entanglement and the information loop intrinsic to interactions, such as phone conversations, online chats, or even moments of eye contact. For instance, consider the photon, an elementary particle akin to the information theory concept of a *BIT*, constituting the smallest narrative unit.

In the context of art and design practice, interactions often emerge as unpredictable entities, much like the unpredictability inherent in quantum leaps. Recent research even suggests the anticipation of signals preceding quantum leaps, reminiscent of preludes before specific interactions, like the ring before answering a phone call. In this analogy, interventions aimed at reversing quantum leaps might be compared to the abrupt termination of an interaction or ending a call.

The objective of this practice-based research is to construct a creative storytelling framework that can enhance practices in art and design. Notably, this framework is founded on the concept of 'Interaction as Storytelling,' incorporating elements of quantum theories. By delineating an eleven-dimensional framework known as Interaction Hyperspace, it has the potential to stimulate the creative process, fostering innovation, and facilitating the analysis of storytelling within artworks.

The Research is Guided by the Following Questions:

- What is interaction from the perspective of quantum theory?
- How do quantum theories intersect with storytelling, forming the basis of art and design?
- How does the storytelling framework *Interaction Hyperspace* contribute to enhancing students' creativity?

The Theoretical Framework

I present a comprehensive conceptual framework for storytelling that explores eleven dimensions, a numerical choice inspired by the notion of supersymmetry in the realm of space-time dimensions, as initially recognized by Nahm (1999, p.7). This framework, tentatively named Interaction Hyperspace (as depicted in Figure 1), outlines these eleven dimensions to offer a deep understanding of the interaction phenomenon.

These eleven dimensions, collectively referred to as 11Ds, represent diverse aspects of interactions. They encompass Location, Action, State, Time, Interaction, Entangled Results, Time of Interaction, Possibilities, Intensity, Result towards the external, and Memory. Additionally, this construct incorporates a zero dimension, symbolizing the core entity responsible for initiating interactions.

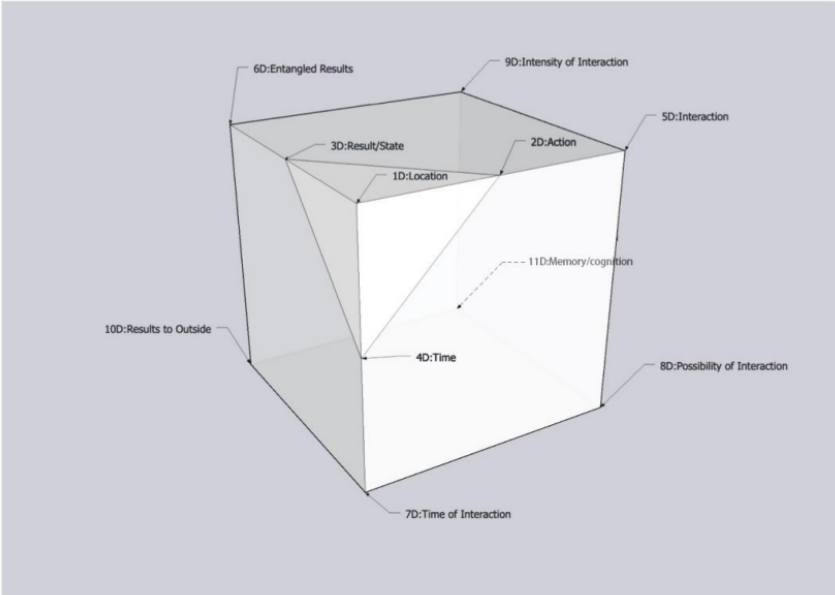

Figure 1: The Model of Interaction Hyperspace

As depicted in this model, a tetrahedron is integrated, housing the primary elements – the first four dimensions (4Ds). By altering these 4Ds, the model transforms into various narratives. It promotes exploring possibilities and risks, encouraging a departure from the search for a single, definitive answer.

In traditional storytelling, "the Five W's" of Communication – Who, What, When, Where, and Why – form the basic structure to convey information to an audience (Hart, 1996, p.139). Contrasting with this classic approach, my proposed 11Ds model shifts the focus to relationships and impacts between objects rather than central characters. The model can be dissected to explore binary relationships among people, objects, environments, and even within individuals themselves.

Building on my current understanding of interaction, I aim to broaden the definition, encompassing a wider array of species and types. This expansion seeks to liberate imaginative storytelling from design constraints and encourages individuals to challenge conventions and personal boundaries. This research project finds practical applications in various fields, including university education, industrial design, and interdisciplinary collaborations.

The methodology, designed to stimulate creativity, has the potential to offer individuals from non-traditional creative backgrounds a fresh perspective on innovative thinking that transcends conventional norms.

The Case Study: Animation Performance

Course: Animation Performance

Teaching Objectives:

In this course, students will explore creative thinking and physical expression as references for animation works. The primary aims include:

1. Cultivating creativity and sensory observation
2. Encouraging synesthetic experiences to feel like various entities
3. Promoting self-expression and relaxation
4. Thinking critically and performing as characters
5. Developing characters with comprehensive backgrounds
6. Documenting personal and peer performances
7. Creating frame-by-frame sketches for animation reference

Teaching Content:

1. Fundamental actions (narrative expansion)
2. Animal impersonation performances
3. Personification of non-living objects
4. Fine motor skills and body movement
5. Facial expressions and gestures
6. One-line improvisation performances
7. Storyboard relay
8. Acting scenes from classic movies
9. Combining virtual and real-world elements in the final assignment

Teaching Methods:

In this course, students will be guided through the learning process using the Framework Interaction Hyperspace to inspire creativity through osmosis. The class training will follow the "Perform, Associate, and Sketch" approach.

Class Training: Perform, Associate and Sketch

Perform: Students will act out given actions with their unique identities, backgrounds, and motivations. Four basic actions: "Opening a book," "Standing up," "Raising hands," and "Crying." Students divided into four groups, randomly assigned orders. Initially, they will act out the actions with self-created identities. Subsequent rounds add details, including location, states, causes, and results. The goal is to enhance the action with creativity and dramatic elements.

Associate: Exploring the difference between stage performance and animation performance, students will add depth and fun to their actions. Focus on understanding the uniqueness of animation performance. Add dramatic effects to the actions. Create unexpected results to form memorable and meaningful narratives. Each round of performance will follow lectures and examples to enrich the students' understanding of character development and storytelling.

The physical performances will serve as immersive references for virtual character design and storytelling. By merging the animated world with the real world, students can develop deeper empathy for their characters. The Interaction Hyperspace framework serves as a guide to aid in teaching, promoting creative narratives and character development. While some elements are highlighted in the class, aspects like 4D time, 5D interaction, and 7D time of interaction are considered integral to the overall learning experience.

Discussion

Concluding the teaching segment, I conducted an anonymous questionnaire survey to gather feedback from the students regarding their learning experience. The questionnaire featured four open-ended, non-mandatory questions, strategically crafted to elicit subjective viewpoints from the students. This process served a dual purpose, facilitating a succinct and introspective evaluation while also establishing the foundation for future qualitative research through case studies.

It is essential to recognize that although the students voluntarily participated in the questionnaire, this approach had its merits and demerits. On one hand, the lack of obligation allowed students to respond candidly and ethically positively to the questions, potentially fostering more honest feedback. On the other hand, the quantity of feedback gathered was considerably less than the total number of attendees, with only 12 out of 70 participants. Moreover, some responses were overly simplistic, lacking in detailed information.

Considering that this phase marked the inception of my case study research, it provided valuable insights to refine my question formulation skills and enhance the effectiveness of data collection during interviews. Despite these challenges, a rich source of meaningful responses emerged, underscoring the success of my teaching approach and its alignment with the intended educational objectives. This initial feedback not only serves as a testament to my teaching methods but also lays the groundwork for further research into student learning experiences and their impact on creative thinking and performance.

Conclusion

The framework *Interaction Hyperspace*, which serves as a structural guide for crafting narratives, is currently in its early developmental phase. The intention is for this framework to evolve into a novel methodology geared towards aiding individuals within the creative industry to scrutinize their artistic and design endeavors, while aligning these assessments with sociological and psychological perspectives.

In its current iteration, this framework has been incorporated into teaching practices centered around script writing and animation planning. The utility of this framework has become evident, particularly in its ability to stimulate students to generate a greater number of design concepts and in its provision of diverse avenues for fostering design thinking.

As the research advances, my subsequent focus will likely pivot towards investigating student responses across varied backgrounds and discerning the efficacy of the framework within multicultural classroom settings. This progression represents the next phase in my research journey.

References

Boje, D. M., & Saylors, R. (2014). An ontological perspective on process. *Language and communication at work: Discourse, narrativity, and organizing*, pp.197-218.

Hart, G. (1996). The five W's: An old tool for the new task of task analysis. *Technical communication*, 43(2), 139-145.

Jarmusch,J. (2013). Things I've Learned: Jim Jarmusch, *MOVIEMAKER*, https://www.moviemaker.com/jim-jarmusch-5-golden-rules-of-moviemaking/

Koyama, K. and Niwase, K. (2017). 'A Linear Approximate Model of Creativity in Quantum and Chaos Theory', *NeuroQuantology*, 15(4). Available at: https://doi.org/10.14704/nq.2017.15.4.1038.

Nahm, W. (1999). Supersymmetries and their representations. *In The World in Eleven Dimensions: Supergravity, Supermembranes and M-theory,* pp. 7-24.

Polkinghorne, J. (2002). *Quantum theory: A very short introduction*. New York: Oxford University Press Inc.

汤黎. (2013). 量子叙事: 一种全新叙事模式. *国外文学*(4), pp. 11-18.