

# Research on Key Theory and Internal Mechanism of Design Thinking in Public Art

Zhang Zejia, Yuhani Bin Ibrahim

Faculty of Creative Technology and Heritage, University Malaysia Kelantan, Pengkalan Chepa, Kota Bharu, Kelantan, Malaysia

Faculty of Creative Technology and Heritage, University Malaysia Kelantan, Pengkalan Chepa, Kota Bharu, Kelantan, Malaysia

## ABSTRACT

The research on the key theory of design thinking in public art involves the analysis of a mind work that cannot be observed by the naked eye. This research analyses the laws and characteristics of design thinking in public art through the study of various forms of creations and their internal mechanism. Research has shown that the internal mechanism of design thinking in public art occurs in the process of transformation between logic and imagination. The process of using language or words to describe an object requires logical thinking; whilst the process visualization of discrete object to fulfil one's fantasy using experience, imagination, and simulation within the mind requires imagination. In the meantime, studying the role of visualization and viewpoint breakthrough in public art design thinking allows one to improve design thinking, create unique imagination and widen space for logical thinking. An in-depth analysis of the internal mechanism also provide opportunity for further improvement and strengthening.

**Keywords:** key theory; internal mechanism; logical thinking; imagination; visualization; viewpoint breakthrough

## 1 Introduction

Public art is a creative pursuit conducted by humans to achieve certain objectives. It is the most fundamental workspace for humans to modify the physical world for survival and evolution. <sup>[1]</sup> Humans have never stopped their artistic thinking in public arts and creations ever since they first started creating to fulfil the needs of daily lives. <sup>[2]</sup> Since ancient times, design thinking has evolved continuously, resulting in the accumulation of immense creativity for humans; rapid advancement of modern science and technology has caused the replacement cycle to become shorter, hence concluded that the future of public arts does not depend on the quantity in the market but the unique and creative design. <sup>[3]</sup> Public art innovation requires change in the way of thinking and transformation of concept to adapt to this change in the market. While a change in the way of thinking and transforming the concept requires one to break up and analyse the old concept in order to rebuild and create a new and more reasonable method. <sup>[4]</sup> A clear understanding of the process of design thinking in public arts is crucial to solve these problems in order to better grasp the laws and innovations of internal mechanism. <sup>[5]</sup>

## 2 Specialties and Methods of Internal Mechanism of Design Thinking in Public Arts

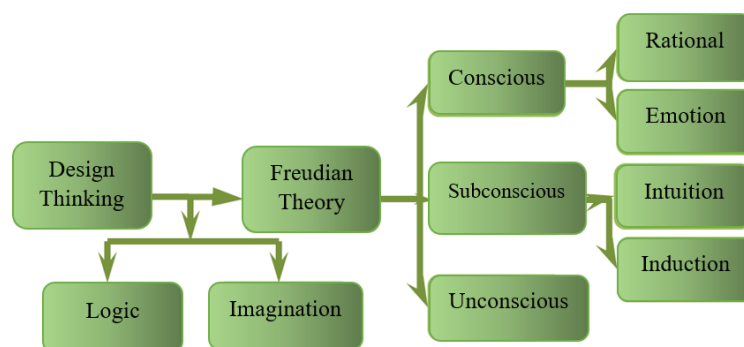


Figure 1: Internal Mechanism of Design Thinking in Public Arts

## 2.1 Fundamentals and Performance of Design Thinking in Public Arts

Design thinking in public art differs from purely artistic thinking. It is not just about regular arts that posses imaginary thinking, but also about logical thinking. <sup>[6]</sup> Logical thinking is the fundamental of rationality, whereas imaginary thinking expresses one's personality. Logical thinking in public art design thinking is categorised under rational cognition since it involves the process of analysing, organising, evaluating and decision making, as well as preserving the image of the physical world as perceived by the human mind by prioritising the material functionality, technical uniqueness, and the value elements. The speciality of imaginary thinking is that the mind perceives reality as a whole instead of different pieces, it is then rearranged, processed, reorganised and a new image is created through imagination. It is a breakthrough in the way of thinking, a reasonable conclusion of perceptual thinking on the basis of logic, by endowing the material world with souls through creative thinking. Research has shown that the correct method is by understanding how to utilize logic and imagination in public art design thinking to discover, contemplate, study and solve problems. This is done by listing phenomena, discovering factors plus the external elements to be able to find the association to connect the dots, hence the thinking process. <sup>[7]</sup>

## 2.2 Freudian Theory of Design Thinking in Public Art

This key to connection of the design thinking process is to connect the elements in designing through public art design thinking. We can have a better understanding of this connection by referring to the theory by Sigmund Freud who is the founder of psychoanalysis. <sup>[8]</sup> Freud divided the human consciousness into three main levels, namely conscious, subconscious, and unconscious. Rational thinking and emotions occur at the level of consciousness, while intuitive experience and thoughts are at the level of subconsciousness. From Freud's Theory, it can be concluded that the internal mechanism of public art design thinking is an objective-subjective-objective process. The main processes consist of three stages which are the preparation stage, to conduct a comprehensive investigation of the problem, to determine the direction of public art design, and to conceive a creative plan; the design stage, to find a breakthrough for a solution; the review stage, to revise and adjust; the perfect stage, which is the finalized plan. It should be clearly understood that design thinking in public art not only emphasizes the inspiration of pure art, but also includes comprehensive technical work and highlights the ability of comprehensive thinking and analysis.

## 3 General Laws of Design Thinking in Public Art

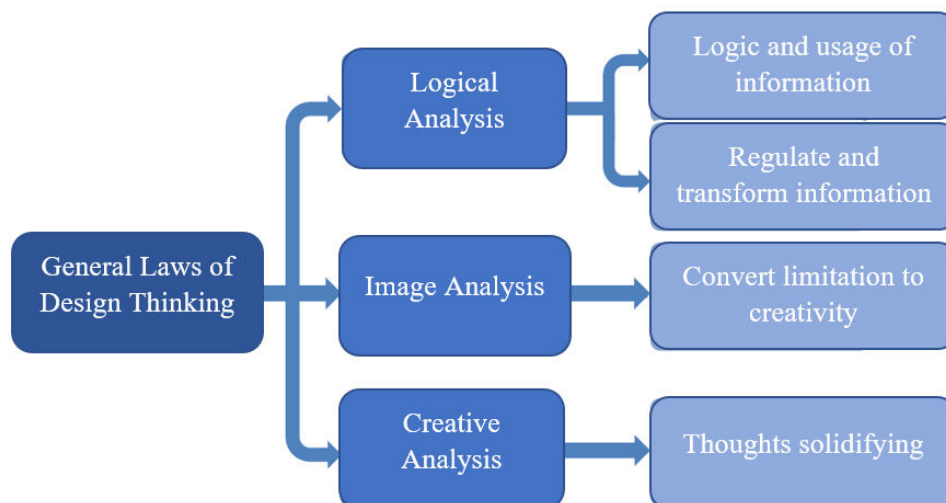


Figure 2: General Laws of Design Thinking

### 3.1 Logical Analysis of Design Thinking in Public Art

First and foremost, a theme must be established through research, data collection, formulating design plans, and utilizing language as a tool with strong logic to deliver description towards an established subject. Nevertheless, visual thinking which requires strong imagination allows the mind to configurate creative arts by utilizing methods from experience, imagination, simulation, etc. to form myriads of images in the mind. <sup>[9]</sup> Hence, logical thinking plays a major role, while imagination plays a secondary role. Public art design is also a logical analysis

and study of functional requirements, production characteristics, values, and material properties which act as the resources of public art design with strict scientific standard. This research shows that a designer's logical analysis and intuition towards materials and process technology play a vital role as inspiration for public art design thinking. Every material possesses distinct properties. Designers should be good at discovering materials and making use of them while considering the color, texture, pattern and shape which can directly encourage creation.

### 3.2 Image Analysis Method of Design Thinking

Any public art design is not something that the designer pursues based on the subjective judgement of the designer. It is limited by the characteristics of information and materials, which are an invisible shackle to the designer's image thinking. This information determines the design content, form, stylistic technique and determines the freedom of conception which in turn hinders the development of conception [10]. Image thinking and logical thinking carry a perception which leads to the germination of public art design conception, leading to accumulated reasoning and a sense of individuality reflection [11]. The concept of public art design has a sense of strong pertinence and purpose waiting for a breakthrough and an advancement in thinking through the coming forth of inspiration. At this time, image thinking is three-dimensional thinking and creative thinking that is constantly extending and expanding along the vertical and horizontal aspects at different levels of the development of things.

### 3.3 Creative Analysis of Design Thinking in Public Art

In creative thinking, imagination can be stimulated when the thought subject is embodied, and certain images are formed in the mind. This thinking ability allows us to predict the result and image of the end product and 'see' it before the product is actually finished. For instance, in the process of public art design, materials from different memories will appear in the mind, then through logical induction they are organized and adjusted. Then imagination is developed, and innovative solutions are found, which then are included or removed, and lastly converted into design prototypes according to design requirements.

## 4 Association Between Logic Thinking and Imagination in Public Art Design Thinking

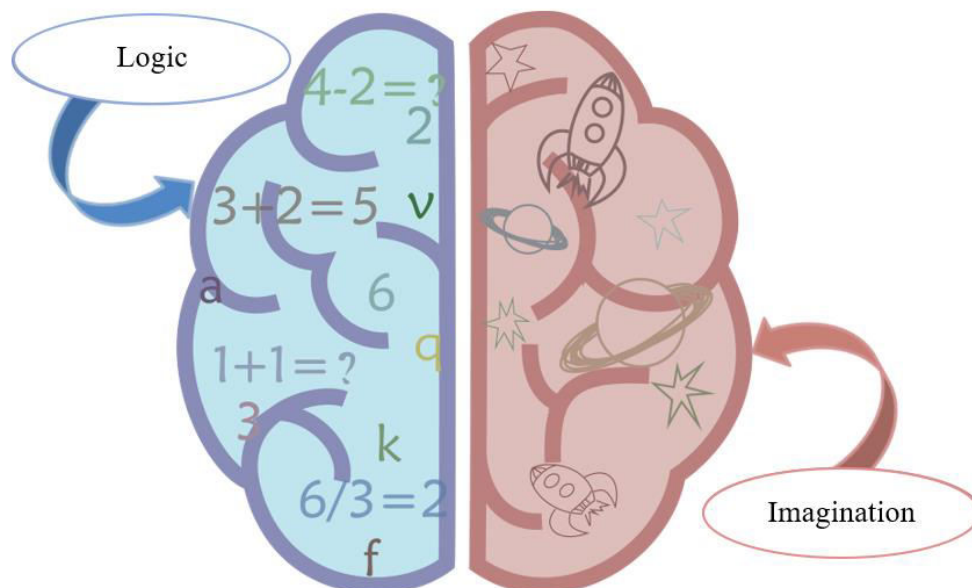


Figure 3: Logic thinking and Imagination in Public Art Design Thinking

### 4.1 Left-brain and right-brain ideological activity

Public art design thinking is an ideological activity of the human brain. The human brain is generally divided into the left and right hemispheres which are respectively responsible for different functional areas. Logical thinking and image thinking belongs to these two different hemispheres of the brain [12-14]. As the world master of arts and crafts, William Morris said: "The essence of design method is the combination of image thinking and logical

thinking, which is an intellectual structure.” Research shows that in the specific operation process of design thinking and logical thinking, there is no clear dividing line between them. The thinking process of the human brain is a complex three-dimensional space. From the beginning of the topic selection, conception and production of public art design, logical thinking and image thinking plays a mutual role in promoting each other’s development. Logical thinking plays a role in the entire design process through the intuitive way of image thinking, which is connected in the series with neural information transmission of the left and right side of the brain and eventually ideological activities.

#### 4.2 Ideological fusion

In the concept of public art design, design thinking is the point of intersection of scientific logical thinking and artistic image thinking. The process of design thinking is the process of co-creation of scientific logical thinking and artistic image thinking. Public art design represents the intersection between science and art. Therefore, design thinking roams freely in the two worlds of logical and image thinking, integrating them as one and runs through the entire ideology of public art design thinking, which is reflected in the visual communication design, industrial product design, fashion design, environmental design etc.

## 5 Research Element of Design Thinking in Public Art

### 5.1 The function of vision

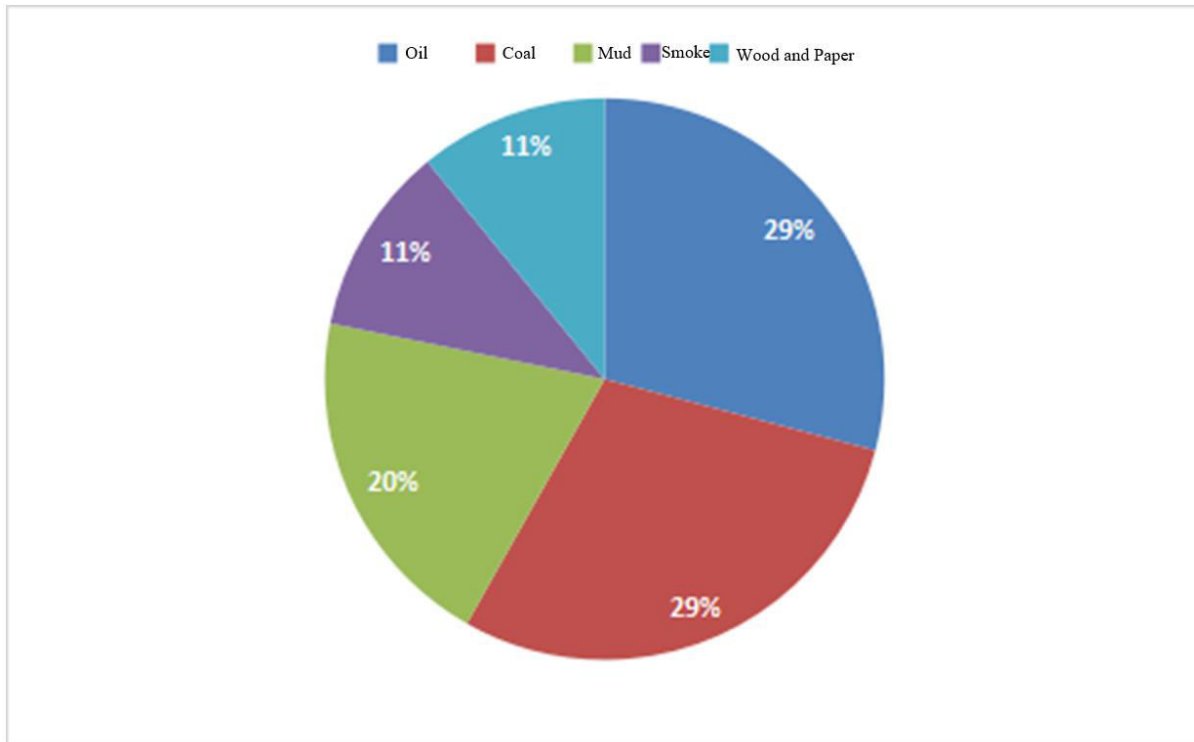
The function of vision is to analyse the design thinking of public art works from the perspective of sensory organic materials and inorganic materials. The sight range has a wide coverage utilizing the Japanese “Mono-ha” as a foundation in order to choose the industrial materials such as oil, charcoal, mud etc., to carry out visual function decomposition.

Liquid mineral oil, a natural material that exists beneath the earth is closely related to the development of industry. In our life, industry gives us the impression of a world of steel and oil. When a person stumbles upon a public artwork of mineral oil, the environment is reflected by what appears to be a calm, huge mirror. The surrounding scenery is infused into the artwork. The objects and people around, including the viewer himself, all images gather at the same time in the mirror surface of the oil, all are the embodiment of reality and have an inseparable relationship, which promotes innovative changes in the visual functions.

The function of charcoal has been closely related with the development of human civilization since ancient times and is closely connected with fire. The visual perception of charcoal is that it releases heat energy during combustion which is appreciated by humans. The charcoal public art works by Katsuhiko act as a medium to reflect a vision that is a relatively common creative element in design thinking.

Mud that is a formation from water and soil is concrete as a substance, The material phenomena of soil and water both act on vision through functional combination. Mud is an organic object composed of soil and water, remains neither hot nor cold and has a sticky texture to it. Kasuo Shiraga’s public artworks represent a visual functionality that is a living body full of heat.

The root problem of visual function research is the selection of material materials and the essence of visual presentation. In the 21st century, public art is more inclusive and contemporary. Due to the change of spatial structure, the elements of material selection are constantly expanding and developing. This can be said that the element of visual function is constantly improvising and finding new breakthrough points in terms of materials and objects which are in accordance to the context of different forms in vision. (Refer Chart 1)



**Chart 1: The Proportion of Material Selection by the Japanese “Mono-ha” Public Artist**

### 5.2 Viewpoint Breakthrough

The self-positioning point is emphasized in the breakthrough of vision due to the choices we incur brought by the impact from the outside world. The external factors of public art design thinking include the impact and stimulation from the Western art, allowing us to recognize the importance of the culture, awakening and perceptions from the Eastern and Western culture. In the culture of heaven and earth, one is constantly breaking through the viewpoints and maturing. In the aesthetics of the times and public aesthetics, firstly a self-conscious public art design thinking method should be discovered, and then expand to a wider mechanism, emphasizing on the exploration and research of the essence of thoughts.

The motion state for searching and exploring objects is the signal points generated when searching and exploring objects through a visual medium. Through the logical thinking experience, judgment and analysis of the brain, a pre-set image of thinking is formed hence reflecting the shape and size of the object from the thinking. During the movement of the viewpoint, the position changes constantly along with the displacement by time. In real social life, various perspective factors, secular, traditional and living conditions inspire people’s way of thinking and source of creativity. However, in order to surpass and break free from the internal conflicts, viewpoints often have to go through a process of enrichment, find and explore a new form of thought process that can trigger a greater inspiration in terms of design. At the same time, viewpoints co-exist in the human spirit and natural materials. When the internal subjective viewpoints collide with new external viewpoints, the sparks caused from the collision may create new viewpoints, generate new ideas, broaden horizons and bring vitality to public art design thinking.

## 6 Conclusion

With the rapid development of the world’s economy and culture, the original unified process model has gradually entered an era of development with individualized characteristics and excellent public arts. Creative designers can guide the new development direction of the industry in this era. Designers should also be good at creating their own unique design thinking methods, set up their own design logic thinking and have a vast imagination, at the same time have a profound understanding on the uniqueness and method of internal mechanism as well as constantly improve and strengthen them, making them the pillars of the industry development in the new era.

## References

1. Zhou Shu Hua, Xiong Xing Fu. The Dualoty of Public Art Design Thinking [J]. Packaging Engineering, 2005, 26(6):217-219.
2. Lin Lin, Shen Shu Sheng. Conceptual Connotation And Training Strategies of Public Art Design Thinking [J]. Modern Distance Education Research, 2016(6):18-25.
3. An Wa. The Application of Interaction Design Thinking in Service Experience [J]. Packaging Engineering, 2015(2):5-8.
4. Hu Rong. Research on Universal Design Value and Design Thinking [J]. Packaging Engineering, 2014, 35(20),122-125.
5. Yin Bi Ju, Li Yan, Xiong Yan, et al. Research Status and Development Trend of Public Art Design Thinking [J]. Computer Integrated Manufacturing System, 2013,19(6):1165-1176.
6. Neil Anderson, Caroline Timms, Karin Haji Hashimi, et al. Using Design Thinking Methods to Improve the Quality of Online Learning [J]. China Distance Education, 2014(9):5-12.
7. Thomas Lockwood, Li Cui Rong, et al. Design Thinking: Intergrating Innovation, User Experience and Brand Value[M]. Electronic Industry Press, 2012
8. Li Jin. Interpretation of Packaging Design Thinking in Brand Redesign [J]. Packaging Engineering, 2014, 35(4):9-12.
9. Zhao Wen. Design Thinking and Design Experession in Art Design Teaching [J]. Journal of Taiyuan University College of Education, 2009,27(b06):86-88.
10. Wu Guo Qiang. Walking Design Thinking – An Exploration of Design Thinking in the Intergrated Teaching Mode of Industrial Design [J]. Journal of Nanjing University of the Arts: Art and Design Edition, 2005(1):130-132.
11. Xu You Yi, Shen De Kun. The Relationship Between Hand-painted Expression Skills and Public Art Design Thinking [J]. China Science and Technology Information, 2007(2):221-222.
12. Yin Cui Jin, Ren Li Zhao, He Ren Ke. Research on Graphical Method of Design Thinking in Public Art [J]. Packaging Engineering, 2008,29(3):137-138.
13. Chen Juan, Zhong Zhi Xian. On Teaching Design From The Perspective of Design Thinking [J]. Journal of Jiangxi Radioand Television University, 2011(2):54-58.
14. Yan Hanbing, Zheng Dong Fang, Li Xiao Ying. Design Thinking: An Indispensable Enabling Methodology for Maker Education [J]. Digital Education Research, 2017(6):34-40.