



TALLINN UNIVERSITY OF TECHNOLOGY  
SCHOOL OF ENGINEERING  
Design and Technology Future

**PROMOTING CRAFT THROUGH MAKERS' EDUCATION: CASE STUDY OF  
WENZHOU COLORED STONE INLAY.**

**KÄSITÖÖ EDENDAMINE MAKER HARIDUSE KAUDU: WENZHOU VÄRVILISE KIVI  
INTARSIA JUHTUMIANALÜÜS.**

MASTER THESIS

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Tallinn 2021

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Hereby I declare, that I have written this thesis independently.

No academic degree has been applied for based on this material. All works, major viewpoints and data of the other authors used in this thesis have been referenced.

20.05.2021

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### III. Thesis Task

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**Thesis topic:**

Promoting Craft Through Makers' Education: Case Study of Wenzhou Colored Stone Inlay.

(in Estonian): Käsitöö edendamise Maker hariduse kaudu: Wenzhou värvilise kivi intarsia juhtumianalüüs.

**Thesis main objectives:**

1. How to simplify the experience of Wenzhou Colored Stone Inlay for kids?

**Thesis tasks and time schedule:**

Nr.	Task description	Completion date
1	Topic Research	01.01.2021
2	Research of Traditional Craft and Maker Space	06.02.2021
3	Define User Needs and Design Value	12.03.2021
4	Design Brief and Concept Generation	18.04.2021
5	Finishing Thesis	20.05.2021

**Language:** English **Deadline for submission of thesis:** "Käsitöö edendamise Maker hariduse kaudu: Wenzhou värvilise kivi intarsia juhtumianalüüs" 30.05.2021

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## **VI. Abstract**

People appreciate the aesthetics of ancient elegant traditional crafts. In modern society, the traditional craft is impacted seriously by mass production; nevertheless, it still stands its unique values, such as Aesthetics, Cultural Symbols, Entertainment.

Unfortunately, Traditional Colored Stone Inlay has a high threshold for beginners and not playable for kids. Nowadays, with maker space and digital devices, playing complicated traditional crafts is possible for the kids.

The thesis aims to explore using the maker-space platform to lower the experience threshold for kids playing Wenzhou Colored Stone Inlay. Experience design will embed knowledge of traditional craft and Maker education. The colored stones are reshaped as Tangrams. The kids can easily experience the Colored Stone Inlay at home or attend an offline craft workshop in a local maker space.

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# Chapter 1: Introduction

## 1.1 Inspiration

### Throwback in memory.

The trigger of what brings me to this topic is my personal experience from childhood. When I was a kid, I have encountered craftsmen of bamboo wickerwork. Sometimes, they push their craft trolley full of handmade wickerwork products, passing through neighbors' door by door, trying to sell their works; sometimes, in the corner of blocks, on the stairs of the garden. I remember them taking a break from sales work. I keen on chatting with them and just sitting next to them, watching the craftsmen weaving bamboo sticks with their hands. It became one of the warm and shimmering memories of my childhood. However, as I grew up, craftsmen had appeared less and less. Until this year, next to the Museum of Estonian Architecture, when I was standing in front of the 4m high futuristic wood pavilion, which is weaved from timber planks, my mind was thrown back my old memory of bamboo weaving crafts. The craftsmen in my childhood, where are they right now?

### Reflection

Digitalization and mass production in society is international; the impact on the traditional craft is worldwide. Instead of being perished by "mass production", "Maker movement" born in the 1980s, "Designer makers" emphasize the integration of advanced technology and traditional craft, gradually, "Maker movement" becoming a megatrend globally. It might be an answer for preserving the traditional craft.

How the "traditional craft" can be recognized by the young generation? It might be helpful for children's growth; on the other side, it gives scope to itself's value and survives in this way. These thoughts keep pouring into my mind. I decided to start my following research. It might also apply to other traditional crafts in other countries, provide a practical example and developing direction.

## 1.2 Aim

The aim of the thesis is:

- To explore using the maker-space platform to Promote traditional craft and lower the experience threshold for kids playing traditional craft- Wenzhou Colored Stone Inlay.

This thesis mainly focuses on the problem:

- How to simplify the experience of Wenzhou Colored Stone Inlay for kids?

Meanwhile, sub-questions related to traditional craft and maker space are discussed:

- What is the value of traditional craft in modern society? craft skills or aesthetics?
- How the Maker movement benefits traditional craft? And how to combine maker education and traditional craft?

## 1.3 Scope

In recent years I can see how creative business is booming in my hometown Zhejiang Province. Nevertheless, I barely witnessed traditional crafts being playable for kids and friendly to beginners. Wenzhou City in Zhejiang Province is known for its traditional Colored Stone Inlay Craft. Moreover, Wenzhou City is the only city producing Colored Stone Inlay pieces nationwide. Instead of being buried in oblivion, I choose Wenzhou traditional Colored Stone Inlay as my research object.

For the target users, the age range is 8 to 12 years old. Kids start to have more logical thinking ability and practical ability, and Interests in craft and technology booming in this age range.<sup>1</sup>

## 1.4 Thesis Structure Framework

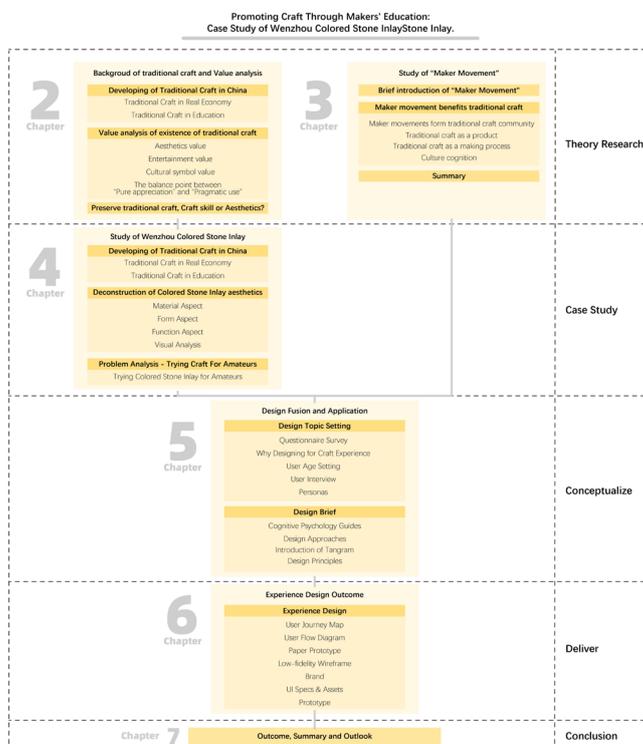


Figure 1.1 Thesis Structure Framework. Graph by author.

The Thesis Structure Framework in Figure 1.1 shows an overview of this paper. Which provides a whole picture for the readers.

<sup>1</sup> Tolin, L. (2021, March 22). 39 best gifts for 8-year-old boys and girls in 2021 - TODAY. TODAY.Com. Retrieved Apr 23, 2021, from <https://www.today.com/shop/best-gifts-toys-8-year-olds-according-development-experts-t139821>

## **1.5 Methodology**

### **1.5.1 Literature Research**

In the early stage of the thesis, literature research was used to demonstrate the value of traditional craft in the modern mass production context and find the direction of how to preserve traditional craft.

By consulting the relevant literature of the Maker movement, the value of combining traditional craft and Maker education is clarified, which has a certain theoretical reference significance for improving thesis design scheme.

In the middle stage of the thesis, literature research based on Piaget's Cognitive-developmental Theory, Visual Perception of Gestalt Psychology and Color Psychology of Children provide guidelines for the Experience design of the craft.

### **1.5.2 Interviews**

Through in-depth interviews with the traditional craft artisans, craft studio owners, master of Wenzhou Colored Stone Inlay studio, interviewees provided valuable perspective from the insider of the traditional craft business, which pushed the thesis to move forward to explore the possibility of combining Maker education.

Interviews were also conducted with the kids and parents. To better understand children's interests of "Traditional craft class & Maker class" and the preference for Craft Experiences, summarize the favorable factors of experience design, and apply it.

### **1.5.3 Questionnaire**

With 39 valid questionnaires, people showed big interests in "activity of craftsmanship combined with the maker space"; however, statistics showed a big portion of people has not aware of the maker space. The fact that questionnaires encouraged that maker education needs to be embedded in the experience design.

### **1.5.4 Persona**

Product managers usually create "Personas" for specifying user needs. In the thesis, personas are used to frame the target users and a better understanding of Experience. The whole experience design will be built up for serving the persona. Personas' prior needs will be satisfied. According to Maguire (2001), the name, personality and background story should be given to these two personas.<sup>2</sup>

### **1.5.5 Prototyping**

The prototype validates and evaluates the design in terms of paper prototype, digital prototype, functional product prototype. After understanding the experience design concept,

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<sup>2</sup> MAGUIRE, M. (2001). Methods to support human-centred design. *International Journal of Human-Computer Studies*, 55(4), 587–634. Retrieved Apr 19, 2021, from <https://doi.org/10.1006/ijhc.2001.0503>

the 3D-printed models, tangram stones, CNC carved wood board, and high-fidelity UI prototype was produced; thesis design has realized the transformation from theory to practice.

## **Chapter 2: Inherit Aesthetics of Traditional Craft In Modern**

### **Context of Mass Production**

#### **2.1 Developing of Traditional Craft in China**

In general, traditional crafts refer to craft varieties and techniques with rich national style or regional characteristics. Most products are made of natural raw materials, processed in hand-workshops to change the shape and make into products. Traditional craft is an important part of intangible cultural heritage, which still has a strong vitality and development space in contemporary life. Professor Yiyi Xu explained: "Traditional crafts" generally carry the cultural tradition of the nation.<sup>3</sup>

##### **2.1.1 Traditional Craft in Real Economy**

Overall, in recent years, the real economy of the Traditional Craft market witnesses a boost. Many craftsman/crafts studios took big advantage of introducing modern machines in craft processes; those craftsman/crafts studios' products which early transformed into "modern life" oriented, benefited from the booming China traditional craft market.

"2013-2018 China Arts and crafts industry market prospect analysis and Investment Strategy Research Report" mentioned that The growth rate of China's folk handicrafts market has maintained steady growth in the past decade, with an annual growth rate of about 11%. By 2020, the total market size has been close to 10 billion CNY (about \$1.52 billion). After years of development, by 2018, China's arts and crafts market has become the largest producer and exporter in the world.<sup>4</sup>

##### **2.1.2 Traditional Craft in Education**

In China, the protection of traditional crafts has received extensive attention. The primary schools and middle schools commonly launched the traditional craft classes.

Ministry of Education announced a document in May of 2018: The Advice on Constructing Chinese Traditional Culture Inheritance Bases. It was devoted to popularizing, inheriting traditional culture through the academic theory resources and talents resources of schools and universities.

The construction project includes Traditional Craft Curriculum, Traditional Craft Community, Local Workshops, Exhibition and exchange, which encourages the innovative traditional craft

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<sup>3</sup> Yiyi Xu. (2018). Innovation and creation of traditional handicraft

<sup>4</sup> cninfo360.com. (2013). 2013-2018 China Arts and crafts industry market prospect analysis and Investment Strategy Research Report. Retrieved Dec 22, 2020, from <http://www.cninfo360.com/yjbg/qthy/qt/20130916/300463.html>

fusion with education. In the form of visiting lecturers, with certain rewards, schools invite folk artisan, traditional craftsmen from all over the nation to teach students.

At the university level, students' traditional craft projects and clubs will be introduced to the artisan. Moreover, local workshops will be provided with facilities and venues for projects and practical experience activities.<sup>5</sup>

## 2.2 The Value of Existence of Traditional Craft, In The Modern Society

### Context of Mass Production

Although compared with products produced by traditional crafts, large-scale produced products can provide goods needed in daily life at a lower cost, the traditional craft still stands various special values. The following sections will be combined with my literature research and my personal understandings to elaborate on the values of traditional crafts that meet modern social needs.

#### 2.2.1 Value 1: Aesthetics

After the industrial revolution, with mass production, the big collective craft workshops and small studios tend to survive. By the end of 2015, there were more than 50000 enterprises in China's traditional craft industry. There are about 36000 private enterprises, accounting for 72% of the total, and about 4000 collective, collective joint ventures and joint-stock cooperative enterprises, accounting for about 8% of the total.<sup>6</sup> All kinds of private enterprises are the main body of development. Most traditional handicraft enterprises have less than 100 employees.<sup>7</sup> Those craftsmen and studios devoted to pragmatic articles for daily use before developed a very strong form of craft and visual languages, time by time, partly it became a pure art form (appreciation). It has gained a unique aesthetic value, replacing a part of past pragmatic tendencies with pure artistry...".

Deming Zhang, a master who major in basketry and weaving art of bamboo textile, over the past decade, he has gradually transformed from pragmatic craft products into artistic bamboo weaving. Now his art pieces are recognized by the market and even invited to cooperate with international luxury brands. The boundary between modern craft and so-called pure art seems to be blurred.

Not only happened in mainland China but also in Estonia, which gives expression to the blur

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<sup>5</sup> Liu. (2018, May). The Advice on Constructing Chinese Traditional Culture Inheritance Bases. Ministry of Education of People's Republic of China. Retrieved Jan 11, 2021, from [http://www.moe.gov.cn/srcsite/A17/moe\\_794/moe\\_628/201805/t20180523\\_336874.html](http://www.moe.gov.cn/srcsite/A17/moe_794/moe_628/201805/t20180523_336874.html)

<sup>6</sup> Sansheng consulting company. (2015, April). 2015-2020 China folk handicraft industry development prospect forecast and investment strategy analysis report [Photograph]. China Industrial Information Research Network. Retrieved Dec 28, 2020, from <http://www.china1baogao.com/report/20150617/5202448.html>

<sup>7</sup> Zhiyan consulting company. (2017, July). Market Research and market analysis forecast report of Chinese folk handicrafts from 2017 to 2022. Market Research and Market Analysis Forecast Report of Chinese Folk Handicrafts from 2017 to 2022. Retrieved Nov 11, 2020, from <https://wenku.baidu.com/view/a6937807590216fc700abb68a98271fe910eaf01.html?re=view>

between modern craft and pure art. OmaMood used to be a showcase which to exhibit students' graduation works of the University of Tartu Viljandi Culture Academy. On 11 June 2020, the OmaMood fashion show was held at Estonian National Museum. <sup>8</sup> Now developed into a comprehensive fashion show that aims to popularize garments inspired by native handicrafts and demonstrate the possibilities of modernizing heritage crafts. By organizing this fashion show, we wish to highlight the beauty of Estonian native design ..." depicted by the producer: Henri Karmiste.

### **2.2.2 Value 2: Entertainment**

Traditional craft used to be a pragmatic art. "But The need of modern craftsmanship is more tended to be a spiritual need. Handicraft is no longer a means of earning a living, the need of usefulness is not that much important, so it becomes a creative activity like a hobby and pastime"<sup>9</sup> written by Professor Liu; It evolves into entertainment. In the modern context, the functional value of traditional crafts has been weakened by mass production, and its aesthetic factors are becoming the core of the inheritance of traditional crafts. The making threshold is still very high for the public regarding the traditional craft-oriented pragmatic-use products. Having said that, if its aesthetic of a traditional craft needs to be recognized by the public, it needs to be promoted and popularized. Thus, I think entertainment is a good way to achieve that.

Especially, the furniture designed with Chinese traditional mortise-tenon joint, in the modern context, the functionality of the traditional mortise-tenon joint was replaced by mass-produced metal components. But its dedicated designed fixing joints have been introduced in mobile games; Thunder game and Tencent game company have launched a mortise-tenon joint game, respectively. In the Thunder game's "The Wood Craft", the structural joints are designed into a puzzle game. Users can click, slide up and down to see the cooperative modes. It is easier access for audiences with the simpler operation and lower pressure on accepting information compared to serious craft training.

Moreover, traditional mortise-tenon joint show up in Public welfare courses, delivering the basic knowledge of Mechanics and Structure. Guide students to respect traditional craft from the aspects of technology, arts, and engineering.<sup>10</sup>

### **2.2.3 Value 3: Cultural Symbols**

Another important value of the existence of traditional craft is as a cultural symbol. When a culture fades away when it does not meet people's needs anymore, on the contrary, culture lasts. Traditional craft, as a usual production method of the culture, will keep existing.

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<sup>8</sup> Estonian Fashion Festival. (2021, January 4). OmaMood 2020 fashion show | Estonian Fashion Festival. Estonian Fashion Festival | Estonian Fashion Festival – Eff. Retrieved Oct 14, 2020, from <https://fashionfestival.ee/en/oma-mood>

<sup>9</sup> Liu, A. I. (2015, September). Production of handicraft workshop and social exchange -- A case study of Jiangxi Wengang brush. China Social Sciences Press.

<sup>10</sup> Pang, Y., & Xun, Z. (2020). Public welfare courses - Clever mortise-tenon joint. Sciclass.Cn. Retrieved Dec 11, 2020, from [https://www.sciclass.cn/course/courseDetail?course\\_id=235](https://www.sciclass.cn/course/courseDetail?course_id=235)

In scholar Xiaokang Gao's figure of speech, he describes it as "hospice care" and "inheriting the lineage".<sup>11</sup>

### **2.2.3.a Retrospection of Past Culture, "Hospice Care"**

Its' to memory the dying culture. Introduced by Julian Steward, regarding the viewpoint of cultural ecology, as former production technology, handicraft technology, behavior has an impact, and it is bound to impact people's social organization.<sup>12</sup> However, it has become an irreversible trend for a certain part of the culture to decline gradually, and the traditional handicraft will also disappear. Therefore, the archival preservation of the core elements of intangible cultural heritage is a kind of "hospice care" for cultural heritage. Written in the UNESCO World Heritage Selection Criteria, No.2 is that to exhibit an important interchange of human values over a while or within a cultural area of the world.<sup>13</sup>

Mr. Lili Fang, an art anthropologist, has made a metaphorical exposition and Analysis on the issue of cultural protection by borrowing the concept of natural state: globalization and the advent of post-industrial society may be another succession process of human culture. In this process, the original culture has become the organic matter and seed of new cultural growth.<sup>14</sup> Therefore, intangible cultural heritage needs us to protect But the purpose of protection is not to let it exist in a static state but to grow again in our lives in a new form.<sup>15</sup>

### **2.2.3.b A Presentation of Holistic Lifestyles, "Inheriting The Lineage"**

Raymond Williams, in 1958 said in the introduction of his book: Culture and Society, he summed up culture into three definitions: the first definition of culture, culture is "A Whole Way of Life". "What we sometimes call 'culture'-a religion, a moral code, a system of law, a body of work in the arts- is to be seen as only a part, the conscious part of that.<sup>16</sup> It is undeniable that traditional craft is one of the carriers of culture, with prospering culture, traditional crafts perpetuating and developing.

With "Inheriting the lineage", traditional crafts' knowledge and skills associated with traditional artisanry are passed on to future generations so that crafts can continue to be produced within their communities, providing livelihoods to their makers and reflecting creativity.<sup>17</sup>

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<sup>11</sup> Gao, X. (2016). Paradox of intangible cultural heritage living inheritance: preservation and development. Cultural heritage. Nanjing University. Retrieved Dec 11, 2020, from <https://doi.org/10.3969/j.issn.1674-0890.2016.05.001>

<sup>12</sup> Steward, J. Haynes. (1965). The concept and method of cultural ecology. Indianapolis, Indiana: Bobbs-Merrill, College Division.

<sup>13</sup> UNESCO World Heritage Centre. (2004). The Criteria for Selection. Unesco.Org. Retrieved Nov 22, 2020, from <https://whc.unesco.org/en/criteria/>

<sup>14</sup> Fang, L. (2001). The problem of cultural ecological imbalance, Journal of Peking University (PHILOSOPHY AND SOCIAL SCIENCES EDITION). Peking University.

<sup>15</sup> Gombrich, E. H. (1999). The Uses of Images: Studies in the Social Function of Art and Visual Communication by E.H. Gombrich (1999-01-26). Phaidon Press.

<sup>16</sup> Raymond. Williams. (1960). Culture and Society 1780-1950. New York: Anchor Books.

<sup>17</sup> unesco. (2020). UNESCO - Traditional craftsmanship. Unesco.Org. Retrieved Nov 11, 2020, from <https://ich.unesco.org/en/traditional-craftsmanship-00057>

## 2.2.4 The Balance Point Between “Pure Appreciation” And “Pragmatic Use”

As early as 1959-960's, there was a heated discussion on this topic in Britain. One side thought that handicraft development should abandon industrialized production mode, "Studio Crafts Movement" focused on the exploration of pure art, gradually divorced from daily life. The other side argued that craft production should respond to the trend of the development of technology. Through the combination of industrial technology and handicraft, and try to develop industrial art that is suitable for the production requirements of an industrial society. As the Bauhaus movement practiced, handicraft was integrated into large-scale industrial production and moved towards industrial art.<sup>18</sup>

Shortly, the development of traditional crafts is not towards polarization but a middle balance point.

The balance points are different due to certain traditional crafts and the culture behind them.

### 2.2.4.a Traditional crafts originally oriented to pragmatic use

Those traditional crafts originally oriented to pragmatic use, such as woodcraft, basketry and weaving art of bamboo textile. Mr. Yong Li, the Master of carpentry craft from Ningbo City, commented in the interview, “as the most important means of production in ancient China, the pragmatic character of carpentry craft was dominant. Even though the carpentry craft has been artistically developed to a great extent, its practicality is still an important embodiment of its value. I keep that in mind with doing my craft works (showed in Figure 2.1)”<sup>19</sup>



Figure 2.1 The works by Master. Yong Li, and his carpentry craft studio “Jiang Workshop Culture”. From the thesis's interviewer [Photograph], shared by interviewee, (2021), Yong Li

### 2.2.4.b Traditional crafts originally oriented to aesthetics

For those traditional crafts originally oriented to aesthetics, Some craftsmen are trying to

<sup>18</sup> Qing Yang. (2019). Research on the art innovation of digital handicraft. (Doctoral dissertation).

<sup>19</sup> Author. (2020). Interview with Mr. Yong Li, the Master of carpentry craft and owner of carpentry craft studio “Jiang Workshop Culture”, Ningbo City 29,11,2020

apply the aesthetics of traditional crafts to pragmatic products. When Master. The author asked Miao, "Can you summarize the change of colored stone inlay products?", he answered, "The earliest colored stone inlay was made on the "Screen and Byobu" to fill the visual blank and add a space theme. Since the 1960s, with the development of the market economy, colored stone inlay gradually began to diversify and live, from pure art appreciation screen to jewelry box combined with daily life, etc. "In the future, our studio's business will be inclined to practical daily decoration, mainly furniture based, at the same time with small, exquisite ornaments as auxiliary decorative products. At present, we are working with one of China's top ten furniture brands in Shenzhen City to make a Chinese style customized light luxury furniture brand, and the product modeling will also tend to be simple and modern."<sup>20</sup>

### **2.3 Debate of Preserve Traditional Craft: Craft Skill or Aesthetics?**

The debate on the preservation of traditional crafts has been going on for a long time. In the modern society where technology is constantly updated, should the traditional handicraft stay its original technology and aesthetics or keep pace with the times, change with technology.

After all, traditional craft skill does not equal creative work; without innovation/concept, the handicraftsmen are only replacing the machine. Like professor Li Zeng commented, for traditional embroidery, Weaver is not the same as craftsmen, Weaver uses the hand as a tool, and all the ideas and concepts of artistic creation belong to artisans. Weaver does not create. She is producing.<sup>18</sup>

Shortly, traditional craft skill is only a means of realizing the creation.

Professor Huang claims in his journal, in terms of the jewelry industry, 3D printers have almost completely replaced the skill of manual mold, and the efficiency of 3D printing wax mold is 20 times higher than that of manual mold.<sup>21</sup>

Furthermore, I learned from the interview with Mr. Miao, who is a Master of Wenzhou traditional Colored Stone Inlay, nowadays, they also have part of the cutting works are realized by automation, "Compared with the complete traditional process, I have simplified a lot." said by the fourth inheritor of the 108-year-old Colored Stone Inlay studio (Chonglin Studio). "However, I think aesthetics and ideas are more important. The traditional craft skill can be replaced by tools. Just as with the development of photography technology, a large part of realistic painting school declines. What reserved and emphasized more is the light & shadow, composition, color, and so on. In the development of traditional crafts, what change is technology, and what remains is artistic aesthetics."<sup>20</sup> He added.

The craftsmen couple of woodcarvings, Mr. Changguo Zhi and Madam. Aiyue Ji, who is also based in Wenzhou City, devoted to woodcarvings for 30 years. In the interview, I was informed

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<sup>20</sup> Author. (2020). Interview with Mr. Yichuan Miao, Master of Wenzhou traditional Colored Stone Inlay and owner of Chonglin Studio. 01,12,2020

<sup>21</sup> Dequan Huang. (2015). 3D printing technology and contemporary arts and crafts. *Decoration*, 33-35.

that their wood carving studio completed the mechanical transformation in 2014 (the new carving studio in Figure 2.2). Madam. Ji indicated, "and the original studio with as many as 100 people has reduced to 11 now."<sup>22</sup> After introducing automatic engraving machines, only the final polishing and waxing process of woodcarving would be completed manually. A fully automatic engraving machine can almost equal the labor force of 10 people. At the same time, all their orders were from Japan, and the number of orders kept increasing.<sup>22</sup>



*Figure 2.3 Engraving machines of Madam. Ji's Zelong art carving studio. From the thesis's interviewer [Photograph], shared by interviewee, (2021), Ji's Zelong*

Overall, the point of view of the thesis is that the traditional craft skill should be developed and simplified with modern technologies. But the aesthetic / the visual form effects of traditional craft are crucial.

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<sup>22</sup> Author. (2020). Interview with Madam. Aiyue Ji, Master of woodcarvings and owner of Zelong art carving studio. 05,12,2020

## **Chapter 3: Study of “Maker Movement”**

### **3.1 Brief Introduction of “Designer-Maker Movement”**

In the recent ten years, in world-sweeping DIY activities, the word "maker" has been widely spread worldwide.

The first "designer maker" originated in Britain in the 1980s. It was regarded as the third way between artistic crafts and industrial art. On the one hand, the design and duplicate in limited quantity, which can fully control the whole process; on the other hand, they emphasize the integration of advanced technology and traditional craft, get rid of the limitation of traditional craft manual skills, highlight the innovative application of materials and crafts, and explore the possibilities of transforming traditional regional craft into contemporary global visual language.<sup>23</sup> After entering the digital era, digital technology stores and disseminates traditional craft knowledge, skills and products, which greatly reduces the threshold of personal creation and production.

### **3.2 Maker Movement Benefits Traditional Craft**

#### **3.2.1 Maker Movements Form Traditional Craft Community**

Further, a lower threshold means more people can involve with traditional crafts. And Maker Movement is one of the connecting tissues to group people. Scholars Wen Wen and Qing Yang concluded on two sides.

Space-wisely, in Maker Movement, Maker space is an important carrier of these activities such as traditional craft communication, innovation and partial business support.<sup>24</sup>

Education-wisely, in Maker space also provides a new place for the teaching and experiencing traditional craft. At present, many maker organizations start to recruit traditional craftsmen and try to provide experience courses to the public.

#### **3.2.2 Traditional Craft as A Product**

From the perspective of products, the traditional craft is a pragmatic art. As a product, one of the principal values is being offered to sale. It has both practical and aesthetic value. Moreover, the Maker movement more emphasis on custom-made and handmade. It improves the scarcity of the Traditional craft product. Also, as a product, traditional craft culture can be spread wider.

#### **3.2.3 Traditional Craft as A Making Process**

From the perspective of the making process, In the dynamic process, making traditional craft is an activity to gain the "Flow experience ". (" Flow Theory" put forward for the first time in

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<sup>23</sup> Ximin Yuan. (2009). Has the post craft era come? -- Concept Evolution and positioning adjustment of Contemporary Western handicraft. *Decoration*, 15-23.

<sup>24</sup> Wen Wen, Qing Yang. (2017). Research on maker movement and cross-border innovation of handicraft. *Journal of Guangxi University for Nationalities: Philosophy and Social Sciences*, 039(006), 21-27.

1975 by Mihaly Csikszentmihalyi)<sup>25</sup>. It is a unique experience when people are doing a doable but challenge activities. Two important characteristics of "flow experience", "concentrating on an activity, and have fun from that activity"<sup>26</sup> both could be achieved in traditional craft activities.

### 3.2.4 Culture Cognition

Published by scholars Lin Yong and Mlinggang Fang, cultural identity includes cognition, emotion, and behavior. As for the traditional craft, first is the understanding and appreciation of the craftworks, followed by recognizing the cultural values and the knowledge and participation of the craft production process.<sup>27</sup> Therefore, "hands-on making," just like the maker movement promoted, is one the best ways to pass on the traditional craft.

Ghani and Deshpande (1994) found requires. There are two influencing factors: the best challenge level for specific skills, and the other is the sense of control over the environment.<sup>26</sup>

## 3.3 Summary

According to Mr. Jen's (Founder and CEO of Wangyan carpentry craft studio in Shenzhen City) talk in Professor Wen Wen's interview: "In fact, we have calculated that the conversion rate of this kind of open free experience quota to members is basically as low as 0. Of course, it may play a role of publicity. People can see the environment of your whole space, and may make them approve a certain product you designed or manufactured in disguise. This is a more reasonable business path, rather than attracting people to teach them skill to do carpentry."<sup>28</sup>

In summary, the traditional craft needs to be promoted to the public, let people recognize it, both the value of being a product and being an experience of crafting. They complement each other. And promoting the craft through maker space is a direction of revitalizing the traditional craft.

So, the traditional craft could take advantage of the "Maker movement"; it is feasible to carry out traditional craft innovation activities in the maker space (such as public welfare courses, experience events).

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<sup>25</sup> Csikszentmihalyi, I. S. (2000). *Beyond Boredom and Anxiety*. Wiley.

<sup>26</sup> Ghani, J.A, Deshpande, S.P. (1994). Task characteristics and the experience of optimal flow in human—Computerinteraction. *J. Psychol.* 1994,128, 381–391

<sup>27</sup> Lin Yong, Minggang Wan. Factors influencing Tibetan and Chinese cultural identity of Tibetan college students. *Research on psychology and behavior* 181-185.

<sup>28</sup> Wen Wen. (2019). Chapter 6 Case study, *Maker culture research*, Shenzhen University.

## **Chapter 4: Aesthetics Study of Wenzhou Traditional Colored Stone Inlay**

### **4.1 Brief Introduction**

#### **4.1.1 History**

Wenzhou traditional Colored Stone Inlay is an ancient folk art combining stone carving with wood carving. Its origin is related to the local "Luofu stone" in Wenzhou. About 140 million years ago, crustal movement, volcanic eruption, and lava flow promoted ore decomposition and reorganization to form pyrophyllite from the late Jurassic to Cretaceous.

"Luofu stone", one of the pyrophyllites with bright colors, has been called "soft stone" by local people since ancient times, suitable for carving. Since the Neolithic Age, the local ancestors began to exploit and use it as grindstone, sculpture, sacrificial materials, and seal stone.

In 1883, Amin Pan, an old artist in Zhejiang Province, began to inlay mahogany with colored stones. According to the records of Arts and crafts in Contemporary China, Colored Stone Inlay began in Wenzhou City. At that time, most of them were used in mahogany furniture, with figures, flowers, insects, fish. There are more than ten workshops and shops in the old town area. In 1920, the products were sold to southeast Asia, and some of the works also participated in the International Exhibition in Tokyo, Japan.<sup>29</sup> Before the Anti-Japanese War, there were more than ten workshops and more than 100 craftsmen in Wenzhou. During the war, a center for selling Wenzhou Colored Stone Inlaid handicrafts was established in Shanghai. In 1950, Wenzhou Colored Stone Inlay entered the Hong Kong market, with an annual output of more than 600 pieces. More than 10 Wenzhou artists once settled in Hong Kong and directly accepted orders from Hong Kong customers. In 1955, eight masters, including Dong and Wang, back to Wenzhou and initiated the Wenzhou art carving cooperative.

After more than half a century, Wenzhou colored stone inlay has developed different art forms and production materials. The stone used in such as pyrophyllite, natural colors to agate, ox horn, artificial and natural gemstones.

#### **4.1.2 Craft Process**

Colored Stone Inlay is a craft that unites the beauty of nature and artificiality, it takes 11 processes to make a complete work. See the figure 4.1 below for details.

These production processes were simplified and demonstrated by Master. Yichuan Miao, to present a universal way of Wenzhou traditional Colored Stone Inlay. Different details of production processes vary from different styles of Colored Stone Inlay.

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<sup>29</sup> Long Ji. (1984). Arts and crafts in Contemporary China. China Social Sciences Press



#### Design

Conceive the carving form and draw on the paper the design.



#### Computer graphics

Scan the hand-drawn design into the computer for a more accurate painting. Then print it over.



#### Stone selection

In addition to pyrochylite, there are bloodstone, coral, agate, pearl, and gold also used. Their natural form, texture, and rich colors are used as a visual language.



#### Color matching

Cut the printed drawing into each part with a carving knife, and stick it on the stones selected in advance.



#### Stones Cutting

According to each part of the drawing, cut the stones into slices, and make them into suitable thickness.



#### Board Carving

Carve 2-3 mm thickness on the board corresponding to the original drawing.



#### Inlaying

According to the concave parts of the board, inlay the stones one by one, and stabilize each part of the stones with glue.



#### Rough Sanding

To obtain a certain height of each stone, make them easy to follow-up carving.



#### Carving

The whole work becoming harmonious, and details are carved on the stones.



#### Polishing

Rub with stones with sandpapers to make them smooth and delicate.



#### Waxing

Finally, apply liquid wax evenly on the work to ensure that the color remains bright in long-term preservation.

Figure 4.1 The craft processes of Colored Stone Inlay. By author. Contents screenshots taken from MgTV documentary. (2020). The fellas of century-aged shops, Episode1 [Photograph]. Sorted, edited by the author, (2021).<sup>30</sup>

<sup>30</sup> MgTV documentary. (2020). The fellas of century-aged shops, Episode1. Retrieved Feb 23, 2021, from [https://w.mgtv.com/b/349305/10156211.html?fpa=se&lastp=so\\_result](https://w.mgtv.com/b/349305/10156211.html?fpa=se&lastp=so_result)

## 4.2 Deconstruction of Wenzhou Traditional Colored Stone Inlay

### Aesthetics

As Doctor Yu depicted, through the making process, the aesthetics of traditional craft reflect in the three aspects of material, form and function.<sup>31</sup> In the following, the author will try to deconstruct the aesthetics of Wenzhou traditional colored stone inlay from these three aspects.

#### 4.2.1 Material Aspect

As we know, there are abundant ores in the underground. The natural conditions and different element contents at the time of formation result in numerous colorful ornamental stones or gemstones. The inlaying and carving of colored jade takes advantage of this feature. It uses the natural colors of jade from different places in the world to set up art pieces. The places of stone origin are mainly in domestic China.

Pyrophyllite is the most common material in Wenzhou traditional Colored Stone Inlay. It is a mineral composed of aluminium silicate hydroxide:  $\text{Al}_2\text{Si}_4\text{O}_{10}(\text{OH})_2$ . Which has pearly luster on its surface and with greasy touch.<sup>32</sup> Different pyrophyllite presents different colors because different metal elements contained. The Mohs hardness of Pyrophyllite is small (1.0 to 1.5) which means soft. (Mohs Hardness Scale is used to identify the hardness of minerals). Similar to soapstone, it is so soft even it's able to carve with a knife. Beginners usually start stone carving with these stones.<sup>33</sup>

After more than half a century, Wenzhou colored stone inlay has developed various production materials. The stone used in such as pyrophyllite, natural colors to agate, ox horn, artificial and natural gemstones. Also, with the convenience of modern transportation, many stone products come from all over the world, including Myanmar, Laos, Pakistan, Iran, Afghanistan, India, Bolivia, Italy...<sup>34</sup>

As for the board basement, in the early ages, mahogany, camphor and rosewood were used as carriers of colored stones. Nowadays, some artists also gradually try to introduce other materials as basements, such as gypsum, plastic and cement, "in order to experimenting modern styles, and fit the aesthetic of young people." Mr. Miao explained to me with his work (presented in Figure 4.2).

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<sup>31</sup> Qiang Yu. (2016). Introduction to fashion design, Chapter 7 Category and basic characteristics of fashion design aesthetics. Beijing Book Co. Inc,

<sup>32</sup> Pyrophyllite. (2020, December 31). In Wikipedia. Retrieved Dec 19, 2020, from <https://en.wikipedia.org/wiki/Pyrophyllite>

<sup>33</sup> The sculpture studio. (2019). Types of Stone for Carving. Retrieved Dec 19, 2020, from <https://www.thesculpturestudio.com/typesOfStone.html>

<sup>34</sup> Chonglin Studio. (2020). Brief Introduction of Wenzhou traditional Colored Stone Inlay. Retrieved Dec 19, 2020, from <http://chonglinzhai.com/index.php/history>



Figure 4.2 The Exhibited work of the Chonglin Studio in Wenzhou Cultural Industry Fair. From *The fellas of century-aged shops, Episode1* [image]. Screenshoted by the author, (2021). Retrieved Dec 19, 2020.<sup>30</sup>

### 4.2.2 Form Aspect

Colored stone mosaic is the combination of collage and sculpture, as explained in Figure 4.3, which is the integration of 2D and 3D. on 2D, every part of stone after cutting equals an extruded object with different colors. Meanwhile, on 3D, the “extruded object” will be processed with chamfering. Some wrinkles carving and texture carving are needed as well. However, it is not sculpture, in a figure of speech, it is a relief sculpture on a base of intaglio.

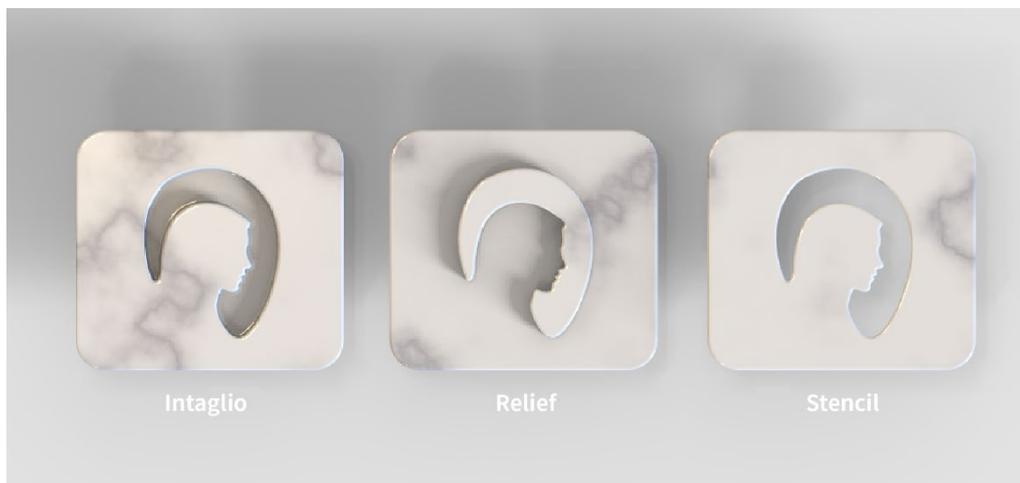


Figure 4.3 Intaglio, Relief and Stencil plates. Modeled and Rendered By author, (2021).

### Colors

Because the stones are separated from each other and inlaid together, each part has an independent color block. Therefore, gradient colors barely existed in Wenzhou Colored Stone Inlay. Unless the stone naturally has it.

In addition, stones are formed by natural minerals, so the color of stones is seldom bright ,or the saturation is very high.

### Wrinkles and Textures

As for Wenzhou Colored Stone Inlay, the skilled masters are kin on relief carving complex objects such as layers of flower, feathers on the wing. They are the crucial presence of masters'

exquisite craftsmanship. Because of the sanding and polishing process, the edge and corner of the stone are usually smooth and round; its surface presents a glossy and translucent jade texture.

Buddhist themes have been manifesting for a long time. The Buddhist characters with gorgeous clothes appear in the works often. For this reason such as work in Figure 4.4, delicate wrinkles of cloth are another proof of excellent works. Furthermore, the wrinkles become a symbolic element of Wenzhou Colored Stone Inlay.



Figure 4.4 Eighteen Arhats. From Products Introduction page of Chonglin Studio [Photograph], by Chonglin Studio. (2020).<sup>35</sup>

### 4.2.3 Function Aspect

Since the first piece of Colored Stone Inlay been finished by Master. Pan, after that, other craftsmen were inspired and decided to develop this craft technique, they continued to innovate and create, in addition to decorative paintings, they also combined the Colored Stone Inlay with mirrors and small jewelry boxes, and so on.

## 4.3 Visual Analysis

In order to have a visual analysis of the Wenzhou Colored Stone Inlay works which exist on the market, based on the search result of online on-sale Wenzhou Colored Stone Inlay commodities, I mapped out items according to their size.

### 4.3.1 Size scale - Complexity

Combining with the dimension of complexity, in the Figure 4.5 diagram and Figure 4.5 map, the group of small-scale shows that items presents less complexity and simpler composition of stones. The requirement of carving and inlaying skills is not as high as big-scale items. Functionally, as for the big-scale items like 2m X 1m, usually, they are ordered by Temple, restaurants, hotels as big decoration in the lobby. As for the small-scale items, they are sold as jewelry box and traditional stationery container.

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<sup>35</sup> Chonglin Studio. (2020). Eighteen Arhats, Retrieved Dec 29, 2020, from <http://www.chonglinzhai.com/index.php/bigua/arahan?start=15>

Due to the project is facing amateurs, mostly, the people who have not received sculpture training. Small-scale items are easier to accepted by them. So, I choose the small-scale items to continue analysis.

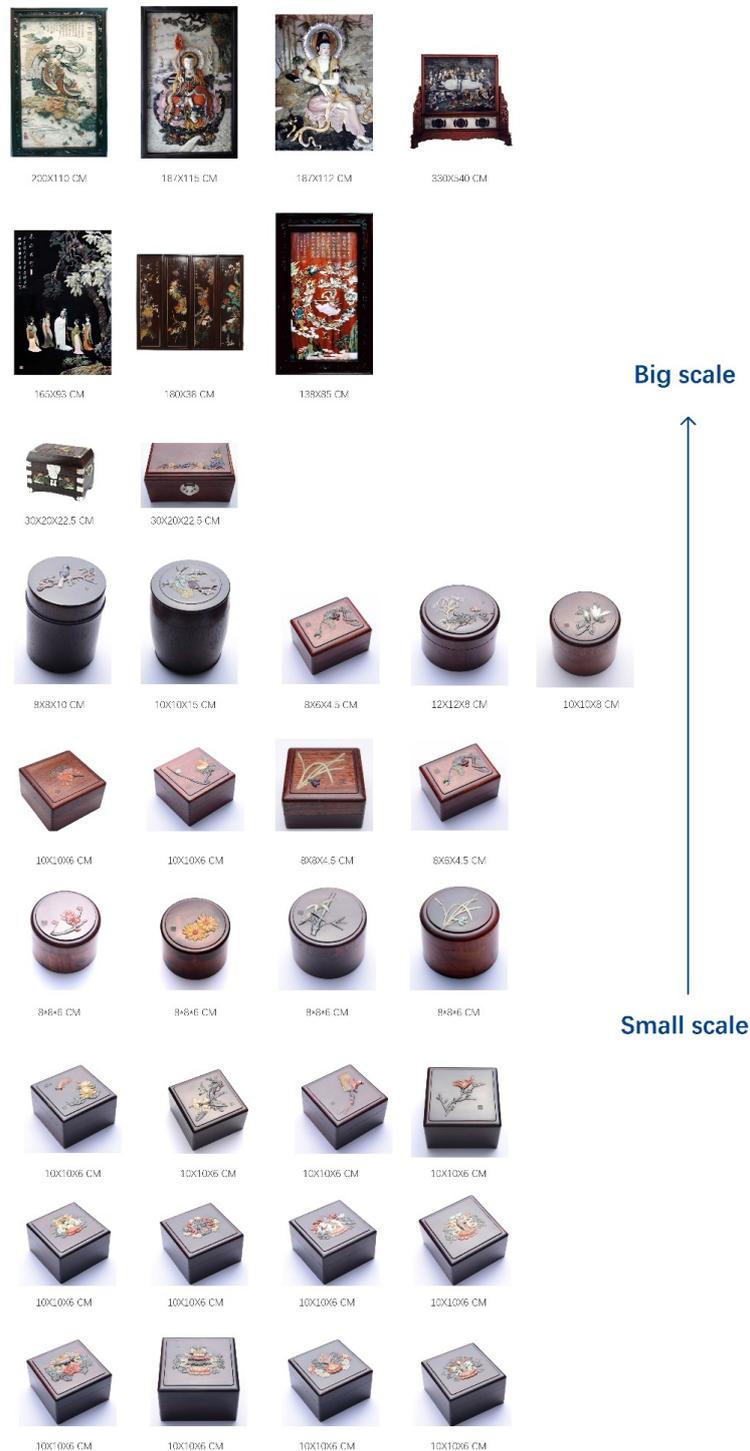


Figure 4.6 The Size scale – Complexity diagram. By author. Contents screenshotted from Search result of online on-sale Colored Stone Inlay commodities [Photograph] (Information from Taobao and chonglinzhai), edited by author, (2021).

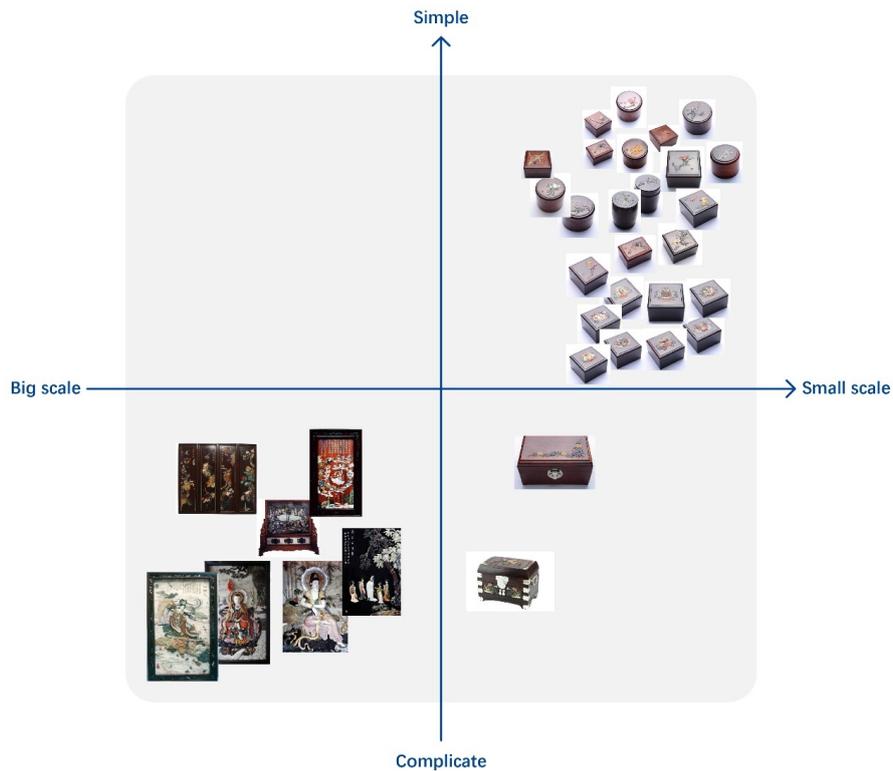


Figure 4.7 Map of items according to size scale and complexity. By author. Contents screenshotted from Search result of online on-sale Colored Stone Inlay commodities [Photograph] (Information from Taobao and chonglinzhai), edited by author, (2021)

### 4.3.2 Atlas Analysis

In Figure 4.8 and Figure 4.8, ten small-scale items from the previous analysis are listed. Among them, plants, flowers, and little animals are the most common elements. The areas of colored stone inlaid are not accessing than 50% of the surface.

Commonly, there is a specific curve (like the branch of trees, the tail of birds, etc.) as the visual guideline, then some other elements lying on it. And leaves are one of the frequent compositions of the picture. According to the basic geometric graphics, I try to simplify the pattern with Simple strokes and depict the original picture.

And, in these ten small-scale items, high saturation colors are used with great restraint, only for small areas. By contrast, colors like dark brown, green and yellow with low saturation are common.

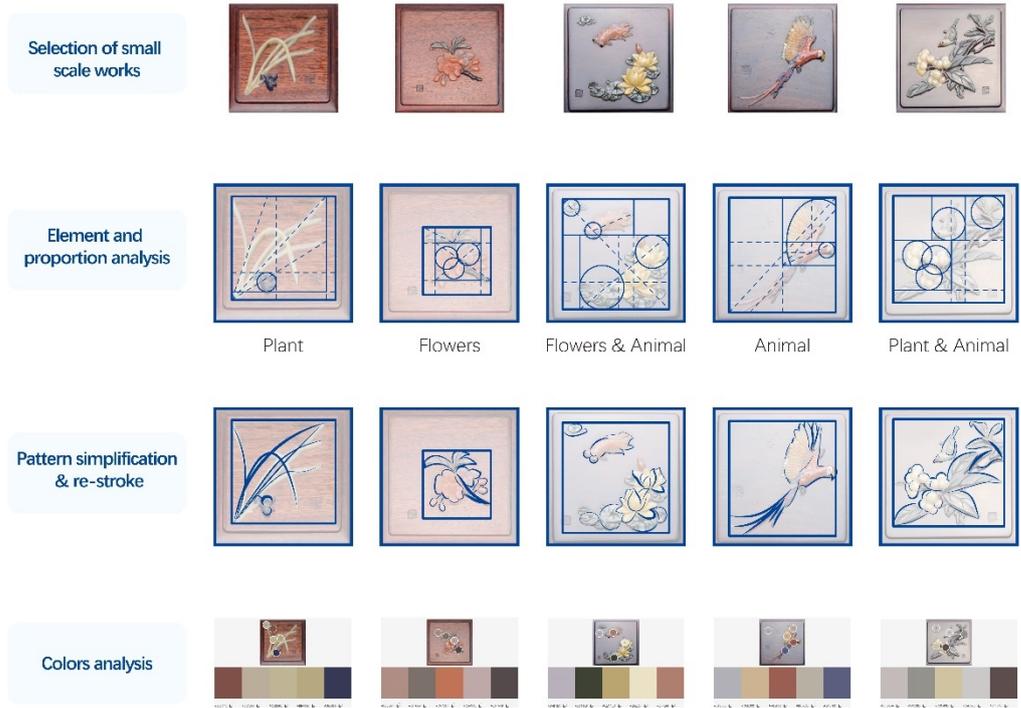


Figure 4.9 Atlas Analysis 1. By author, (2021).



Figure 4.10 Atlas Analysis 2. By author, (2021).

## **4.4 Problem Analysis - Trying Craft For Amateurs**

Because this thesis is facing the public who are amateurs, so the perspective of analysis of the problems is based on untrained users. To have a better design fusion in the later stage, I analyze the problems of trying Wenzhou Colored Stone Inlay through 3 aspects. (Colored Stone Selection, Carving and Inlaying Skills, Function of Colored Stone Inlay Product respectively)

### **4.4.1 Colored Stone Selection**

Colored stone inlay takes makes of the natural stone to compose a complete work. Colored Stone Inlay studios generally have huge warehouses for colored stones. However, it is almost impossible for the general public to have an inventory of stones. For them, the choice of stone color is quite limited.

### **4.4.2 Carving and Inlaying Equipment And Skills**

In order to carve exquisite patterns on colored stones, craftsmen often need a complete set of carving and inlaying equipment, plus several years of hard practice. Such as the process of Stones Cutting, usually, a cutting machine is required.

Normally, the cutting process is all operated on a wire cutting machine by hands; keeping precise cutting is difficult for green hands. Moreover, because the stone is pyrophyllite, the stone powder is massively generated during cutting, which is harmful to the lungs. For this reason, dust masks and goggles are necessary. And, for Board Carving, control carving depth manually is difficult. Besides, the pattern carved on the board should be matched perfectly with the outline of stones.

### **4.4.3 Function of Colored Stone Inlay Product**

The main function of Colored Stone Inlay is decoration, whereas due to the great difficulty with carving and inlay on a curved surface, most Colored Stone Inlay work has been done on a flat surface.

And the common carriers are flat paintings, mirrors and small jewelry boxes, its functional expansibility is not strong enough.

## Chapter 5: Design Fusion And Application

### 5.1 Design Topic Setting

Design Topic: Promoting Craft Through Makers' Education: Case Study of Wenzhou Colored Stone Inlay.

#### 5.1.1 Questionnaire Survey

A total of 39 questionnaires were collected and 39 were valid.

##### Questionnaire Survey About Colored Stone Inlay and Maker space

Hello, I'm Wang Shujun. Thank you for your help. I'm working on the graduation project of Wenzhou colored stone inlay technology recently, so I need to know your idea, please 2 minutes.

1. What is your gender?

- A. Male
- B. Female

2. Your age is?

- A. Under 18 years old
- B. 18-25 years old
- C. 25-40 years old
- D. over 40 years old

3. Which city do you live in? \_\_\_\_\_

4. Have you ever bought cultural and creative products about traditional handicrafts?

- A. Yes
- B. No

5. What's your opinion on supporting re-innovation of traditional crafts?

- A. Support the business of local craftsmen
- B. Just for fun
- C. The product with some pragmatic value?
- D. Others

6. If you have the right materials and simple tools, are you willing to try the Wenzhou colored stone inlay process?

- A. Yes
- B. No
- C. I will think about it.

7. You are more willing to experience offline in a group, doing at the same time

- A. Play by yourself by mailing materials and watching tutorial videos
  - B. Participate in the online live course.
  - C. I will think about it.
  - D. Other \_\_\_\_
8. Do you know about maker space in your city? Mark down points 1-5.
- 1—I don't know at all.
  - 2—I know very well.
9. If there is an activity of craftsmanship combined with the maker space, would you like to experience it in the local maker space?
- A. Yes
  - B. No
  - C. I will think about it.

Statistical results powered by Tencent Questionnaire.

### The Aim of Survey

The public's interests of colored stone inlay, and accessibility of maker space.

### Result Analysis of Survey

#### Basic information about the examples:



Figure 5.1 Location information of interviewees. From Tencent Questionnaire [Photograph], by author, (2021).

Figure 5.1 indicates most of the respondents are from Zhejiang Province, which occupies 62%; the rest of 38% are from Hunan Province, Shenzhen City, Beijing City, etc.

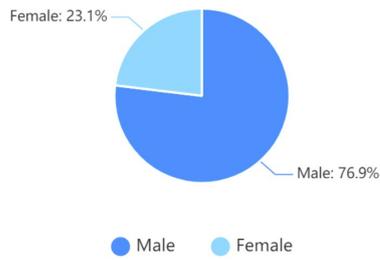


Figure 5.2 Gender Information. From Tencent Questionnaire [Photograph], by author, (2021).

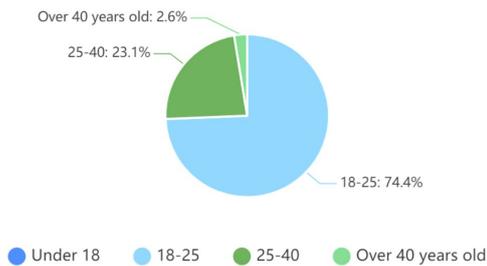


Figure 5.3 Age distribution. From Tencent Questionnaire [Photograph], by author, (2021).

Figure 5.4 and Figure 5.3 show, there are 30 males and 9 females in all the respondents. Most of them are 18-25 years old (74.4%), 23.1% are 25-40 years old, and 2.6% are over 40 years old (only one person)

### Consuming of traditional crafts product



Figure 5.5 Consumption of Cultural and creative products. From Tencent Questionnaire [Photograph], by author, (2021).

Figure 5.4 shows 53.8% people bought cultural and creative products, 46.2% of them have not.

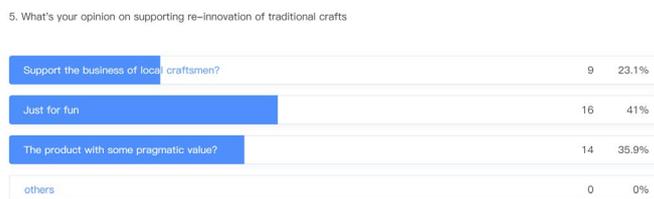


Figure 5.6 What's your opinion about re-innovation of traditional crafts. From Tencent Questionnaire [Photograph], by author, (2021).

According to Figure 5.7, the biggest group of people (41%) shopping re-innovation of traditional crafts products "just for fun". The people who want to have some pragmatic function of the outcome following in the second place. An only a small group of people

claimed that they want to support the business of local artisans. Thus, as for traditional crafts products, the entertainment and pragmatic function take an important part of value.

6. If you have the right materials and simple tools, are you willing to try the Wenzhou color stone inlay process?

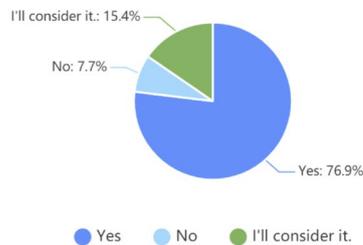


Figure 5.8 People's willingness to try the Wenzhou colored stone inlay. From Tencent Questionnaire [Photograph], by author, (2021).

Among the respondents, 76.9% said they are willing to try the Wenzhou colored stone inlay process, 7.7% of people showed no interest, and the rest of them remain unsure. (see Figure 5.6)

7. As for traditional craft activities

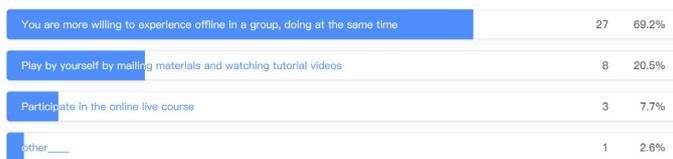


Figure 5.9 How you prefer to play traditional craft activities. From Tencent Questionnaire [Photograph], by author, (2021).

Figure 5.7 shows in the survey, 27 people said if they have traditional craft activities, they prefer it will be held in face to face offline group.

## Maker space

8. Do you know about maker space in your city?

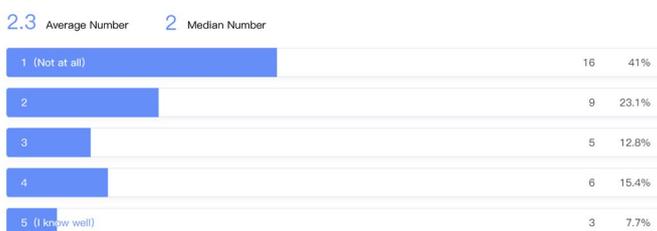


Figure 5.10 How you are familiar with Maker space. From Tencent Questionnaire [Photograph], by author, (2021).

Figure 5.8 witnesses 41% of people do not know maker space at all, the median number and average number (score 2.3 points, 2 points respectively) showed most people are not aware

of the maker space. An only a small group of them know well about it.



Figure 5.11 People's willingness of attending a combination activity. From Tencent Questionnaire [Photograph], by author, (2021).

In the Figure 5.9, the activity of craftsmanship combined with the maker space seems attracted a lot of people, and 3 people clearly said no.

### 5.1.2 Why Designing for Craft Experience.

Knowing customers' need is important for narrowing down the design section. Dr. Yang, Y's research report (Figure 5.10) indicated a direction for me.

Among all the cultural and creative products, the most popular three categories were creative food (80.6), accessories (77.8), and home furnishings (77.2). The combination of cultural creation and the daily life of cultural relics units has become the starting point. It is worth noting that for some traditional tourist souvenirs, such as travel supplies (71.), dolls, and toys (73.5), people have a certain degree of aesthetic fatigue and low interest.<sup>36</sup>

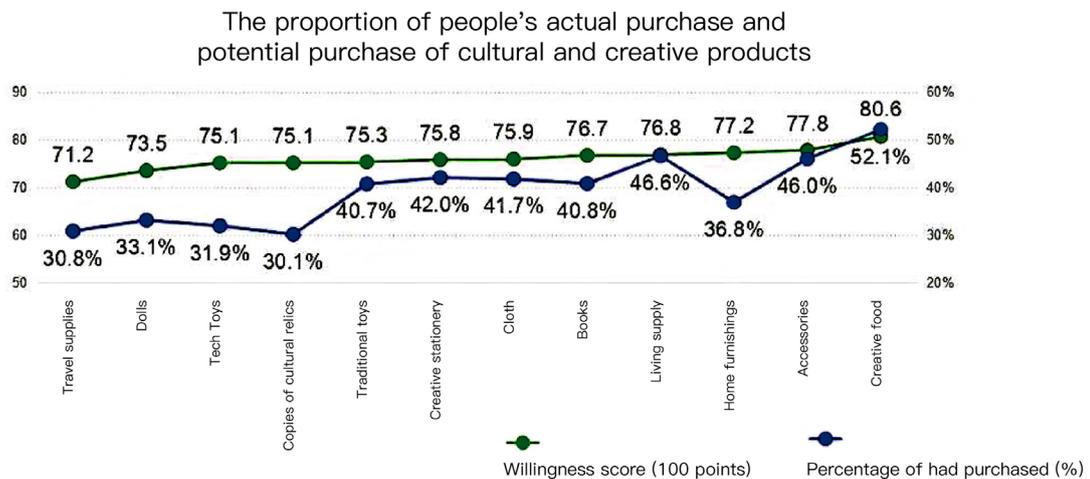


Figure 5.12 The proportion of people's actual purchase and potential purchase of cultural and creative products (Translated and re-drew by the author). Data from Research Report | Consumption demand [Chart], by Sohu.Com Inc, (2020, October 23), Yang, Y.<sup>36</sup>

The above chart illustrates that the more significant gap between the blue line (Willingness

<sup>36</sup> Yang, Y. (2020, October 23). Research Report | consumption demand of cultural relics and creative products presents nine characteristics. Sohu.Com Inc. Retrieved Feb 02, 2021, from [https://www.sohu.com/a/426808074\\_534424](https://www.sohu.com/a/426808074_534424)

score) and the red line (percentage of had purchased), there is more potential unexploited market existing. The creative food sector has saturated the market. Compared to other industries, the “Technology Toys” sector shows a relatively large gap, which means I will have more design opportunities here.

### 5.1.3 Summary

After the questionnaires and literature research, I found out that people do interesting in traditional craft innovative products, and the design in its “maker & technology toys” remains blank. So, I decided to design for children, and the users can experience the traditional craft processes and experience as a “maker designer” at the same time.

Eventually, the design topic is set up as **Promoting Craft Through Makers' Education: Case Study of Wenzhou Colored Stone Inlay.**

## 5.2 User Age Setting

Children’s Intelligence and practical ability develop very fast during their childhood, Children of different ages have different demands for toys. Thus, Experience design should positioning for very specific age range.

0-8 years old usually be defined as early childhood which to develop children’s physical, cognitive, socio-emotional, and language abilities. Middle childhood is from 6 to 12 years old, in this period of time, children learn the physical skills and try to understand how to building social relationship.<sup>37</sup>

Doctor Robert S. Feldman, from the University of Massachusetts Amherst, concludes the middle childhood stage in his book- Development Across the Life Span. 1. During this period, children will have better fine motor skills, for instance, writing, typing. 2. The ability to apply logical operations to problems is expected. 3. The children could understand Subjects’ Conservation and transformation. (shape-changing does not affect the quantity; particular objects could have multiple states. 4. Children can think from various perspectives; it is so-called “decenterize”. 5. Memory capacity of encoding memory, storage memory, and retrieval memory will get significant improvements. 6. For the Language aspect, the awareness of social conventions and self-monitoring is growing fast.<sup>38</sup>

However, from my perspective, the Experience Design of craft (based on Traditional Craft and maker Education) will require physical craft skills and further understanding of using the digital device, the children will be more prepared after two years development. Dr. Amanda Gummer

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<sup>37</sup> Office of Disease Prevention and Health Promotion, US. (2020). Early and Middle Childhood | Healthy People 2020. Retrieved Apr 19, 2021, from [https://www.healthypeople.gov/2020/topics-objectives/topic/early-and-middle-childhood#:~:text=Middle%20childhood%20\(usually%20defined%20as,them%20for%20adolescence%20and%20adulthood.](https://www.healthypeople.gov/2020/topics-objectives/topic/early-and-middle-childhood#:~:text=Middle%20childhood%20(usually%20defined%20as,them%20for%20adolescence%20and%20adulthood.)

<sup>38</sup> Feldman, R. S. (2017). Chart of Different Features of Life Spans. In *Discovering the Life Span Fifth Edition* (4th ed., pp. 3–5). Pearson.

mentioned in her article that some children some may start to identify as “athletic” or “artistic” because of the social role and physical skills development. In this age, kids are “becoming more physically adept, independent and sophisticated in their problem-solving”.<sup>1</sup>

Thus, the age range of the “Experience design of Traditional craft and Maker” should be set as 8 to 12 years old.

## 5.3 User Interview

### 5.3.1 Selection of Interviewees

In this interview section, I found 3 children, 3 parents as interviewees, they are from different families. Every interview participated by interviewer (the author) and one interviewee. Due to the limitation of my social circle, the interviewees were mostly based in Hangzhou City. The families' finance situation was not investigated in detail. The interview samples cannot represent the general situation of the region, but have a certain reference value. To protect the personal privacy and sensitive information of the interviewees, pseudonyms are used in the below text.

### 5.3.2 Interview for Children

(Interview date: 20/March/2020 - 24/March/2020)

#### 5.3.2.a Interviews Questions

##### Basic information about interviewee

1. How old are you?
2. Your gender is?
3. Which grade are you?

##### Questions about craft class or interest group program

1. What interest group program after school you regularly take?
2. Have you ever taken any craft classes from school? Was it related to traditional craft?
3. During the quarantine times, did you attend any craft classes from distance?
4. Have you heard or participate “Maker Class”? How you feel about it? If you participated, do you like it, why? What you want to share?
5. Which one you prefer “Traditional craft class” or “Maker class”?
6. If there's a interest group program which is combining “Traditional craft class” with “Maker class”, will you like to try it?

##### Questions about the interest group program which combines “Traditional craft class” and “Maker class”.

1. If there is this kind of class, would like to attend with your parents or you prefer to join it by yourself alone?
2. If there is this class offering, would you like to do it with 1. delivered tools and online tutorials (or live streaming) or 2. participating a group in real life face to face? And why?

### **5.3.2.b Conclusions of Interviews**

#### **Basic information**

The children interviewees are Lucy Wang, 13 years old girl in middle school second year; Anna Shen, 11 years old girl in 6th grade of primary school; Niki Jin, 10 years old boy in 4th grade of primary school respectively. Two of them are from 2-children family, and all three of them are studying in public school right now.

#### **Craft class or interest group program**

Generally, they all attended craft class or interest group program before, mostly, provided by the public school. However, the craft classes are different from different schools. In the middle school, craft classes are so called "Extended curriculum course". Comparing with primary school's, they are focus more on basic subject theory and Arouse students' interest in Science. And to develop the students' ability to analyze and solve practical problems.

For instance, in primary school, children are offered fabrics handicraft, simple cooking, cardboard model, etc. When the children entry middle school, physical experiments, simple aeromodelling, etc.

3 children all blurted out, when the covid pandemic hit, they lost their beloved craft classes. 2 of them complained about during almost the whole semester-long online studying period time, they did not have a chance to have craft classes face to face with their friends. Neither with parents, experienced any craft learning section.

#### **"Traditional craft class" or "Maker class"?**

Although, different preferences were demonstrated by 3 children when the choosing "Traditional craft class" or "Maker class" question coming out; very strong interests were showed by them when I was mentioning about interest group program which combines "Traditional craft class" and "Maker class". Whereas two of them said they haven't attended the "Maker class", they all agree that "face to face workshop/class" will be their better option. Two girls said it is more interesting doing the craft with friend, and the boy worried "maker class might be more difficult than other craft class, so teacher's timely help is necessary.

### 5.3.3 Interview For Parents

(Interview Date: 20/March/2020 - 24/March/2020)

#### 5.3.3.a Interviews Questions

##### Basic information about interviewee

1. How old are you?
2. Your gender is?
3. Which grade is your child in? And how old is he or she?

##### Questions about craft class or interest group program

1. What interest group program your child's school offering?
2. If there is craft class related to traditional craft, would you encourage your child to attend? What is your motivation?
3. Would you like to participate with your child?
4. During the quarantine times, did your child attend any craft classes from distance or you did with him/her?
5. Have you heard or acknowledged "Maker Class"? would you encourage your child to attend it? What is your motivation?
- 6.
7. Which one you prefer "Traditional craft class" or "Maker class"?
8. If there's a interest group program which is combining "Traditional craft class" with "Maker class", will you like to try it?

##### Questions about the interest group program which combines "Traditional craft class" and "Maker class".

1. Would you like to let your child to try, if there is an interest group program which is combining "Traditional craft class" with "Maker class"? And why?
2. What is the price of this kind of craft class or interest group program acceptable for you?

#### 5.3.3.b Conclusions of Interviews

##### Basic information

The Parents interviewees are Mr. Lion Wang, 40 years; Mrs. Lan, 46 years old; Mrs. Yang, 37 years old. Two of them have 2 kids in family, their kids' age varies from 5 to 14 years old, and most of them are studying in public school.

##### Craft class or interest group program

3 of parents said their children attend the classes from outside after school but only the Math,

Chineses, Science, dancing, painting classes are picked by them, 1 of them said that his child has been attending craft class.

Mr. Wang told author that his 11 years old daughter has learned bamboo weaving in a short-term traditional craft class from outside school. He mentioned that at first, her daughter really interests in handicraft, secondly, he thinks practical ability is important for kids. "the histories, stories from our ancients should be remembered, and I would like to see my child learned the local traditional craft heritage", he added. In the interviews, the rest of two parents basically agree with that, craft class could drive children's curiosity. During the quarantine time, only one parent said she did some craft activities with her kids, but not from distance class.

#### **"Traditional craft class" or "Maker class"?**

Regarding the "Maker class", three parents all heard before, but their children have not attended. Mr. Wang said he does have some friends who picked the "Maker class" for their kids; it is becoming a trend recently. Mrs. Lan declared that she prefers her son would take the "Maker class", it seems more "useful" in the future, and it is Technology-oriented. Mrs. Yang said, if her kids do not have enough time or her kids in the last year of primary, and have immense study pressure, she would not encourage kids to attend the "Traditional craft class" or "Maker class". Besides, it all depends on children's interests; parents will not force them.

All the parents showed vital interests in the interest group program, combining "Traditional craft class" with "Maker class". And they said they would like to let their kids attend the class offline in an actual workshop or classroom instead of learning from a distance. "Under the consideration of study efficiency, a real face-to-face workshop is more practical." Parents said.

According to the information provided by the parents, the price range of normal interest group program outside school is about "150- 250RMB (19.5-32.4 EURO)" per hour (group class with (5-12 children). From the perspective of parents, the acceptable price range of Interest group program can be slightly higher than the normal price, but cannot be too much higher.

### 5.3.4 Personas

To specify the target user, Personas are set up (Figure 5.11). Leo Ding, 12 years old, interested in craft and technology, with a father who very much supports his off-school activities.



Figure 5.13 Persona. By author, (2021).

## 5.4 Design Brief

The idea of the "toy" (Experience design of the craft) should not be limited to either "Product Design" or "UI/UX Design". The author's purpose of the thesis is to more emphasis on the "experience". Through the "Traditional colored stone inlay" and "Maker Designer" experience with acceptable difficulty level,

It is easy to get the children interested in the hands-on project.

### 5.4.1 Cognitive Psychology Guides children's Experience Design

#### 5.4.1.a Piaget's Cognitive-developmental Theory

Piaget's Four Stages put forward in his book *Theory and Stages of Cognitive Development*. The 8 to 12 years old age range is in between "Concrete Operational Stage" and "Early Formal Operational Stage", which means children's cognition is from "Logical thinking" transferring to "scientific reasoning".<sup>39</sup>

Children's thinking can be more abstract during 8 to 12 years old age, start to develop to the adult level gradually. Therefore, the digital interface could be introduced into the Experience Design, build a linkage between digital interface and real-world craft activity. Potentially, the design could embed more knowledge related to traditional craft and maker education in the Experience Design to let children immerse themselves in the feeling of being "traditional craftsman" and "maker designer".

#### 5.4.1.b Visual Perception of Gestalt Psychology

In German, Gestalt means "form". In human perception, visual perception is the main one. Gestalt Psychology's principles explain how human-beings "grouping, recognizing and simplifying visual elements" while seeing particular objects. One article from Interaction-Design Foundation explained: Gestalt principles include the laws of "Similarity, Continuation, Closure, Proximity, Figure/Ground, Symmetry and order." This principle is an essential guide for product design and UI/UX design.<sup>40</sup>

Visual objects contain many sources of information. We expect the eyes to receive information beyond the object, which generally includes the cognition from the object's experience. This cognition is not limited to vision but has other senses, such as smell, touch, taste, hearing, temperature, and pain.<sup>41</sup>

For this reason, in the design of "Experience Design", it should consider the characteristics of "toys" that attract children's attention and consider the other sensory experience that Experience Design can bring to children.

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<sup>39</sup> Mcleod, S. (2020, December 7). Jean Piaget's Theory of Cognitive Development. Simplypsychology.Org. Retrieved Apr 05, 2021, from [https://www.simplypsychology.org/piaget.html#:~:text=Piaget%27s%20\(1936%2C%201950\)%20theory,and%20interaction%20with%20the%20environment.](https://www.simplypsychology.org/piaget.html#:~:text=Piaget%27s%20(1936%2C%201950)%20theory,and%20interaction%20with%20the%20environment.)

<sup>40</sup> Interaction-Design Foundation. (n.d.-b). What are Gestalt Principles? The Interaction Design Foundation. Retrieved Apr 27, 2021, from <https://www.interaction-design.org/literature/topics/gestalt-principles#:~:text=Gestalt%20principles%20or%20laws%20are,the%20separate%20simpler%20elements%20involved.>

<sup>41</sup> Gregory, R. L. (1978). Seeing. In *Eye and Brain : The Psychology of Seeing* 3rd Edition Revised and Updated (3rd Edition Revised and Updated ed., pp. 09–14). World University Libraries.

### 5.4.1.c Color Psychology of Children

Children have different color psychological characteristics at different ages. Infants aged 0-3 prefer more colorful colors, conducive to their observation and cognition of the surroundings. With the growth of children's age, the color of "toys" should gradually transition from bright color to soft and scenic color configuration. Because of the maturity of their psychology and personality, children who are approaching adolescence no longer like too naive colors.<sup>42</sup>

Accordingly, should pay attention to moderate and rational colors to design an elegant, quiet, and cold playful atmosphere.

As Clare Willetts mentioned in her article *A world of colour*, Kids should be given the rights of choosing their color "without any of the stereotypes that can limit their aspirations and wellbeing"<sup>43</sup>. Indispensably, the freedom of color choice (stone textures) is necessary.

Besides, materials play an essential role in "Traditional craft and Maker" Experience Design. Materials with different characteristics will bring different psychological feelings. For example, glass is transparent and fragile with a sense of transparency, metal has a sense of modern science and technology, and the antique wood can give people a feeling of nature and classical. The original colorful stone textures and 3D printed material will provide children with the sense of "Traditional Craft" and "Maker Tech."

## 5.4.2 Design Approaches

### 5.4.2.a Introduce Craft Processes of Colored Stone Inlay

Through experience with the "toy", children would understand the basic processes of Colored Stone Inlay. In order to reduce the difficulty of manual practice, the original 11 processes will be divided and simplified into three sections- 1. Design, 2. Inlay, 3. Polish.

In the "1. Design", instead of drawing on paper with complicated patterns, children will do it on the digital platform; they could combine, stack and rotate certain elements to form different patterns and choose the color scheme for their patterns. So that, they finished the "Stone Selection". Also, "Stone Cutting" and "Board Carving" will be done by colored stone providers and 3D printing providers. Afterward, children will get a pack of stone pieces and a "base", with these materials, children can continue to the next step.

In the stage of "2. Inlay", with a simple and safe tool kit, children can inlay their stone pieces into the "base" to restore the pattern they designed before and create their aesthetic look. With an easy tutorial, they can do some carving and sanding work on the surfaces of stone.

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<sup>42</sup> Jiang, M. (2009). Color design of children's toys. *Journal of Science and Technology Information*, 338–340. Retrieved Apr 23, 2021, from <https://doi.org/10.3969/j.issn.1001-9960.2009.33.257>

<sup>43</sup> Willetts, C. (2020). *A world of colour*. *Toys n Playthings Winter 2020*, 47. Retrieved Apr 22, 2021, from [https://issuu.com/lemapublisihng/docs/toys\\_n\\_playthings\\_december\\_2020](https://issuu.com/lemapublisihng/docs/toys_n_playthings_december_2020)

At the last step

"3. Polish", they can finish up their "Inlay work" with polishing and waxing. Hopefully, some local cultures of Wenzhou City could be embedded into the design.

#### **5.4.2.b Introduce the Processes of be a "Maker Designer."**

Design Digitally, Craft Physically

To let children feel like a "Maker Designer", rather than a didactic introduction.

##### **Design Digitally, Craft Physically**

The design will focus on the whole experience of connecting the digital world with real life, which means that what you created in the digital world can be brought into the real world. Children will get to know how the "Maker Space" tools work, for example, 3D printing with different material, CNC machines and so on.

##### **The Spirit of Sharing**

Maker culture is focusing on the characters as informal, networked, peer-led, and shared learning.<sup>44</sup> The spirit of sharing is essential to improve children's communicative ability, and they can also learn from their peers.

Dr Amanda Gummer, the Good Play Guide founder, claimed that "toys" could improve children's social skills. Children can be easier to open up a discussion with others if they have a common interest. The process of crafting and sharing both give children a sense of accomplishment.<sup>45</sup>

##### **Group Workshops in Person and Delivery Service**

Through the interviews and questionnaires, more people interested in participating in a group workshop in person. Hence, the function of group workshops should be considered in the Experience design of the craft.

On the other side, accessibility of the maker space workshop is limited in the urban area, and it's not convenient for children living in the outskirts and countryside. Also, some people prefer playing with the craft by themselves. So the delivery service and remote experience should be included as well.

Moreover, even though China's COVID-19 pandemic has been well controlled by 2021 March,

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<sup>44</sup> The Open University (UK). (2013). *Innovating Pedagogy 2013: Exploring new forms of teaching, learning and assessment, to guide educators and policy makers*. Retrieved Apr 30, 2021, from [https://www.researchgate.net/publication/256475436\\_Innovating\\_Pedagogy\\_2013\\_Exploring\\_new\\_forms\\_of\\_teaching\\_learning\\_and\\_assessment\\_to\\_guide\\_educators\\_and\\_policy\\_makers](https://www.researchgate.net/publication/256475436_Innovating_Pedagogy_2013_Exploring_new_forms_of_teaching_learning_and_assessment_to_guide_educators_and_policy_makers)

<sup>45</sup> Amanda Gummer. (2020). One for the boys-more than just a pastime. *Toys n Playthings* Winter 2020, P64. Retrieved Apr 28, 2021, from [https://issuu.com/lemapublisihng/docs/toys\\_n\\_playthings\\_december\\_2020](https://issuu.com/lemapublisihng/docs/toys_n_playthings_december_2020)

some areas are still unstable. So that,

In the future, if the Experience design of the craft will be applying to overseas countries outside of China, perhaps, the unexpected weaves of the COVID-19 pandemic lower the people's willingness of practicing in person, the design of delivery service and remote experience will be required. Plus, according to MD Richard Wells, single-player games that work both for virtual platforms and in-person are becoming more and more popular this year (2021).<sup>46</sup>

### **5.4.3 Introduction of Tangram**

The ancient puzzle game will be introduced into the design. In the section 1. Design, children can digitally play the tangram, and set up the patterns they want; in the section 2. Inlay, children will get tangram stones pieces, and inlay and carve them on the board.

#### **5.4.3.a The History**

The puzzle game is made by seven flat geometric patterns. As an ancient Chinese puzzle game, Tangram has a profound history. It is an extensively welcomed dissection puzzles game. The game concept of Tangram was formed around the 17th century (Ming Dynasty) from folk games. Tangram was introduced into America and Europe by trading ships in the 18th century, after which the first world war witnessed a booming spreading of the tangram puzzle game.

#### **5.4.3.b Why Tangram?**

Culturally, tangram is one of the Chinese traditional toys with large audience, which is very familiar for children. Hence, it fits the theme with the Colored stone inlay craft.

In the market aspect, according to NPD (National Purchase Diary Panel Inc. and NPD Research Inc.) figures, the games & puzzles category had a +19% growing sales during the 2020 lockdown.<sup>46</sup>

In terms of production, tangram has a fixed size of 7 pieces, which means it is easy to cut and produce the tangram stones pieces. However, for children, there is endless freedom to combine and play these pieces.

#### **5.4.3.c Research about tangram game**

In "Section 1 Design", children need to play with the tangram to design their patterns. To understand the "tangram interface" better, five games were tested by the author (Figure 5.14 to Figure 5.6), 3 are app games, 2 are web games.

Case 1: tangram! App game

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<sup>46</sup> Toys n Playthings Media. (2021). Stay ahead of the game. Toys n Playthings March 2021, P28. Retrieved Apr 06, 2021, from [https://issuu.com/lemapublisihng/docs/toys\\_n\\_playthings\\_march\\_2021](https://issuu.com/lemapublisihng/docs/toys_n_playthings_march_2021)



Figure 5.15 tangram! App game processes. From tangram! Game page Screenshot by author [image], (2021), Retrieved April 05, 2021, from PadOs app tangram! ©2010-2018 Gergely Borbas.

tangram! App game processes. From tangram! Game page Screenshot by author [image],(2021), Retrieved April 05, 2021, from PadOs app tangram! ©2010-2018 Gergely Borbas.

#### Case 2: New tangram! Seven boards of skill App game



Figure 5.16 New tangram! Seven boards of skill App game processes. From New tangram! Game page Screenshot by author [image], (2021), Retrieved April 05, 2021, from PadOs app tangram! ©2010-2018 Gergely Borbas.

#### Case 3: Tangram- App game

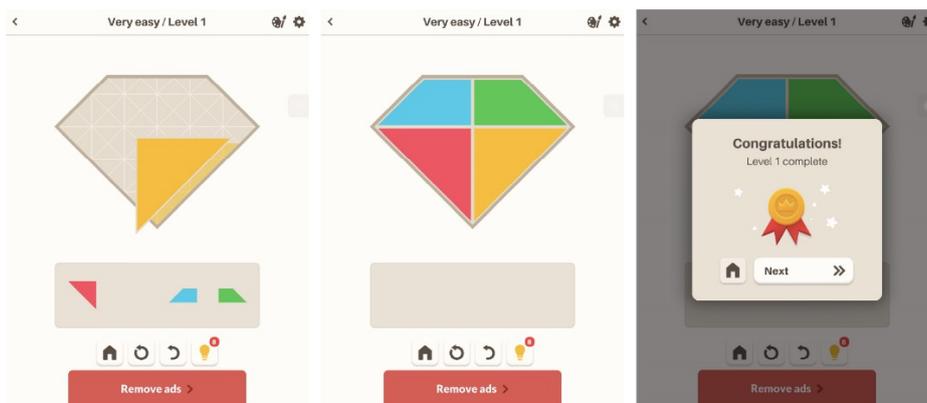


Figure 5.17 Tangram- App game processes. From Tangram- Game page Screenshot by author [image], (2021), Retrieved April 05, 2021, from PadOs app Tangram- ©2018 PUZZLE GAMES FACTORY.

#### Case 4: Tangram of mathigon.org Web game



Figure 5.18 Tangram of mathigon.org Web game processes. From Tangram of ©2021 mathigon.org page Screenshot by author [image], (2021), Retrieved April 05, 2021.<sup>47</sup>

### Case 5: Tangram of Toytheater Web game

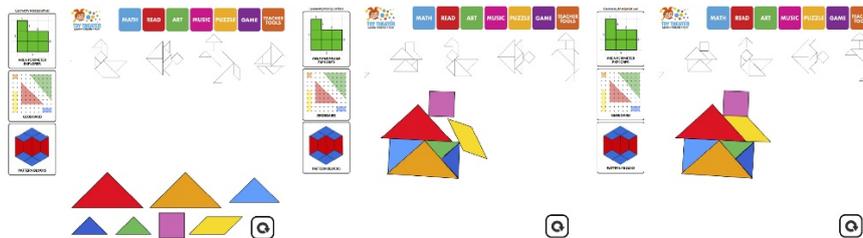


Figure 5.19 Tangram of Toytheater Web game processes. From ©2021 Toytheater page Screenshot by author [image], (2021), Retrieved April 05, 2021.<sup>48</sup>

### Summary:

Four games have the rotating function; three of them applied a rotating handle. Four games have adsorbing operation to increase usability (when the user drag one piece A to approach other pieces, piece A will automatically slightly rotate a little bit to adjust other ones.)

Three app games have a better interaction experience than web games; Compared to web games, they are more similar to mission games and have less degree of freedom. The web games are hard to operate with a mouse, but they are more alike real-life tangram games. The game from mathigon.org even has color options and a mirror function for each piece. Moreover, it is the only game support user to overlap tangram pieces on the other ones, which open up bigger freedom.

## 5.4.4 Design Principles

### 5.4.4.a Human-Centered Design

The users of the Experience design of the craft are 8 to 12 years old children. Children's understanding ability should be considered in this design, and information should be conveyed to children in a concise and easy to understand way. Visually, sections related to UI/UX design should consider children's acceptance level. As the tools involved in the design, ergonomically should be easy to use and fit with children's size. And the method of interaction should follow the principles of human-centered design.

<sup>47</sup> Tangram Web game. (2021). mathigon.org. Retrieved April 05, 2021, from <https://mathigon.org/tangram>. Screenshot by author.

<sup>48</sup> Tangram of Toytheater Web game. (2021). Toytheater Retrieved April 05, 2021, from <https://toytheater.com/tangram>. Screenshot by author.

#### **5.4.4.b Safe & Green**

Given this age group of children, their awareness and ability of self-protection are not mature enough. The safety design principle is fundamental in this design. Safety factors include psychological levels such as feeling at ease and trust and physiological levels such as cleanness and harmlessness. Not sharp modelling, harmless materials, smooth surface treatment, etc., should be used in the design.

So in the craft processes, the relatively dangerous operations such as stone cutting and board carving will be avoided; stones will be cut by the color stones inlay studio and hand to children by delivery; the board will be 3D printed with wooden material. To develop an awareness of environmental-friendly and sustainability, so the materials in the Experience Design will be chosen from renewable, biodegradable materials.

#### **5.4.4.c Entertainment Principle**

In short, the principle of entertainment is a positive psychological state and an indispensable demand for children. Therefore, in the design of Experience design of the craft, entertainment elements should run through UI design and products. Interesting visual elements and sound effects can be added to Experience Design to enhance the entertainment.

#### **5.4.4.d Education principle**

In the process of playing, children can experience different scenarios as a “craftsman” and a “maker designer.” Experience design of the craft should enhance the interaction between “toys” and people, embed traditional culture education and maker education in the game to make people more deeply integrate into the experience. Children can learn the traditional culture, understand the structure and explore the exciting patterns in games.

# Chapter 6: Experience Design Outcome

## 6.1 User Journey Map

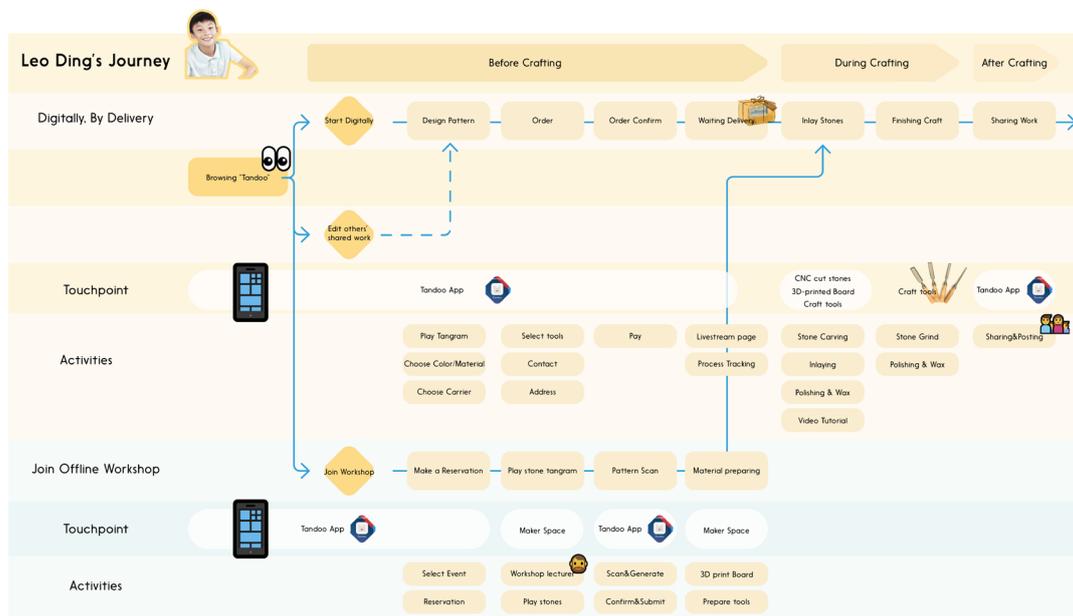


Figure 6.1 User Journey Map. By author, (2021).

User Journey Map Figure 6.2 is built from the previous persona: Leo Ding's perspective; it outlines the Experience Design. The journey is divided into three phrases, Before, During and After Crafting. The three phrases are connected by the "Tandoo" app. There are two different ways to experience the craft journey. The light yellow part represents "Design the pattern digitally" and "Materials sent by delivery"; the light blue part represents "Join offline workshop".

The yellow part aims to provide service of experience craft at home. Users can play Tangrams and design patterns digitally, then get the craft tools and the tangram stone pieces according to their designed pattern.

The light blue part is meant to help people who want to join an offline workshop and experience the craft in the local Maker space. After making a reservation for an event in the "Tandoo" app, users can attend the workshop. The Maker space will offer lectures(from craftsmen, Maker Designer), tools, materials for the participants. People can learn the craft skill and knowledge about being a Maker. Tangram stones will be offered there; users can play them physically. After the pattern is finished, it can be scanned and recognized by the app. After users choose the carrier, the Colored Stone Inlay Product(wood CNC or 3D printing) will be manufactured on the spot. Then users can start inlay. The lecturer will guide me through all the processes.

Meanwhile, the "Tandoo" app provides certain social functions. The craftworks can be exhibited and posted by users. From the shared posts, users can edit others' shared work. The spirit of sharing is essential in Maker culture; sharing behavior needs to be encouraged.

In the Colored Stone Inlay, accurately inlaying stone pieces is essential. Grinding is one of the important parts of crafting. Hence, if the user designed some overlapped patterns, overlapped stones will not cut; they will keep in their original tangram shape. On the other hand, it reduces the workload for the stone cutting studio, and after cutting, the strength of the stone piece will not be as high as before; it is easier to break during transportation.

## 6.2 User Flow Diagram

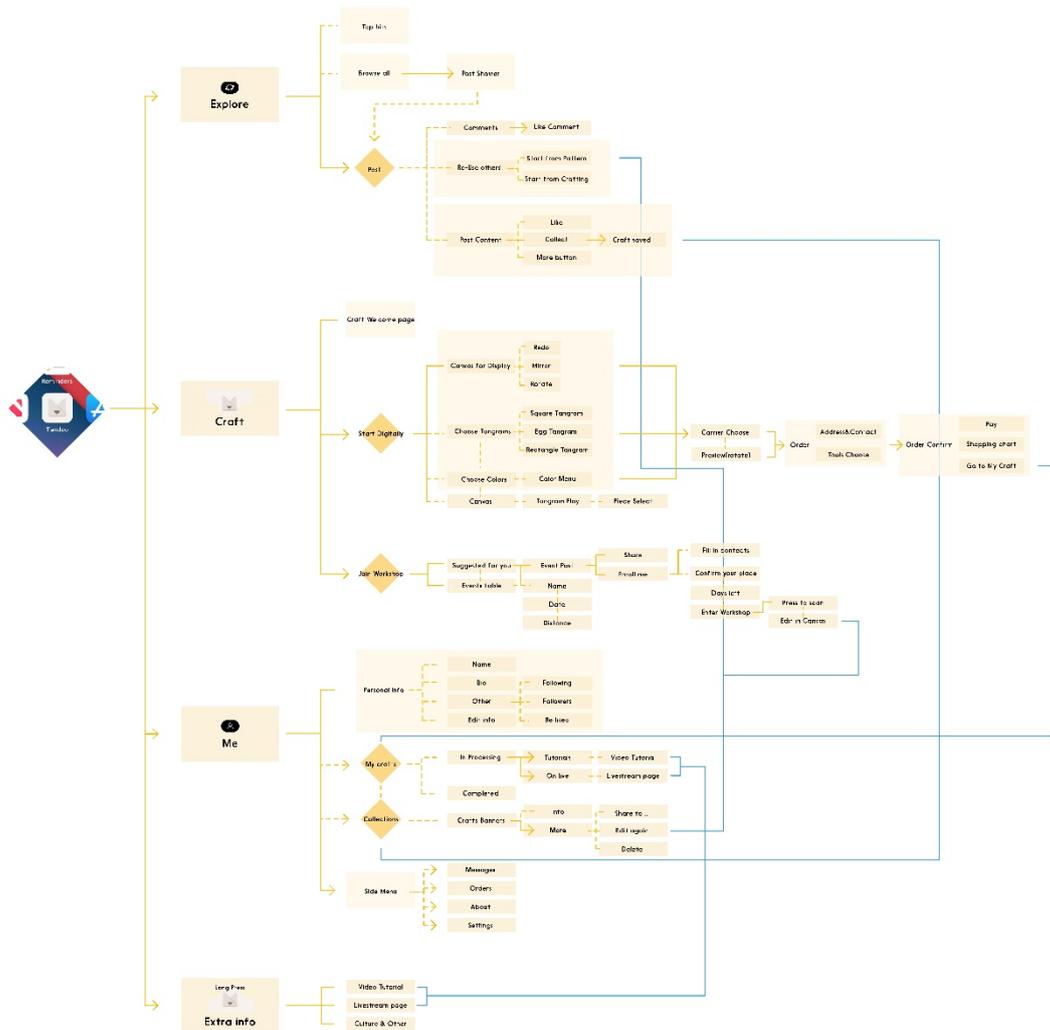


Figure 6.3 User Flow Diagram. By author, (2021).

User Flow explains the structure of the UI Design (see Figure 6.4). The app is an important auxiliary tool to realize the whole Experience Design. It is divided into four main categories: Explore, Craft, Me, Extra info. The four parts realize different functions individually; also, they are an integrated whole.

Explore:

The attributes of social function are reflected in this part; kids can share their finished craftwork with a post, the work which received more likes can have a chance to be exhibited

in Top hits. In the post, kids can comment on others' work, exchange the craft experience, make a new friend. It is aiming for forming a craft community. More than just getting likes and social, kids can share their Designed craft pattern with others, and others can take from the post and re-use or re-design your craft.

#### Craft:

It is where craftwork start. The craft part is designed as two parts.

Start digitally; kids can choose three different tangrams to start, including Square Tangram, Egg Tangram and Rectangle Tangram.

They can play tangrams and make their patterns. Functions such as Redo, Mirror, Rotate are provided. The tangrams can be rotated at any angle, overlapped with other ones. The operations of the tangram will be real-time synchronized on Canvas. After finishing the pattern setting, the next step is coloring, and the tangram pieces need to be colored with natural stone materials. In which dozens of stones are available, what choice kids made, the tangram pieces will be coming true and being delivered in real life. When the pattern is ready, kids can apply the pattern on carriers (real product such as a lamp, flowerpot, wood board……); they can choose one and have a preview. Colored Stone Inlay tools are also available on the ordering page. After confirming the order and payment, the carrier and tools will come along with stone pieces in a delivery package. Since then, the real practice of Color Stone Inlay is ready to start; they can experience it from home.

Join workshop is set as a reservation function. During the workshop, it has also been used as a Smart Tangram Recognition Function.

#### Me:

On the Me page, users can see personal information, their recent and past crafts, their collections. When the Color Stone Inlay materials are in Processing and delivery has not arrived, kids can witness through a live stream of how their colored stones being cut and prepared by the studio, how their carrier being 3D printed in the local Maker space. The knowledge about CNC, 3D printing…… is embedded in the live stream page. When the materials arrived, kids will be notified with tutorial video, knowledge as culture and historical stories also can be found on this page. In my craft, kids will be guided step by step until they complete all the processes and share the finished work.

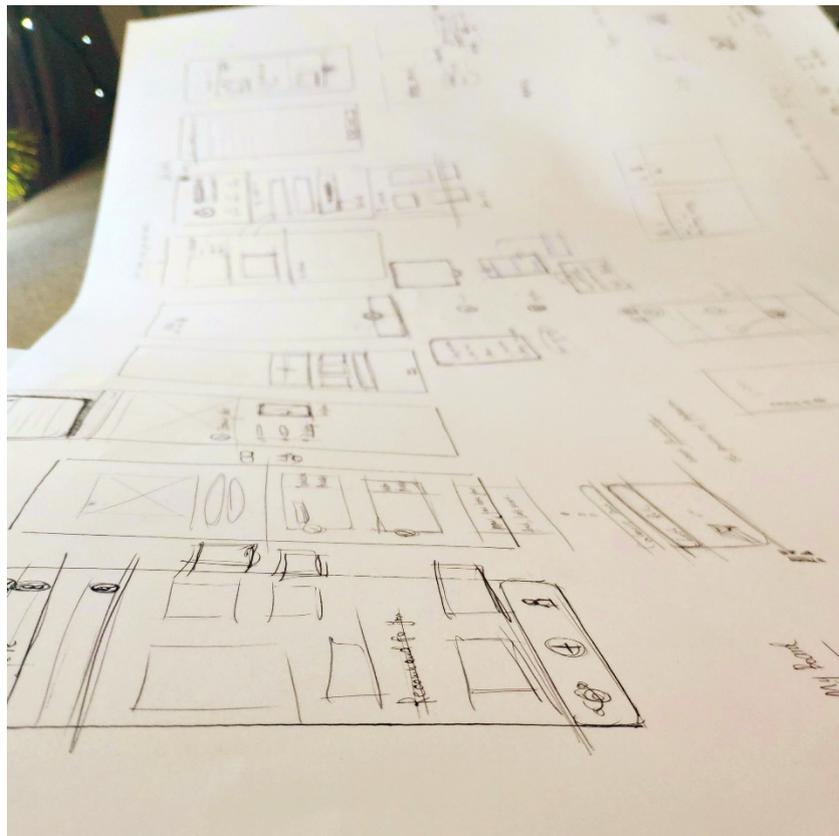
The saved posts can be found in Collection, where kids can review them and re-use others' shared patterns.

A Side menu is included on the Me page.

#### Extra info:

This page only pops up when the user long-press the "Craft Button"(the logo in the middle) and slide up. It is organized as a container, Livestream page, Video Tutorial, Culture, and Other interesting contents, even though the user has not consumed it on the app.

## 6.3 Paper Prototype



*Figure 6.5 Paper Prototyping [Photograph], By author, (2021).*

After completing User Experience Map and Logics Chart, Paper Prototyping Figure 6.3 is the initial stage for Low-fidelity Wireframe. Which is suitable for the early conceptualizing stage; the basic layout of UI and visual elements have been sketched; the feasibility of main features has been verified. With the feedback from users, Paper Prototyping has been keeping iterating. Paper Prototyping is essential for the fundament of building up the final prototype.

## 6.4 Low-fidelity Wireframe

Figure 6.6 to Figure 6.6 are made as Low-fidelity Wireframe. They play as an early stage of Hi-fidelity prototype.

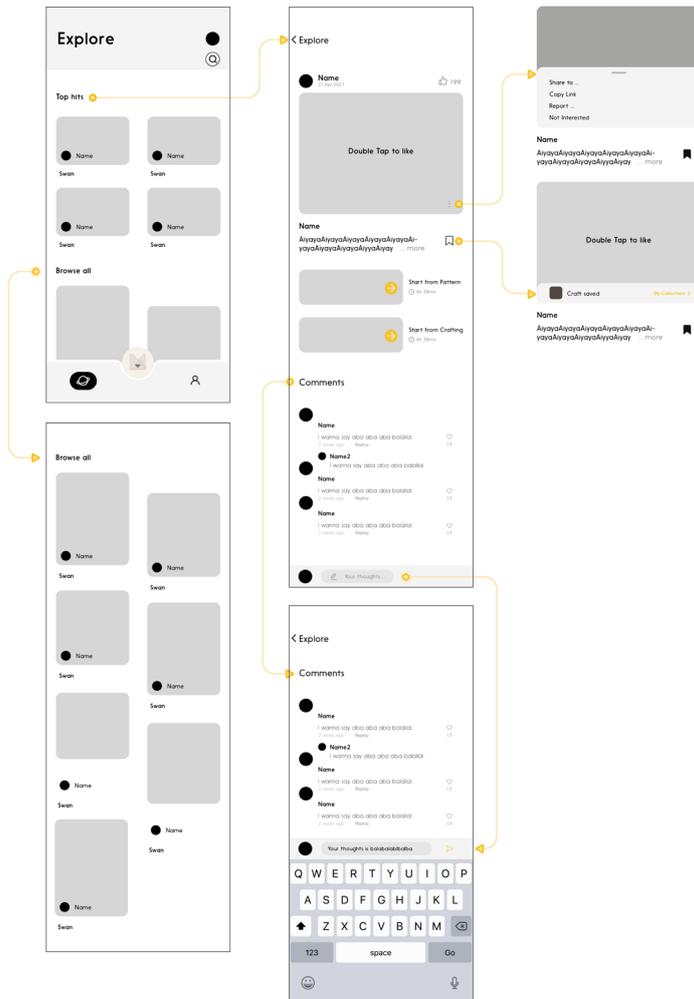


Figure 6.7 1 Explore page, Low-fidelity Wireframe. By author, (2021).

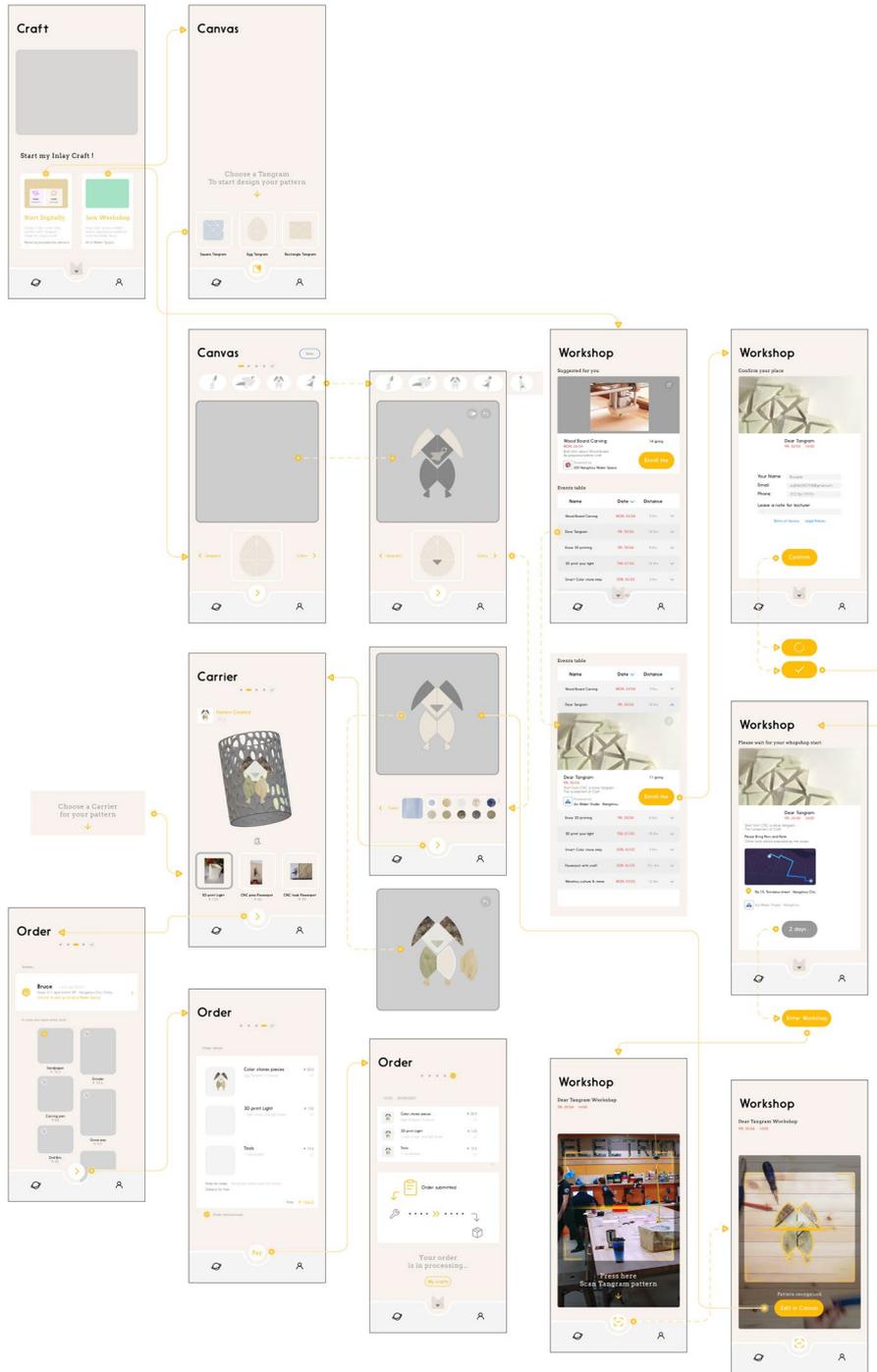


Figure 6.8 2 Craft page, Low-fidelity Wireframe. By author, (2021).

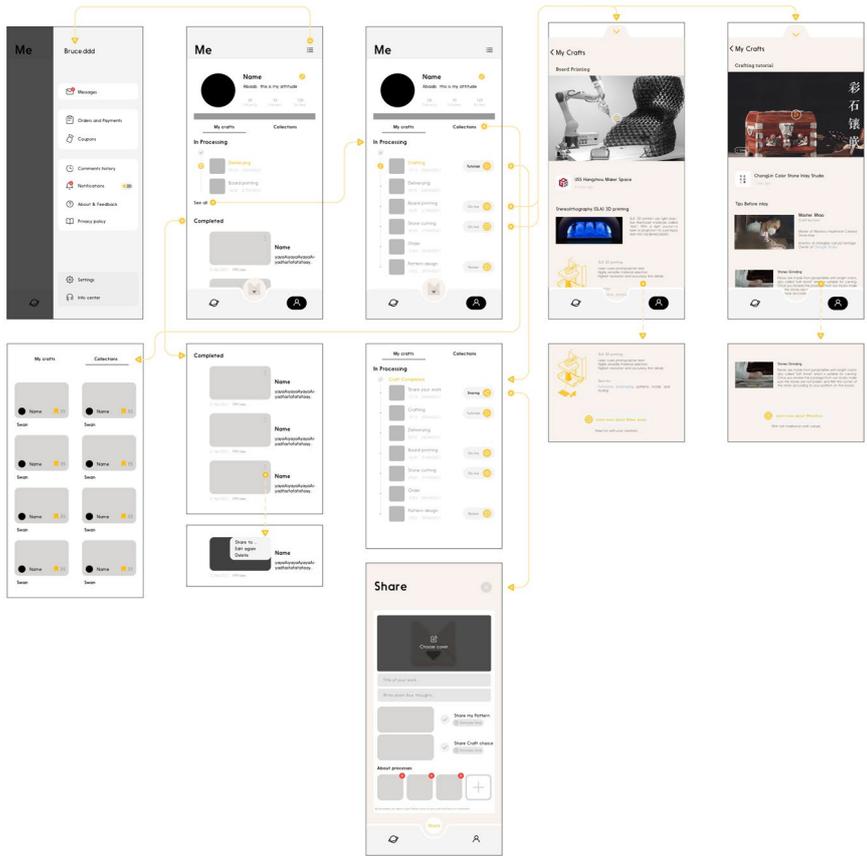


Figure 6.9 3 Me page and Extra info page, Low-fidelity Wireframe. By author, (2021).

## 6.5 Brand

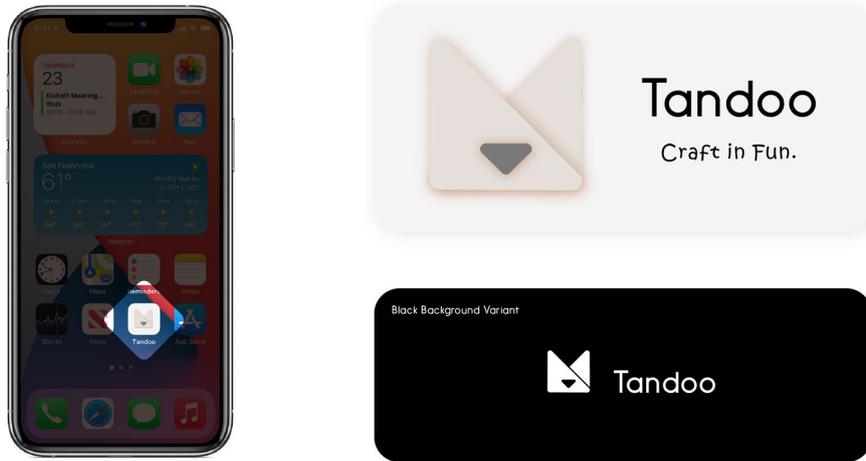


Figure 6.10 Brand of "Tandoo". By author, (2021).

The app is named "Tandoo" (in Figure 6.11). Such as "CHADO", which is interpreted as "The way treat tea." "Tandoo" can be explained as "The way treat Tangram." Both Tangram and Wenzhou Traditional Colored Stone Inlay are with a long history, but now they reborn in another form. The simple and vivid logo depicts it is facing the modern era.

The app's icon consists of tangram triangle pieces, and it is illustrated as an abstract dog face. The cartoon-like image and light-yellow theme color indicate that the brand is children-friendly and serves kids. The Inverted triangle on the top overlaps with the other one, which suggests the app feature: support rotating and support overlap tangram pieces on the other ones. With limited pieces, users can have endless possibilities of tangram patterns.

The brand's slogan is set as: "Craft in Fun." which represents the philosophy of the service is to make the traditional craft more interesting and let kids have fun during the experience of craft.

## 6.6 UI Specs & Assets

### 6.6.1 Typeface & Colors

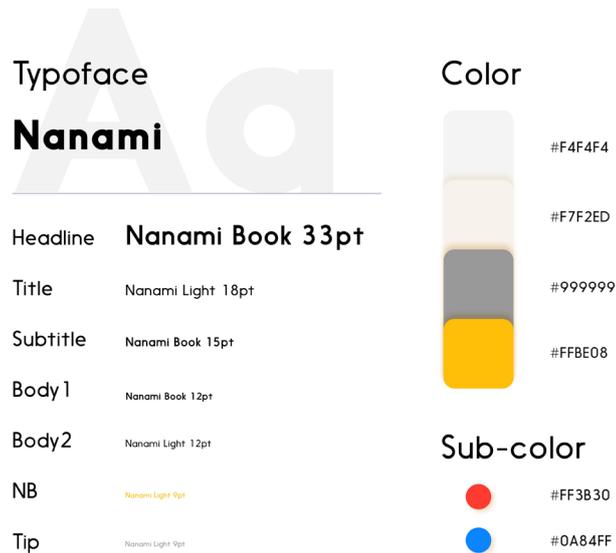


Figure 6.12 Typeface & Colors. By author, (2021).

In this project, Nanami is chosen as the Typeface for “Tandoo” ( see Figure 6.13). Most text displayed with black color; NB and Tip are designed as bright yellow and light gray. In the color theme, colors #F4F4F4 and #F7F2ED are used as background; the bright yellow is used for interactive buttons. As for sub-colors, bright blue and bright red are set for sub-interactive buttons and notifications icons.

## 6.6.2 Icons

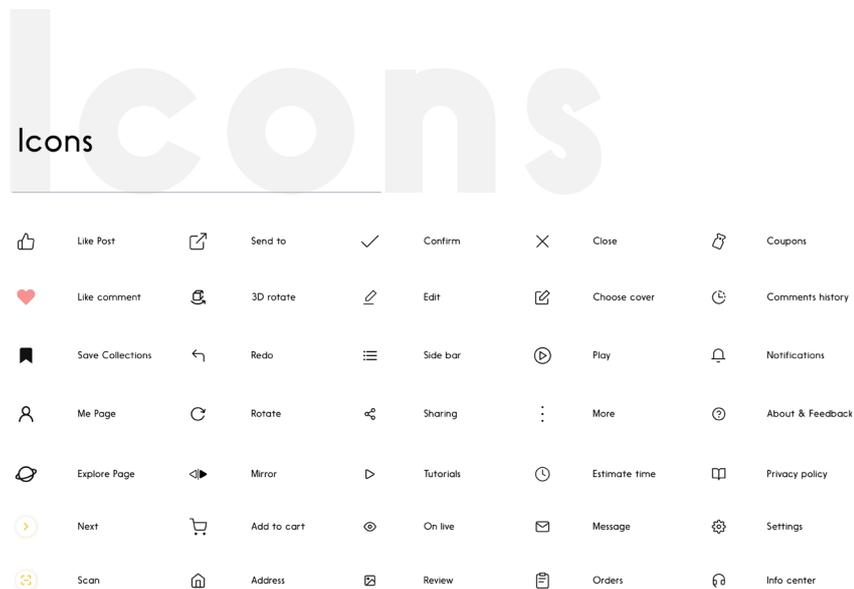


Figure 6.14 Icons. By author, (2021).

Essential Icons showed in Figure 6.9.

## 6.7 Prototype

In Prototype, High fidelity UI and scenarios were demonstrated, which showed all the processes of the User journey.

The Tangram stone pieces and stone cutting service were provided by Mr. Yichuan Miao, Chonglin Studio. The scenarios were set up by the author's father, Mr. Fengbin Wang from China, who was also responsible for craft guiding and lecturing. Xinrui Shen and Qun Yang were invited as testers for this project. The pictures were photographed by the author's mother, Mrs. Yuqun Wang. The author finished image editing.

### 6.7.1 Explore

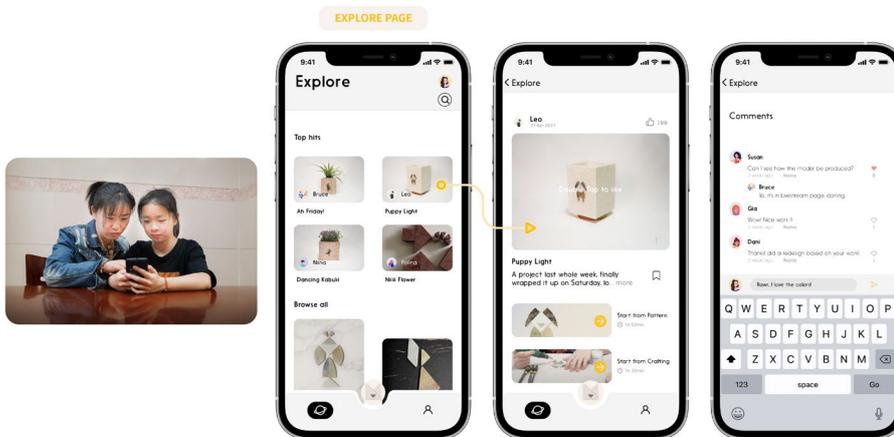


Figure 6.15 The girl and her mother are looking in Explore Page. Photographed by Yuqun Wang, edited by the author, (2021).

As showed in Figure 6.10, in Explore Page, the girl and her mother are browsing other kids' posts of craftwork. Post details and Comments page can be reached from here. "Tandoo" provides some "bonding time" for parent-child interaction. Parents can participate in kids' craft experiences early to show support and interest in kids' craftwork.

### 6.7.2 Craft



Figure 6.16 The girl browsing in Craft Page. Photographed by Yuqun Wang, edited by the author, (2021).

Craft Page offers the entries of "Start Digitally" and "Join Workshop". (in Figure 6.11) . The girl chose "Start Digitally".

### 6.7.3 Start Digitally



Figure 6.17 Editing tangram pattern on Canvas, Start Digitally of Craft Page. Edited by the author, (2021).

After choosing “Start Digitally”, three tangrams popping out in Figure 6.18. User can choose one of them to start making their pattern on Canvas Page. At the top of Canvas, to let kids easier start making patterns, few example patterns are provided. The Color Select page has a material select window; the user can scroll down and see all the stone/color choices. If the user needs to leave temporarily, the user can save the pattern and continue to edit it later; the Save button is on the top right corner. After that, the user comes to the Carrier Select Page, in which the user can review the Chosen Carrier in 3D vision. Plus, a Navigation Indicator is set on the top to indicate the user in which step currently.

## 6.7.4 Order

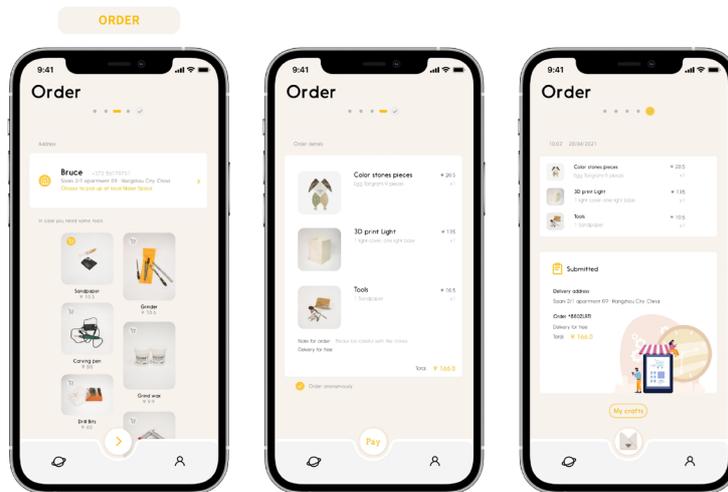


Figure 6.19 Choose the craft tools and Order the craft materials. Edited by the author, (2021).

After finishing the pattern and carrier choice, next is the Order Page Figure 6.13. Furthermore, the user needs to fill in the delivery address and pick necessary craft tools into the shopping cart. Then, the user confirms the order and makes the payment. The page will display order details; it tells the user his/her order is submitted and processed soon. Since then, the “1. Design” part of Colored Stone Inlay has been finished.

A button “My Craft” sits below the page; it is a shortcut going to “Me Page”. The user can track the order which is in processing; also, the user can get more information about the processing steps.

## 6.7.5 Experience Craft at Home



Figure 6.20 The girl starts experience craft at home 1. Photographed by Yuqun Wang, edited by the author, (2021).

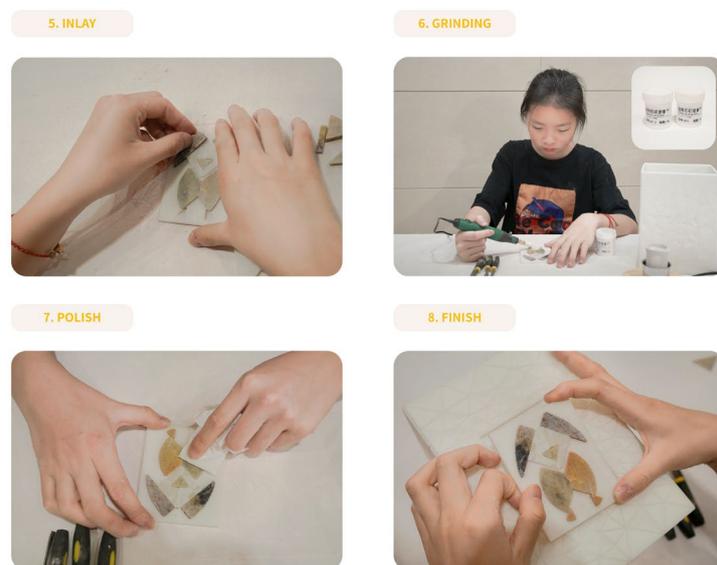
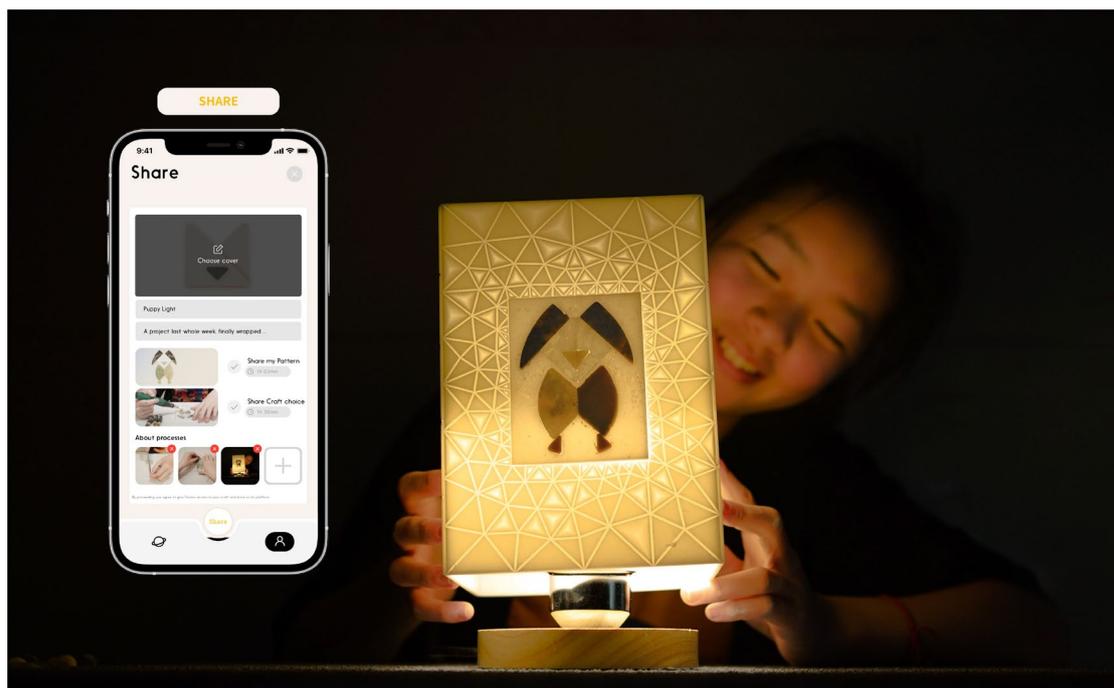


Figure 6.21 The girl starts experience craft at home 2. Photographed by Yuqun Wang, edited by the author, (2021).

In the Figure 6.14Figure 6.15 showed that few days after the order, the girl gets a delivery package from “Tandoo”, which includes a 3D printed light, tangram stone pieces as she designed before, and some other craft tools. The “2. Inlay” and “3. Polish” parts begin from

here. She starts hands-on craft as soon as she received the delivery. The first step is confirming the pattern; the user puts tangram stone pieces together. When the user-designed pattern with overlapped shape (for instance, the Dog example showed above), the stone pieces will not cut completely; the user needs to carve the shape of “Nose of the dog” on the stone. Kids can experience the carving process of Colored Stone Inlay. The following step is to glue and inlay the tangram stone pieces on the 3D-printed board. After that, the girl refines the stone; she uses grind wax and polishing wax with an electrical grinding pen. Finally, she puts the board with the light model and assembles all the rest of the light.

### 6.7.6 Share



*Figure 6.22 The girl finishes her first Colored Stone Inlay work and share her post. Photographed by Yuqun Wang, edited by the author, (2021).*

The girl finishes her first Colored Stone Inlay work in Figure 6.16. In her post, she shares her happiness with the Craft Experience and other craft processes. Also, she generously shared her pattern and carrier choice with the “Tandoo” community.

### 6.7.7 Join Workshop

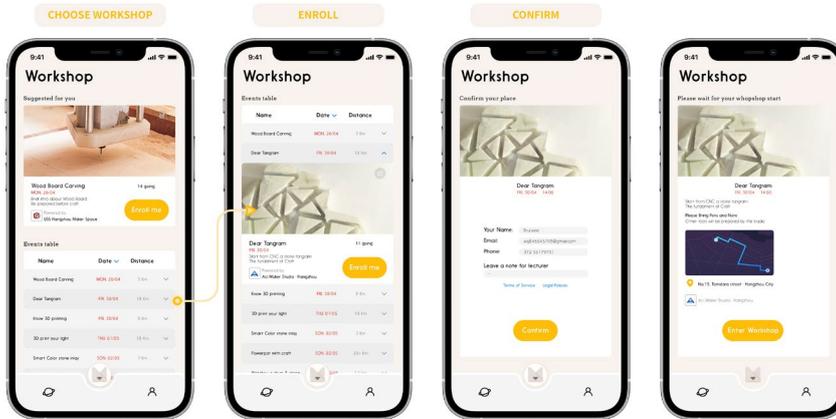


Figure 6.23 Choose a Workshop from Event table. Workshop Page. Edited by the author, (2021).

If the girl chose “Join Workshop” entry in Craft Page ( see Figure 6.17). She will be led to this “Workshop” page. According to event popularity and her location, an event from local maker space will be recommended to her. All the events below are provided by local maker spaces which collaborating with “Tandoo”. The event on the Events table can be unfolded, and user can see the details of the event, and choose to enroll into the workshop. After filling the application, user can wait the date event starts and enter the workshop.

### 6.7.8 Craft Lecturer

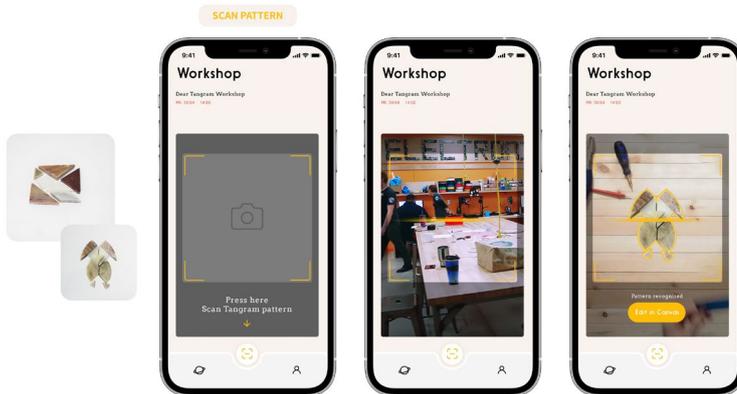


Figure 6.24 Craft lecturer from local maker space is introducing Wenzhou Traditional Colored Stone Inlay and

*Tangram stone pieces. Photographed by Yuqun Wang, edited by the author, (2021).*

Local Maker space will invite craftsmen to give lectures for the kids such as showed in Figure 6.18. The craft lecturer is introducing Wenzhou Traditional Colored Stone Inlay and Tangram stone pieces.

### 6.7.9 Scan Pattern



*Figure 6.25 In Maker space, stones tangrams being scanned into “Tandoo”. Edited by the author, (2021).*

In Figure 6.19, in the workshop, Maker space prepares ready tangram stone pieces; participants can pick whichever pieces they like and make their pattern there. The “Workshop Page” of “Tandoo”, provides a Smart Tangram Recognition Function. User can use it to scan their pattern, and import into “Canvas Page” with shapes and colors, then they can continue editing or making some changes in “Canvas Page”.

### 6.7.10 Craft Guiding



Figure 6.26 Craft Lecturer is guiding the girl with Colored Stone Inlay. Photographed by Yuqun Wang, edited by the author, (2021).

During the workshop, Craft Lecturer will guide the participants to craft safely, and provide other knowledge related with the traditional craft. (see Figure 6.20)

### 6.7.11 Me Page

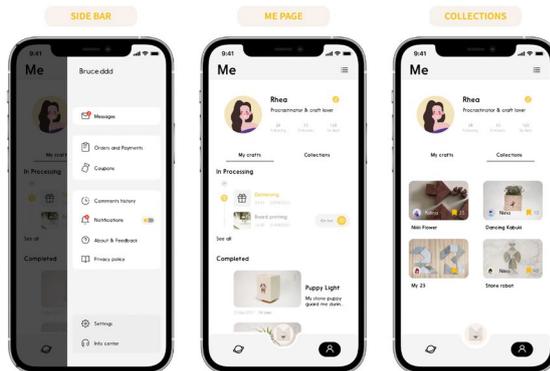


Figure 6.27 Me Page. Edited by the author, (2021).

In Figure 6.21, the Messages, Orders, Coupons, Setting and other functions are located in the Side Bar of the “Me Page”. “Me Page” displays the user’s profile and social information such as Following, Followers and Be liked, which encourage users to keep innovative with

Craftworks and keep active on the “Tandoo” Community. “My Crafts” divided into two parts: “In Processing” and “Completed”. “In Processing” keeps updating the contemporary craftwork and guide the user through the experience. Slide right, there is the “Collections” part; the user can find the posts they saved before.

### 6.7.12 In Processing & Extra Info

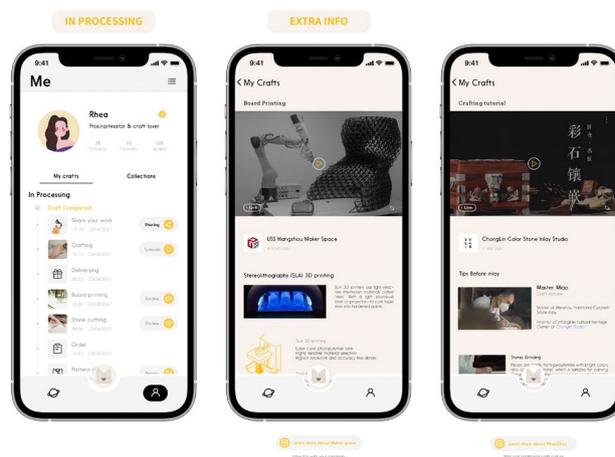


Figure 6.28 In Processing & Extra Info Page. Edited by the author, (2021).

As showed in Figure 6.22, the “Extra Info” Page can be reached by clicking the buttons popping out with the “In processing” updates., or the user can long-press the “Craft Button” (the logo in the middle) and slide up. It provides the Livestream of the 3D-printing board, Stones Cutting, other Video Tutorials, and other side knowledge.

### 6.7.13 Other Works

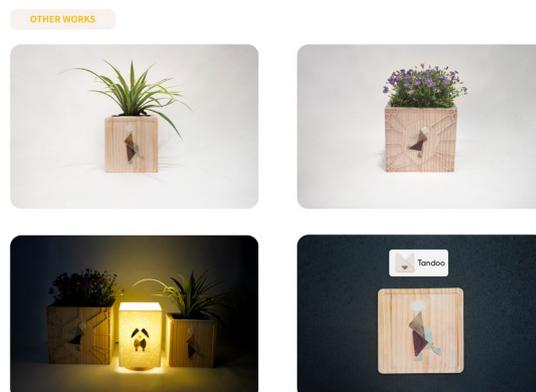


Figure 6.29 Other Works. Photographed by Yuqun Wang, edited by the author, (2021).

## **Chapter 7: Conclusion**

### **7.1 Outcome**

The aim of the thesis was:

To explore using the maker-space platform to lower the experience threshold for kids playing traditional craft- Wenzhou Colored Stone Inlay.

In the Theory Research, the question "What is the value of traditional craft in modern society? craft skills or aesthetics?" has been answered. The values of traditional craft in modern society were described in detail: Aesthetics, Entertainment, Cultural Symbols. The traditional craft is not either for "Pure Appreciation" either for "Pragmatic Use"; there is a Balance Point in between. It pointed out the further design direction for the Wenzhou Colored Stone Inlay product. The thesis agreed that aesthetic / the visual form effects weigh more than traditional craft skill. Traditional craft skills can be developed with modern technologies.

Besides, "Maker Movement" was recognized can greatly reduce the threshold of personal creation and production of Craft. It is an ideal carrier for storing and disseminating traditional craft knowledge, skills and products.

"Maker Movement" can be beneficial to Traditional Craft, which has been discussed through 3 aspects: Form "Traditional Craft Community", "As A Product" and "As A Making Process".

Furthermore, the Case Study phrase reveals the potential of Wenzhou Traditional Colored Stone Inlay. The Craft Process has been researched, and the Aesthetics of it has been deconstructed and analyzed.

The question "How to simplify the experience of Wenzhou Colored Stone Inlay for kids" and "How to combine maker education and traditional craft?" were answered in Chapter 5: Design Fusion And Application.

The original 11 processes of Colored Stone Inlay will be simplified into three sections- 1. Design, 2. Inlay, 3. Polish. Tangram was introduced to lower the difficulty of design a pattern of Colored Stone Inlay. "Stone Cutting" and "Board Carving" will be done by colored stone providers and 3D printing providers. Part "1. Design" is mostly done digitally.

In the "2. Inlay" and "3. Polish", kids are supported with the simple and safe tool kit and tutorial videos. Kids are also offered a chance to join the local Maker space workshop.

The app "Tandoo" is designed as an important platform to support and educate kids, where they can find sharing, designing patterns, crafting, booking workshop, learning knowledge of traditional craft and Maker methods. Through the processes, kids can also acknowledge Wenzhou Colored Stone Inlay culture, "Maker Space," and "Maker culture".

### **7.2 Summary**

This thesis probed into Traditional Craft and Maker Movement, based on research, one

direction of conducting traditional craft innovation is clarified. It completed an experiment of combining Traditional Craft and Maker Education. An in-depth case study on Wenzhou Colored Stone Inlay, an Experience Design of Craft is created.

However, the thesis design passed by the fulfillment and obtained the stage result, the theory of combining Traditional Craft and Maker Education still needs to be more consolidated; the research work needs to be improved. It is only one of the directions to revitalize traditional crafts. Due to the finite time and ability, this thesis only chooses Wenzhou Colored Stone Inlay as the case study; more traditional crafts should be studied, and the universality of theory has not been validated. Limited by conditions, the function realization of Experience Design is still at the primary level, which is a deficiency.

### **7.3 Outlook**

In the expectation of the Experience Design, the Tandoo App should be further improved and lunch on the market; the cooperation with craft studios and Maker space will be carried out officially. In the future, the Experience Design of Craft will not just stay as a conceptual prototype but become a real product, a profitable service.

At different times, children's toys have different forms. In the information society, the Experience Design that combine software and hardware, traditional crafts and modern technologies will be a major development direction.

In addition, the concept applies not only to Zhejiang Province, China but also to other traditional crafts around all over the world.

## **Chapter 8: Acknowledgements**

After two years in Taltech and EKA, I am going to finish my postgraduate study. Choosing to go abroad from China to Estonia is an essential turning point in my life. In this journey, I received numerous support and help.

First of all, I need to deliver my sincere thanks to my Supervisors and Tutors: Ruth-Helene Melioranski and Martin Pärn. Thanks to your insightful feedback, which pushed my research further and sharpened my thesis design.

I would like to express my gratitude to those who helped with my dissertation. Mr. Yichuan Miao, the master of Colored Stone Inlay Studio, offered me invaluable advice and craft assistance. Thank you, Xinrui Shen and Qun Yang, for helping and experience my craft experience design. And my parents Mr. Fengbin Wang and Mrs. Yuqun Wang, thank you for all the craft operating work, photographing, and patience. Your unrequited help made all my design concepts happened in reality, and you deserve a diploma as well.

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