"Hao Shi Duo Mo": The Combination Practice of Gameplay and Culture Art with IPO-AER Principle

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Abstract
Up until the early 1960s, rural Taiwanese people used grindstones to grind food items such as beans or wheat. As technology developed, this tool gradually fell out of use in Taiwan. Yet for the older generation, the tool remains a symbol of the belief that hard work will lead to prosperity. This paper aimed to invoke these memories and beliefs through the design of an innovative museum exhibit. To achieve this, we designed a human-computer interface using the form and feel of this important historical artefact. We analyzed the design of this exhibit using the Idea-People-Object-Physical Attract-Engage-Flip (IPOP-AEF) model developed by Pekarik, Schreiber, Hanemann, Richmond, and Mogel (2014). The designed exhibit "Hao Shi Duo Mo" was on show in Taiwan in May 2015. It was well-received by visitors, which was likely due to its fulfilment of each of the six elements of the IPOP-AEF model. This analysis serves as valuable reference for exhibition designer and artists.

Keywords: grindstone, IPOP-AEF principle, interactive installation, culture art

Introduction

The rapid advance of technology in recent years has thrown a large number of human tools, which were only a few decades ago considered essential, into obscurity. These items still however hold a significant place in our heritage, and their cultural legacy is worth preserving. This study explores the historical importance of the grindstone in Taiwanese culture and mediums of conveying this context to the general museum-going public. Through the theoretical framework of IPOP-AEF, we designed and evaluated an exhibit focused on this artefact. Our team designed an interactive digital installation in which a grindstone formed the principal element of the user interface. The design of this exhibit, entitled "Hao Shi Duo Mo," used the above framework to take the preferences of visitors into consideration.

1.   Context of the grindstone in Taiwan

The grindstone was a household tool in rural areas in general use until a few decades ago. Comprising two circular stones of different sizes, one lodged inside the other, the grindstone was used to grind foods such as rice, wheat, and beans into powder (see Figure 1). It was manually operated by humans or animals. This tool was also used to make pastries and cakes. Similar tools were in use in other countries. The Japanese call it a "mortar" (いしうす), while it is called a "grain miller" in western countries. This paper specifically examines the social context associated with the grindstone in Taiwan.

Figure 1. Grindstone in use
(Photo credit: http://paper.wenweipo.com/2013/08/02/WY1308020004.html)

As technology advances, everyday life is made more and more convenient with the proliferation of automated modular devices. Yet this shift is accompanied by the loss of items that represent traditional and historical values (Dai, 2004).   Among these is the grindstone. Its growing obscurity has been well-noted:

Since the 1960s, grindstones are rarely seen in Taichung… At that time, you could buy any pastries you like in the marketplace. Fewer and fewer women made rice cakes when they needed to offer sacrifices to ancestors at certain occasions. Yet my mother-in-law was frugal and insisted on making rice cakes every year. She used

electric grinders and molds to make rice cakes, saying they tasted better than the ones bought from vendors. (Lin, 2011, web page)

Turning a grindstone is time-consuming and laborious… not to mention that the food ground from it is very soon eaten up. Then you must turn the grindstone once again for another batch of pastries, rice cakes, or rice dumplings… Since the electric grinder was invented, the grindstone fell out of use. Today the few grindstones that are to be found in households or restaurants are displayed as antiques and used to add a nostalgic air. (Wu, 2006, web page)

In Taiwan, the grindstone is often used as a garden water feature, acting as a portent for a good harvest and prosperity (Figure 2). Pronounced "Shi Mo" in Chinese, a grindstone literally advises us to be strong and face challenges head-on. It serves as a metaphor indicating that in the end everything will turn out well. For older generations in Taiwan, these connotations are deeply rooted, and are integrated into their spiritual beliefs. This artefact is therefore an important symbol endowed with multiple meanings and is worthy of a steadfast place in our modern culture.

Figure 2. Grindstone used as a water feature in a Chinese garden

In recent years, local associations for the conservation of cultural assets have made efforts to collect cultural items for display in local museums. Their aim is to provide access for the general public to important cultural historical artefacts and to build a platform for cultural knowledge dissemination. The mere physical display of antiques such as a grindstone however seems an inadequate channel for conveying the heritage of the item. We therefore sought to design an innovative exhibit which would more effectively present the history and connotations of the grindstone.

2. Experiences of Museum Visitors

For many people, a museum is the only place where they will ever see a traditional grindstone. Audience studies have been an important topic in exhibition design and museum research in recent years. In this kind of research, the exhibition, the information it contains, and every audience member in the exhibition are considered part of an interactive process. An increasing number of exhibitions are beginning to adopt innovative approaches to better appeal to visitors.

2.1 IPOP-AEF principle

Andrew, Zahava and Jean (1998) conducted a survey among the participants who attended an exhibition called "Puja: Expressions of Hindu Devotion" (1996). This was the first study to explore audience experience within the field of museum research. Their results demonstrated that visitors use very different foundations in the formation of their judgments or preferences. Some are attracted to ideas (or learning), some want to know more about people (and their emotions), while others focus on the aesthetics of objects. These observations were later formulized into the Idea-People-Object (IPO) model (Andrew, James, Nadine, Kelly & Barbara, 2014).

Pekarik and Mogel (2010) extended the IPO model with the introduction of three basic principles for the organization of an exhibition: Attract, Engage, and Flip (AEF). As materials and exhibition styles have diversified, a new element was added to the model: physicality (Pekarik and Schreiber, 2013, 2014). This aspect is used to analyze the extent of physical engagement experienced by the visitors, through for example bodily movements, hand contact, sound, light, or odor. The IPOP model can be readily used to design or analyze any exhibition. Using the three basic principles, an art curator can be sure to *attract* the viewers' attention so they will stop in front of an exhibit, to improve their *engagement* during the process, in order to help their perspectives *flip*, i.e., lead to a radical change in perspective or engage them in a memorable experience. The emergence of the IPOP model attests to the fact that audience satisfaction is gaining wider attention in the academic community. The present paper considers a case study of a museum exhibit which puts the principles of the IPOP-AEF model into practice.

3.   Interactive installations

Ridel et al. (2014) presented a visualization system that boasts the technology of "augmented reality" in which real objects and 3D models are integrated to enhance audience interaction. For example, in that study spectators were able to explore information by shining a flashlight over specific areas of the exhibit. For this kind of system, information is best displayed in graphs or images rather than text-heavy descriptions. Ridel et al. (2014) conducted follow-up interviews with audience members, many of whom expressed positive attitudes toward their exhibit.

With the aid of interactive technology, museum-goers can engage in a hands-on experience to aid in cultural appreciation. Interactive technology has also been applied to art representation. Human-computer interaction helps to boost audience satisfaction. A successful installation artist is therefore expected to adroitly manipulate each aspect of self (cognitive, physical, and emotional) in the creation of his/her artwork to render a multi-layered interactive installation that conveys his/her innermost ideas in such a way as to elicit a strong response from his/her audience (Winkler, 2000).

4.   Design of "Hao Shi Duo Mo"

The name of the exhibit is a play on words. "Shi" and "Mo" refer to the grindstone. "Hao Shi Duo Mo" implies that all will eventually be well as long as one makes every effort to remove the obstacles in one's way. The grindstone was an everyday tool in Taiwanese culture that became iconic of hard work. This was a trait admired by the

Taiwanese people. Although the grindstone has fallen into disuse, this trait is still valued in Taiwanese culture. Many people strive for their lifelong goals with relentless determination and effort, just like their ancestors turned the heavy handle of the grindstone day in and day out.

As discussed above, the artwork "Hao Shi Duo Mo" was presented in the form of an interactive installation so as to provide a hands-on experience for attendees. This installation comprised a wooden box, into and onto which was placed a system for human-computer interaction (shown in Figure 3). This installation allows viewers to interact with the interface while absorbing relevant information displayed on-screen. The interaction into which the viewers were invited comprised three stages: Seeking, Grinding, and Obtaining. This was designed to mimic the process of using a traditional grindstone. It is symbolic of the manner in which determined people pursue their goals: setting the aim, enduring hardships and facing challenges, and arriving at their destination.

Figure 3. Interactive installation "Hao Shi Duo Mo"

4.1 Interactive interface

At the start of the exhibit, animated icons are on the computer screen, and when the visitor operates the installation, animations and text guide him or her through the three-stage process (Figure 4).

Figure 4. Stills of on-screen animation

Stage 1: "Seek"

In the first stage, five building blocks are displayed. These blocks represent five categories of goals people often set for themselves: health, love, family, career, and dreams. The visitor selects a block and places it into the grindstone. This mimics putting the raw food ingredient into the grindstone in the process of creating a desirable foodstuff. Each block corresponds to a different game scene (Figure 5).
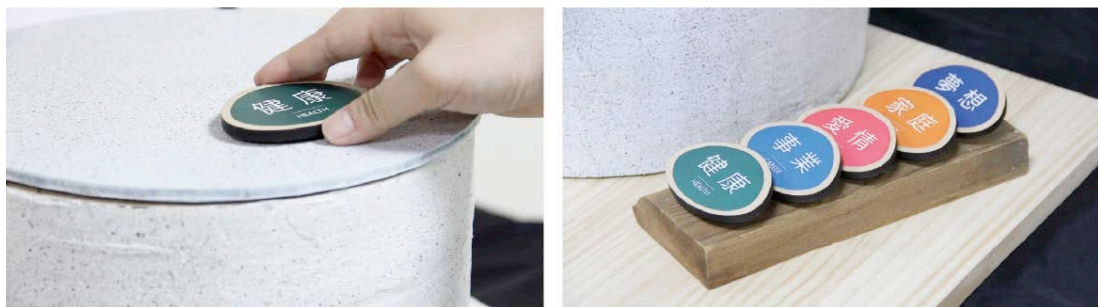

Figure 5. Five building blocks

Stage 2: "Grind"

To achieve one's goals, one must usually exert a large amount of effort. In this stage, the visitor controls a game character who moves up or down through manipulation of the grindstone. (Figure 6)
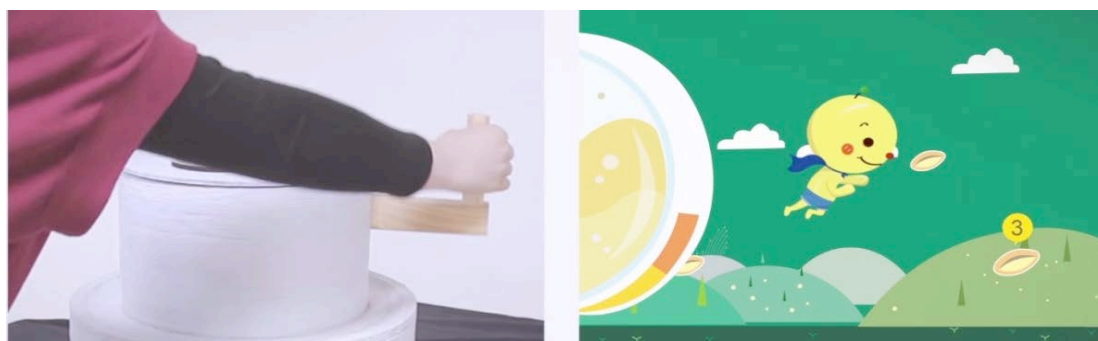

Figure 6. Operation of the grindstone

Stage 3: "Obtain"

When the visitor completes Stage 2, he/she sees a feedback animation on the computer screen. Each game scene returns a different digital result on-screen, and also drops a physical card down the chute of the grindstone, granting the viewer a concrete reward for his/her efforts. (Figure 7)
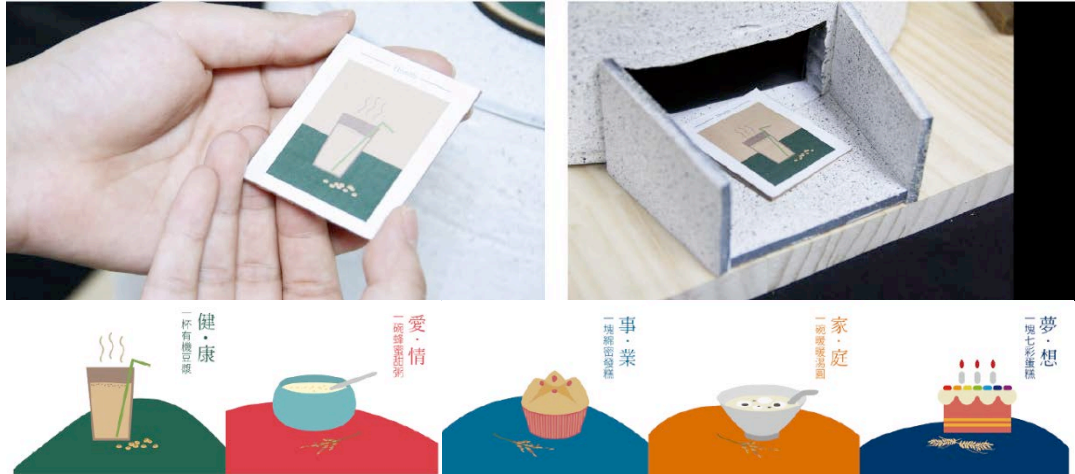

Figure 7. "Hao Shi Duo Mo" rewards hard work

5 . Results and discussion

"Hao Shi Duo Mo" was the result of a collaboration among five artists (Figure8) and was displayed at the Young Designers' Exhibition (YODEX) at the Taipei World Trade Center from May 1 through May 4, 2015. The exhibit received enthusiastic feedback from the audience (see Figure 9).

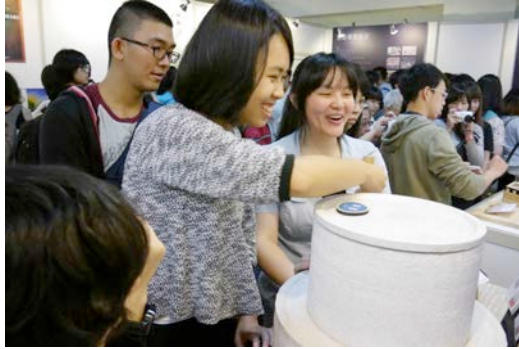Figure 8. Designers of "Hao Shi Duo Mo"

Figure 9. Visitors to YODEX 2015 enjoying "Hao Shi Duo Mo"

"Hao Shi Duo Mo" is an innovative design pioneering interactive interfaces for museum exhibits. In this paper we proposed six elements for the practice of interactive exhibits with IPOP-AEF principle for discussion.

Idea:

A representation of cognitive thinking: Knowledge is traditionally presented in a direct fashion in museums and cultural associations. The designers of this exhibit conveyed knowledge in an inviting style so as to attract the eye of visitors and to engage them in an active participation. In this way, the audiences was totally immersed in the desired conceptual understanding while in pursuit of the storyline.

A thought-provoking mechanism: Many exhibit-goers enjoy a lively conversation with the exhibits they are watching for emotional or intellectual satisfaction. They do this simply because they love this simultaneous interaction. Therefore it might be very important for a curator or artist to actively provide a stimuli from which attendees may get inspiration and get a "flip" sense out of partaking in the process. This is what the "Hao Shi Duo Mo" intends to accomplish in the stage of seeking.

People:

Enacting roles to connect: People who live in different times and circumstances have divergent ways of thinking. Yet we tend to harbor curiosity toward people and things that are unfamiliar to us. Through taking on new and different roles, we can develop a connection with these seemingly strange things. Viewers seem to find much excitement in the "grinding" phase, grinding grains in a similar way to their forebears. This participation allowed them to experience a "flip" of perspective. This further triggers discussion among viewers and may well enhance interaction at the venue.

Object:

Aesthetic representation: For an exhibit (object), the aesthetic representation consists of the exhibit itself as well as its surroundings. For an art installation that boasts high technology, however, it is the overall appearance combined with the functions and appearance of its software and outer furnishings. Aside from visual language, technology-aided interfaces are an important route to engaging audience members.

Environmental factors: Audiences may have differing perception of an object under differing contexts. For example, a grindstone placed in a bustling space (like YODEX) might provoke very different effect on audience members than one placed in a quiet museum. "Hao Shi Duo Mo" was originally intended to convey a sense of "slowness" to the viewers, drawing on its historical context, but the busy atmosphere of YODEX seemed to have exerted a negative impact on the audience in this aspect. Some viewers lost patience with the pace of the game and even suggested fast-forwarding the introductory animation.

Physical

Gains: People tend to want to make physical contact with new media and engage in a hands-on experience rather than passively experiencing new information. The mention of "gains" refers to the satisfaction felt by visitors who touched the exhibit or operated the 3D interface, and also a sense of "worthiness" about the time spent in the process. Virtual technology provides a unique opportunity for attendees to interact with artworks, yet we recommend future researchers continue to seek out new and diverse ways to engage participants. Authenticity was an important goal of this project "Hao Shi Duo Mo". It was designed with the aim of giving the audience an accurate feel of this traditional experience and artefact. The time, speed, and necessary application of force were all determined by the parameters of the topic. We believe this level of authenticity aids the audience in feeling satisfaction and acquiring a sense of having gained something from the process.

Conclusion

As audience studies have gained momentum, curators and artists have learned to integrate the opinions of their audiences, or even the audience themselves, into their installations. In its representation of the traditional grindstone, the value of "Hao Shi Duo Mo" lies in the experience it grants its audience, one that is enjoyable and memorable, bringing to life this important historical and cultural artefact to preserve our heritage. The integration of advanced technology helps to create a lively and appealing atmosphere that is difficult to match with conventional exhibitions. Although it is not always possible to satisfy the diverse needs of all attendees at an exhibition, the IPOP-AEF model seems to be an effective approach which allows designers to consider the perspectives of their market (visitors).

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