



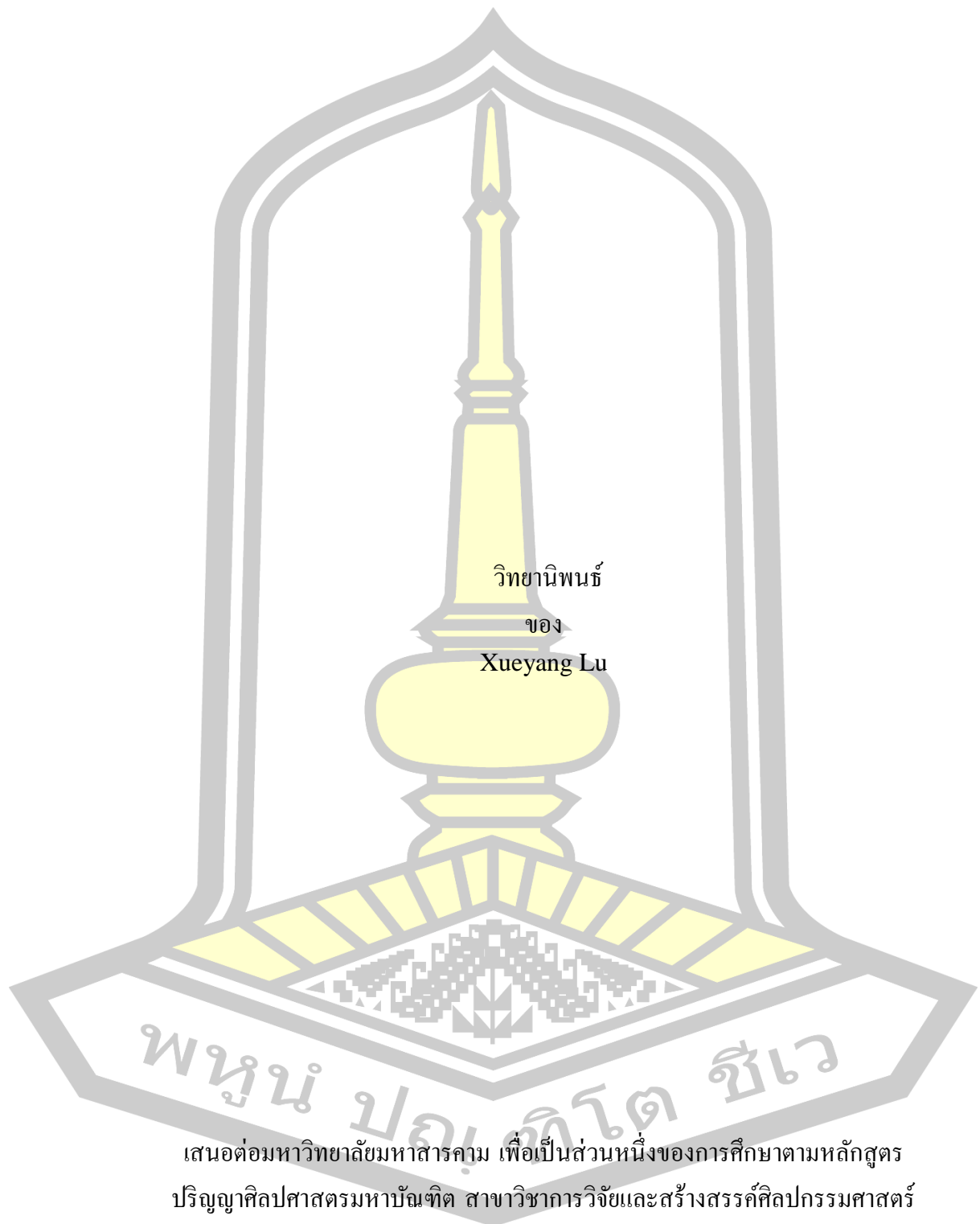
Waste paper reuse Luoyang twelve zodiac art innovation design

Xueyang Lu

A Thesis Submitted in Partial Fulfillment of Requirements for  
degree of Master of Arts in Fine and Applied Arts Research and Creation  
December 2024

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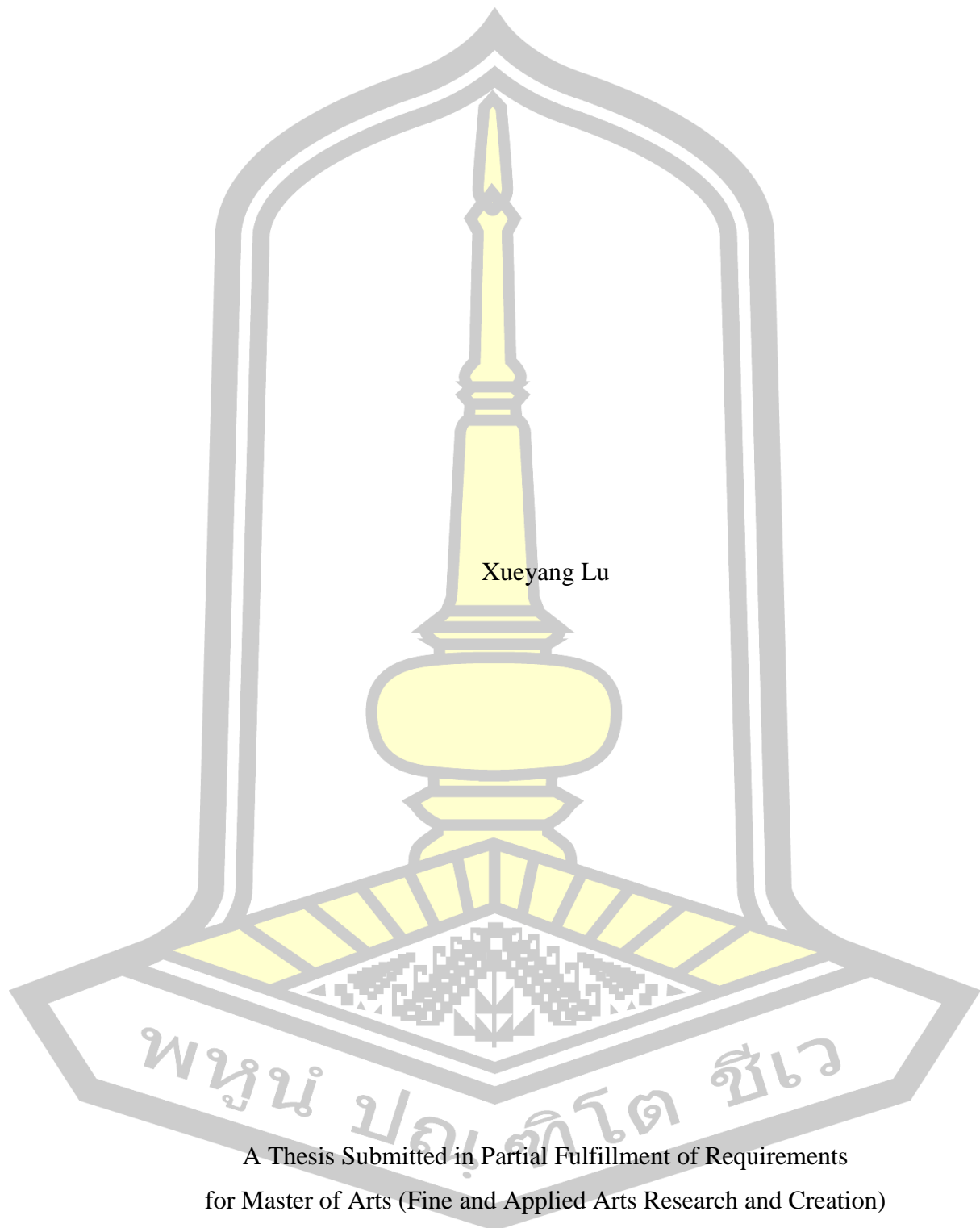
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ธันวาคม 2567

ลิขสิทธิ์เป็นของมหาวิทยาลัยมหาสารคาม

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December 2024

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The examining committee has unanimously approved this Thesis, submitted by Ms. Xueyang Lu , as a partial fulfillment of the requirements for the Master of Arts Fine and Applied Arts Research and Creation at Mahasarakham University

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### ABSTRACT

The author of this thesis aims to explore the fusion and application of waste paper and the innovative design of the arts innovation of the zodiac signs of Luoyang. With the improvement of environmental protection and sustainable development awareness, the use of waste paper as a feasible solution is increasingly valued. At the same time, Luoyang Zodiac Art, as a treasure of traditional Chinese culture, has rich symbolic significance and aesthetic value.

This thesis describes the three research purposes: study and analyze the relevant situation of waste paper, study and analyze the history and characteristics of the zodiac signs of Luoyang, and use waste paper to design the Luoyang Zodiac artwork.

This study is based on the in -depth research on the re -use technology of waste paper, and combines the essence of the Zodiac art of the Luoyang, and proposes an innovative design concept. First of all, through the treatment and processing of waste paper, it converts it into materials that can be used for artistic creation. Then, the image and meaning of the Zodiac of the Luoyang created a series of unique artworks, such as sculptures, painting and handmade products. These works not only show the environmental significance of re -use of waste paper, but also convey the deep connotation and traditional value of Luoyang's zodiac culture.

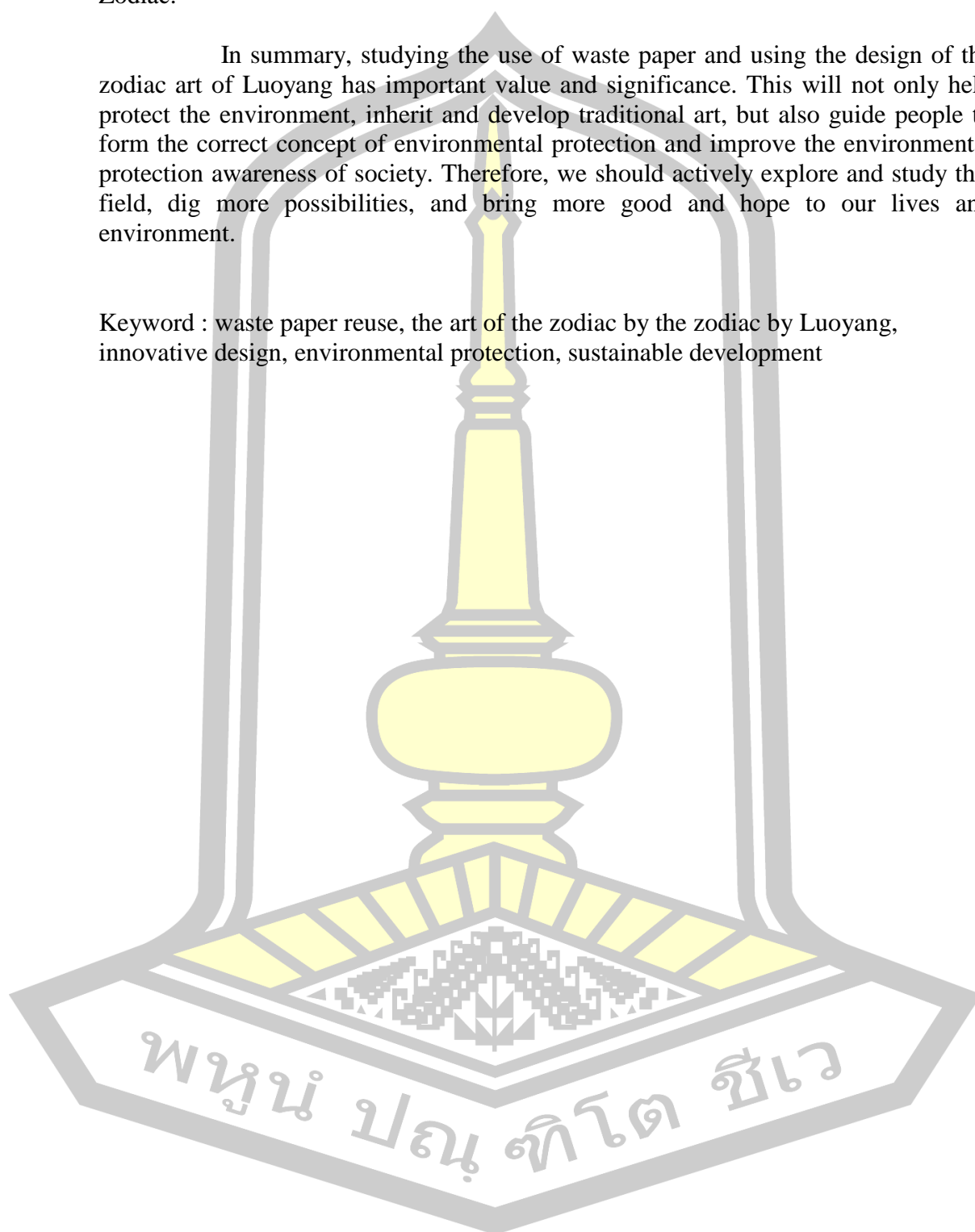
This study adopts interview method. Through the methods of interviews, observations and investigations, the feasibility and effect of waste paper reuse the innovative design of the art innovation design with the zodiac signs of Luoyang. The results show that through reasonable design and artistic expression, the use of the combination of waste paper with the combination of the art of the zodiac signs of Luoyang can produce unique and attractive art works, which has triggered the audience's thinking about environmental protection and cultural heritage.

The results of this study are of positive significance for promoting the application of waste paper reuse technology and the innovation and development of traditional culture. Related design concepts and practical experience can provide reference and reference for artists, designers and environmental protection practitioners. However, further research still needs to explore the widespread

application and potential of the innovative design of the Zodiac arts with Luoyang Zodiac.

In summary, studying the use of waste paper and using the design of the zodiac art of Luoyang has important value and significance. This will not only help protect the environment, inherit and develop traditional art, but also guide people to form the correct concept of environmental protection and improve the environmental protection awareness of society. Therefore, we should actively explore and study this field, dig more possibilities, and bring more good and hope to our lives and environment.

Keyword : waste paper reuse, the art of the zodiac by the zodiac by Luoyang, innovative design, environmental protection, sustainable development



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Time, the white haze passed the gap, in a blink of an eye, the study life of Mahasarakham University is about to end. In these two years, I met many good teachers and friends, and they gave me a lot of selfless help and support. Here, I want to express my heartfelt thanks to them.

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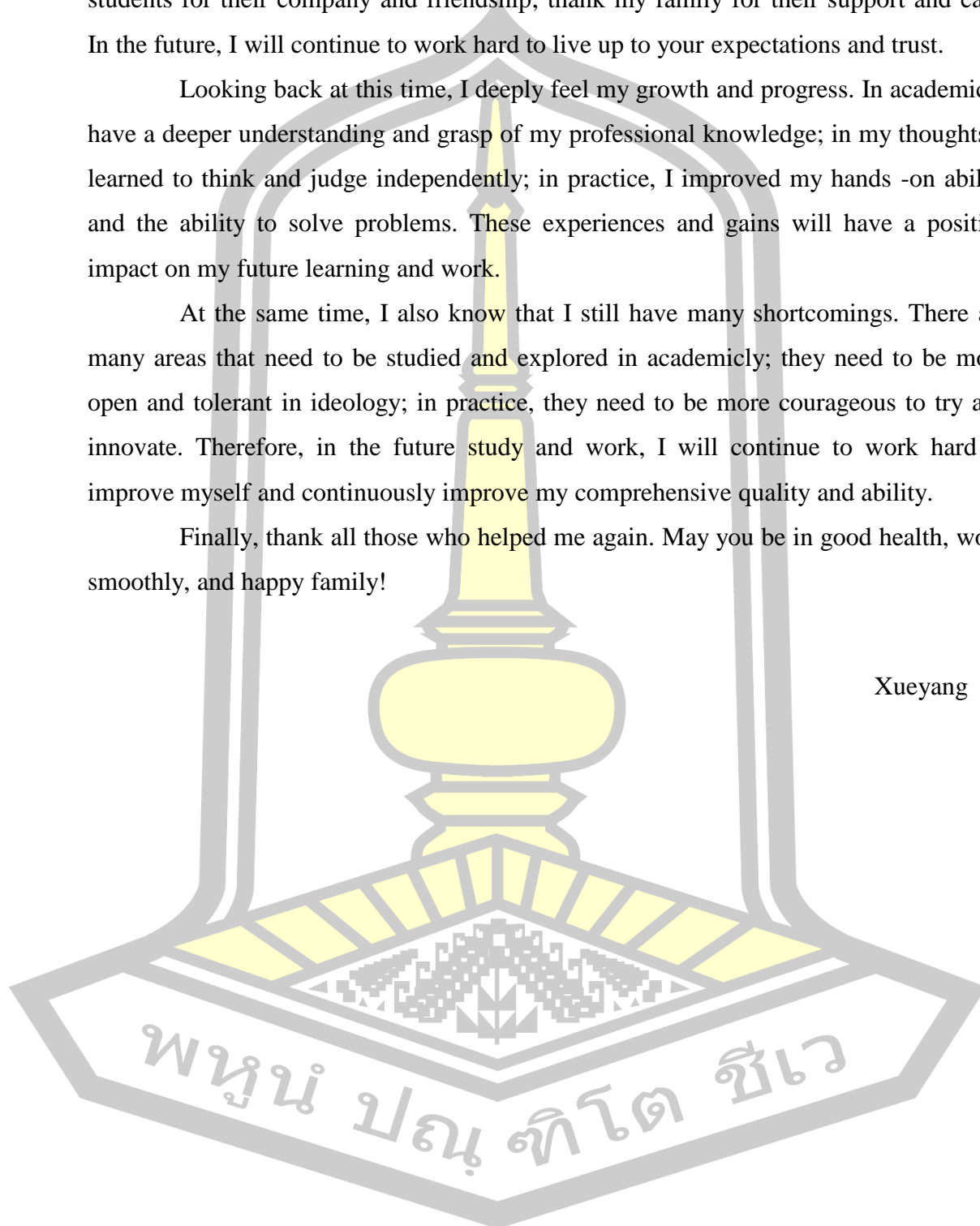
unforgettable youth here; thank the teachers for their hard work and teachings; thank students for their company and friendship; thank my family for their support and care. In the future, I will continue to work hard to live up to your expectations and trust.

Looking back at this time, I deeply feel my growth and progress. In academic, I have a deeper understanding and grasp of my professional knowledge; in my thoughts, I learned to think and judge independently; in practice, I improved my hands-on ability and the ability to solve problems. These experiences and gains will have a positive impact on my future learning and work.

At the same time, I also know that I still have many shortcomings. There are many areas that need to be studied and explored in academically; they need to be more open and tolerant in ideology; in practice, they need to be more courageous to try and innovate. Therefore, in the future study and work, I will continue to work hard to improve myself and continuously improve my comprehensive quality and ability.

Finally, thank all those who helped me again. May you be in good health, work smoothly, and happy family!

Xueyang Lu



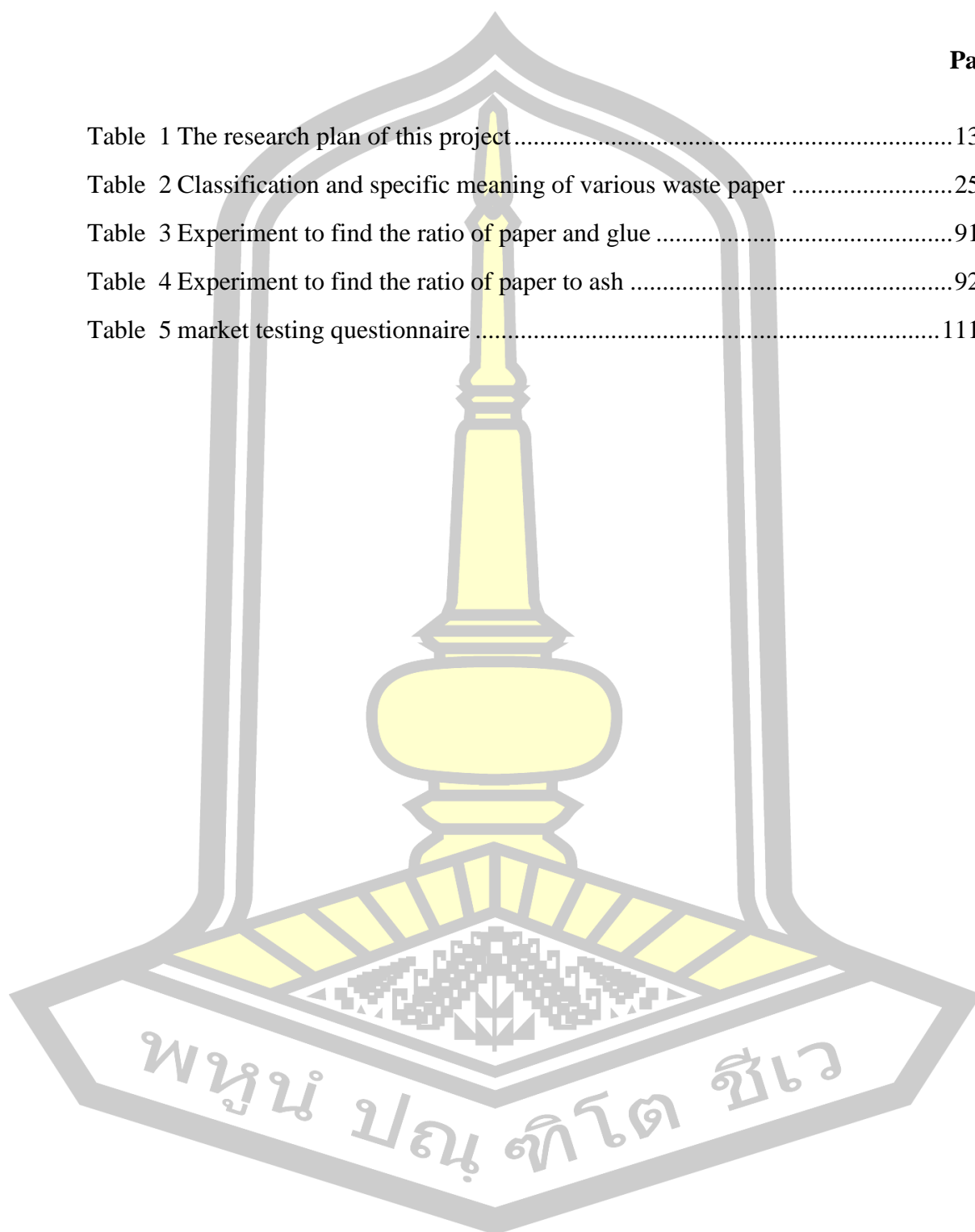
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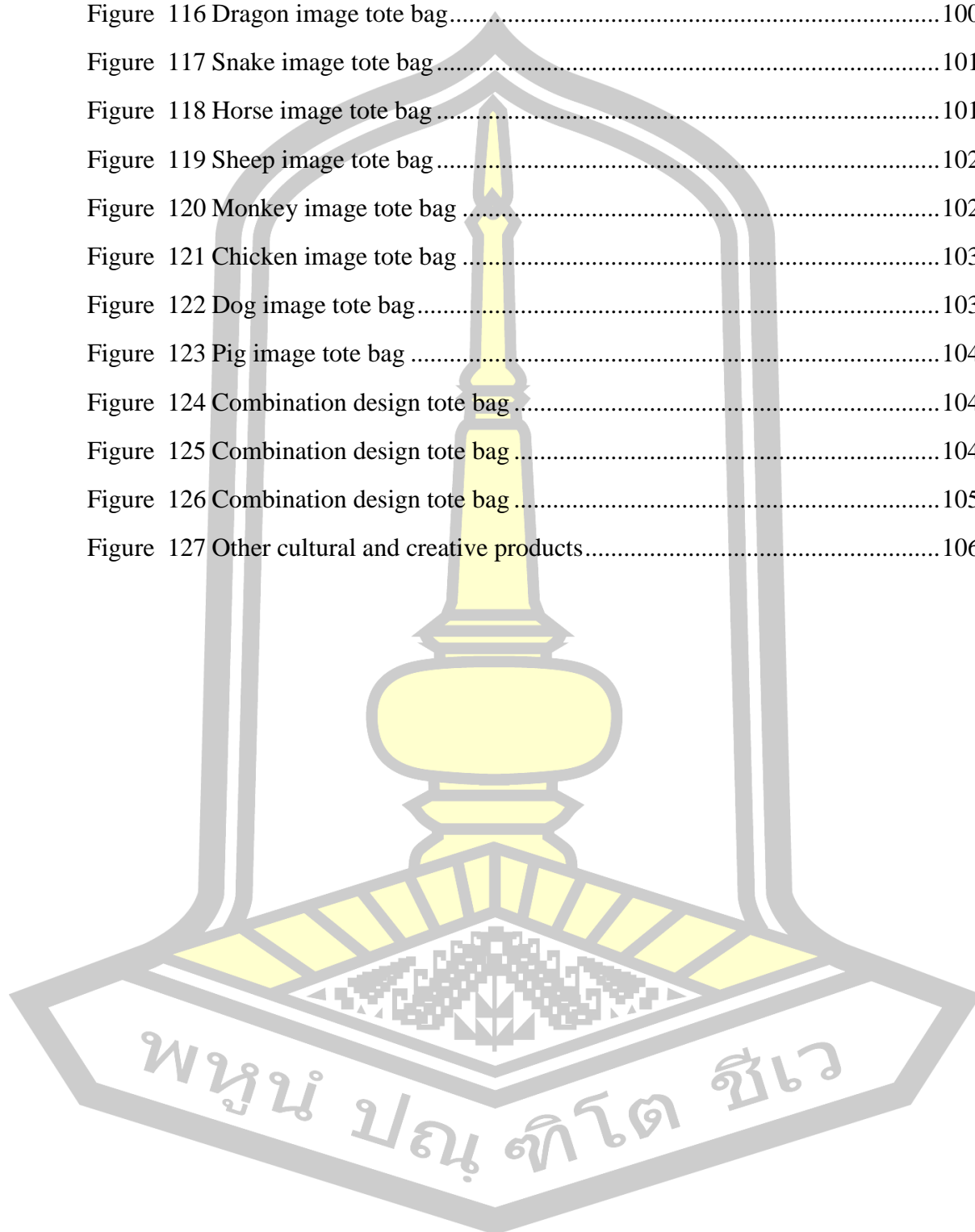


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# Chapter I

## Introduction

### 1.1 Background of Research

#### 1.1.1 Enhancement of environmental protection awareness

After the invention of the self-made paper, paper accompanied by human activities, which is widely used in human life from ancient times to the present. The progress and development of social civilization have promoted the evolution and richness of paper. Paper plays an important role in creating material and spiritual culture and the development of civilized society. But with civilization and progress, the resources of pure wood pulp paper are also huge. At the beginning of the 21st century, reports from the International Forest Research Center showed that the papermaking industry used 60 million cubic meters each year. According to data in 2013, the largest forest resources, tropical rain forests are about 7,140 square meters per second, which is the size of a football field size.

With the increasingly serious global environmental problems, people's awareness of environmental protection has gradually increased. As a common waste, waste paper has a greater impact on the environment. Traditional waste paper treatment methods include incineration and landfill. These methods will not only produce a large amount of carbon dioxide and harmful gases, but also occupy a large amount of land resources. Promoting and using recycled paper resource paper making is becoming increasingly urgent. Therefore, the use of waste paper has become an environmental protection method that has received widespread attention. By converting waste paper into art or design works, it can not only reduce waste of waste paper, but also improve people's awareness of environmental protection.

#### 1.1.2 Demand for cultural heritage

The Chinese zodiac signs are an important part of traditional Chinese culture. It is also a unique cultural symbol, representing the Chinese people's understanding of time and life. These zodiacs include rats, cows, tigers, rabbits, dragons, snakes, horses, sheeps, monkeys, chickens, dogs and pigs, as shown in Figure 1.1. Each zodiac has its unique characteristics and symbolic significance. For example, the rat symbolizes wisdom and wit, cows represent hard work and endurance, and tigers symbolize courage and strength. Rabbit represents gentleness and agility. The dragon symbolizes power and mystery. Sheep represents gentleness and kindness, monkeys symbolize cleverness and wit, chickens represent hard work and bravery, dogs symbolize loyalty and friendship, pigs represent hard work and kindness. These zodiac signs are widely used in various aspects in Chinese culture, such as the name of the lunar calendar, the appearance of people's zodiac signs, and mascots. Each zodiac has its corresponding year, which cycle every 12 years. People believe that their zodiac signs will affect their character and destiny. In addition to in China, these zodiac signs have similar cultural significance in other Asian countries such as Japan, South Korea, and Vietnam. Every year in the lunar calendar, people celebrate the transition of the genus to welcome the arrival of the new year. In general, China's 12 zodiac signs are one of the important symbols in Chinese culture, representing people's understanding of time and life, and a kind of identity and expression of their



own personality and destiny. It has deep historical and cultural connotations. However, with the development of modernization, traditional culture has gradually been forgotten. By combining the use of waste paper with the art design of the zodiac, traditional culture can be integrated into modern life, and cultural heritage and innovation can be achieved.



Figure 1 China's Zodiac Image

**Source:** <http://www.mianfeiwendang.com/doc/b06cff06d2c147ef>

#### 1.1.3 The needs of art innovation design

With the development of society, people's demand for artistic innovation is also increasing. Traditional art and design works often use traditional materials, such as canvas, paper, etc. However, with the rise of waste paper, people began to try to use waste paper as a material for artistic innovation. The waste paper has a unique texture and texture, which can add unique charm to artworks and design works. At the same time, the use of waste paper can also provide more creative inspiration and possibilities for artists and designers, so that they can create more innovative and unique works.

#### 1.1.4 Technological development of waste paper reuse

With the enhancement of environmental protection awareness, waste paper re-use technology has received widespread attention and application. The use of waste paper reuse is a sustainable way that can reduce dependence on forest resources and reduce energy consumption and environmental pollution.

The development of waste paper re-use mainly includes three aspects: waste paper recycling, waste paper reconstruction and waste paper. Recycling of waste paper refers to the collection of waste paper, classification, cleaning and compression, making it reuse raw materials. Waste paper reconstruction refers to the production of recycled waste paper through the preparation of pulp, papermaking and processing, and produces recycled paper that meets the requirements. The use of waste paper refers to the use of waste paper as raw materials to make various paper products such as cardboard, carton, and paper bags.

The development of waste paper reuse has been promoted by scientific and technological progress. With the continuous progress of technology, waste paper re-use technology has been improved more efficient and environmentally friendly. For example, modern waste paper recycling equipment can automate the classification and cleanliness of waste paper, which improves recycling efficiency and quality. At the same time, the preparation and papermaking process have also been improved, making the quality and performance of recycled paper closer to native paper.

In addition, the development of waste paper reuse is also supported and encouraged by government policies. Many countries and regions have issued relevant environmental protection policies and regulations to encourage enterprises and individuals to participate in waste paper recycling and reuse. The government also provides a series of subsidies and reward measures to promote the promotion and application of waste paper reuse technology.

The technological development of waste paper reuse also provides more possibilities for artistic innovation design. Traditional waste paper re-use mainly includes handmade and simple recycled paper production. However, with the advancement of science and technology, the technology used by waste paper is also constantly developing. Now, people can use advanced technology to transform waste paper into fiber boards, pulp and other materials. These materials can be used to make art, furniture, decorations, etc. At the same time, the technology used by waste paper can also be combined with other materials to create more diverse art and design works. The development of these technologies provides more possibilities and creative space for artistic innovation design.

## **1.2 Research purpose**

### **1.2.1 Research and analysis of the history and characteristics of the twelve zodiac signs of Luoyang**

Among the long history of China, the zodiac signs, as a unique cultural symbol, have long been deeply rooted in people's hearts. Why do you want to study and analyze the history and characteristics of the zodiac signs in Luoyang? This is not only an exploration of local culture, but also the inheritance and development of traditional Chinese culture.

Studying the history of the twelve zodiac signs of Luoyang can help us understand the local historical and cultural background. Since ancient times, the zodiac signs have different interpretations and applications in various parts of China. As a historical capital, Luoyang's cultural connotation must have its own uniqueness. By tracing its historical origin, we can better understand the development trajectory of this cultural phenomenon in the Luoyang area, and then explore the social, economic and cultural factors behind it.

In -depth analysis of the characteristics of the zodiac signs of Luoyang will help us grasp the core value of this culture. Each zodiac has its unique symbolic meaning and personality characteristics. Are these characteristics different in the interpretation of the Luoyang area? By comparing the special signs of zodiac signs in different regions, we can find the similarities and differences, so as to better understand this cultural phenomenon. In addition, the zodiac signs in the Luoyang area may also contain the wisdom, aesthetic concept and value orientation of the local people. Therefore, in -depth research on its characteristics helps us understand the folk customs and social psychology of the Luoyang area.

Studying the zodiac signs of Luoyang also helps to inherit and promote the excellent traditional Chinese culture. In today's globalization, the diversity of culture is particularly important. By studying the zodiac signs of the Luoyang area, we can better understand and understand the rich connotation of traditional Chinese culture, thereby enhancing cultural self-confidence. At the same time, such research also helps to better inherit this traditional culture and inject new vitality into future development.

In summary, it is of great significance to study and analyze the history and characteristics of the zodiac signs of Luoyang. This not only helps us understand the cultural characteristics of the Luoyang area, but also contribute to the inheritance and development of the excellent traditional Chinese culture. Through this study, we can cultivate our cultural literacy and enhance the sense of recognition and pride in traditional culture. Therefore, we should actively participate in such studies to contribute our own strength to inherit and develop Chinese culture.

### **1.2.2 Study and analyze the relevant situation of the re-use of waste paper**

In the world of our lives, waste paper is everywhere. With the rapid development of information digitization, the importance of paper materials seems to be gradually weakening. However, the problem of waste paper is still severe, not only because of its huge volume, it is difficult to deal with it, but it may also cause serious threats to the environment because of improper treatment. Therefore, the research on the reuse of waste paper is particularly important. This article aims to explore the status, meaning, methods and challenges faced by waste paper, and provide a reference for the practice and research in related fields.

The use of waste paper has attracted global attention. Due to the limitedness of forest resources and increasing environmental awareness, the recovery and reuse of waste paper has become an important part of sustainable development. Waste paper contains a large amount of fiber. These fibers can be reused through a certain process process to make new paper, pulp, cardboard, etc. In addition, the use of waste paper can also reduce energy consumption and carbon dioxide emissions, which is of positive significance for environmental protection.

At present, the method of reuse of waste paper mainly includes mechanical and chemical methods. The mechanical method is to transform waste paper into recycled pulp through physical processes such as crushing, filtering, purification, and then making paper by forming and drying. The advantages of this method are low cost and high output, but the quality of recycled paper is relatively low. The chemical law is to separate the fiber from the waste paper from the rubber, fillers, etc. through chemical reactions to obtain pure regenerative fibers. This method can produce high-quality recycled paper, but the cost is high and may produce a certain chemical pollution.

Although waste paper has many advantages, it also faces many challenges. First of all, the collection and classification of waste paper is a key factor that restricts the reuse of waste paper. Due to the extensive sources of waste paper, there are many types, and different quality, it takes a lot of manpower and material resources to classify and deal with. Secondly, some environmental problems may occur during the use of waste paper, such as wastewater treatment, waste emissions, etc. In addition, some impurities and pollutants in waste paper may also affect the reuse process.



Finally, the market demand used by waste paper needs to be further expanded. At present, the share of recycled paper in the market is still low, and more policies and publicity are needed to promote its application.

In response to the above issues, I put forward some suggestions and measures. First of all, strengthen the construction of waste paper classification and recycling system, and increase the recovery rate of waste paper. Second, optimize the use of process and technology to reduce environmental impact. At the same time, strengthen the construction of relevant laws and regulations, standardize the recycling of waste paper and the development of the industry. In addition, strengthen publicity and education, and improve the public's awareness and participation.

In summary, the use of waste paper reuse is an important way to realize the recycling and environmental protection of resources. However, there are still many challenges and problems in this field. Through in -depth research and exploration, we have reason to believe that in the near future, waste paper reuse will make greater breakthroughs and progress in technology, economy and environment. This will not only help promote sustainable development and the construction of ecological civilization, but also make important contributions to the sustainable development of human society.

### **1.2.3 Using waste paper design Luoyang Twelve Zodiac Artworks**

With the gradual strengthening of environmental protection awareness, the recovery and reuse of waste paper have become a hot topic of society. However, just recycling waste paper is not enough to bring us enough environmental benefits. We need deeper thinking and innovation, transform waste paper into artistic values, so as to meet the aesthetic needs and achieve the goal of environmental protection. This article will focus on studying the value and significance of the innovative design of the Zodiac art of Luoyang.

The zodiac art is an important part of traditional Chinese art. Its vivid and profound image is loved by people. However, traditional zodiac arts are often made of expensive materials, which undoubtedly increases the threshold for their collection and purchases. The use of waste paper to design and make zodiac art works not only low cost, but also can reduce the number of waste paper and reduce the pressure on the environment.

In terms of environmental protection, the regeneration of waste paper can reduce the cutting of trees and protect the ecological environment. According to statistics, about hundreds of millions of tons of waste paper are generated in the world each year. If these waste paper can be effectively recovered and reused, it will greatly alleviate the pressure of forest resources. The converting waste paper into artworks can not only reduce the number of waste paper, but also increase the added value of waste paper, making the process of recycling and reuse more economical.

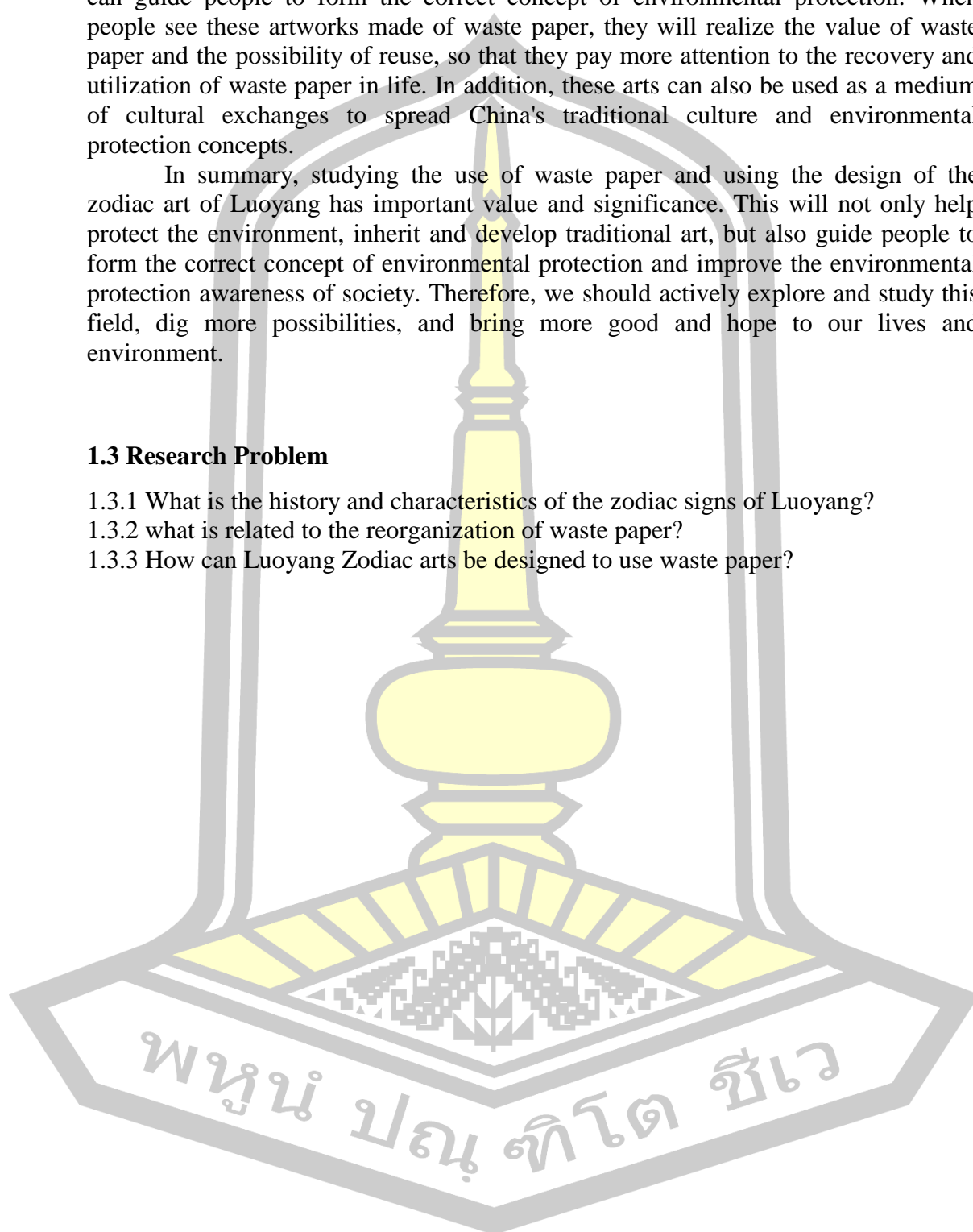
In terms of artistic value, the zodiac art designed by waste paper also has high artistic value. Although the waste paper itself does not have a gorgeous appearance, under the clever processing of the designer, it can show a different beauty and artistic atmosphere. This beauty comes from the re -creation of waste materials is the embodiment of innovative thinking. At the same time, the combination of traditional art with waste paper is not only the inheritance of traditional art, but also the re - understanding and excavation of the value of waste paper.

In terms of social benefits, the use of waste paper design Twelve zodiac arts can guide people to form the correct concept of environmental protection. When people see these artworks made of waste paper, they will realize the value of waste paper and the possibility of reuse, so that they pay more attention to the recovery and utilization of waste paper in life. In addition, these arts can also be used as a medium of cultural exchanges to spread China's traditional culture and environmental protection concepts.

In summary, studying the use of waste paper and using the design of the zodiac art of Luoyang has important value and significance. This will not only help protect the environment, inherit and develop traditional art, but also guide people to form the correct concept of environmental protection and improve the environmental protection awareness of society. Therefore, we should actively explore and study this field, dig more possibilities, and bring more good and hope to our lives and environment.

### **1.3 Research Problem**

- 1.3.1 What is the history and characteristics of the zodiac signs of Luoyang?
- 1.3.2 what is related to the reorganization of waste paper?
- 1.3.3 How can Luoyang Zodiac arts be designed to use waste paper?



## 1.4 term explanation

**Regenerative paper:** Diseel is a paper produced by more than a dozen processes such as scaling, purification, pulp, and copying through scaling paper. Essence

**Sustainable development:** one of the basic requirements of scientific development concept. The theory and strategy of coordinated development of nature, science and technology, economy, and society. The earliest appearance of the "Outline of the World Natural Resources Protection" in the 1980 International Nature Conservation Alliance: "It is necessary to study natural, social, ecological, economic, and use the basic relationships in the process of natural resources to ensure sustainable global development.

**Cultural and creative products:** Cultural and creative products, that is, produced products with market value through creative transformation of cultural themes or cultural resources. Such products not only have practical functions, but also allow people to feel the culture in the process of buying and use. Exist that its cultural nature is the added value of cultural and creative products. Cultural and creative products can be art, cultural tourism souvenirs, office supplies, home daily necessities, science and technology daily modeling design, etc., through the wisdom, skills and talents of creators, combined with modern scientific and technological means to create and create cultural resources and cultural supplies Improve and use the development and application of intellectual property rights to generate high value-added.

**Emperor's capital:** the city where the emperor lives. Also called "Emperor Jing"

**Closed -loop process:** It is a closed cycle process. It forms a complete system by interconnected and connecting different links.

**Secondary fiber:** The pulp produced in the waste paper in paper is a secondary fiber, also known as recycling fiber.

**Regional culture:** Regional culture should be based on geographical, history as the main line, and reality as the appearance, and the humanistic spirit in the process of society.

## 1.5 Research Scope

### 1.5.1 Research field

First of all, we have to clarify the core area of research: Luoyang, as a long history of the Thirteen Dynasties of China, Luoyang not only has a rich cultural heritage, but also an important birthplace of ancient Chinese civilization. By digging the cultural elements in the Luoyang area, we can better understand the connotation and value of this artistic innovation design.

Secondly, field inspections are also an important part of research. When you walk into Luoyang, you can experience the customs and customs there, and communicate with local art workers to get one -handed information and real experience. Through field inspections, we can more intuitively understand the application of the waste paper and reuse in the local application, as well as its degree of integration with Luoyang culture.

In summary, the research area of "Re -use of Waste Paper -Luoyang Zodiac Art Innovation Design" is not only limited to the specific geographical area of Luoyang, but also includes all related areas involved in field inspections. By using a variety of research methods, we can explore this theme more comprehensive and in -depth, and provide useful references for the development of waste paper reuse and art innovative design.

#### 1.5.2 Research Time

This thesis aims to analyze the potential of waste paper from 2018 to 2024, and discuss how to turn waste paper into an innovative method of the art design of the zodiac sign.

From 2018 to 2024 today, with the continuous progress of technology, research by Chinese waste paper has entered a new stage. During this period, research focuses on the development of new types of waste paper treatment technology and processing methods to further improve the recycled utilization rate and environmental performance of waste paper. At the same time, more and more scholars and enterprises have begun to get involved in the field of waste paper and use, which has promoted the rapid development of the field.

By analyzing the year of research, we can see that waste paper reuse technology is constantly developing. In the future, with the advancement of technology and society's emphasis on environmental protection, the re -use field of waste paper will usher in more development opportunities. We look forward to more scholars and enterprises to join the research and practice of this field, jointly promote the use of technological progress of waste paper reuse, and contribute to building a better ecological environment.

#### 1.5.3 Analysis unit in the research process

This thesis aims to study the problem of scrap paper in the design of the zodiac art design of Luoyang. Through the analysis of the art design of the zodiac signs of Luoyang, the application and significance of the use of waste paper reuse in art design are discussed.

First of all, we conducted in -depth research on the art design of the zodiac signs of Luoyang. By collecting relevant information and field inspections, we learned that the art design of the twelve zodiac signs of Luoyang is a unique art form. With the theme of the twelve zodiac signs in traditional Chinese culture, it is manifested through sculpture, painting, and cultural and creative design. This artistic design not only has cultural connotation, but also has ornamental and collection value.

Then, we paid attention to the application of waste paper and then used in Luoyang's zodiac art design. By communicating and observing with the artist, We found that the waste paper was greatly available in the design of the zodiac art design of Luoyang. Artists can transform waste paper into part of artworks through paper -cutting, collage and other techniques. This approach can not only reduce waste of waste paper, but also give new life and value of waste paper.

Then, we analyzed the significance of waste paper in the artistic design of the zodiac signs of Luoyang. First, waste paper reuse can improve the sustainability of art works. By using waste paper as a material, artists can reduce dependence on natural resources and achieve sustainable development of artistic creation. Secondly, the use of waste paper can convey environmental awareness. The use of waste paper in art works can not only attract the attention of the audience, but also transmit the concept

of environmental protection through the power of art, causing people to think and act on environmental protection.

In summary, the use of waste paper in the art design of the twelve zodiac art of Luoyang is an important innovation method. By converting waste paper into part of artworks, not only the use of waste paper reuse, but also transmitting environmental awareness and cultural connotation. This method of artistic design has a positive role in promoting sustainable development and environmental protection, and it is worth further promotion and research.

### **1.6 Research Methodology**

Interview, observation and investigation method: This study uses interviews, observations and investigations to collect data. By randomly selected a certain number of participants in Luoyang to interview, observe and investigate. The content of the interview includes the degree of understanding of the re-use of waste paper, the awareness of the artistic design of the zodiac signs of Luoyang, and the combination of the combination of the use of the artistic design with the Zodiac of the Luoyang. First of all, study the history, characteristics, status, functions, use and meaning of the zodiac signs of China. Interviews and interviews through research books, journals, research articles, and crowds.

The second step is to study the relevant situation of waste paper from the number and characteristics of waste paper.

The third step is to try to create work with waste paper and use related materials as a piece of method.

The fourth step is to summarize the characteristics of the materials and lead to creative design process.

The fifth step, the draft and design, including the preparation of the prototype.

Step 6, evaluate creative design work from waste paper crumbs.

Step 7, get the final conclusion.

Collect real data information through the above methods and finally draw relevant conclusions.

#### **1.6.1 population; group**

Luoyang City, as a famous historical and cultural city in China, has a wealth of cultural heritage and population. This study aims to explore the impact of the artistic design of the zodiac art in the project in the project on different population groups. The population group includes but not limited to the following aspects:

(1) Local residents in Luoyang City: Local residents are the main population groups in Luoyang City. They have deep emotions and responsibilities in Luoyang's cultural heritage and environmental protection. Studies will explore the impact of the environmental consciousness and cultural identity of the zodiac art design on the environmental consciousness and cultural identity of the local residents.

(2) Tourists and travelers: Luoyang City, as a famous historical and cultural city in China, has attracted a large number of tourists and travelers. Studies will investigate the perception and acceptance of tourists and travelers for the art design of the Zodiac, as well as their attitudes and behaviors of the reuse of waste paper.

(3) Student groups: The student group is an important part of society, and they have a positive influence on environmental protection and cultural heritage. Studies will investigate students' awareness and attitude towards the art design of the Zodiac, and their degree of participation in scrap paper reuse projects.



(4) Artists: Artists have a high ability to appreciate and understand artistic design. Their acceptance of the artistic design of the zodiac signs and the degree of support for waste paper reuse projects will be the focus of research.

#### **1.6.2 instrument/tool**

(1) Record books such as on -site work, drawings, measurement and other records.

(2) Interview questionnaire

(3) Tools to recording audio and video, namely the camera.

#### **1.6.3 Data collection**

(1) On -site work data collection

Interview: Through the direct communication with the research objects, understand its views, attitudes and behaviors in depth, and provide rich first -hand information for the dissertation. The interview method is flexible and interactive. According to research purposes and problems, the outline of the interview is designed, and information is planned and purposeful. At the same time, you can ask at any time during the interview to obtain more details and background information.

The interview issues will include the following aspects:

1. Personal information: including basic information such as gender, age, occupation, in order to analyze the cognition and attitude of different people's use and artistic design of waste paper.

2. Use consciousness of waste paper reuse: To understand the degree of understanding, participation, and the awareness of the importance of the recurrence of waste paper through a series of questions.

3. The Zodiac Art Design Cognition of the Zodiac Zodiac: Understand the interviewer's understanding of the artistic design of Luoyang's zodiac art and the degree of preferences, and the awareness of the re -use of the waste paper.

4. Awareness of environmental protection: To understand the degree of attention, participation in environmental protection through a series of issues, and the awareness of the role of waste paper reuse in environmental protection.

5. Performance design needs: Understand the needs and expectations of artistic design, and their views on the application of waste paper reuse in art design.

6. Other opinions and suggestions: Provide interviewees with a space for free expressing and suggestions to collect more views and ideas.

Through the above survey methods, we will be able to collect the public's views and attitudes of the use of the artistic design of the Twelve Zodiacs of Luoyang to further understand the potential and influence of waste paper reuse in environmental protection and art design. These data will provide important reference and support for our research.

(2) Documentary data collection:

Collect data through the Internet, organize relevant information, and refer to urban libraries, electronic libraries and major museums, and finally get overall survey results, analysis and research.

#### **1.6.4 Data analysis**

(1) Analysis of the results of the survey

1. Basic user information analysis

2. Analysis of the public's re -use of waste paper

3. Analysis of the public design interest in Luoyang Zodiac Arts Arts

4. Whether the public supports the analysis of the combination of waste paper reuse with art design.

## **1.7 Concept, theory and conceptual framework**

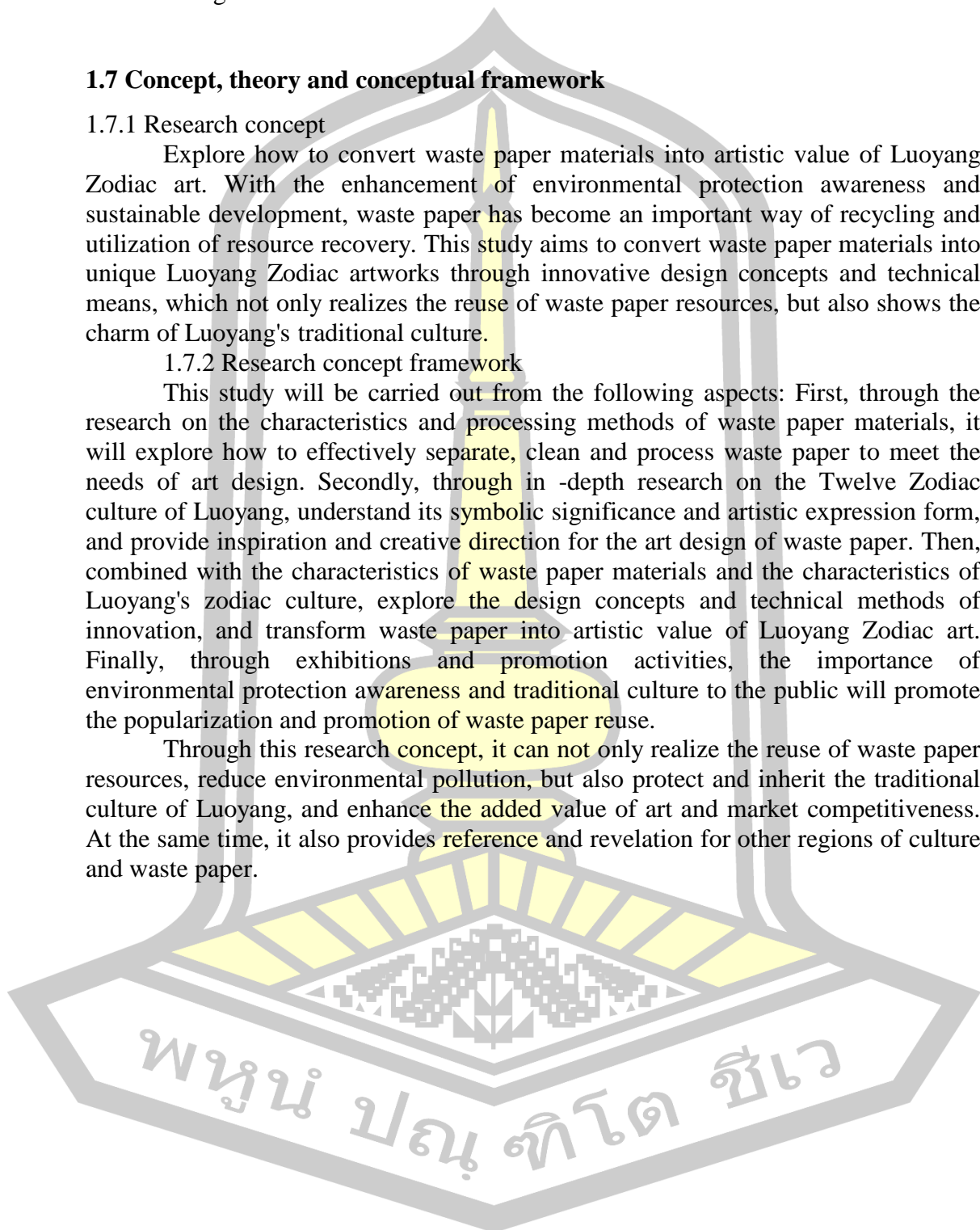
### **1.7.1 Research concept**

Explore how to convert waste paper materials into artistic value of Luoyang Zodiac art. With the enhancement of environmental protection awareness and sustainable development, waste paper has become an important way of recycling and utilization of resource recovery. This study aims to convert waste paper materials into unique Luoyang Zodiac artworks through innovative design concepts and technical means, which not only realizes the reuse of waste paper resources, but also shows the charm of Luoyang's traditional culture.

### **1.7.2 Research concept framework**

This study will be carried out from the following aspects: First, through the research on the characteristics and processing methods of waste paper materials, it will explore how to effectively separate, clean and process waste paper to meet the needs of art design. Secondly, through in -depth research on the Twelve Zodiac culture of Luoyang, understand its symbolic significance and artistic expression form, and provide inspiration and creative direction for the art design of waste paper. Then, combined with the characteristics of waste paper materials and the characteristics of Luoyang's zodiac culture, explore the design concepts and technical methods of innovation, and transform waste paper into artistic value of Luoyang Zodiac art. Finally, through exhibitions and promotion activities, the importance of environmental protection awareness and traditional culture to the public will promote the popularization and promotion of waste paper reuse.

Through this research concept, it can not only realize the reuse of waste paper resources, reduce environmental pollution, but also protect and inherit the traditional culture of Luoyang, and enhance the added value of art and market competitiveness. At the same time, it also provides reference and revelation for other regions of culture and waste paper.



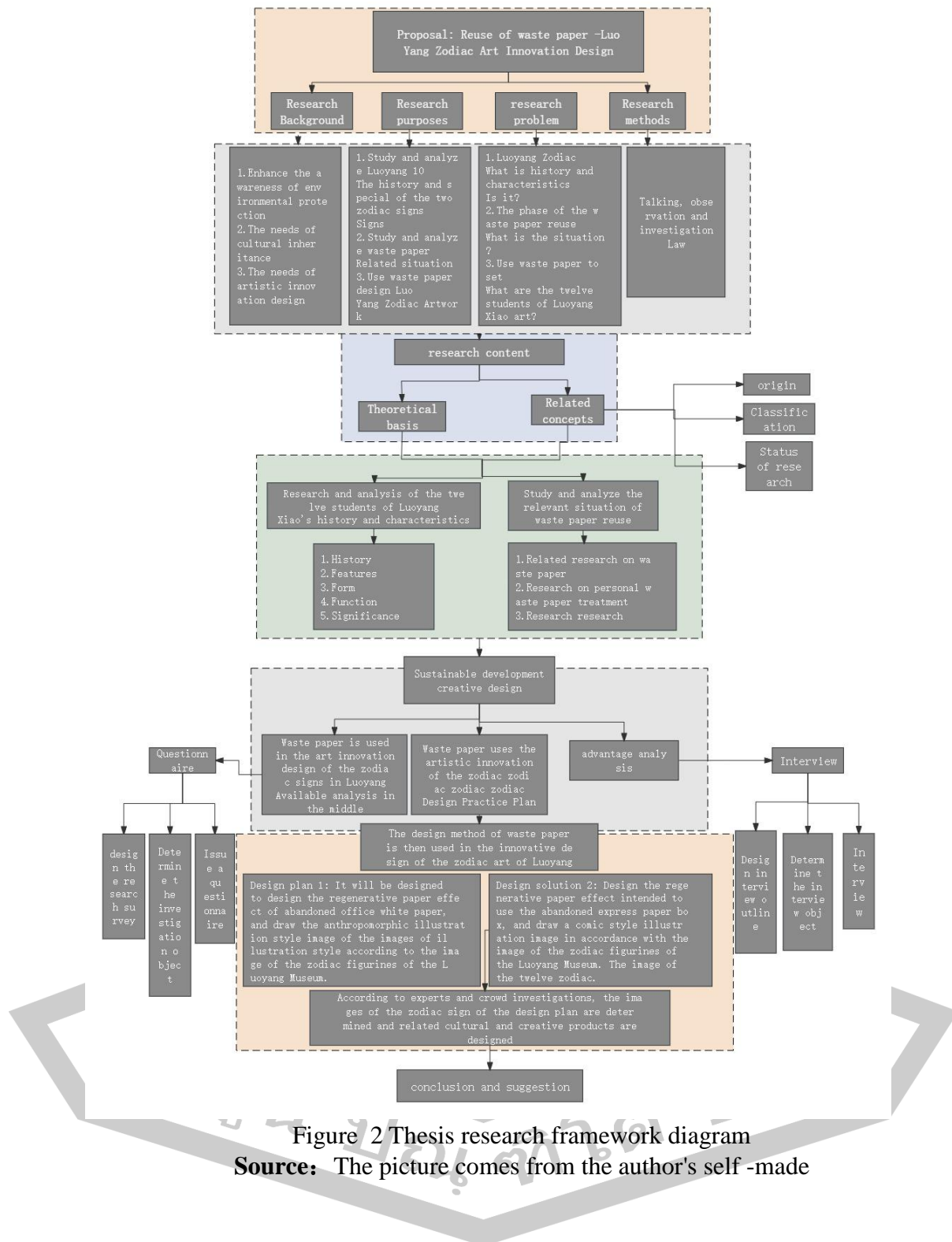


Figure 2 Thesis research framework diagram

Source: The picture comes from the author's self -made



## 1.8 Research Plan

Table 1 The research plan of this project

Stage	Time	subject	job content	Stage results
1	2022.11-2022.12	<b>Stage 1. Determine the research topic</b>	Determine the research background, research purpose, research question, research scope, research methodology, data analysis, research conceptual framework, research plan, and research benefits	part 1-> Complete the opening defense and determine the research topic
2	2023.01-2023.02	<b>Stage 2. Explore the current state of the research</b>	To study and analyze the reuse of waste paper, and analyze the history and characteristics of Luoyang zodiac	start2-> The relevant status of the research topic
3	2023.03-2023.05	<b>Stage 3. Study methods and analysis</b>	Feasibility analysis of waste paper reuse in Luoyang	part 3-> Complete the research work Published 1-2 academic papers
4	2023.06-2023.10	<b>Stage 4. Study design and conception</b>	Waste paper reuse - Luoyang twelve Chinese zodiac art innovation design practice program	part4-> Complete the design practice
5	2023.11-2023.12	<b>Stage 5. Summary and discussion</b>	Made a summary of the research thesis and wrote the dissertation	part5-> Write complete the graduation thesis
6	2024.01-2024.02	<b>Stage 6. Organize the research report</b>	Paper revision, final draft, submitted to the tutor for guidance; Thesis submission, to participate in the graduation defense	part6-> Thesis submission, to participate in the graduation defense



## 1.9 Research benefits

### 1.9.1 The benefits of academic circles

This topic can be used as a reference for learning, teaching and creative design. Improve research methods and thinking, make scientific research documents.

### 1.9.2 Research places for benefiting from society and communities

The benefit of the research place in society and the community: After the history and characteristics of the zodiac signs have been understood, I learned the method of making recycled paper in waste paper. It is expected that the exquisite Luoyang Zodiac art works can not only show creativity and Aesthetics can also remind people to cherish resources and reduce waste.

Secondly, the use of waste paper reuse can reduce environmental pollution. In addition, the use of waste paper can also promote social and economic development. The establishment of waste paper can use the establishment of the industrial chain, which can create employment opportunities and improve employment rates. As a creative industry that is reused by waste paper, the art design of the zodiac signs can not only create economic benefits for the society, but also cultivate creative design talents and promote the development of culture and art. Finally, the use of waste paper can convey environmental awareness and cultural values. Luoyang Zodiac Art Design uses waste paper reuse, integrates environmental protection concepts into artistic creation, and passes to the audience and the public. This art design not only has ornamental, but also attracts people's attention and thinking about environmental protection, and cultivates people's awareness and sense of responsibility. In summary, the importance of waste paper reuse in social places cannot be ignored. Through the case of the art design of the twelve zodiac signs of Luoyang, we can see that the reuse of waste paper can reduce the waste of resources, reduce environmental pollution, promote social and economic development, and convey environmental awareness and cultural values. Therefore, the use of waste paper is not only an environmental protection behavior, but also a reflection of the benefits of social places.

### 1.9.3 The benefits of formulating national or local government policies

Luoyang is a famous historical and cultural city in China, with rich cultural heritage and artistic traditions. The use of waste paper provides new creative materials and technical means for the design of the zodiac art of Luoyang. Through processing and reuse of waste paper, the unique and artistic value of the zodiac can be produced, showing Luoyang's cultural charm and innovation ability.

The formulation of national or local government policies is of great significance to the promotion and development of waste paper reuse. First of all, the formulation of policies can provide economic support and incentives, and encourage enterprises and individuals to participate in waste paper reuse industries. The government can provide financial support, tax benefits and rewards, reduce the cost of reuse of waste paper, and promote the development and innovation of the industry. Secondly, the formulation of policies can establish relevant laws and regulations and standards, and standardize the production and use of waste paper reuse. This helps improve the efficiency and quality of waste paper reuse, and reduce environmental pollution and waste of resources. In addition, the formulation of policies can also strengthen the publicity and education of waste paper reuse, and increase the public's understanding and participation of environmental protection awareness. The

government can organize exhibitions, training and publicity activities that scrap paper reuse, the importance and benefits of popularizing the reuse of waste paper to the public, and encourage everyone to actively participate in the action of scrap paper reuse. Finally, the formulation of policies can promote the coordinated development of waste paper reuse. The government can promote the reuse of waste paper to use cooperation and exchanges with other related industries to promote resource sharing and technological innovation. For example, a circular economic model that can cooperate with paper manufacturers to promote the recovery and reuse of waste paper to maximize the use of resources and reduce environmental load.

In summary, the formulation of national or local government policies plays an important role in the promotion and development of waste paper reuse. The formulation of policies can provide economic support, establish laws and regulations and standards, strengthen publicity and education, and promote the coordinated development of the industry, thereby promoting the healthy development of waste paper to re-use the industry and achieve the goal of environmental protection and sustainable development.



## Chapter II

### Study and analyze the history and characteristics of the zodiac signs of Luoyang

#### 2.1 The historical origins of the zodiac zodiac zodiac zodiac zodiac

The zodiac, also known as the zodiac, is a group of twelve animals used by some ethnic groups in China and East Asia to represent the year. These twelve animals are rat, ox, tiger, rabbit, dragon, snake, horse, sheep, monkey, rooster, dog, and pig. They are the twelve animals of the twelve earthly branches that match the year of a person's birth to form the zodiac. Law. The zodiac culture has a long history and rich connotations, embodying the traditional values and cultural psychology of the Chinese nation.

In traditional Chinese culture, each zodiac sign has its own unique symbolic meaning and personality characteristics. For example, the rat is seen as resourceful and flexible, while the ox represents hard work and stability. These zodiac signs are not only signs of time, but also symbols of people's self-character and behavioral norms. Therefore, in China's daily life, zodiac culture is ubiquitous and profoundly affects people's words and deeds.

However, when we go abroad, we will find that different countries and regions have their own unique zodiac cultures. For example, India's zodiac culture includes lions but not tigers, while Vietnam's zodiac culture is very similar to China's, but the order is different. These differences reflect the cultural backgrounds and historical traditions of different countries and regions.

The spread and evolution of zodiac culture is the result of cultural exchange and integration. In today's globalized world, cultural exchanges between countries are becoming increasingly frequent, and zodiac culture is also constantly developing and changing in this exchange. For example, as Chinese culture spreads around the world, more and more foreigners have begun to understand and accept the Chinese zodiac culture and regard it as an important part of Chinese culture.

In the rich treasure house of Chinese culture, the zodiac signs are a bright pearl. First of all, we must understand what is the zodiac zodiac. Many countries have different images of zodiac signs. In China, it is an important part of traditional Chinese culture. The historical origin of the zodiac signs in China can be traced back to ancient China and has a history of thousands of years. There are two main claim about the origin of the zodiac signs.

The first statement: According to the legend, the Jade Emperor needs to choose a set of animals as a representative in the heavenly world. The fairy found twelve animals within a day and brought back to the heaven(Yang Qian, 2022: p. 18.)These animals include rats, cows, tigers, rabbits, dragons, snakes, horses, sheep, monkeys, chickens, dogs, pigs. After being brought back to the heavenly world, these animals were given the title of the Zodiac Zodiac and arranged in the order of them.

The second statement: Another statement is that the zodiac signs first appeared in the system that recorded the record time. It was divided into twelve hours a day and

night, and each hour corresponds to a zodiac. This statement is determined based on the habit of animal activity: the zodiac signs:

From 23:00 to 1 o'clock -Zi: Mouse. In the middle of the night, also known as Ziye, Midnight, the first hour of twelve hours. On the day of the day, the last moment of the day was the beginning of the new day. It is a rat in the zodiac signs.

1 am to 3 am -Ugly time: cow. Chicken Ming, also known as barren chicken, the second hour of twelve hours was ugly at the dark stage before dawn. It is said to be the moment when Niu started to cultivate the field. Belongs are cows in the zodiac signs.

From 3 am to 5 pm -Yin Shi: Tiger. Pingdan, also known as Liming, Morning, Sun Dan, etc., is the alternation of night and day. During the day, when the heavenly Fang was big, it was the moment when the tiger began to move, so it belonged to the tiger among the twelve zodiac signs.

From 5 am to 7 o'clock in the morning - : : Rabbit. The sunrise, also known as the sun, dawn, rising sun, etc.: Refers to the time when the sun has just exposed, and it was rising. The time was that the sun had risen eastward, and began to let go of the light. Bullets of the Zodiac.

From 7 am to 9 am -Chen Shi: Dragon. When eating, it is also known as early food. At the moment of the sun thermal heat of the sun, it is said to be the moment when the dragons are west, so it belongs to the dragon among the zodiac signs.

From 9 am to 11:00 in the morning -Step: Snake. In the middle, also known as Riyu, etc., is called Luozhong near noon. The sunlight was stronger in the time, and it belonged to the snake in the zodiac signs.

From 11 am to 13 pm -noon: horse. In the middle of the day, also known as Hiroshi, noon, etc. In the day, the sun is the most violent. It belongs to the horse in the zodiac.

From 13 pm to 15:00 -Wei Shi: Sheep. The sun is also known as the sun, the sun, and the sun, and the sun. During the day, it was time to disappear the summer heat. Sheep belongs to the zodiac signs.

15 pm to 17:00 -Shen Shi: Monkey. People are also known as Dingyun, etc., also known as Dingyun, etc., people are also quiet. During the day, Shen Shi's summer heat was almost passing. Monkey in the zodiac.

From 17 pm to 19 pm -you: Chicken. Entry, also known as sunset, sunset, and evening: means when the sun falls. In the middle of the day, the time is the moment of the night. It belongs to the chicken in the zodiac signs.

From 19 pm to 21:00 -time: Dog. Dusk, also known as day and night, day and evening, day and night, etc. At this time, the sun has fallen, the world is dim, and everything is hazy, so it is called dusk. In the middle of the day, the time was the spread of the night, and the lantern was at the beginning of the time. It belongs to the dog in the zodiac.

From 21 pm to midnight at 23 o'clock -Hai: Pig. At this time, the night was deep, and people had stopped activity and had a sleep. During the day, Hai Shi will be exhausted one day, and it will be time before tomorrow. Belongs are pigs in the zodiac signs.

Regardless of the statement, the zodiac signs have become a unique symbol in Chinese culture, symbolizing various quality and characteristics, as shown in Figure



2.1,2.2. These twelve animals have their own characteristics and their own stories, and some of them are closely linked to the historic city of Luoyang.



Figure 3 The image of the Twelve Chinese zodiac signs

Source : <https://www.bmfsm.com/shengxiao/kaiyun/192039.html>

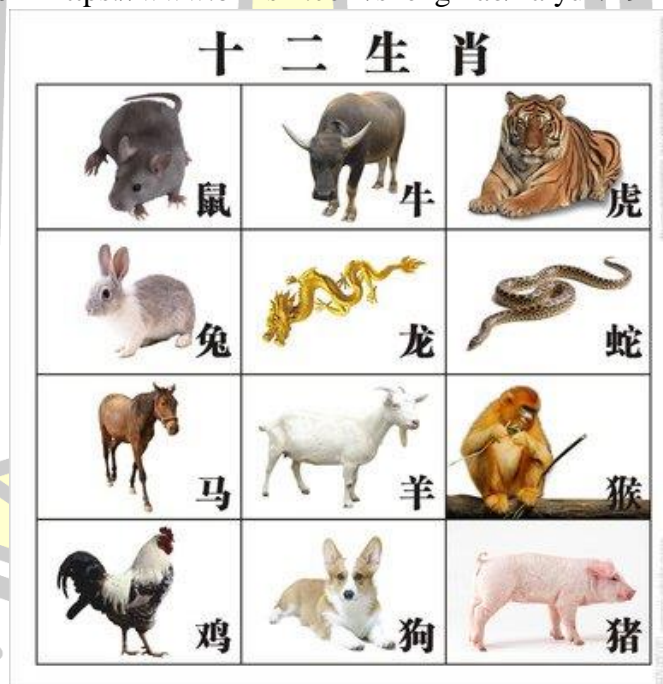


Figure 4 The image of the Twelve Chinese zodiac signs

Source : nipic.com <https://www.nipic.com/show/21509045.html>

As for Luoyang, as the political and cultural center of ancient China, the twelve zodiac animals in Luoyang first appeared in the Eastern Han Dynasty. The twelve zodiac animals were all finalized in the Luoyang area (Pan Lige, 2020-1: Luoyang Daily.) The twelve zodiac animals are made of pottery figurines with animal heads and human bodies. , standing upright, with an expression that may be majestic, gentle or respectful. The cultural relics with the most middle-aged flavor in the Luoyang Museum may be this set of pottery figurines of the twelve zodiac animals from the Tang Dynasty. Unfortunately, when this set of cultural relics was unearthed, three of them, the rat, the tiger, and the dog, were missing. Only nine of them have been preserved. pieces. The twelve zodiac figurines were first discovered in tombs in the Sui and Tang Dynasties. Groups of three are distributed in the four corners of the tomb. Of course, they are not placed randomly, but start with the rat and end with the pig. They are arranged in order and take turns to be on duty according to their corresponding hours to protect the tomb owner.

In addition, Luoyang also has many historical sites related to the twelve zodiac animals. For example, White Horse Temple is the first government-run temple after Buddhism was introduced to China (Hu Jing, 2014-5: Chizi) and is also an important symbol of ancient Chinese culture. According to legend, during the construction of the White Horse Temple, the architects cleverly used the zodiac element of "horse" and integrated it into the architectural design, attracting countless tourists to visit.

The worship of the twelve zodiac signs has a long history. According to the Qin bamboo slips unearthed in Yunmengsuihudi, Hubei and Fangmatan, Tianshui, Gansu (Zhou Muxin, 2022: p. 7.) A relatively complete zodiac system existed in the pre-Qin period, but these The recorded zodiac signs include insects, deer and other animals, which are different from today's zodiac signs.

Each of these twelve animals has its own characteristics and meaning. They not only represent the flow of time, but also represent people's expectations for life and vision for the future. The twelve zodiac signs are not only a mark of time, but also the cultural inheritance and spiritual sustenance of the Chinese nation.

The earliest classic book that completely records the twelve zodiac animals that are the same as today is "Lunheng". This book was written in Luoyang by the thinker Wang Chong of the Eastern Han Dynasty. Wang Chong came from a famous family, but by his generation, his family had already fallen into decline. When he was young, he studied at Taixue University in Luoyang. Because his family was poor and he had no money to buy books, he often hung out in bookstores in Luoyang and could never forget the books he read.

He wrote in "Lunheng": "Yinmu is also a bird and tiger; Xutu is a bird and dog... It can be seen that in the Eastern Han Dynasty, the twelve zodiac signs were all finalized in Luoyang area, and these zodiac signs were also related to The Spring Festival is integrated and profoundly affects the life of the Chinese nation.

In general, zodiac culture is a cultural phenomenon with world significance. It not only reflects the cultural characteristics and historical traditions of various countries and regions, but also promotes exchanges and integration between different cultures.

## 2.2 Characteristic analysis of the zodiac signs of Luoyang

In traditional Chinese folk culture, the zodiac signs are an indispensable part. They are: mice, cows, tigers, rabbits, dragons, snakes, horses, sheep, monkeys, chickens, dogs and pigs. These zodiac signs not only represent the twelve earthly branches of China, but also symbolize the character and destiny of the Chinese. In this chapter, I will conduct in -depth feature analysis of the zodiac signs of the Luoyang area.

First, let's take a look at the rat in the Luoyang area. The Luoyang rat is usually described as alert, flexible and smart. This echoes Luoyang's historical background and cultural atmosphere. As an ancient capital of China, Luoyang has accumulated deep cultural heritage and wisdom here.

Then there is a cow. In the Luoyang area, cows symbolize hard work, tenacity, and stability. This is consistent with the personality characteristics of the Luoyang people. They are famous for hard work, work diligently, and work hard for life.

The tiger in the Luoyang area represents bravery, strength and independence. This is related to the geographical environment of Luoyang. Luoyang is located in the Central Plains. It is a place where soldiers must fight in history. People here are brave and fearless, not afraid of difficulties.

Rabbit is considered gentle, kind and innocent in the Luoyang area. This echoes Luoyang's historical and culture. The people of Luoyang are gentle, kind and innocent, and are full of humanistic care.

As a symbol of China, Long is even more respected in the Luoyang area. Luoyang Dragon symbolizes nobleness, strength and mystery. This is consistent with Luoyang's status as the ancient capital, and it also reflects people's deep feelings for dragons.

Snakes are regarded as wit, keen and mysterious in the Luoyang area. This is consistent with the characteristics of the Luoyang people. They are smart and wise, good at observing and thinking, and can be at ease in complex environments.

The horse represents unrestrained, free and vitality in the Luoyang area. This is related to the natural environment of Luoyang. Luoyang is located in the plain, flat terrain, suitable for horses to run, and also symbolizes the spirit of people's pursuit of freedom and vitality.

Sheep is deemed to be docile, kind and obedient in the Luoyang area. This is consistent with the kind and gentle personality of the Luoyang people. They respect tradition and are good at adapting to the trend of the times.

Monkey is regarded as wit, curiosity and flexibility in the Luoyang area. This is consistent with the wisdom of the Luoyang people. They are good at thinking and courage to explore new fields.

The chicken represents hard work, early and staying in the Luoyang area. This is consistent with the hard work of the Luoyang people. They get up early and return early, work diligently, and obey time.

Dogs are regarded as loyal, brave and guardians in the Luoyang area. This is consistent with the importance of the Luoyang people to the family and the nostalgia for their hometown. They are loyal to family and friends, and bravely guard their homes.

Finally, pigs. In the Luoyang area, pigs are considered a symbol of wealth, happiness and satisfaction. This is consistent with the pursuit of the Luoyang people's



pursuit of a better life. They long for a wealthy and happy life, and they also know how to enjoy the happiness in life.

In summary, the analysis of the twelve zodiac signs in the Luoyang area fully demonstrated the rich connotation and regional characteristics of traditional Chinese folk culture. Through the analysis of these zodiac signs, we can better understand the cultural personality and spiritual style of the Luoyang people, and we can better inherit and develop traditional Chinese culture.

### 2.3 Conclusion

In the vast river of history, the Chinese zodiac culture of China is like a bright pearl, flashing with mysterious glory. A student who explored the depth of culture, with the desire for knowledge and the awe of history, deeply tap the story behind the zodiac signs.

In this millennium ancient capital, each zodiac is carrying deep historical heritage. They are not only the marking of time, but also the carrier of culture, and the crystallization of the wisdom of the ancestors. I cross the dust of history and explore the origin and evolution of each zodiac. From the mouse's machine, to the hard work of the cow; from the bravery of the tiger, to the docile of the rabbit; from the majesty of the dragon to the mystery of the snake; from the unrestrained horse to the peace of the sheep; from the wisdom of monkeys, to the morning Mingming of the chicken ; From the loyalty of the dog to the thick of the pig. Each zodiac is a unique story, a vivid history.

I taste the characteristics of each zodiac in the information and feel their souls in folk stories. I tried to interpret every detail, each symbol, and they seemed to tell the ancient story. I was immersed in this study, as if in a magical world, dancing with these zodiacs, and listening to them.

In -depth research, I found that the zodiac signs are not only a division of time, but also a cultural heritage. They are the wisdom of the people, their understanding of life and awe of nature. Each zodiac represents a kind of quality, a spirit, and they jointly build the spiritual world of the people. This article aims to summarize and refine the main discoveries in the chapters in order to provide useful references for future research.

First of all, through the combing and field inspections of historical documents, we found that these animals have undergone complex changes in the long river of history, but they always maintain their unique symbolic significance.

In terms of characteristic analysis, we have deeply studied the characteristics, symbolic significance and function of each zodiac. For example, as the head of the zodiac signs, although it is often associated with theft and cunning in reality, it is given a witty, keen and flexible characteristics in culture. Similarly, Niu represents hard work and strength, tigers symbolize bravery and independence, and rabbits represent gentleness and kindness. These characteristics not only reflect the ancient people's understanding of nature, but also their understanding and expectations of life.

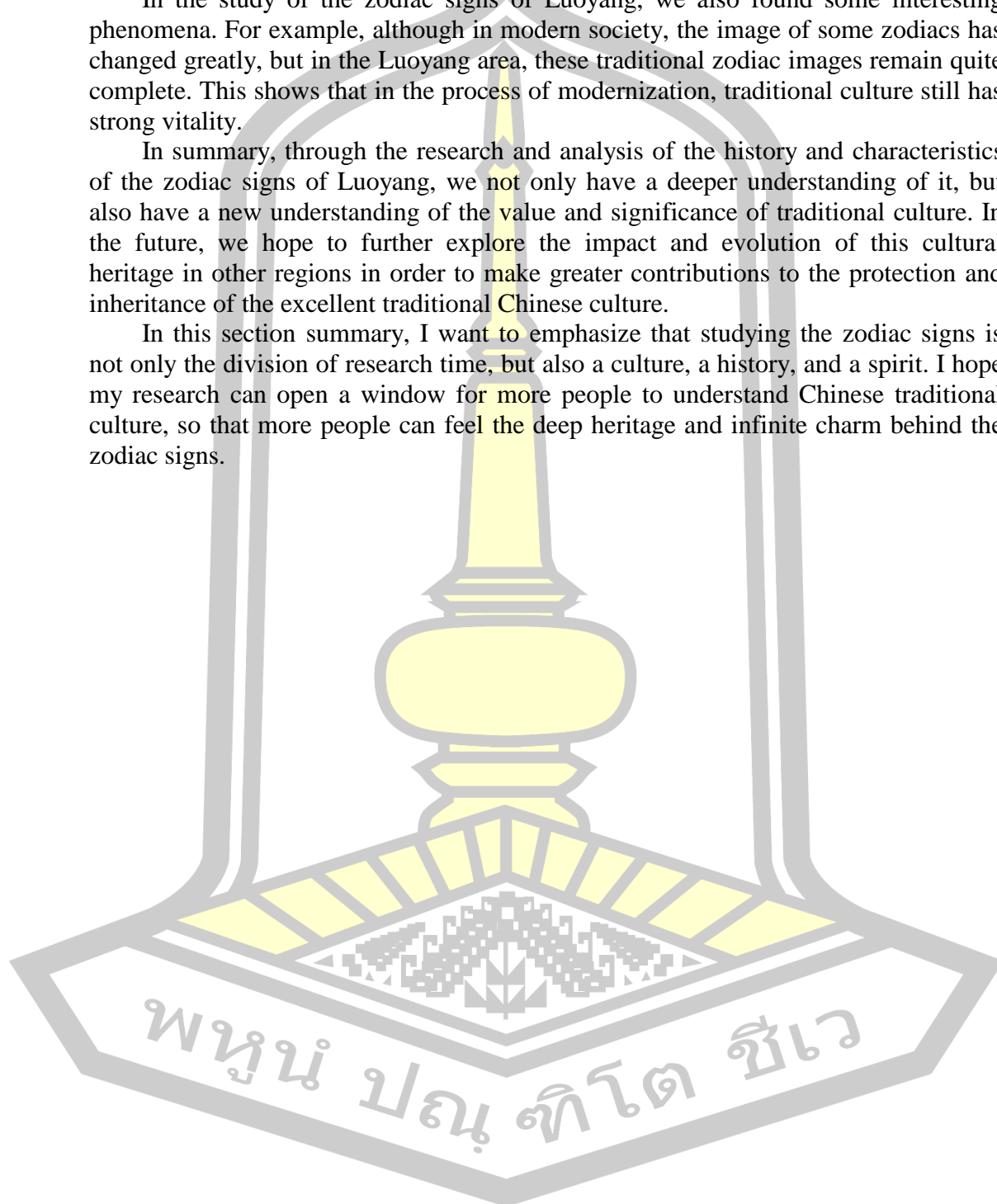
In addition, in addition to individual research on zodiac signs, we also analyzed the inherent connection and structure of the Zodiac as a whole. We found that these twelve animals are not randomly combined, but arranged in accordance with certain rules and logic. This arrangement not only reflects the ancient people's understanding

of nature, but also reflects their understanding and imagination of the universe. For example, the order of rats to pigs meets the living habits of animals, but also coincides with the ancient people's understanding of time, season and life cycle.

In the study of the zodiac signs of Luoyang, we also found some interesting phenomena. For example, although in modern society, the image of some zodiacs has changed greatly, but in the Luoyang area, these traditional zodiac images remain quite complete. This shows that in the process of modernization, traditional culture still has strong vitality.

In summary, through the research and analysis of the history and characteristics of the zodiac signs of Luoyang, we not only have a deeper understanding of it, but also have a new understanding of the value and significance of traditional culture. In the future, we hope to further explore the impact and evolution of this cultural heritage in other regions in order to make greater contributions to the protection and inheritance of the excellent traditional Chinese culture.

In this section summary, I want to emphasize that studying the zodiac signs is not only the division of research time, but also a culture, a history, and a spirit. I hope my research can open a window for more people to understand Chinese traditional culture, so that more people can feel the deep heritage and infinite charm behind the zodiac signs.



## Chapter III

### Study and analyze the relevant situation of waste paper reuse

#### 3.1 Research on waste paper

Waste paper, this seemingly insignificant item, actually plays an important role in our lives and ecological environment. It is a recycled recycling resource everywhere in production and life, including various high -end paper and waste paper. Boxes, cutting side paper, corporate unit paper, engineering paper, books and newspapers and so on. In recent years, with the increasing awareness of environmental protection, the recovery and treatment of waste paper has become a hot issue for social attention. This paper aims to explore the source, impact, and solutions of waste paper in order to provide some useful insights for the reasonable use and environmental protection of waste paper.

Choose waste paper and then use it as a problem that we study attention. First of all We think about which node changes from, and then expand new schemes used by waste paper, so that the waste paper "reinstates new life" and once again enter the process of recycling. The waste paper uses to some extent change the simple chain of "resource -product -waste" followed by most paper. At the same time, it reduces the use of a large amount of raw materials and reflects the core core of sustainable design.

First of all, the source of waste paper comes from two aspects: production and consumption. The waste paper produced during the production process, such as printing errors, corners, etc.; In the consumption process, it is mainly waste in people's daily life, such as newspapers, magazines, wrapping paper, etc. If these waste paper is not treated in time, it will not only occupy valuable land resources, but also cause serious pollution to the environment.

The impact of waste paper on the environment is mainly reflected in two aspects: one is the decrease in forest resources, and the other is the pollution of water and soil. (Chen Yuanhua, 2023-08: Environmental protection science.)Because waste paper contains a large amount of fiber components, if it cannot be effectively recovered and treated, it will cause excessive consumption of forest resources. In addition, waste paper will produce a large amount of wastewater during the treatment process. If these wastewater is directly discharged without treatment, it will cause severe pollution to the water body and soil.

Faced with the problems brought by waste paper, we need to take a series of measures to solve it. First, strengthen publicity and education and raise the public's awareness of environmental protection. Through publicity and education, people recognize the importance of waste paper recycling, so as to develop the habit of recycling and utilization in life. Secondly, the government should introduce relevant policies to encourage the recovery and treatment of waste paper. For example, policies such as tax discounts and funding support for waste paper recycling enterprises are given; a certain reward is given to individual waste paper recycling behaviors. Finally, strengthen technology research and development and improve the recycling rate of waste paper. At present, the recycling rate of waste paper has a lot of

room for improvement. Through technological research and development, increasing the recycling and utilization rate of waste paper can not only reduce environmental pollution, but also save forest resources and achieve a win-win situation for economic and environmental benefits.

In the specific implementation process, we can start from the following aspects: First, establish a sound waste paper recovery system. By establishing waste paper recycling stations and encouraging communities and enterprises and institutions to participate in waste paper recycling, establish a widely covered and efficient waste paper recycling system. The second is to strengthen the research and development and application of waste paper treatment technology. In response to the characteristics of waste paper, the efficient and environmentally friendly waste paper treatment technology is developed to improve the recycling rate of waste paper. The third is to promote the green development of the waste paper industry. Through policy guidance and market mechanism, promote the development of the waste paper industry in the direction of resource conservation and environmental friendliness, and achieve the unity of economic and environmental benefits.

In summary, in the face of the environment and resource issues brought by waste paper, we should in-depth research and exploring the source, impact, and solutions of waste paper in order to protect the sustainable use of resources while protecting the environment. This requires the joint efforts of our whole society, let us work together to contribute to the green future of the earth.

### **3.1.1 Waste paper recycled types**

Today, with the increasing awareness of environmental protection, the recycling of waste paper has become the focus of our attention. Waste paper, as a common waste in life, actually contains huge regeneration value. So, what kind of recyclable types are recyclable? The category of waste paper is richer than what we can get in contact with daily, and produces various occasions. Among the national standards that use the technical requirements of waste paper, recyclable waste paper can be roughly divided into the following 11 categories, such as the common mixed waste paper, waste books and magazines, waste newspapers(Li Qiong, 2019: Farm Bookstore)office waste paper, etc.3.1 Show.

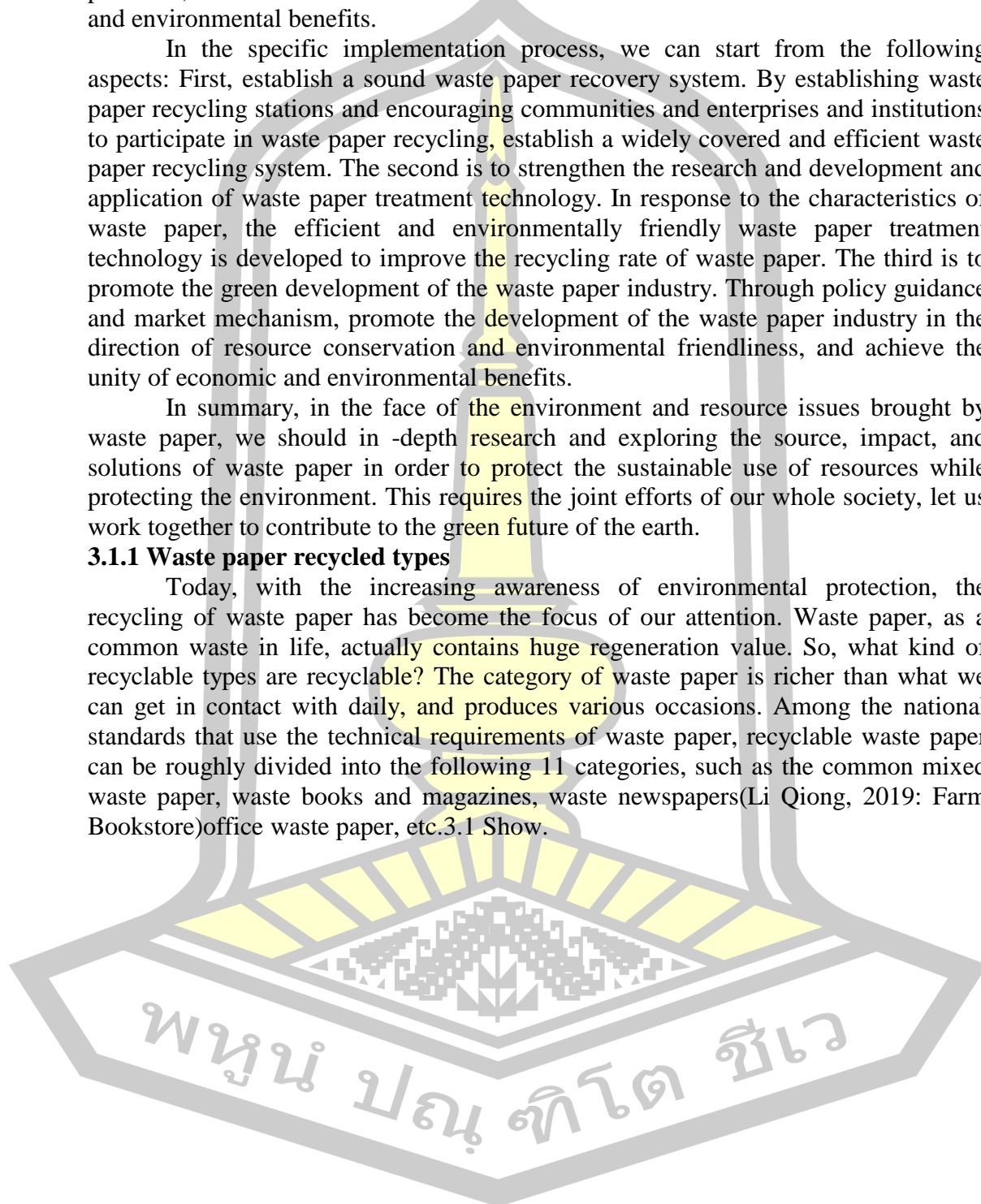


Table 2 Classification and specific meaning of various waste paper

type	Specific meaning
Mixed waste paper	Composed of unclassified waste paper
Waste packaging carton	Waste packing box without corrugated structure
Waste corrugated carton	Some waste corrugated boxes exist as packaging
Special waste paper	Special waste paper containing chemicals
Waste books and magazines	Waste magazines or books and similar printed paper
Waste newspaper	Dry primary color discarded newspapers, and do not include scrap magazines
Waste cowhide paper	Waste kraft paper and paper bag paper do not contain usable lining paper
Carton cut edge	The material in the production of cartons and cardboard
Office waste paper	Recycled used office waste paper
Journal white paper edge	White paper edge of unprinted publication
newsprint	Unprinted newsprint pages and cutting edges



Figure 5 Mixed waste paper

Source: [https://www.sohu.com/a/281182635\\_100001403](https://www.sohu.com/a/281182635_100001403)





Figure 6 Waste bag box

Source: <http://www.fakutownee.cn/shehui/>



Figure 7 Waste corrugated box

Source: [http://www.tz1288.com/supply\\_view\\_198248909.html](http://www.tz1288.com/supply_view_198248909.html)







Figure 8 Special waste paper

Source: [http://www.tz1288.com/supply\\_view\\_198248909.html](http://www.tz1288.com/supply_view_198248909.html)



Figure 9 Abandoned book magazine

Source: <https://www.douban.com/group/topic/248786201/>

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Figure 10 Scrap newspaper

Source: <https://www.feijiu.net/FeiZhi/5792733.html>



Figure 11 Scrap cowhide

Source: <https://adminmanager.zaixun.wang/details.aspx?InfoId=7307>

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Figure 14 Pressing Paper

**Source:** <https://www.1688.com/huo/b-BFA8D6BDC4DACCF5.html?from=ye&bizId>



Figure 15 newsprint

**Source:** <https://xsj.699pic.com/sou/zhishuxiaobaobiankuang.html>

Obviously, we cannot recycle all types of waste paper. Therefore, according to factors such as our service objects, existing technologies, and economic restrictions, we can choose the appropriate type of various types of waste paper in the subsequent design.

### 3.1.2 Recycling of waste paper

For a piece of waste paper, the best trajectory may follow such a closed-loop process: recycling -processing -reuse -waste, in order to minimize the destruction of the environment and the waste of resources. As the first step in this process, waste paper recycling has a pivotal role. After this step is missing, the treatment of waste paper will be empty talk, let alone the use of waste paper. In addition to the waste paper recycling in the recycling of waste paper, the waste paper produced in the production and life of our country also includes waste paper imported from abroad every year in our country. The proportion of waste paper occupies about 60% of the original fiber materials in the Chinese paper industry, of which nearly one-third of them come from imports. The purpose of imported waste paper is to save resources, reduce pollution produced by pulp, and maintain the quality and proportion of various fibers in domestic waste paper. From 1990 to 2019, my country's imports of more than 400 million tons of waste paper were imported, and more than 75 billion U.S. dollars exported countries were paid, reaching the level of about one-third of the world. It is the major country in the world's waste paper imports (Zhang Quan, 2017-9: Paper-making information.) At the same time, the top ten of waste paper exports are high-income countries, and 71.13% of waste paper in the world has been exported. The waste paper trade has presented high-income countries such as Europe and North America to my country and other low-income Asia-Pacific countries. Imported waste paper has played a positive role in cracking down the shortage of domestic papermaking raw materials and promoting energy conservation and emission reduction; but at the same time, the environmental risks generated by foreign waste illegal entry and toxic and harmful bands cannot be ignored.

In order to cope with the above series of issues, the government and individuals should take various methods to change these situations. In order to prevent the environmental risks of waste imports, the Ministry of Environmental Protection has formulated the "Regulations on the Management of Important Paper Environmental Protection", and the state has been reducing the total amount of solid waste imports year by year and achieved good results (Li Tuobin, 2013: Organic fertilizer prepared with sludge.) At the same time, the concept of garbage classification has also been proposed that my country needs to experience a long reform process in terms of garbage classification recycling. From the establishment of my country to the 1990s, garbage has not yet clearly classified standards. However, at present, the state has formulated relevant regulations on garbage classification by considering environmental pollution and waste of resources. For example, in July 2019, Shanghai introduced the "most stringent" domestic waste management regulations in Shanghai, becoming the first city in the country to implement garbage classification, and gradually developed in other cities. For example, from May 1, 2020, Beijing also joined the ranks of Shanghai and began to formally implement more stringent garbage classification standards (Zheng Baochen, 2012-4: Fujian Paper Information) Garbage classification can help further improve waste paper recycling

Quality and quantity, and even promoting the ecological reshaping of the recycling paper industry, which is conducive to achieving a virtuous circle of industry development. However, garbage classification treatment requires a gradual process. Most of the unprecedented cities, even if the trash can have recyclable garbage, non-

recyclable garbage, harmful garbage and other types of different differences, we will find that we will find that we live. Most of the garbage is not fully implemented in accordance with the classification standards, and some recyclable garbage often appears in non-recycled trash cans. In such an atmosphere of environment, waste paper, as a recycled garbage, has not been fully recovered. Therefore, it is necessary for us to use this as the entry point, thinking and improvement from the recycling of waste paper and reuse, and find effective solutions to the use of waste paper.

### **3.2 Personal waste paper treatment research**

The degree of reconstruction of waste paper in my country is always far lower than that of Western European and American countries. We should find a way to increase the reuse ratio of waste paper, so that the life cycle of waste paper can be extended, and the dependence on the import of waste paper is gradually removed. One ton of waste paper can regenerate 850 kg of regeneration paper, save 3 cubic meters of wood, and can save 100 cubic meters of water, saving about 600 degrees of electricity(Wang Qinch, 2018: Chinese paper.) According to previous data, we can know that our country listed a large amount of waste paper every year, and the number of recycling and utilization of recycling is about 10 million tons each year. Therefore, we study the current methods of re-use in domestic waste paper, some problems, and related technical means. We need to find the opportunity to design design in the existing waste paper.

#### **3.2.1 Personal waste paper treatment method**

The use of waste paper for individual groups is flexible. It can be divided into the following directions: throw directly into the trash can, send it to the waste paper acquisition station, make handicraft production, throw into the paper machine and plant fertilizer.

##### **(1) Throw it into the trash can**

Sometimes it is limited by the time and place of waste paper. Most people choose to directly throw the waste paper directly into the trash can, as shown in Figure 3.12. Because my country is not perfect for garbage classification, some waste paper has been directly thrown into non-recyclable trash cans. Even if the waste paper is thrown into the recyclable trash can, it takes a lot of energy to consume a lot of energy, so that most of the waste paper cannot be fully used.



Figure 16 Waste paper recycling trash bin

Source: <https://image.baidu.com/search/detail?ct=503316480&z>



## (2) Waste paper acquisition station

In our daily life, waste paper is everywhere. Whether it is a school, office, or a family, a large amount of waste paper is generated every day. However, these waste paper is not useless, they can be effectively reused through the waste paper recycling station.

Some people with a strong awareness of environmental protection will choose to accumulate the waste paper around them to a certain amount, and then choose to send it to the waste paper recycling station for recycling and use as shown in Figure 3.13. Compared with other ways, this obviously can better play the role of waste paper.



Figure 17 Waste paper recycling station

**Source:** <https://image.baidu.com/search/detail?ct=50331648>

Waste paper recycling station, as the name suggests, is a place where waste paper is dedicated to recycling. These sites are usually classified, cleaned, crushed, and pulled, and finally made into recycled paper. This recycled paper can be used not only for writing, printing and other purposes again, but its quality is almost the same as the slurry paper. More importantly, the reuse of waste paper can greatly reduce the cutting of the forest, thereby protecting the environment and slowing the speed of global warming.

Of course, the establishment of waste paper recycling stations is not an easy task. First of all, you need to invest a lot of manpower, material and financial resources to build stations and purchase equipment. Secondly, the collection of waste paper also requires a lot of transportation tools and manpower. In addition, the operation of the waste paper recycling station requires a lot of money. Therefore, the establishment of a waste paper recycling station requires the joint efforts of the government, enterprises and all walks of life.

In many countries and regions, the government has introduced a series of policies to encourage the recovery and reuse of waste paper. For example, the government can give a certain tax discount and subsidy policy support for waste paper recycling stations. At the same time, the government can also increase the public's understanding and participation of waste paper recovery through publicity and education.

In addition to government support, enterprises can also play an important role in waste paper recycling. For example, enterprises can establish a waste paper recycling system internally to encourage employees to actively participate in waste paper recycling. At the same time, enterprises can also cooperate with waste paper recycling stations to achieve targeted recycling and reuse of waste paper.

In summary, waste paper recycling stations are of great significance to protect the environment and save resources. Each of us should actively participate in waste paper recycling and contribute our own power to the sustainable development of the earth.

### (3) Making handicrafts

There are many directions to choose from using waste paper for handicraft production. For example, keeping the basic physical form of waste paper is not that, it does not develop complicated chemical reactions to waste paper. Through the simple treatment of origami and paste, it becomes a handicraft, which generally contains purely pure Watching and acting as small tools in life. Put the waste paper into the bottle and shake the water with water, you can get paper paste, and then you can get the handicrafts shown in Figure 3.14 below after removing moisture, hand -made manufacturing, and coloring decoration.



Figure 18 Waste paper making handicrafts

**Source:** The pictures are made by the author

### (4) The shredder is crushed

The Shredder Consist Mainly of a Set of Rotating Blades, Paper Combs, and Drive Motors. The Paper is fed from the shredder and is cut into many pieces of the place ve more comprehensive confidenceity, as shown in Figure 3.15. Shredder Protects The Company's Information and Trade Secrets. For some National Party and Government Organs, Financial Institutes and Medical Institutes and Other Pher P Ublc Institutions, Information is more related to the information security of the whole industry or event the country.



Figure 19 Waste paper is thrown into the shredder

**Source:** <https://699pic.com/tupian-303404549.html>

#### (5) Plant fertilizer

Some people grow vegetables with broken pulp, but if you pay attention to ink, it will be absorbed by the root system of the plant. Plaslas are grown grass, flowers, and succulent. The advantages of this method are relatively lighter, saving water, as shown in Figure 3.16 below. In particular, the role of waste paper can also prevent some plants from getting sick, and the effect is very amazing. Mastering the proportion of pulp in fertilizer can reduce the incidence of plants by about three - quarters(Ruan King Kong, 2019-6: Shangxun.).



Figure 20 Waste paper acts as a plant fertilizer

**Source:** <https://baidu.com/pcpage/similar?carousel=503&>

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### 3.2.2 Personal processing method thinking

The reason why waste paper cannot be fully used is a variety of diverse, which is very related to my country's national conditions and waste paper recycling methods. The following are preliminary analysis of the following reasons, hoping to provide us with inspiration.

(1) There is a sense of environmental protection, and the implementation efficiency is not high

Many people can realize the importance of ecological protection and also have basic awareness of ecological protection. However, due to the high cost of recycling of scrap paper, there is no more appropriate waste paper reuse method, which can be seen everywhere. For example, to make handicrafts with waste paper, it requires a certain amount of handicraft foundation and time cost, which is not suitable for most people. The use of waste paper as plant fertilizers requires learning and mastering a certain amount of knowledge of fertilizer. It cannot be easily achieved, and it is not suitable for most people who do not maintain flowers and plants. Therefore, the awareness of ecological and environmental protection of the people should not be allowed to stay in ideology, and the energy consumed by the recovery of waste paper should be reduced, the cost of implementation is reduced, and the recovery of waste paper should be improved.

(2) The classification of waste paper is not fine enough, and the effect is not good

The American Waste Industry Association divides US waste paper into 54 types, and provides regulations on the source, type, and processing methods of waste paper in the classification standards(Leonard Zeid., 2016-11: China papermaking)Many types of waste paper resources are not sufficiently classified in many domestic types. Because the waste paper recycling points are very small, some are convenient and smooth, and the waste paper is discarded directly in the trash. Even if the waste paper can be recycled in this case, it not only requires a lot of labor costs, but also contains a lot of misunderstandings, and it is not convenient to be recycled.

(3) There are too few recycling methods to easily recycle

At present, the mainstream waste paper recycling method is the accumulation of individuals or enterprises for a period of time to form a certain amount of delivery to the waste paper acquisition station, but this process is very tedious and time-consuming. The time and frequency of waste paper are not determined. If the additional is far from the acquisition station, there will be a situation where waste paper cannot be successfully recovered. Therefore, this recycling channel is not very efficient. The situation is similar on the campus. Without particularly good recycling means, students who want to recycle paper recycling will slowly disappear. There is no good way to recycle the waste paper.

After the above -mentioned common analysis of the use of waste paper in life and the lack of these methods, some breakthroughs can be provided for subsequent waste paper reuse. For example, the problem of waste paper recycling and use is closely related to the convenience, efficiency, and diversity of waste paper recycling channels. Next, we look for design points from the way of enterprise waste paper.



### 3.3 Research Research on Enterprise Waste Paper Reuse

#### 3.3.1 Enterprise waste paper re-use method

Regardless of individuals, enterprises, or national governments, it has not fully attached great importance to the use of waste paper. According to calculations, the target of the waste paper recovery rate in my country in 2020 is about 50%(Ke Yuhong, 2017-8: Journal of Jiamusi Vocational College.)Compared with other countries, there is still room for improvement in waste paper recovery in my country. Therefore, each of us should pay attention to the recycling and reuse of waste paper, so that the life cycle of waste paper can be extended, and the dependence on the import of waste paper is completely avoided. There are huge differences in the way enterprises and individuals are reused by waste paper. They are the objects we need to study.

After the enterprise recycles the waste paper, the processing of large machines is mainly used to make daily necessities of recycled paper, packaging materials, paper furniture and paper as raw materials. Plant fibers such as grass, bamboo, wood, and reeds are the core of paper manufacturing. "Secondary fiber" is the alias of waste paper. The most valuable in waste paper is the fiber, which can be used to make products such as regeneration paper.

##### (1) Packaging material

Paper is a very good packaging material, which is applied to many fields. The current common packaging production method is: pulp molding packaging, honeycomb cardboard packaging, and corrugated paper composite panel packaging.

Polying molding packaging is an excellent alternative to wood packaging. In recent years, it has a rapid new packaging material. For example, we have common eggs in our lives, and are equipped with a hard paper tray for fruit. It can tolerate and protect the packaged products, which are convenient and practical. Polyng molding packaging is shown in Figure 3.17.



Figure 21 Pulp molding packaging

Source : <https://image.baidu.com/search/detail?ct=503316480&z>

Honeycomb cardboard is made of natural honeycomb structure, and its internal structure is composed of many three-dimensional positive hexagon. Based on the characteristics of light quality, low price, high strength, recyclable, etc., it is a new type of green packaging that saves resources and protects the environment. The honeycomb cardboard is shown in Figure 3.18 below.



Figure 22 Honeycomb cardboard material

**Source :** <https://baidu.com/search/index?tn=baiduimage&ipn=r&ct=20132659>

Corrugated paper has the advantages of low cost, light quality, easy processing, high strength, high strength, excellent printing adaptability, and convenient storage and handling. Most of the corrugated paper can be recycled and regenerated. It is very wide and environmentally friendly as packaging materials, as shown in Figure 3.19 below. Its most common use is product packaging and transportation. However, under the design of creativity, they can also become daily necessities.

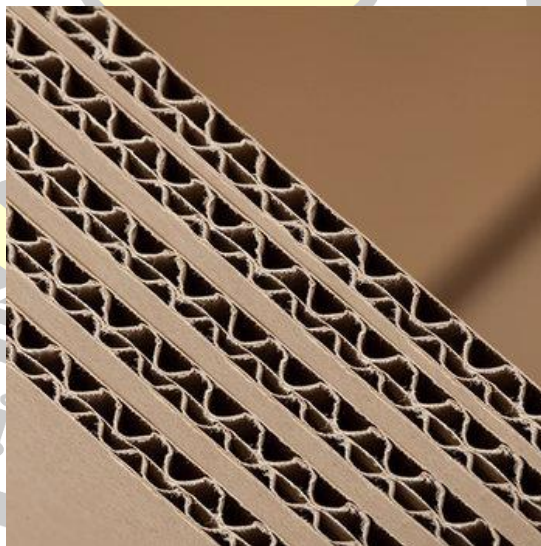


Figure 23 corrugating paperboard

**Source :** <https://image.baidu.com/search/detail?ct=503316480&>



## (2) Waste paper furniture

With the improvement of people's living standards, a large amount of waste paper is made every day around everyone. However, the recovery rate of waste paper in my country is only 47.6%, and the utilization rate is 63.9%. It can be seen that the number of waste paper is very large, and the recovery rate is not high. After the recovery of waste paper is recycled, it is mainly used for papermaking, but the quality of recycling paper will decrease. Is there any way to use other waste paper? That is to use waste paper to make furniture boards to mix the secondary fiber of recycled paper with other wooden materials to create high value -added wood composite materials. A furniture made of waste paper as the raw material is shown in Figure 3.20 below.

This method can reduce the pollution of the environment for physical and chemical technology during the treatment of waste paper, and it can also alleviate the contradiction between supply and demand due to lack of wood resources in the furniture industry. The price of furniture is low. Can greatly reduce the cost of furniture. And the waste paper is elegant and can be stained. Paper materials are a material that is easier to dye, which can basically meet the requirements of furniture production. So how to process waste paper furniture? Usually crush the waste paper, add other wooden materials, and finally add a adhesive to make plates under a certain temperature and pressure, so as to connect to the production of board furniture by connecting the connector. Waste paper furniture is a green and environmentally friendly furniture, which will have great development potential in the future.

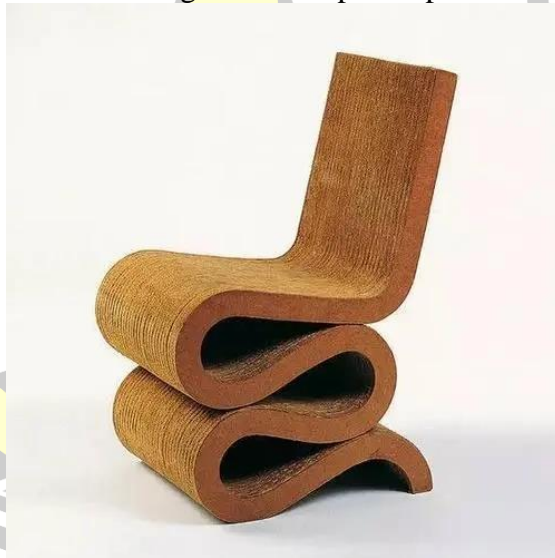


Figure 24 Chairir furniture made from waste paper

Source : <https://m.sohu.com/n/452219308/>

### (3) Discovery paper

Waste paper is the main material for producing recycled paper. It can be produced by multiple steps such as sorting, purification, and pulp. And recycled paper can be used like normal paper, which has the benefits of protecting the eyes. The use of waste paper as raw materials for paper production, and there is no difference between paper produced by using wood pulp and other use, as shown in Figure 3.21 below.



Figure 25 Regenerative paper

**Source:** Pictures are derived from the author's homemade recycled paper

### 3.3.2 Enterprise waste paper reuse technology

Enterprises in different scale and direction of development have numerous different treatment methods and use directions for waste paper re-use. Due to space limitations, we only introduce typical technologies that can be adopted. Because different waste paper is made of different fiber raw materials, the final variety of waste paper pulp can be produced by the pulp varieties contained in waste paper. The varieties with a relatively large amount of waste paper are corrugated paper, boxboard, news paper and white cardboard(Wang Jian, 2014-6: Journal of Tongren College)In order to better meet the domestic demand for paper and cardboard, the paper industry has changed the situation of small production lines and low efficiency by introducing international advanced production equipment. In the past ten years, my country's waste paper has been fully used. And almost all with the largest largest papermaking machine currently in the world, as shown in Figure 3.22 below.

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Figure 26 Large paper machine

Source : [http://www.ksgjx.com/product\\_info.php?id=48](http://www.ksgjx.com/product_info.php?id=48)

At present, the development potential of the development potential is being widely used. It is based on waste paper as a raw material. It has become a product with different appearances based on the shape of the mold shape on the plasma molding machine, as shown in Figure 3.23 below. Due to the characteristics of production and the quality and volume of the product itself, the volume of the pulp mold molding equipment is usually relatively large. There are many advantages of pulp molding products. The raw materials are easy to obtain. It can be used to use waste paper, including paper paper, waste paper boxes, waste white side paper, etc.; The formation of molding, drying and shading; in addition, the finished product can also be recycled; in the end, the volume of the pulp molding products is smaller than the foam plastic, and the transportation process is more convenient (Roberta Cristina Redante, 2019-1 : Sustainable Production and Consumption.) In addition to the production of lunch boxes and tableware, more production industry buffer packaging is developed very quickly.



Figure 27 Different types of paper pulp molding machine

Source : <https://detail.1688.com/offer/654443149060.html>

### 3.4 Conclusion

This chapter mainly conducts comprehensive and in-depth discussions on the generation, recycling, and re-use of waste paper.

Through the study of this chapter, we not only have a clearer understanding of the re-use of waste paper, but also have a deeper understanding of environmental protection and resource utilization. As a common waste in daily life, waste paper has continued to grow every year for consumption and office. This not only puts pressure on the environment, but also causes waste of resources. The chapters analyze the reasons and ways generated by waste paper in detail, as well as the difficulty and challenges of the waste paper during the recovery process. Through data and cases, we learned that the recovery rate of waste paper has a large difference in global scope. Due to the limitation of technology, policies and consciousness in some regions, the recovery rate of waste paper is low.

The recycling and reuse of waste paper is of great significance for environmental protection and resource saving. On the one hand, the recycling of waste paper can reduce the pressure of garbage landfills and avoid potential pollution of soil and water source; on the other hand, after reasonable reuse, waste paper can be converted into new paper, cardboard and other products to achieve resources to achieve resources Cycle use. The chapters introduce the process and techniques of waste paper reuse, including classification, cleaning, crushing, pulp and other steps, as well as technical problems and solutions that may be encountered during the use process.

The use of waste paper has also brought significant benefits in terms of society and economy. From a social perspective, increasing the recovery rate of waste paper and re-utilization rate will help improve the public's environmental awareness and promote the sustainable development of society. From an economic point of view, the reuse of waste paper created new employment opportunities to promote the development of the circular economy. In addition, the reuse of waste paper can reduce the demand for native fibers, thereby reducing the pressure of forest cutting and protecting biodiversity.

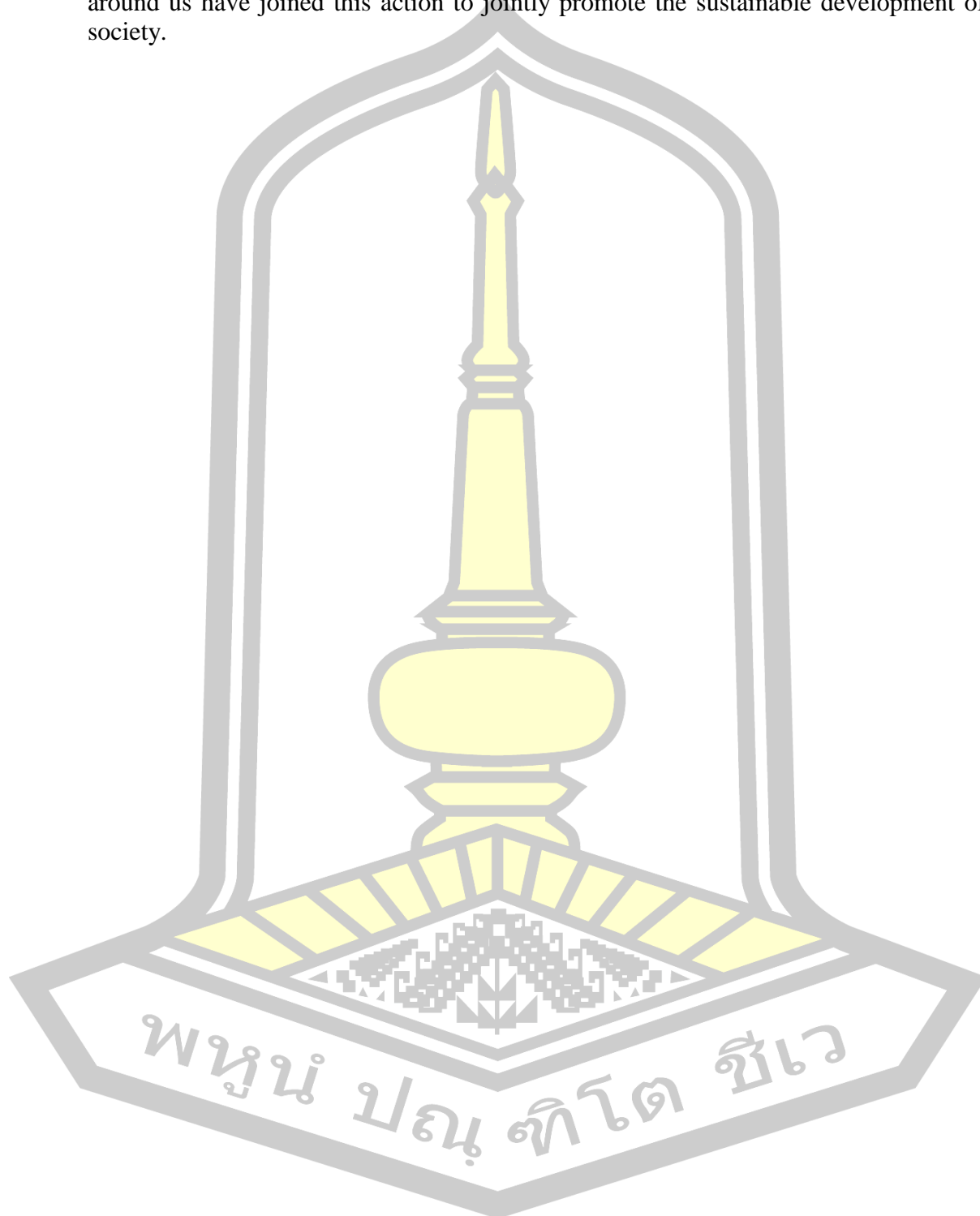
However, although waste paper has many advantages, it still faces many challenges in actual operation. For example, the public's awareness of waste paper recycling is still relatively weak; the imperfect recycling system has led to a large amount of waste paper into domestic garbage; the price system of waste paper recycling in some areas is unreasonable and affects the enthusiasm of recycling. In-depth analysis of these issues in the chapter, and put forward some solutions and suggestions.

In the future, the development direction of waste paper reuse is mainly concentrated in the following aspects: first, to improve the public's environmental awareness and strengthen publicity and education; second, improve the waste paper recovery system, establish a more convenient and efficient recycling channel; the third is to develop new new ones; Technology, improve the re-use rate of waste paper and product quality; fourth, formulate reasonable policies, encourage and support the development of waste paper reuse industries.

Through the study of this chapter, we not only have a deeper understanding of waste paper, but also understand the role we play in promoting environmental protection and resource utilization. We should actively participate in the actions of



waste paper recycling and re -use to contribute our own strength to building a better environment. At the same time, we should also advocate that relatives and friends around us have joined this action to jointly promote the sustainable development of society.



## Chapter IV

### Analysis of the feasibility analysis of waste paper in the innovative design of the zodiac art of Luoyang

#### 4.1 The status quo of waste paper in the art innovation design of the zodiac zodiac signs

##### 4.1.1 The status quo of waste paper in the innovative design of the zodiac art of Luoyang

(1) The shadow of waste paper uses artworks in the market is relatively small. First of all, we must recognize the uniqueness of waste paper art. They are usually abandoned paper, such as newspapers, magazines, wrapping paper, etc. The artists have become a treasure, becoming a artwork, becoming a creative and aesthetic artwork. This form of art not only reflects the concept of environmental protection, but also the reuse and re-creation of waste. However, this form of art has not been produced on a large scale and its share in the market is relatively small, but it has gradually attracted more people's attention and recognition. The following is the status quo of waste paper reuse in the market:

**Increased popularity:** As the importance of environmental protection and sustainable development is constantly prominent, more and more people have begun to pay attention to the method of reuse of waste. Waste paper uses art as a creative and environmentally friendly art form, which has gradually attracted people's interest. Some well-known artists and activities have also begun to promote waste paper and then use artworks to get more exposure in the market.

**Creativity and uniqueness:** The use of artworks to use artworks with creativity and uniqueness. The artists use clever use of waste paper, paper and other materials to create, making it a unique art work(Wang Yijun, 2023-12: Paper equipment and materials.)This innovative art form has attracted the attention of some collectors and buyers. They are willing to buy these unique works to show their personal taste and support for environmental protection.

**Art market channels:** The sales channels of waste paper are relatively limited, mainly concentrated on some specialized art exhibitions, galleries and online platforms. On these exhibitions and platforms, artists can show their works and establish contact with potential buyers. However, compared with the traditional art market, the market channels for waste paper to use artworks are still relatively small.

**Sustainable development trend:** With the increasing attention of society for sustainable development and environmental protection, waste paper has greater development potential with artworks. The awareness of people's awareness of environmental protection and social responsibility has improved, expressing more recognition and support for this art form that uses waste paper as the core. This trend may prompt more artists to join waste paper and then use the creation of artworks, and promote the growth of market share.



In general, although waste paper has a relatively small share in the market, with the popularity of environmental protection awareness and people's pursuit of innovative art, it is gradually attracting more people's attention and recognition. In the future, with the development of related markets and promotion channels, the market share of waste paper will be further expanded by the market share of artworks.

#### **4.2 Questions and solution measures**

4.2.1 Waste paper is then used to use problems in the art innovation design of the zodiac signs of Luoyang

(1) The market awareness of waste paper is limited to the market awareness of artworks

Yes, the market awareness of waste paper is relatively low. Due to the particularity of its material sources, many people may question their artistic value and even ignore their existence. This has led to low awareness of waste paper art in the market, which limits the development of its market.

This is because waste paper is relatively novel and special compared to traditional art, which is different from common forms of painting and sculpture. In addition, waste paper requires certain professional skills and creativity to make the production process of art, so there is relatively few promotion and publicity in the market.

However, with the improvement of environmental awareness and the advocacy of sustainable development, waste paper has gradually attracted more people's attention and love. By converting waste paper into artworks, it can not only reduce waste of waste paper, but also give new values and lives for waste paper. Waste paper uses artworks with unique artistic expression and environmental protection significance, which can cause people to think about sustainable development and recycling of resource.

(2) The production process of waste paper art is relatively complicated

It not only requires the artist to have a solid artistic skills, but also requires them to have innovative thinking and a unique understanding of waste paper. In addition, due to the characteristics of waste paper, these artworks are often fragile and require special preservation methods(Zhu Heping, 2024-1: Ecological economy.)The production of waste paper needs to go through multiple steps and processes, including the following main links: the following main links:

1. Collect and prepare waste paper: First of all, you need to collect various types of waste paper, such as newspapers, magazines, cartons, etc. Then classify, clean, and treat waste paper to ensure the appropriate quality of waste paper, and at the same time remove harmful substances such as ink and glue.

2. Cutting and slurry of waste paper: Cut the collected waste paper for cutting or tearing, and then add a certain percentage of water to soak and stir to make the waste paper become pulp.

3. Screening and drying: Remove the impurities in the pulp by screening or other filtering methods, and spread the pulp evenly on the tablet for drying to turn it into available paper.

4. Handmade shape and carving: According to the design needs, hand -shaped and carved paper are used to use tools, molds and other tools to shape paper into the required shapes, such as flowers, animals, etc.

5. Color and decoration: You can use paint, paint, color pen, etc. to make color and decoration to make waste paper art more colorful.

6. Repair and protection: repair and protect the production of waste paper arts, such as cutting edges and waxing treatment to ensure the integrity and durability of artworks.

In addition, waste paper art also includes software design and production products, such as many types of waste paper design artworks such as cultural and creative products.

The above is only the basic steps for the production process of waste paper art, as shown in Figure 4.1, 4.2, 4.3, 4.4 as the author's self-made waste paper artwork. The actual production may also involve more details and technologies. Due to the particularity and complexity of waste paper art, the production process requires certain professional knowledge and skills, and the requirements for artists and producers are relatively high. These factors have increased the cost and difficulty of waste paper art, making its market price relatively high, which is not conducive to market promotion.



Figure 28 Waste paper character paper carving

Source : The picture comes from the author's undergraduate period to use the abandoned express carton to make a three-dimensional character sculpture



Figure 29 Candid paper making recycled paper lanterns

**Source:** The picture comes from self-made during the study of the author's thesis



Figure 30 Waste paper making recycled paper vase

**Source:** The picture comes from self-made during the study of the author's thesis



Figure 31 Waste paper making recycled paper home decoration lamp

**Source:** The picture comes from self-made during the study of the author's thesis

### (3) Insufficient marketing and marketing strategies

At present, there are indeed some deficiencies in the use of art market promotion and marketing strategies(Zhu Yue, 2023-6: Environmental sanitation project.)The following is some current situation:

The popularity is not high: waste paper is not known enough to use artworks, and many people do not understand their concepts and characteristics.

Market positioning is blurred: waste paper uses the lack of clear positioning and target audiences in the art market, leading to insufficient accuracy of promotion and marketing strategies.

Lack of professional promotion teams: Many waste paper reuses the lack of professional teams and experience in promoting by artistic brands or creators, resulting in poor promotion effects.

Traditional marketing methods are too dependent on: some brands or creators still rely too much on traditional advertising, exhibitions and sales channels, and lack of innovative promotion methods.

Lack of differentiated competition advantages: Waste paper reuses fierce competition in the art market, but there are no obvious differentiated advantages in design, quality and creativity of some brands or creators.



There are no clear stories and brand stories: waste paper reuses the lack of in - depth brand stories and values behind the art market, and it is difficult to attract consumers' emotional resonance and recognition.

Insufficient social media promotion: Some brands or creators have insufficient investment in social media promotion, and cannot make full use of this channel to interact and publicize with the target audience.

#### (4) Insufficient market demand

There are indeed some challenges and deficiencies in the needs of waste paper to use the needs of the art market. Although waste paper has positive significance in environmental protection and sustainable development, its market demand is affected by many factors.

First of all, the degree of appreciation and awareness of waste paper is relatively low, and the public's awareness of its market value and investment potential is limited. Compared with traditional art, waste paper can use artworks to not be in line with mainstream aesthetic concepts in aesthetic, and lacks people's pursuit of uniqueness of art and artist brand recognition.

Secondly, waste paper uses the high production cost of artworks. It takes a lot of time and energy in the production process, and it needs to have certain technical and creativity(Zhu Sirui, 2023-7: Design.)This makes waste paper use the price of artworks relatively high, limiting the desire to buy potential buyers.

In addition, waste paper uses the art market to face the challenges of market promotion and promotion. Compared with the traditional art market, the promotion of waste paper is relatively weak, and the public has less opportunities to understand and contact them. The lack of effective market publicity and promotion methods has limited the expansion of market demand.

In short, the current demand of waste paper is relatively insufficient. It is necessary to promote the development of the market by increasing the public's awareness of its value, reducing production costs, and strengthening market promotion.

#### **4.2.2 Solution measures**

In order to promote Luoyang's zodiac signs and waste paper artworks, the following solutions have been proposed:

##### (1) Strengthen publicity and education

First of all, we should strengthen publicity and education to improve the public's awareness and acceptance of waste paper art. By holding exhibitions and publicity activities, more people can understand the value and significance of waste paper art. At the same time, the education department can incorporate waste paper art into school art education courses to cultivate children's environmental awareness and interest in waste paper art from an early age.

##### (2) Establish professional promotion channels

Secondly, we need to establish professional promotion channels to support the market -oriented operation of waste paper art. It can expand sales channels by establishing waste paper art sales platforms and launching online sales. At the same time, it can also cooperate with relevant enterprises to apply waste paper art to business activities to achieve mutual benefit and win -win results.

### (3) Encourage innovation and personalized development

In addition, we should also encourage innovation and personalized development to promote the development of waste paper art to a higher level. By hosting the design competition and setting innovation awards, etc, the artist's creativity and imagination can be stimulated(Dai Meng, 2015-3: Packaging project.)At the same time, it can give a certain reward and support for excellent waste paper art works to promote it to a wider stage.

### (4) Innovate the cultural innovation of waste paper and Luoyang Zodiac culture

Today, the voices of environmental protection are increasingly rising, how to transform waste items into valuable things has become the focus of research in various fields. And our goal is to combine waste paper with the zodiac culture of Luoyang to create a series of artworks with cultural connotation and environmental value.

Luoyang, the ancient capital of the millennium, has deep cultural heritage, of which the zodiac culture is long. These traditional zodiac images represent the Chinese understanding and expectations of life. However, in modern society, these valuable cultural heritages are often ignored.

Our innovation is that the use of waste paper to regenerate and combine the patterns of the zodiac signs of Luoyang to make various practical items, such as murals, decorations, handicrafts, and design works. This combination not only gives the new life of waste paper, but also allows traditional zodiac culture to be inherited and carried forward.

This move will not only help environmental protection, but also promote the development of cultural and creative industries, and increase people's understanding and respect for traditional culture. Let's work together to let the waste paper and the zodiac culture of the Luoyang zodiac culture glow in the new era.

### (5) Adhere to sustainable development, establish and improve the industrial chain

Finally, we should adhere to sustainable development and establish and improve the industrial chain. In today's society, sustainable development has become a global consensus(Cai Hui, 2024-1: Chinese papermaking.)Facing the reality of tight resources and increasing environmental pressure, how to achieve a win-win situation in economic and environment has become an important issue in front of us. As a renewable resource, the sustainable development of waste paper is of great significance.

#### 1. Waste paper adheres to the necessity of sustainable development

Waste paper is a kind of renewable resource. Its sustainable development is of great significance to alleviate resource pressure, reduce environmental pollution, and promote economic development. First of all, the recycling of waste paper can reduce dependence on natural resources such as forests, thereby protecting the ecological environment. Secondly, the regeneration of waste paper can reduce the production of garbage and reduce the pressure of urban waste treatment. Finally, the recycling and utilization of waste paper can promote employment and economic development.

However, there are still some problems in the recycling and utilization of waste paper. First, the recovery rate of waste paper is not high, and a large amount of waste paper

is discarded or burned at will(Zhao Minjuan, 2014-12: Science and Technology Innovation Guidance.)The second is that the use of waste paper regeneration technology is not advanced, resulting in unstable quality of recycled paper. Third, the waste paper industry chain is not complete, and lacks effective regulatory mechanisms. Therefore, we need to take measures to promote the sustainable development of waste paper.

## 2. Establish a strategy of improving the industrial chain

**Improve the recovery rate of waste paper:** The government should increase the publicity of waste paper recycling, improve the public's environmental awareness, and encourage people to actively participate in waste paper recovery. At the same time, the government can introduce relevant policies, such as providing tax discounts and funding support for waste paper recycling enterprises, which stimulates the enthusiasm of enterprises to participate in waste paper recycling. In addition, the government should strengthen supervision and punish the behavior of discarding waste paper at will, thereby reducing the loss of waste paper.

**Improve regeneration technology:** Enterprises should increase research and development efforts, improve waste paper regeneration utilization technology, and improve the quality and added value of recycled paper(Xue Qing, 2024-1: Research on Coal Economy.) At the same time, enterprises should strengthen cooperation with scientific research institutions, introduce advanced technology and equipment, and promote the upgrading and transformation of the waste paper industry. In addition, enterprises should pay attention to the implementation of environmental protection standards to ensure that the process of recycling of waste paper meet environmental protection requirements.

**Improve the industrial chain:** The government should strengthen the planning and management of the waste paper industry chain, and promote cooperation and coordinated development between upstream and downstream enterprises. Specifically, the government can establish a waste paper trading platform to promote the circulation and transactions of waste paper; encourage enterprises to establish waste paper recycling networks to improve recycling efficiency; promote the cooperation between waste paper regeneration and use of cooperation with downstream enterprises, expand the application scope of recycled products, Essence In addition, the government should strengthen the supervision of the industrial chain to ensure the standardized operation of each link.

**Promote the development of circular economy:** The government should increase its support for the circular economy and promote the integration and development of the waste paper industry and other industries. For example, the use of waste paper regeneration products in packaging, printing, construction and other fields to achieve recycling of resources. At the same time, the government can introduce relevant policies to encourage enterprises to adopt regenerative products to promote the development of the circular economy.

In short, the persistent development of waste paper is an important way to achieve a win-win situation for economic and environment. By improving the recovery rate of waste paper, improving regenerative utilization technology, improving the industrial chain, and promoting the development of circular economy, we can establish a sound waste paper industry chain to promote the sustainable development of the waste paper industry. This is not only conducive to protecting the



ecological environment, alleviating resources, and promoting economic development, but also an important social responsibility that our young people should actively respond and participate.

### **4.3 Popular Trends and expert argumentation**

#### **4.3.1 Popular trend**

In today's society, the sustainable use of resources has become an important issue. Especially in the consumption of paper, a large amount of waste paper is discarded every year. This is not only a waste of resources, but also a destruction of the environment. At the same time, China's modern art design is accelerating, including the cultural and creative design that is popular with the public at the moment (Guo Xiaoyan, 2020-11: Art Education Research.) What is cultural and creative design, it is a design that is based on culture and is driven by creativity. It integrates it into the design through the in-depth excavation, refining and re-creation of culture to achieve cultural heritage and promotion, while creating works with unique charm and market value. Cultural and creative design is an innovative design concept. It combines culture, art and technology, and integrates cultural connotation and artistic value into products, environment or media through design methods. This design method not only has high aesthetic value, but also stimulates people's interest and respect for history and culture, and then promotes cultural heritage and development. Cultural and creative design is a cross-disciplinary design method that covers many fields such as art, history, sociology, and psychology. It not only focuses on the aesthetic value of design, but also pays attention to the cultural connotation and practicality of design, and aims to meet people's dual needs for cultural cognition and aesthetics. However, if we can convert waste paper into valuable cultural and creative products, it can not only reduce waste, but also add an artistic atmosphere to our lives.

Today, with the rapid development of science and technology, cultural and creative design plays an increasingly important role in our daily life. Illustration, as a form of expression of visual communication, has an important position in cultural creativity with its unique artistic charm (Lu Chunlian, 2023-11: Shanghai Packaging.) It includes hand-painted illustrations, flat wind illustrations, gradient illustrations, three-dimensional illustrations, texture illustrations, drawing edges, drawing edges. Seven main types of illustrations and MBE illustrations. The applications of illustrations in cultural and creative design include: book illustration, packaging design, brand image design, publicity poster, etc. From traditional hand-painted to digital art, illustration methods and expression methods, the combination of it with waste paper culture and creative design can bring unlimited possibilities.

#### **4.3.2 Expert demonstration**

The themes studied in this thesis are "Re-use of Waste Paper -Luoyang Zodiac Art Innovation Design". This article combed, analyzed and evaluated the relevant research results of domestic and foreign research through the literature review method, and provided the theoretical basis and background knowledge for expert demonstrations to demonstrate the argumentation of expert demonstrations and background knowledge Essence In order to better evaluate and judge whether this thesis has research significance and academic value, the author invited several experts

to evaluate this. They were Zhang Wenlong and Lu Dongdong. After the final evaluation and review of the experts, the following conclusions were obtained:

In contemporary society, the reuse of resources has become a consensus of environmental protection and sustainable development. Waste paper, as one of the most common wastes in life, also has the value of reuse. Especially in the field of art, waste paper reuse has become a design method of innovation and environmental protection. This article focuses on the theme of "Re-use of Waste Paper -Luoyang Twelve Zodiac Art Innovation Design" and thoroughly tap its research significance and academic value.

#### (1) Research significance

**Improvement of environmental awareness:** The use of waste paper to directly correspond to the improvement of environmental awareness. Globally, a large amount of paper is abandoned every year, which is not only a waste of resources, but also a destruction of the environment. Through the use of waste paper, people can deeply recognize the value of waste paper, thereby reducing waste and increasing environmental protection awareness.

**Promotion of innovative design:** waste paper is used as a design concept, which can promote art innovation. In the innovative design of the artistic innovation of the zodiac signs of Luoyang, waste paper has become the material of creation. Through the transformation of different types of waste paper, the combination of software design and other methods shows a unique artistic effect. This innovative design method not only enriches the expression of art, but also broaden the design ideas and vision.

**The inheritance of regional culture:** Luoyang, as a famous historical and cultural city in China, has a rich cultural heritage(Nie Manman, 2023-5: News enthusiasts.)Through the method of re-use of waste paper, the regional culture of Luoyang is integrated into it, such as the zodiac signs, peony, and Longmen Grottoes of the Luoyang, which can better inherit and promote these cultures. At the same time, this design method can also stimulate people's interest and identity in regional culture.

#### (2) Academic value

**Theoretical research of circular economy:** The reorganization of waste paper is a practical method of circular economy. The circular economy emphasizes the effective use of resources and the protection of the ecological environment, and the use of waste paper is the vivid embodiment of this theory. Through the research on waste paper, it can further enrich the theoretical system of the circular economy and promote the development of the circular economy.

**The development of art design:** As a cross-disciplinary field, art design needs to continuously absorb new elements and methods. The research of the theme of "Waste Paper Reuse -Luoyang Zodiac Art Innovation Design" can provide new ideas and methods for art design to promote the development of art design disciplines. At the same time, this theme can also promote the combination of art and technology and promote the modernization process of art design.

**Research perspective of regional culture:** Regional culture is an important branch of cultural research. The research on the theme of "Waste Paper Reuse - Luoyang Zodiac Art Innovation Design" can provide new perspectives and methods for the research of regional culture. By combining regional culture with waste paper,

we can deeply tap the connotation and value of regional culture and promote the inheritance and development of regional culture. At the same time, this theme can also promote the protection and promotion of cultural diversity.

In summary, experts are unanimously evaluated and argued that this thesis "Re-use of Waste Paper -Luoyang Twelve Zodiac Art Innovation Design" is more feasible and guided in practical applications. It not only helps to improve environmental awareness, promote the inheritance of innovative design and regional culture, but also enrich the theoretical system of circular economy, promote the development of art design disciplines, and provide perspective and methods to provide regional cultural research. Therefore, we should pay more attention to the research and practice of waste paper reuse, and strive to apply it to a wider range of areas, and make greater contributions to sustainable development and environmental protection. At the same time, "Re-use of Waste Paper -the Innovation Design of the Zodiac Art Arts of the Twelve Zodiacs of Luoyang" is also a very innovative topic and hotspot for the current field of cultural and creative design, but there are still many problems in the practice process.

The theoretical framework used in this thesis is more reasonable and perfect, and can support the entire research content. And evaluating the research method is more scientific and feasible, and there are greater hope to achieve research purposes and expected results. This evaluation data source is more reliable and the data processing method is proper, which can support the final research conclusion. The conclusions and suggestions of this evaluation have practical significance and operability, which can promote the development of cultural and creative design fields. In the future, the development trend of cultural and creative design will pay more attention to the practice of cross-disciplinary cooperation and innovation, digital technology, and the practice of sustainable development. Therefore, the future cultural and creative design papers should pay attention to the following aspects: discipline cross-integration, the use of digital technology, the practice of sustainable development concepts, international exchanges and cooperation, talent training and

#### **4.4 Application strategies in the innovative design of the twelve zodiac art of Luoyang**

The use of waste paper has played a key role in the innovative design of the Zodiac art of Luoyang. As a traditional craft, the patterns and meanings of the zodiac signs are widely recognized, but how to give it new vitality in modern society has become a major challenge in front of the designer. The author provides solutions to this problem through waste paper. Due to the many types of waste paper, the author mentioned the type of waste paper in the previous chapter of the previous papers, so the author designed two different types of waste paper in this design plan. The abandoned office white paper is designed with two different sets of cultural and creative products, and the voting of experts and different people finally determines a solution.

This design will adhere to the following principles: the principle of innovation, the principles of beauty, and the principle of practicality. Specifically, we will design it from the following aspects:

#### 4.4.1. Color matching

Using the color of the waste paper itself, combined with the characteristics of the pattern of the zodiac signs of Luoyang, the color matching and design make the work more artistic.

#### 4.4.2. Style creativity

According to the shape characteristics of waste paper, combined with the shape elements of the zodiac of the Luoyang, creative design makes the work more distinctive.

#### 4.4.3 Material selection

Choose different recycled paper materials to ensure that the work meets the aesthetics, but also meets environmental protection requirements.

In the first step, the author first selected two different types of waste paper, namely abandoned courier cartons and discarded office white paper as shown in Figure 4.5 and 4.6. It is planned to design two different background works with software.



Figure 32 Abandoned courier carton

Source : <http://www.etongfeng.com/item.php?id=575519964620>











Figure 35 Recycled paper of abandoned office white paper

**Source :** [https://www.sohu.com/a/227557616\\_308511](https://www.sohu.com/a/227557616_308511)

The third step is to extract the pattern elements of the zodiac signs of Luoyang. The design inspiration comes from the zodiac pottery figurines of the Zodiacs of the Luoyang Museum, as shown in Figure 4.9.



Figure 36 Luoyang zodiac images

**Source:** <https://image.baidu.com/search/detail?ct=503316480&z=0&ipn>

The fourth step is to design two sets of twelve zodiac patterns in different styles according to the images of the twelve zodiac animals in Luoyang, select one set of plans, and finally design a set of twelve zodiac cultural creative products.

#### 4.5 Conclusion

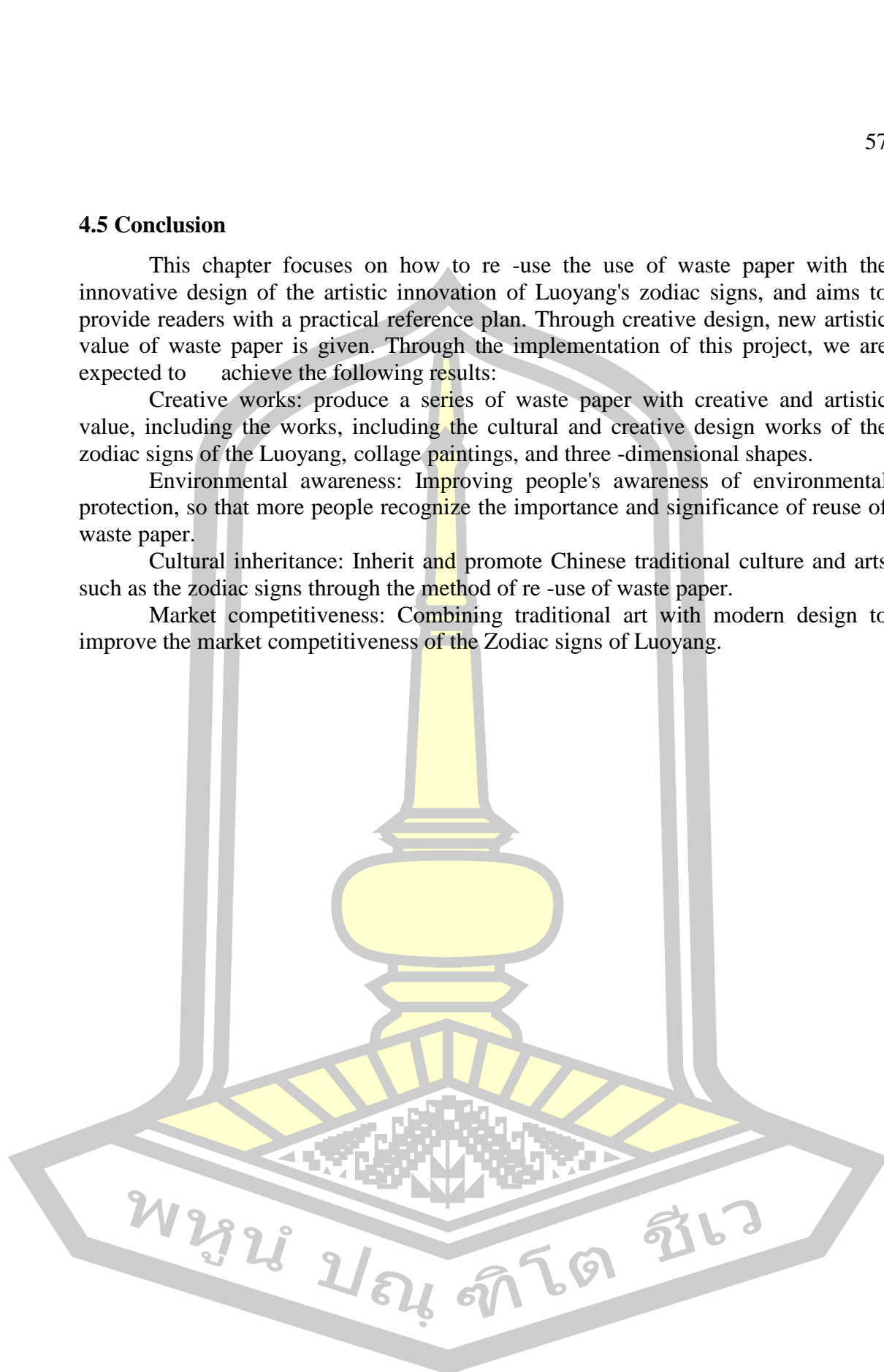
This chapter focuses on how to re-use the use of waste paper with the innovative design of the artistic innovation of Luoyang's zodiac signs, and aims to provide readers with a practical reference plan. Through creative design, new artistic value of waste paper is given. Through the implementation of this project, we are expected to achieve the following results:

**Creative works:** produce a series of waste paper with creative and artistic value, including the works, including the cultural and creative design works of the zodiac signs of the Luoyang, collage paintings, and three-dimensional shapes.

**Environmental awareness:** Improving people's awareness of environmental protection, so that more people recognize the importance and significance of reuse of waste paper.

**Cultural inheritance:** Inherit and promote Chinese traditional culture and arts such as the zodiac signs through the method of re-use of waste paper.

**Market competitiveness:** Combining traditional art with modern design to improve the market competitiveness of the Zodiac signs of Luoyang.



## Chapter V

### Use of waste paper again -Luoyang Zodiac Art Innovation Design

#### Practice Plan

#### 5.1 Design method in the innovative design of the zodiac art innovation in

##### Luoyang zodiac signs

The twelve zodiac signs, as part of traditional Chinese culture, carry profound cultural connotations. However, there are similar zodiac systems in Southeast Asia and around the world. For example, the twelve gods of India and the twelve main gods of Greece all reflect human beings' awe and worship of astronomy, calendars, and animals. These zodiac animals not only represent the cycle of time and the order of the universe, but also reflect the observation and understanding of the natural world by people of all countries. Comparing the zodiac cultures of various countries can provide a glimpse into the diversity and commonality of human civilization, which is of great significance for promoting cultural exchanges and understanding.

##### 5.1.1 Determine themes

Design plan 1:

The first step is to use the recycled paper effect of discarded office white paper to design, and use the twelve zodiac images of Luoyang combined with the twelve zodiac signs of China and the twelve zodiac signs of different countries in the world to draw an anthropomorphic illustration style image line draft, because Luoyang is China's ancient capital for thousands of years, so Luoyang is a city of aristocrats, so the new zodiac animals are designed to be aristocratic. Mainly combining animal faces and human bodies, each zodiac animal wears a Tang Dynasty robe. The following design drawings are arranged in the order of the twelve Chinese zodiac animals.



Figure 37 Luoyang twelve zodiac signs and three colors of Tang Dynasty

Source: <https://image.baidu.com/search/detail?ct=503316480&z=0&ipn>



Figure 38 Chinese zodiac images

**Source :** <https://www.bmfsm.com/shengxiao/kaiyun/192039.html>

In the second step, different colors are filled with different colors of the drawing. The background adds the Chinese calligraphy font and the red seal pattern to complete the design of the first set of zodiac images.



Figure 39 Zodiac signs -the image design of the mouse

**Source:** The picture comes from the author design

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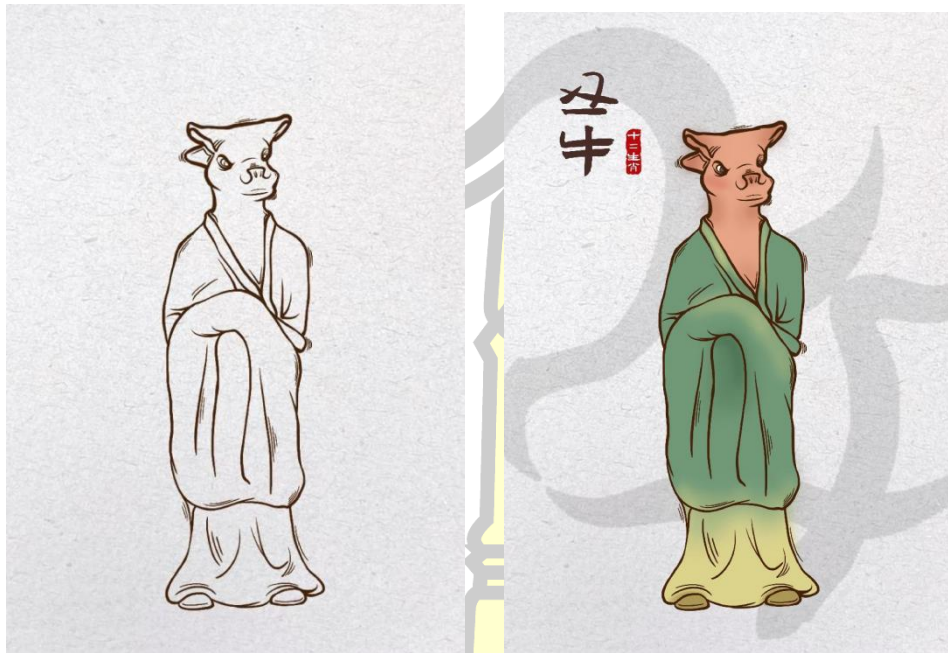


Figure 40 Zodiac -the image design of the cow  
**Source:** The picture comes from the author design



Figure 41 Zodiac signs -the image design of the tiger  
**Source:** The picture comes from the author design





Figure 42 Zodiac signs -the image design of rabbits  
**Source:** The picture comes from the author design



Figure 43 Zodiac -Dragon's Image Design  
**Source:** The picture comes from the author design

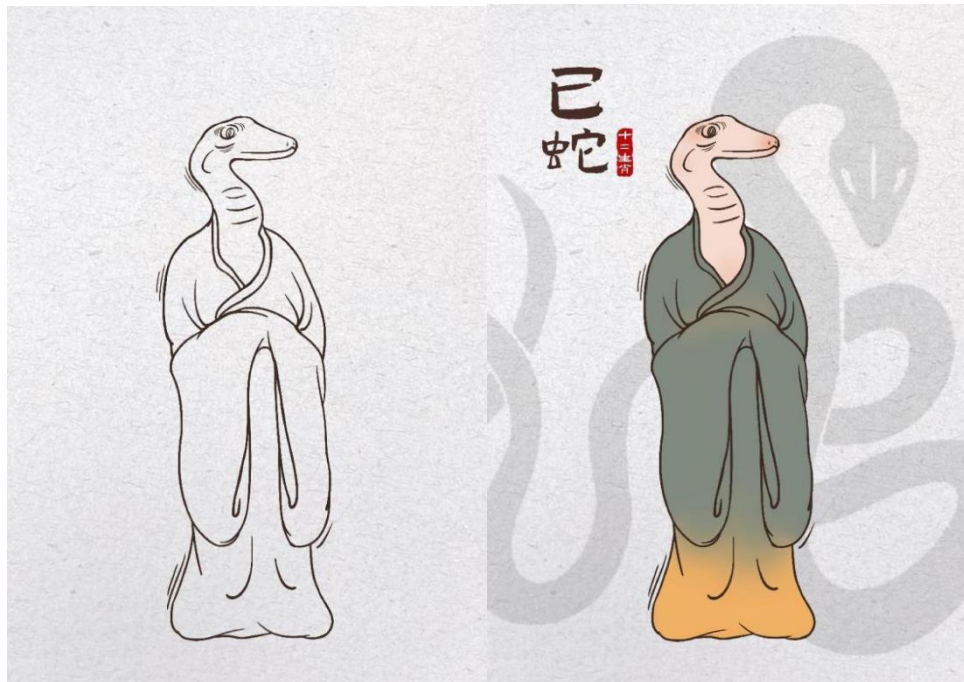


Figure 44 Zodiac Snake -Snake's Image Design  
**Source:** The picture comes from the author design



Figure 45 Zodiac Smart -The image design of the horse  
**Source:** The picture comes from the author design





Figure 46 Zodiac Smart -the image design of sheep  
**Source:** The picture comes from the author design



Figure 47 Zodiac signs -the image design of monkeys  
**Source:** The picture comes from the author design



Figure 48 Zodiac Small -the image design of chickens

**Source:** The picture comes from the author design



Figure 49 Zodiac -Dog's image design

**Source:** The picture comes from the author design





Figure 50 Zodiac -Pig's image design

**Source:** The picture comes from the author design

#### Design Plan 2:

The first step will be designed to design the regenerative paper effect of the abandoned express carton. According to the image of the zodiac figurines of the Zodiac pottery of the Luoyang Museum, the illustration image of the comic style is based on a circular shape to create a lively and lovely The image of the twelve zodiac.

The second step is to simply fill in the drawing line drafts. The background is added to the Chinese calligraphy font and the red seal pattern to complete the design of the second set of zodiac images.

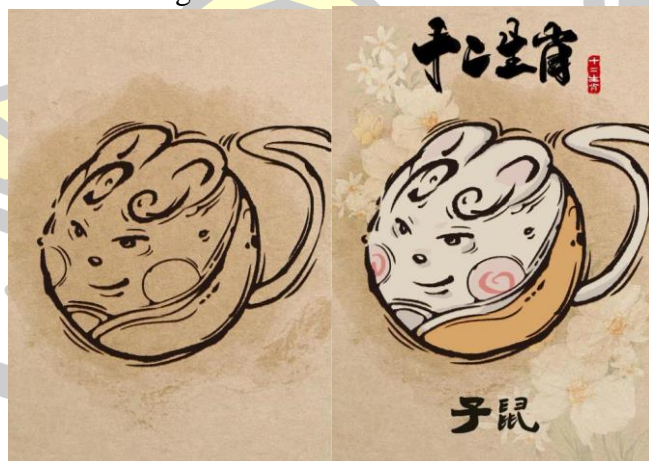


Figure 51 Zodiac signs -the image design of the mouse

**Source:** The picture comes from the author design





Figure 52 Zodiac -the image design of the cow  
**Source:** The picture comes from the author design



Figure 53 Zodiac signs -the image design of the tiger  
**Source:** The picture comes from the author design

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Figure 54 Zodiac signs -the image design of rabbits

**Source:** The picture comes from the author design



Figure 55 Zodiac -Dragon's Image Design

**Source:** The picture comes from the author design





Figure 56 Zodiac Snake -Snake's Image Design  
**Source:** The picture comes from the author design



Figure 57 Zodiac Smart -The image design of the horse  
**Source:** The picture comes from the author design

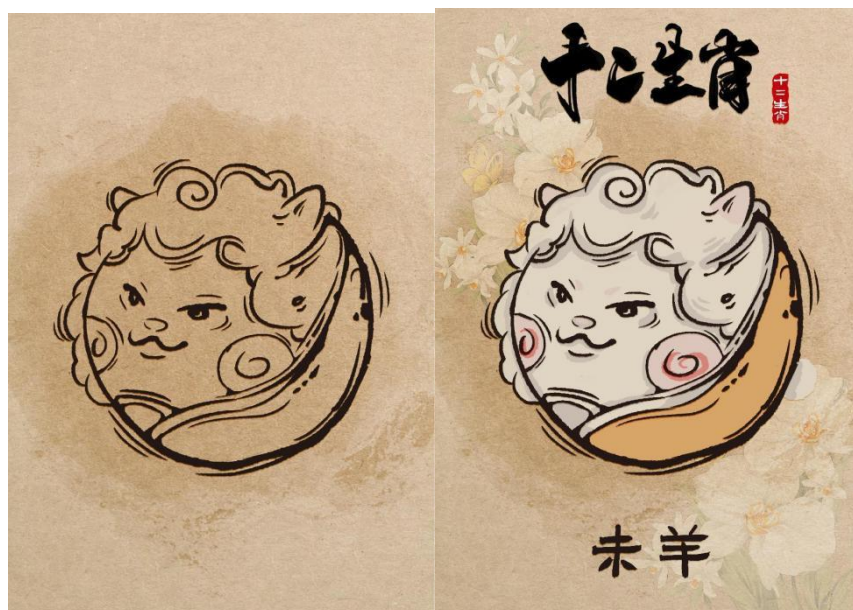


Figure 58 Zodiac Smart -the image design of sheep

Source: The picture comes from the author design

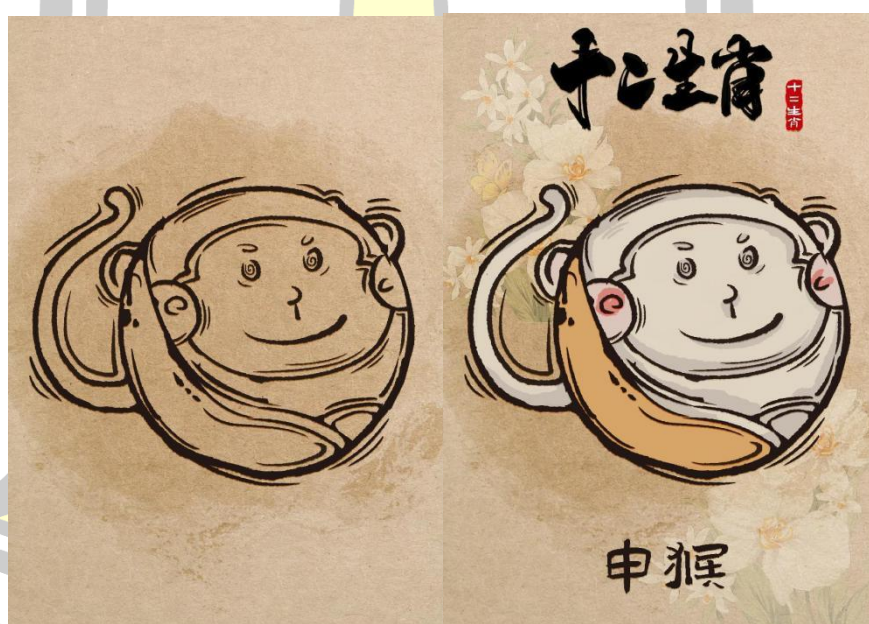


Figure 59 Zodiac signs -the image design of monkeys

Source: The picture comes from the author design





Figure 60 Zodiac Small -the image design of chickens

**Source:** The picture comes from the author design

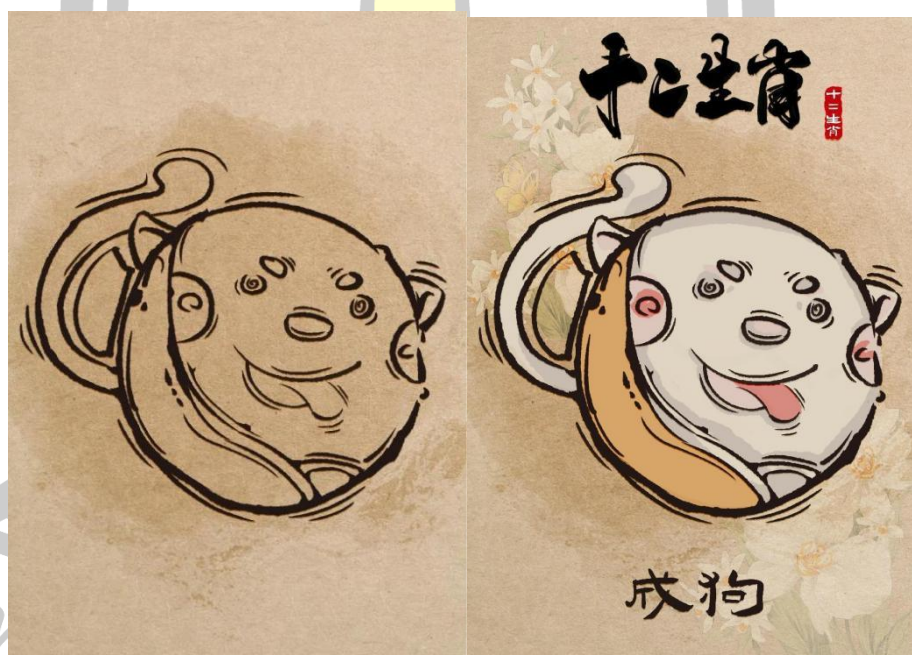


Figure 61 Zodiac -Dog's image design

**Source:** The picture comes from the author design





Figure 62 Zodiac -Pig's image design

**Source:** The picture comes from the author design

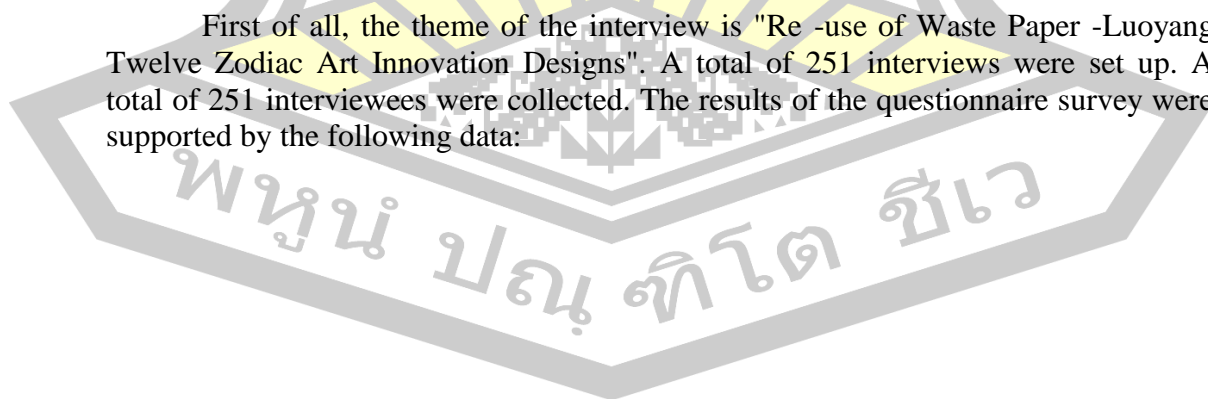
## 5.2 Analysis and positioning

### 5.2.1 Public positioning

In modern society, environmental protection has become the focus of global attention. The use of waste is used as an important environmental protection method (Mao Yunshi, 2019-12: Academic Research.) which has become more and more common in our daily life. Especially in the field of art, many artists have transformed abandoned materials into unique art works to call on people to pay more attention to environmental protection issues. Among them, the innovative design of the zodiac art of Luoyang is a very typical example.

However, we still have many issues that need to understand and research in depth. In order to better understand this theme, I carried out a investigation and research on "Re -use of Waste Paper -Luoyang Zodiac Art Innovation Design". In the process, I designed a series of questions in order to obtain in -depth insights about this theme from the interviewees.

First of all, the theme of the interview is "Re -use of Waste Paper -Luoyang Twelve Zodiac Art Innovation Designs". A total of 251 interviews were set up. A total of 251 interviewees were collected. The results of the questionnaire survey were supported by the following data:



(1) Among them 151 men and 100 women

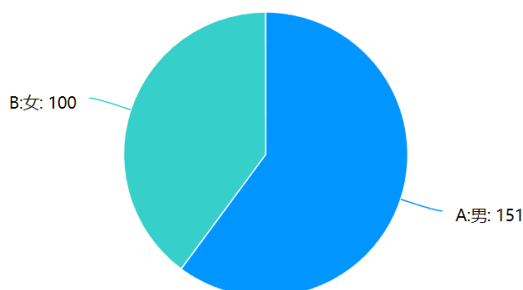


Figure 63 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(2) There are 7 people under the age of 20, 169 people aged 21-40, 40 people aged 41-60, and 35 people over 60 years old.

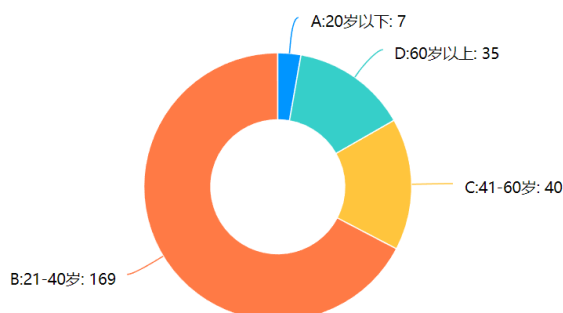


Figure 64 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(3) There are 25 academic qualifications distributed in junior high school and below, 55 in technical secondary school and high school, 137 colleges and undergraduates, and 34 masters and above.

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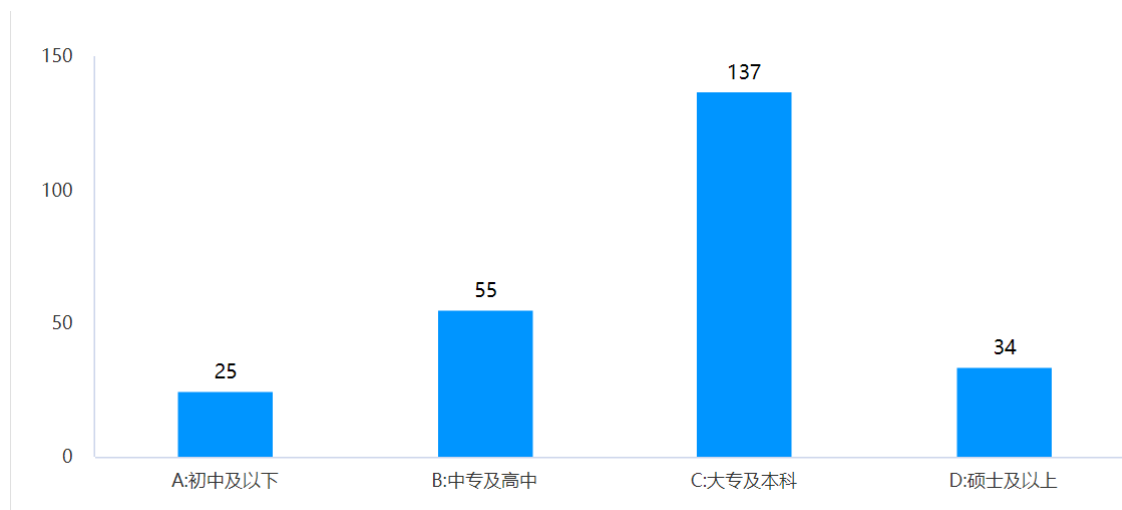


Figure 65 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(4) Occupational distribution: 105 enterprise employees, 28 public institutions, 44 individual industrial and commercial households, 30 scientific research/educators, 43 students, and 1 other occupations.

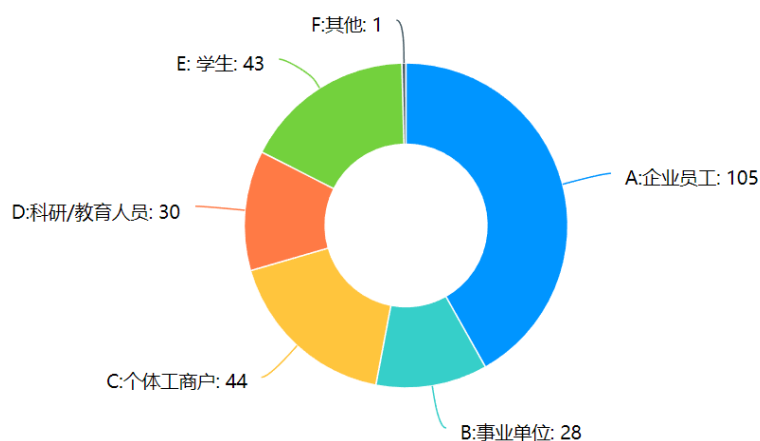


Figure 66 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(5) 43 people with a monthly income of less than 2,000 yuan, 115 people from 2000-4000 yuan, 43 people of 4,000-6000, and 50 people of 6,000 yuan. The respondents' income status is relatively good.

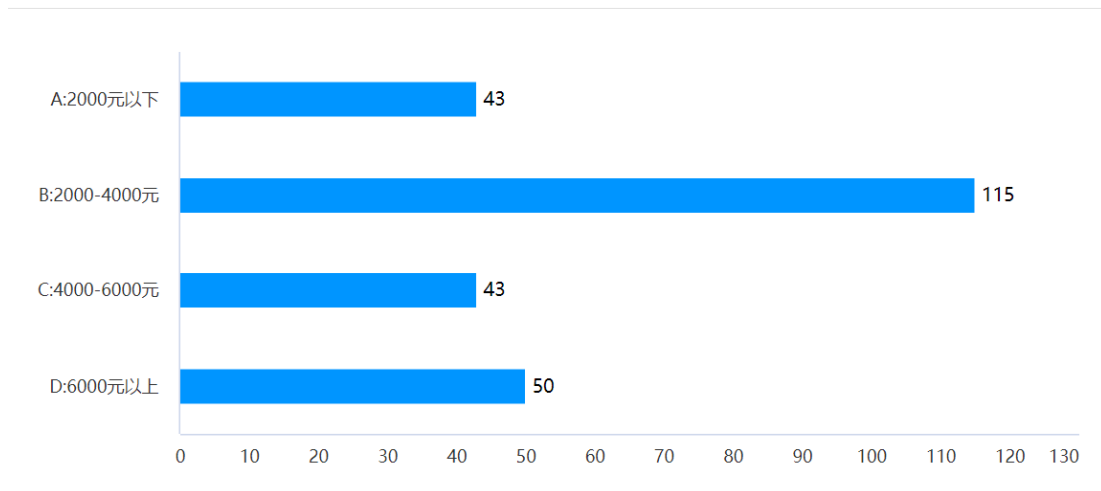


Figure 67 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

### 5.2.2 Analysis of art demand analysis

Secondly, the author set up some issues of this research theme to interview. The purpose of these issues is to comprehensively understand the interviewees from the perspective of the recurrence of waste paper and the innovative design of the art innovative design of the zodiac signs of the Luoyang, as well as their in-depth thinking about this theme. Through the discussion of these issues, we can better understand this theme and provide valuable reference for future research and application.

(1) The interviewed 251 crowd samples have 163 people who have learned about waste paper and have learned about 88 people who have learned about them. There are 88 people who have not understood it. Most people have paid attention to the topic in this regard.

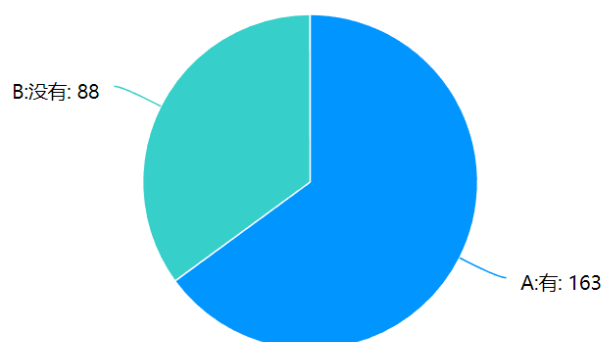


Figure 68 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(2) There are 94 people who have participated in any form of scrap paper



in the interviewed samples of 251 crowds. There are 157 people who have not participated in.

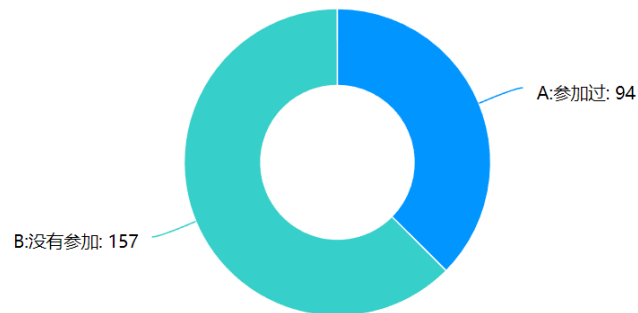


Figure 69 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(3) The interviewed 251 crowd samples have more knowledge of 39 people who know more about the artistic innovation design of the zodiac signs, 46 people who know less, and 166 people who do not know at all. The innovative design of the zodiac art does not understand.

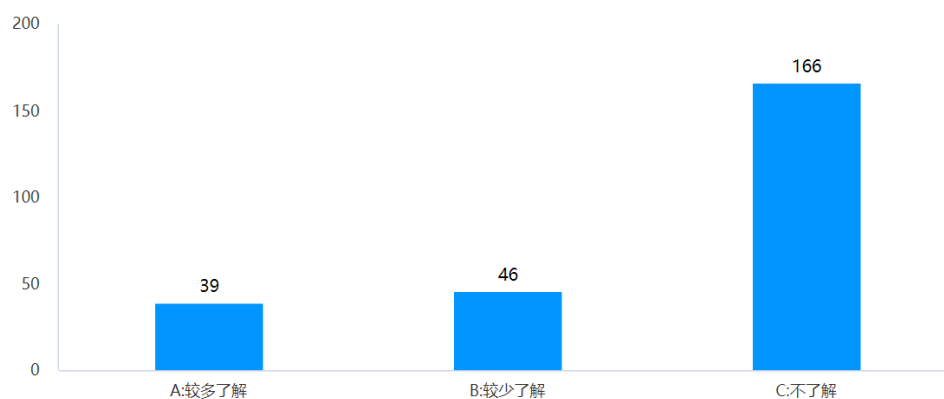


Figure 70 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(4) The interviewed 251 crowd samples believe that the waste paper is reused – 168 people with market prospects in the arts innovation of the zodiac signs of Luoyang, and 38 people believe that there are no market prospects. 45 people who do not know about this study. It can be seen that everyone has good expectations for this research market.

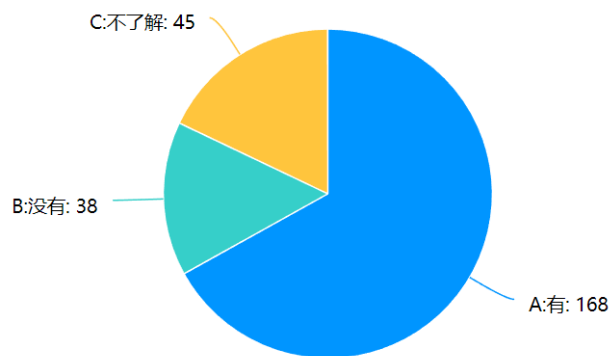


Figure 71 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(5) The interviewed 251 crowd samples believe that 170 people who use waste paper to reuse in the future artistic creation are good. 81 people are considered to see that most people believe and optimize this study. Essence

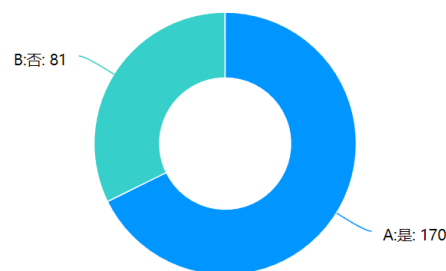


Figure 72 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(6) Among the 251 crowd samples interviewed, different people will choose to buy different types of cultural and creative products during their travels: 17 people who choose stationery, 32 people in office categories, 33 people in electronic categories, and home furnishings. 14 people, 146 people in life, and 9 other types. Most people tend to buy cultural and creative products of life.

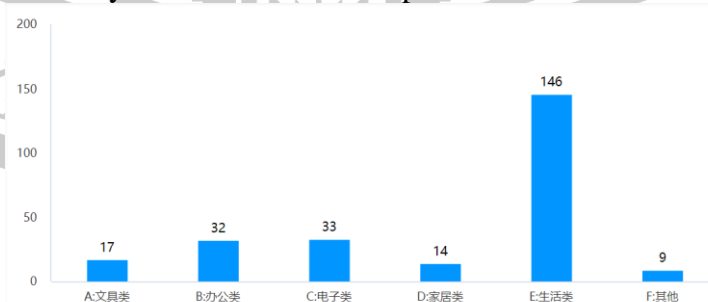


Figure 73 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(7) Among the 251 crowd samples interviewed, there are 180 people who purchase waste paper and then use the designed Luoyang Zodiac cultural and creative products, and 71 people who buy them. Data proves that most people are willing to buy such products.

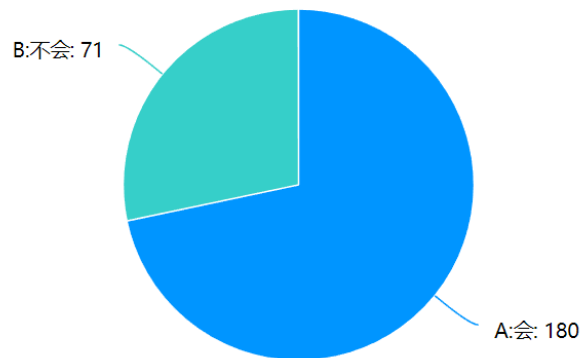


Figure 74 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(8) Among the 251 crowd samples interviewed, they will choose to buy cultural and creative products at different prices, choose 19 people from 10-50 yuan, 179 people of 50-200 yuan, 30 people of 200-500 yuan, more than 500 yuan or more 23 people. It can be seen that everyone is willing to spend money to buy such products.

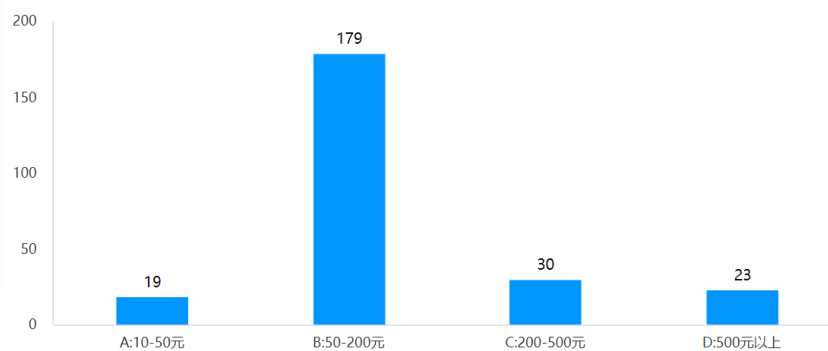


Figure 75 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(9) During the interview, the crowd believed that the waste paper was reused - the following problems in Luoyang's zodiac art innovative design cultural and creative products: 150 people who believe that they are not practical, and 36 people who believe that there are no creativity. There are 17 people, other factors. To sum up, most people think that such products are not practical, so they should pay attention to practicality when designing products.

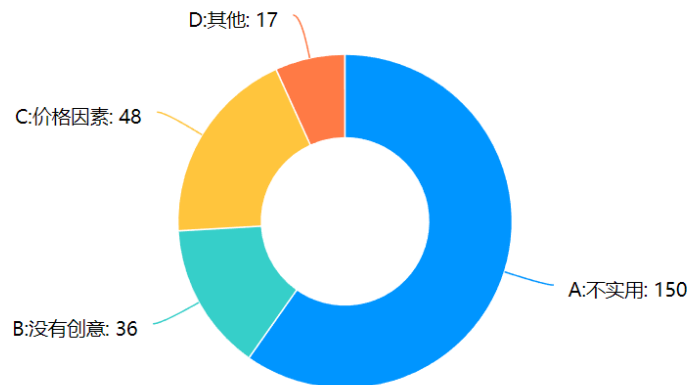


Figure 76 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

(10) Among the 251 crowd samples interviewed, we like to use waste paper and reuse it -the first set of the first set of artistic innovation design of Luoyang Zodiac Art Arts, and 87 people in the second set. Summary of the first set of design. More people.

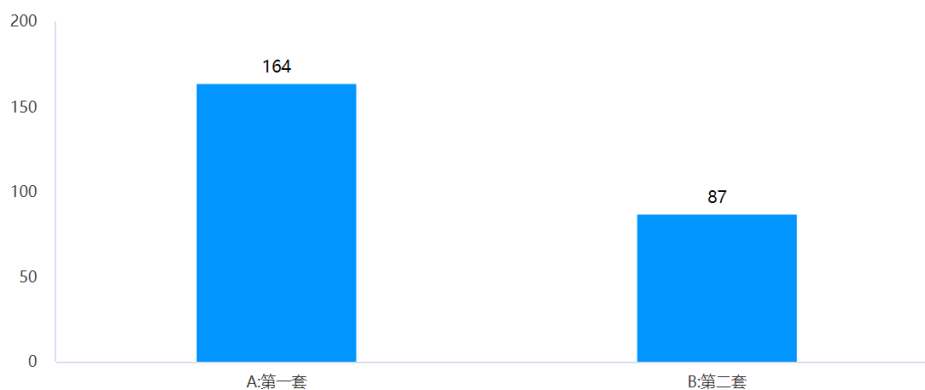


Figure 77 Data diagram of questionnaire results

**Source:** The picture comes from the author's self-made

In addition, the author Zhang Wenlong and Lu Dongdong invited by the author to evaluate the first design plan after evaluating this.

### 5.2.3 Plan positioning

According to the interviews, investigations and observations of experts and crowds, and collected 251 questionnaires, obtained more people who support the first design solution than those who support the second set of solutions. Design with regenerative paper with abandoned office white paper. Let's take a look at the method of making recycled paper before designing:

The first step is to collect and prepare waste paper: First of all, you need to collect various types of waste paper, such as newspapers, magazines, cartons, etc. Then classify, clean, and treat waste paper to ensure the appropriate quality of waste paper, and at the same time remove harmful substances such as ink and glue.

The second step, cutting and slurry: cut or tear the collected waste paper, and then add a certain percentage of water for soaking and stirring to make the waste paper become pulp.



The third step, screening and drying: Remove the impurities in the pulp through the screen or other filtering methods, and spread the pulp evenly on the tablet for drying to turn it into available paper.

The author's final plan uses the first set of zodiac images to design a set of cultural and creative products, and uses the recycled paper with abandoned office white paper for design. This set of cultural and creative products includes: keychain, disposable paper cup, refrigerator sticker, fan, mobile phone case, puzzle, packaging paper box, handbag bags, etc.



Figure 78 Twelve zodiac image design solutions  
Source: The picture comes from the author design

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### 5.3 Cultural and creative product production process

#### 5.3.1 Propose a design theme

For this research topic, I plan to use waste paper, dust, white latex and other comprehensive materials combined with the Luoyang zodiac images in the design plan 1 to design a set of four handbag cultural and creative products. First, use waste paper and comprehensive materials to make handbags. The shape of the bag is then planned to be printed with the twelve zodiac signs using screen printing. Before production, a design draft needs to be drawn for reference in post-production.

#### 5.3.2 Cultural creative handbag design sketch



Figure 79 Tote bag design sketch 1

**Source:** The picture comes from the author design



Figure 80 Tote bag design sketch 2

**Source:** The picture comes from the author design

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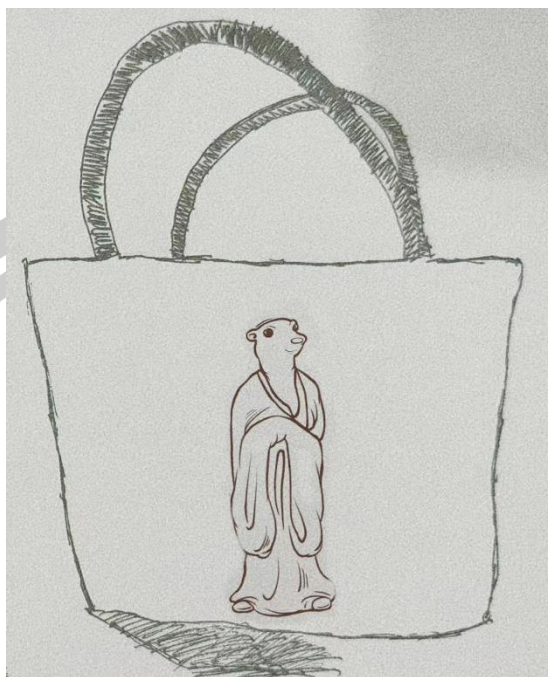


Figure 81 Tote bag design sketch 3

**Source:** The picture comes from the author design

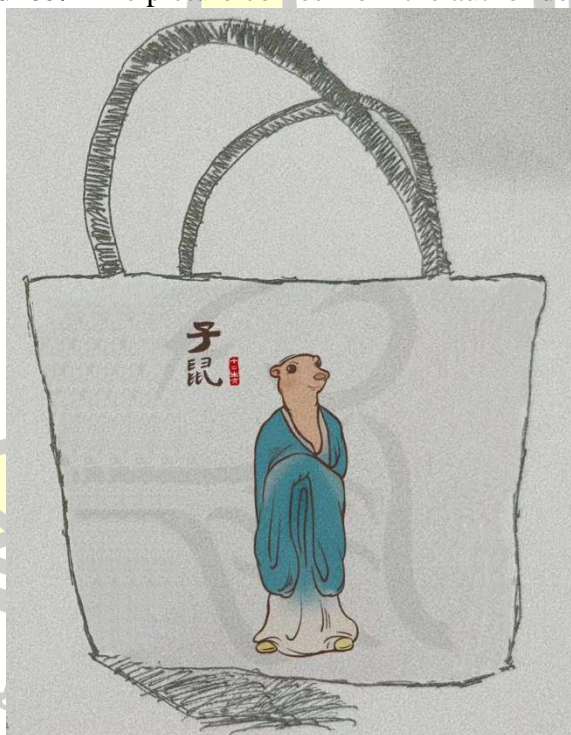


Figure 82 Tote bag design sketch 4

**Source:** The picture comes from the author design

### 5.3.3 Material preparation process

First, prepare the materials needed to make the work, which mainly include office printing waste paper, plastic baskets, water basins and shovels, blenders, white latex, plastic wrap, scissors, rope, express cardboard, ashes, wooden boards, rulers, and gauze. As shown in Figure 5.47-5.58 below.

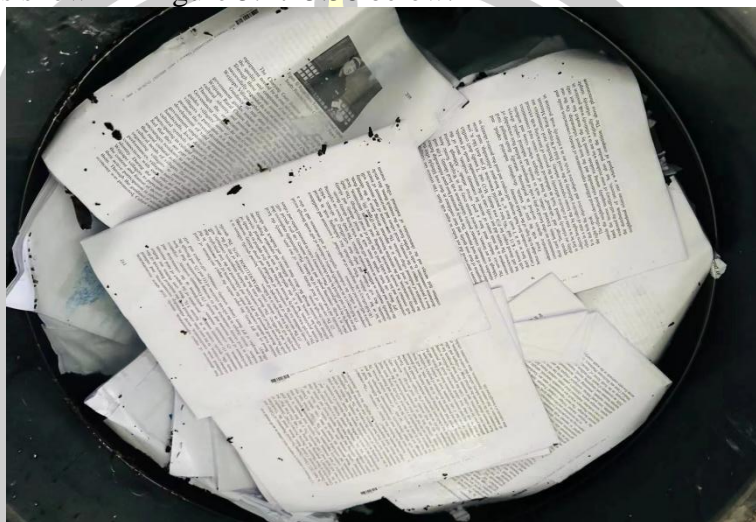


Figure 83 Office printing waste paper

**Source:** The picture comes from the author's shooting  
Office printing waste paper was used as the main material for this production.



Figure 84 Plastic basket

**Source:** The picture comes from the author's shooting



The plastic basket is used for later shaping of the tote bag.



Figure 85 Basin and shovel

**Source:** The picture comes from the author's shooting

Plastic water basins are used to place waste paper and ashes and other materials for crafting.



Figure 86 Mixer

**Source:** The picture comes from the author's shooting

Blenders are a relatively common piece of equipment in our lives. The mixer can mix various materials, and can also increase the speed of work. In this production, it is used to mix materials such as waste paper and ashes.



Figure 87 White latex

**Source:** The picture comes from the author's shooting

White latex is a commonly used adhesive in handmade design and production. In the production of this work, white latex is used to mix with waste paper and ashes, and can bond fragile places.



Figure 88 Repair film and scissors

**Source:** The picture comes from the author's shooting

Cling film is a plastic packaging product, usually made by polymerization using ethylene as the masterbatch. Cling film can be divided into three categories: the first is polyethylene, referred to as PE; the second is polyvinyl chloride, referred to as PVC ;The third type is polyvinylidene chloride, referred to as PVDC. Microwave food heating, refrigerator food preservation, fresh and cooked food packaging and other occasions, this design is used to help the plasticity of the handbag in the later stage. Scissors are used to cut waste paper and clay tablets.



Figure 89 Rope and courier cardboard

**Source:** The picture comes from the author's shooting

The rope is used to wrap around the waste express cardboard, which needs to be cut into thin strips.



Figure 90 Ash

**Source:** The picture comes from the author's shooting

Two different colors of ash are the main materials used to make this work, one is dark gray and the other is off-white, which will be mixed with waste paper scraps.

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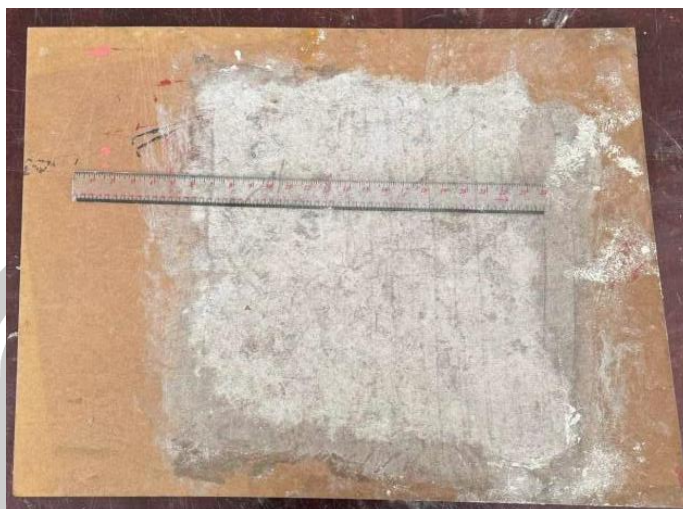


Figure 91 wooden board and ruler

**Source:** The picture comes from the author's shooting

The wooden board is approximately one meter long and wide, and is used to lay out the mixed waste paper mud. The ruler is used to measure the size of the mud board later.



Figure 92 gauze

**Source:** The picture comes from the author's shooting

Gauze is used to make the work more stable and to help set the shape.

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Figure 93 Filter

**Source:** The picture comes from the author's shooting

The mesh of the filter is relatively small, which is very suitable for filtering out the fine ash soil when making this work.

#### 5.3.4 Start production

Material testing process:

The first step is to collect office printing waste paper, wet it with water and tear it into pieces to get enough scraps for use.



Figure 94 Office printing waste paper **Figure 5.60** shredded printing paper

**Source:** The picture comes from the author's shooting

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Figure 95 scraps of paper **Figure 5.62** Shredded paper in a bag

**Source:** The picture comes from the author's shooting

In the second step, filter the two ash powders through filters to remove fine soil.



Figure 96 Sifting ashes **Figure 97** Sifting ashes

**Source:** The picture comes from the author's shooting

The third step is to prepare two kinds of ashes of different colors that have been filtered through the filter, and then prepare a water basin. First put the ashes, soil and shredded paper into it, then add the white latex, and finally stir it with a mixer.

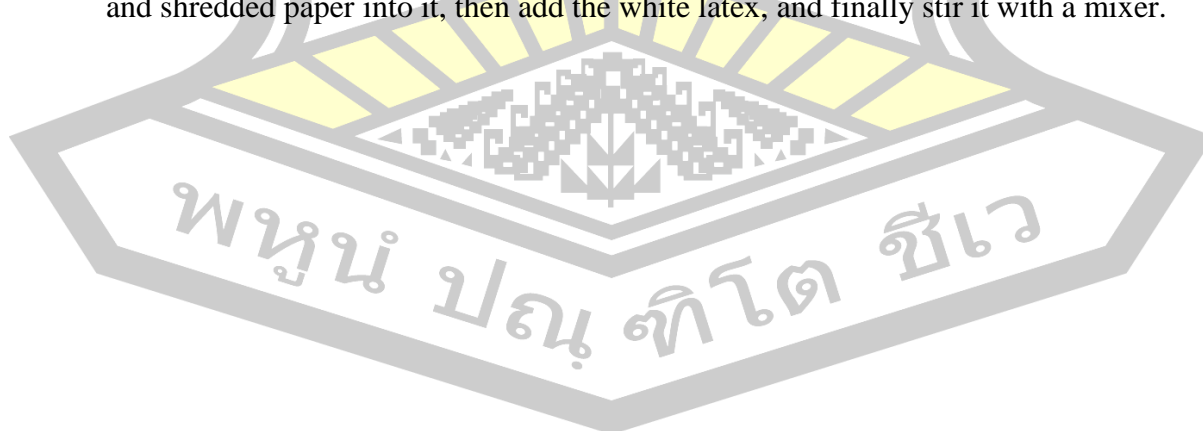






Figure 98 Ash soil mixed with shredded paper  
**Source:** The picture comes from the author's shooting



Figure 99 Pour in white latex  
**Source:** The picture comes from the author's shooting



Figure 100 mixer mix

**Source:** The picture comes from the author's shooting



Figure 101 Stir evenly

**Source:** The picture comes from the author's shooting

In the fourth step, when adding ash soil and shredded paper scraps to the white latex and stirring, we can find that different proportions of the mixture will lead to different material properties, such as the degree of adhesion, roughness and smoothness, and resolution, as shown in the table. 5.1, 5.2.



Table 3 Experiment to find the ratio of paper and glue



Experiment to find ratio of paper and Glue									
Low composit	Ratio (100%)								
Paper	10	20	30	40	50	60	70	80	90
PVA (Glue)	90	80	70	60	50	40	30	20	10
Photo comparison									
The shape of the material	Test materials are unified production into small cuboids more convenient to test.								
Roughness and smoothness of the material	Very smooth	More smooth	More smooth	More smooth	moderate	Some rough	rough	rough	Very rough
Analytical separation degree	Very low	Low	Low	Low	moderate	Higher	tall	tall	very high

Table 4 Experiment to find the ratio of paper to ash

Experiment to find ratio of paper and Ash									
Low composit	Ratio ( 100% )								
Paper	10	20	30	40	50	60	70	80	90
Ash	90	80	70	60	50	40	30	20	10
Photo comparison									
The shape of the material	Test materials are unified production into small cuboids more convenient to test.								
Roughness and smoothness of the material	Very smooth	More smooth	More smooth	More smooth	Some rough	Some rough	moderate	moderate	Very rough
Analytical separation degree	Very low	Low	Low	Low	Higher	Higher	moderate	moderate	very high

Test Results:

This test was conducted based on different proportions of waste paper, ash and white latex, and the differences in adhesion, roughness and smoothness and resolution were analyzed, and two most suitable material proportions were finally determined. The first Seed is 70% waste paper, 30% ash or 80% waste paper, Ashes 20%. These two proportions will be used in the production of subsequent works.

Product forming process:

The first step is to prepare the wooden board, gauze, and plastic wrap. Spread the gauze flat on the wooden board, then spread the waste paper mud mixed with soil on the gauze, stick the plastic wrap on it, smooth it out, and then uncover it.



Figure 102 board

**Source:** The picture comes from the author's shooting



Figure 103 Mix the waste paper mud with soil and spread it on the gauze

**Source:** The picture comes from the author's shooting

In the second step, spread the waste paper mud on the gauze and wait for it to air dry. Wait until the appropriate dryness and humidity level to start cutting and air drying.



Figure 104 Spread the waste paper mud on gauze and wait to dry

**Source:** The picture comes from the author's shooting



Figure 105 Set shape with basket

**Source:** The picture comes from the author's shooting



Figure 106 Crop

**Source:** The picture comes from the author's shooting





Figure 107 Put the prepared basket into it and let it dry and set

**Source:** The picture comes from the author's shooting

This set of photos shows the shaping process of the work. Gauze was added during the production process to make the container stronger.

The third step is to arrange and trim after drying and shaping, and then use thin ropes to wrap the waste express cardboard to make multiple ropes to install on the final cultural and creative handbag work. This time I made a total of five finished products. A mistake in the production process resulted in no preservation. A total of four cultural and creative handbag works are now on display.



Figure 108 Completed four prototypes

**Source:** The picture comes from the author's shooting

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Figure 109 Trim and install portable ropes

**Source:** The picture comes from the author's shooting

#### 5.3.5 Complete the work

Finally, after the handbag is trimmed and sorted, the previously selected first set of zodiac designs are printed on the handbag using screen printing to complete the final cultural and creative handbag work.

Screen printing refers to using a silk screen as a plate base and using a photosensitive plate making method to create a screen printing plate with graphics and text. Screen printing consists of five major elements, screen printing plate, scraper, ink, printing table and substrate. Printing is carried out using the basic principle that the mesh of the graphic part of the screen printing plate can pass through the ink, but the mesh of the non-graphic part cannot pass the ink. When printing, pour ink into one end of the screen printing plate, use a scraper to apply a certain amount of pressure on the ink part of the screen printing plate, and at the same time move towards the other end of the screen printing plate at a constant speed. The ink is removed from the image and text by the scraper during the movement. Part of the mesh is extruded onto the substrate.

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Figure 110 Trimmed and beautified tote bag

**Source:** Pictures taken by the author





Figure 111 Trimmed and beautified tote bag

**Source:** Pictures taken by the author



Figure 112 rat image tote bag

**Source:** Pictures are from the author's design





Figure 113 Cow image tote bag

**Source:** Pictures are from the author's design



Figure 114 Tiger image tote bag

**Source:** Pictures are from the author's design

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Figure 115 Rabbit image tote bag  
**Source:** Pictures are from the author's design



Figure 116 Dragon image tote bag  
**Source:** Pictures are from the author's design



Figure 117 Snake image tote bag  
**Source:** Pictures are from the author's design



Figure 118 Horse image tote bag  
**Source:** Pictures are from the author's design

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Figure 119 Sheep image tote bag

**Source:** Pictures are from the author's design



Figure 120 Monkey image tote bag

**Source:** Pictures are from the author's design

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Figure 121 Chicken image tote bag

**Source:** Pictures are from the author's design



Figure 122 Dog image tote bag

**Source:** Pictures are from the author's design

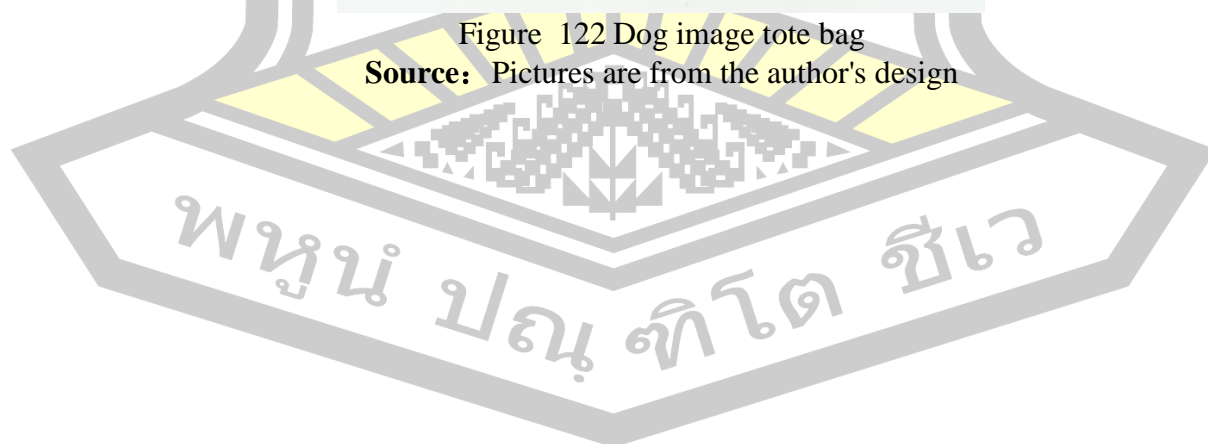




Figure 123 Pig image tote bag

**Source:** Pictures are from the author's design



Figure 124 Combination design tote bag

**Source:** Pictures are from the author's design



Figure 125 Combination design tote bag

**Source:** Pictures are from the author's design



Figure 126 Combination design tote bag  
**Source:** Pictures are from the author's design

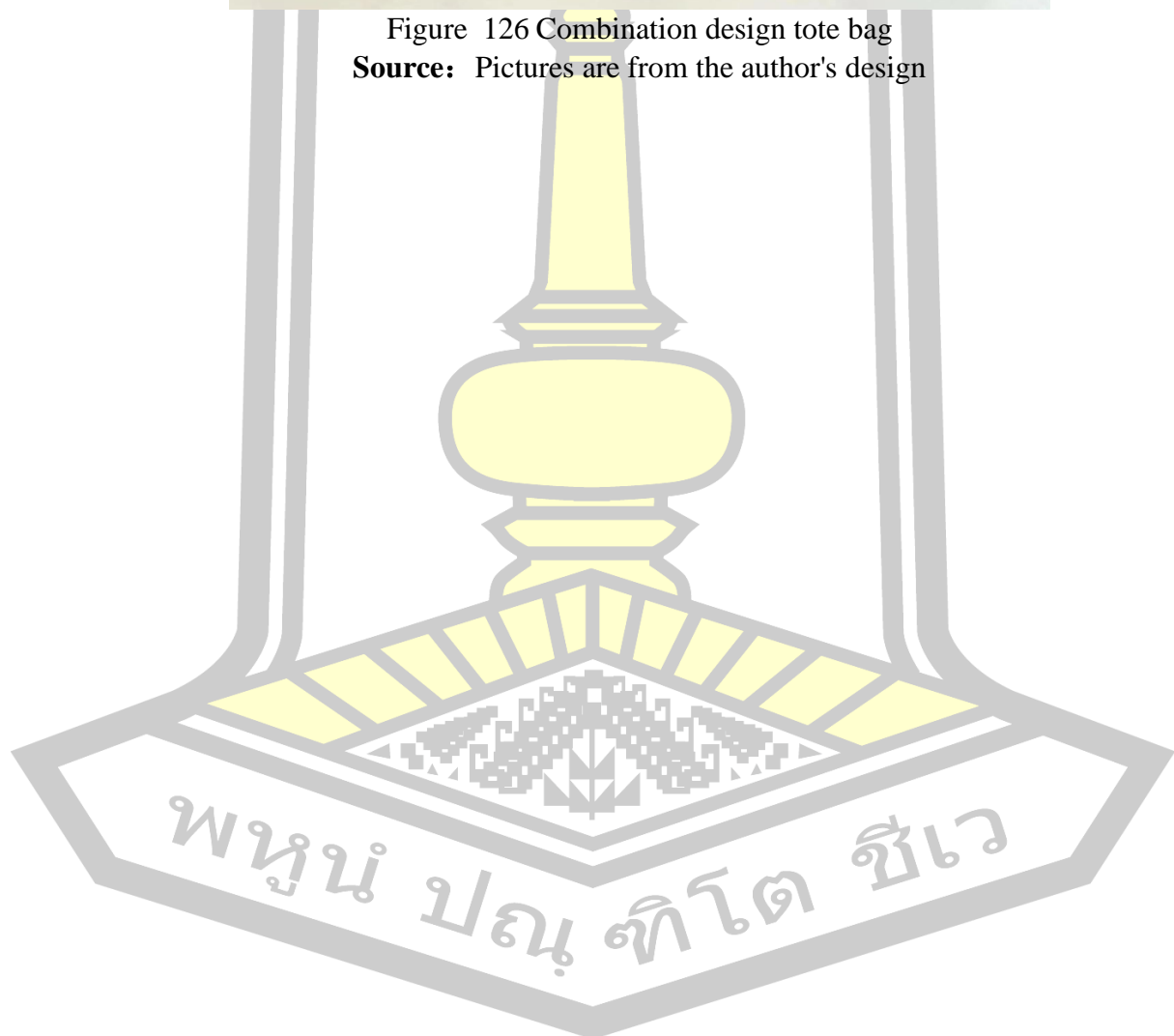




Figure 127 Other cultural and creative products

**Source:** Pictures are from the author's design

This picture shows other cultural and creative design products of the Chinese Zodiac. It can be seen that there are more possibilities for the reuse of waste paper - the art design of the Chinese Zodiac in Luoyang.



### 5.3 Conclusion

In today's society, the sustainable utilization of resources has become the focus of common attention in the world. As a common waste, waste paper is not only reflected in the environmental protection level, but also can be rejuvenated in the field of creative design. This article aims to explore the practical solution of "re -use of waste paper -Luoyang Twelve Zodiac Art Innovation Design". Through practical operations and reflection, summarizes the effectiveness and shortcomings of this practical solution, and provides a reference for the implementation of related projects in the future.

It can be seen that most people have paid attention to the related topics of waste paper and then using art innovation design. Most people have not participated in the waste paper and then used related activities. Most people do not understand the artistic innovation design of the zodiac signs, but everyone There are good expectations for this research market, and most people believe and optimistic about this research. Everyone will be more inclined to buy cultural and creative products of life. The data proves that most people are willing to buy such products. It can be seen that it can be seen that Everyone is willing to spend money to buy such products, and some people think that such products are not practical, so they should pay attention to practicality when designing products.

Through this design, the successful transformation of waste paper into artistic zodiac works not only realized the reuse of resources, but also inherited the traditional culture of Luoyang. In addition, the public has raised the understanding of waste paper re -use and traditional culture.

In practice, some problems have been encountered, such as the difficulty of collecting waste paper and the lack of production technology. This suggests that in the future practice, we should increase publicity and improve public participation; improve the production level. We believe that over time and the deepening of practice, this practical solution will be more perfect and play a greater role in promoting the integration of environmental protection and art.

"Waste Paper Reuse -Luoyang Twelve Zodiac Art Innovation Design" scheme is not only environmentally friendly, but also a cultural heritage and innovation. Through this study, we can not only use the use of waste paper, but also inject new vitality into Luoyang's traditional culture. Looking forward to the future, we expect this plan to be applied and promoted in more areas, and contribute to the construction of a beautiful China. At the same time, it is also hoped that through continuous practice and exploration, we will improve their comprehensive quality and make unremitting efforts to realize the Chinese dream of the great rejuvenation of the Chinese nation.

## Chapter VI

### Conclusion

#### 6.1 Conclusion

My research theme is: waste paper reuse -Luoyang Twelve Zodiac Art Innovation Design. The research method adopted in this thesis is an interview method. In this article, the discussion of the artistic innovation design and the artistic innovative design of the Zodiac of Luoyang obtained the following summary:

In modern society, with the increasing awareness of environmental protection, the recycling of resources and the reduction of waste for waste have become a hot topic. In this context, I chose "Waste Paper Reuse -Luoyang Twelve Zodiac Art Innovation Design" as my research topic, which aims to explore the possibility of reuse of waste paper, and use artistic innovation design to give old paper new paper new paper new paper new paper new paper. Life and value.

My research starts with the cultural characteristics of the Luoyang area, especially the traditional cultural elements of the zodiac signs. Then, starting with the classification and characteristic analysis of waste paper, through in-depth research on the physical and chemical properties of different types of waste paper, the potential and restrictions of their reuse were determined. Innovative ideas. Through design practice, I designed a series of art works with the theme of the Zodiac. These works not only have ornamental value, but also reflect the dual significance of environmental protection and culture.

Through this study, I deeply realize the importance and urgency of waste paper. As a renewable resource, waste paper can not only reduce environmental pollution, save resources, but also stimulate people's creativity and imagination. At the same time, combining traditional cultural elements with modern design can also allow traditional culture to rejuvenate and vitality in the background of the new era.

Looking forward to the future, I hope to continue to explore more possibilities of waste paper and then use, and develop more environmentally friendly, practical and beautiful art works. At the same time, I also hope that through my research and practice, it will evoke more people's attention and attention to the protection and attention of environmental protection and traditional culture. I believe that as long as each of us can start with ourselves and start with little things, we can create a better future for our Earth Homeland.

#### 6.2 Discuss

In today's society, environmental protection and resource cycle use has become the focus of attention. As a common waste in daily life, waste paper is increasingly valued by people. Luoyang is a city with rich cultural heritage. It uses the combination of waste paper with traditional culture. Through artistic innovation design, we present a zodiac art work full of creative and vitality.

Luoyang, as the ancient capital of the Thirteen Dynasties, has a deep historical and cultural heritage. As an important part of the traditional Chinese culture, the zodiac signs carry a rich connotation of folk culture. The combination of waste paper with the zodiac culture of Luoyang is not only the inheritance of traditional culture,

but also an innovative artistic practice. This practice not only helps to enhance people's awareness of environmental protection, but also promote the development of cultural and creative industries.

In the paper "Re -use of Waste Paper -Luoyang Twelve Zodiac Art Innovation Design", the author elaborates the importance and feasibility of the reuse of waste paper in detail. Through the study of Luoyang's twelve zodiac culture, the author proposed a series of innovative design solutions. These solutions not only pay attention to artistic aesthetics, but also fully consider practicality and environmental protection. For example, using waste paper to make the zodiac cultural and creative products, which not only beautify the living environment, but also realize the recycling of resources.

In addition, the paper also analyzes the practical application of waste paper from the artistic innovation design of the zodiac art of Luoyang from multiple perspectives. Through field surveys and data analysis, the author obtains the advantages and existing problems in art design. These analysis provides valuable references, and also provides direction for future research.

However, waste paper is still facing some challenges in artistic innovation design. How to improve the artistic value of waste paper reuse, how to better combine traditional culture, and how to promote industrial development in this field requires us to further think and explore.

In summary, the paper "Re -use of Waste Paper -Luoyang Zodiac Art Innovation Design" provides us with a brand new perspective, let us see the huge potential of waste paper reuse in artistic innovation design. In the future, we look forward to more artists and designers to pay attention to this field, combining waste paper with traditional culture to create more creative and valuable art works. At the same time, we also hope that the government and all sectors of society can give more support and attention, promote the industrial development of waste paper to reuse the industrialization of art innovative design, and make greater contributions to the prosperity of environmental protection and cultural and creative industries.

### **6.3 feedback**

#### **6.3.1 Research results suggestions**

This thesis designed two sets of solutions of different zodiac images, and finally chose the plan one. The plan uses a variety of colors to design a set of illustrations of the zodiac sign of the illustration style, and finally design a set of culture Creative Products.

With the in -depth concept of environmental protection, the use of waste paper has become a hot topic in the design field. This thesis uses the art of the twelve zodiac art of Luoyang as the research object, and explores the re -use value of waste paper in artistic creation. Through a series of experiments and design practice, we have some research results with innovative and practicality.

We suggest that in the design of the art of the twelve zodiac signs in Luoyang, we should pay more attention to the reuse of waste paper. It can be made into cultural and creative products by using waste paper, which can not only reduce waste of resources, but also give new artistic lives for waste paper.

In terms of specific implementation, we can adopt the following strategies: First, collect various types of waste paper, classify and organize, and select paper suitable for reuse; second, combine the cultural connotation of the twelve zodiac signs

of Luoyang, design art works with regional characteristics Third, in the design process, pay attention to the color matching and material use of waste paper, so that it is not only in line with art aesthetics, but also reflects the concept of environmental protection.

In addition, we also recommend strengthening the publicity and promotion of waste paper reuse. By holding exhibitions, lectures, production brochures, etc., more people can understand the significance and value of waste paper reuse, and improve the public's environmental awareness.

At the same time, we should also see that waste paper is still facing some challenges in art design, such as the unstable quality of waste paper and difficult design innovation. Therefore, we need to continuously explore new technologies and methods to improve the artistic effect and practicality of waste paper reuse.

In summary, waste paper has broad application prospects and important practical value in Luoyang's zodiac art innovation design. It is hoped that through the research results of this paper, it can provide some useful references and revelations for the practice and research in related fields.

#### 6.3.2 Further research suggestions

Waste paper is used as an environmental protection behavior, and it has received extensive attention and practice globally. As a millennium ancient capital, Luoyang has rich cultural resources and historical heritage. The combination of waste paper re-use with the zodiac culture of Luoyang can not only reduce environmental pollution, but also promote traditional culture, which has double significance.

**Deepening theoretical research:** The theoretical research of waste paper can be discussed from the perspective of environmental protection to explore its specific role in reducing the waste of resources and reducing environmental pollution. At the same time, combined with the zodiac culture of Luoyang, from the perspective of artistic design, analysis of the potential and value of waste paper reuse in cultural heritage and innovation.

**Expanded practical application:** In terms of practical applications, it can further explore the specific methods and techniques of waste paper reuse. For example, through design experiments, the application effects of different types of waste paper in the innovative design of the zodiac art, as well as the impact of waste paper reuse on the quality and aesthetics of art works.

**Promoting industrialization development:** The combination of waste paper with the innovative design of the Zodiac art of the Luoyang has huge market potential. Therefore, it is recommended to promote the development of related industrialization and transform the research results into actual products to meet market demand. Through industrial development, it can not only promote economic development, but also improve people's environmental awareness and promote cultural heritage and innovation.

In summary, the research on the theory of "Re-use of Waste Paper -Luoyang Zodiac Art Innovation Design" can start with the aspects of deepening theoretical research, expanding practical application, and promoting industrialization development to further promote the development of the field in this field And progress.



### 6.3.3 Further research suggestions

According to a series of cultural and creative design handbag works based on the theme of this research theme, "Re -Using Design of Waste Paper -Luoyang Zodiac Art Innovation Design", a market test questionnaire was made. The public evaluation and opinions of the Zodiac Cultural Creative Pagrants in Luoyang, a total of 50 interviews were collected in this time to guide product development to meet market demand, as follows in Table 6.1.


(1) Basic information of the respondent:


1. Gender: 21 men, 29 women
2. Age: 20 people aged 21-25, 15 people aged 26-30, 5 people aged 31-35, 5 people aged 36-40, and 5 people over 40 years old.
3. Marriage status: 20 single, 30 married people.
4. Occupation: 5 civil servants, 10 corporate units, 5 individual households, 10 freelance occupations, 15 students, and 5 other occupations.



(2) The public's feedback on this cultural creative handbag product:



Disclaimer: Mark 1-5 according to satisfaction in the table bar, the order order means 5 = the most, 4 = a lot, 3 = medium, 2 = less, 1 = minimum.

Table 5 market testing questionnaire


Cultural and creative Tote bag 1	Problem points	Comment level					remarks
		5	4	3	2	1	
	1. Style / product style has Luoyang characteristics	21	29				
	2. The product style reflects the local culture of Luoyang	22	28				
	3. Product production materials are environmental protection	20	30				
	4. The product has exquisite appearance	21	29				
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7. Product development, it has sales value	28	22				

	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 2	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	21	29				
	2. The product style reflects the local culture of Luoyang	25	25				
	3.Product production materials are environmental protection	26	24				
	4. The product has exquisite appearance	25	25				
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	21	29				
	8.The general public is interested in the products	25	25				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 3	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	21	29				
	2. The product style reflects the local culture of Luoyang	21	29				
	3.Product production	25	25				

	materials are environmental protection						
	4. The product has exquisite appearance	26	24				
	5. The product has an appropriate use	28	22				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 4	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	30	20				
	2. The product style reflects the local culture of Luoyang	40	10				
	3.Product production materials are environmental protection	20	30				
	4. The product has exquisite appearance	25	25				
	5. The product has an appropriate use	20	30				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
9. Product design is	23	27					

	very innovative						
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 5	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	21	29				
	2. The product style reflects the local culture of Luoyang	22	28				
	3.Product production materials are environmental protection	40	10				
	4. The product has exquisite appearance	20	30				
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 6	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	21	29				
	2. The product style reflects the local culture of Luoyang	40	10				
	3.Product production materials are environmental protection	20	30				
	4. The product has	25	25				





	exquisite appearance						
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 7	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	21	29				
	2. The product style reflects the local culture of Luoyang	40	10				
	3.Product production materials are environmental protection	20	30				
	4. The product has exquisite appearance	21	29				
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
	Cultural and creative Tote	Problem points	Comment level				

bag 8							
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	40	10				
	2. The product style reflects the local culture of Luoyang	20	30				
	3.Product production materials are environmental protection	25	25				
	4. The product has exquisite appearance	40	10				
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 9	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	21	29				
	2. The product style reflects the local culture of Luoyang	22	28				
	3.Product production materials are environmental protection	35	15				
	4. The product has exquisite appearance	21	29				
	5. The product has an appropriate use	25	25				
	6. The product is	26	24				

	made with appropriate materials						
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 10	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	26	24				
	2. The product style reflects the local culture of Luoyang	28	22				
	3.Product production materials are environmental protection	21	29				
	4. The product has exquisite appearance	25	25				
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 11	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang	28	22				

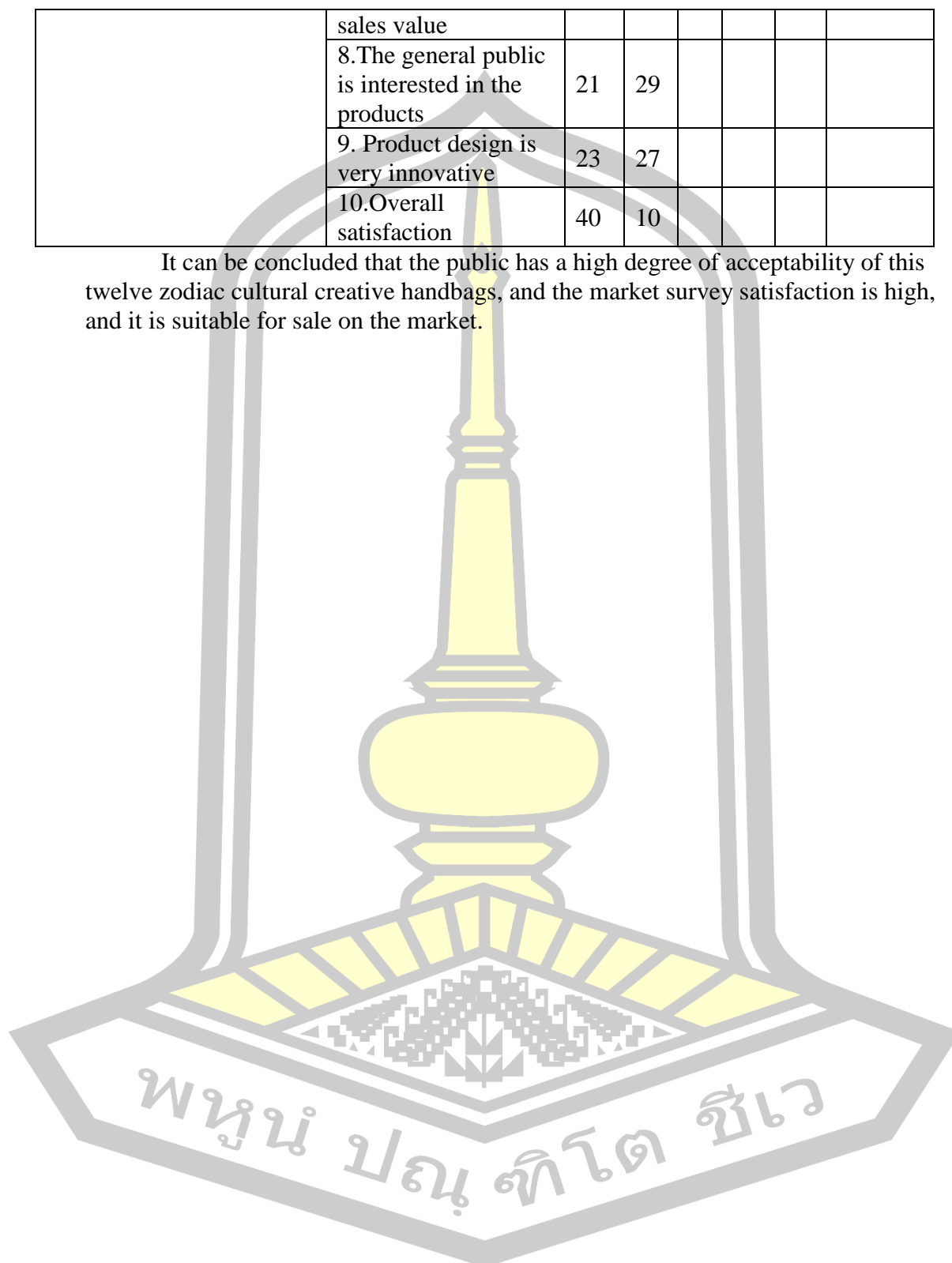


	characteristics						
	2. The product style reflects the local culture of Luoyang	21	29				
	3.Product production materials are environmental protection	23	27				
	4. The product has exquisite appearance	28	22				
	5. The product has an appropriate use	21	29				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has sales value	28	22				
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				
Cultural and creative Tote bag 12	Problem points	Comment level					
		5	4	3	2	1	remarks
	1. Style / product style has Luoyang characteristics	25	25				
	2. The product style reflects the local culture of Luoyang	25	25				
	3.Product production materials are environmental protection	26	24				
	4. The product has exquisite appearance	25	25				
	5. The product has an appropriate use	25	25				
	6. The product is made with appropriate materials	26	24				
	7.Product development, it has	28	22				

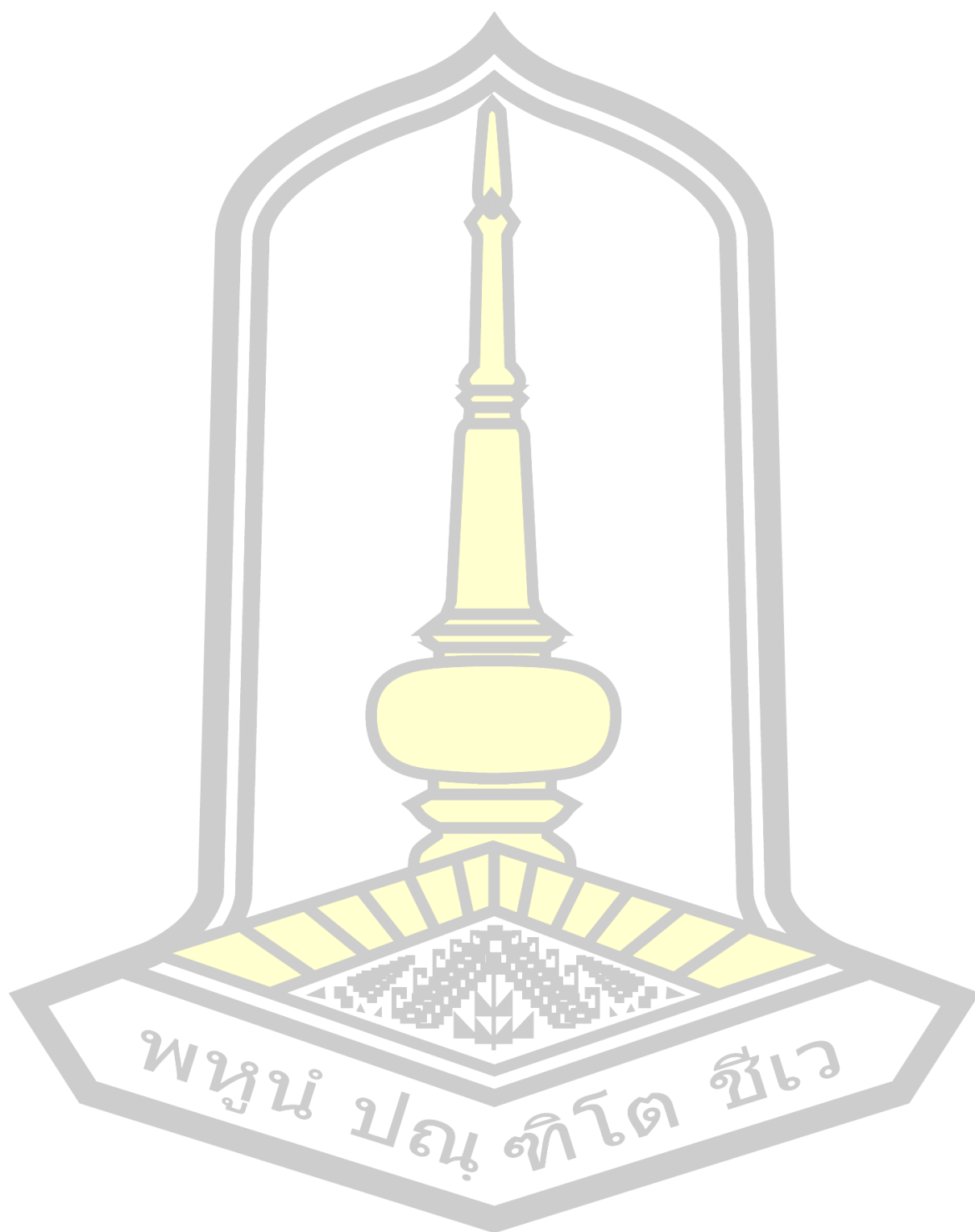


	sales value						
	8.The general public is interested in the products	21	29				
	9. Product design is very innovative	23	27				
	10.Overall satisfaction	40	10				

It can be concluded that the public has a high degree of acceptability of this twelve zodiac cultural creative handbags, and the market survey satisfaction is high, and it is suitable for sale on the market.



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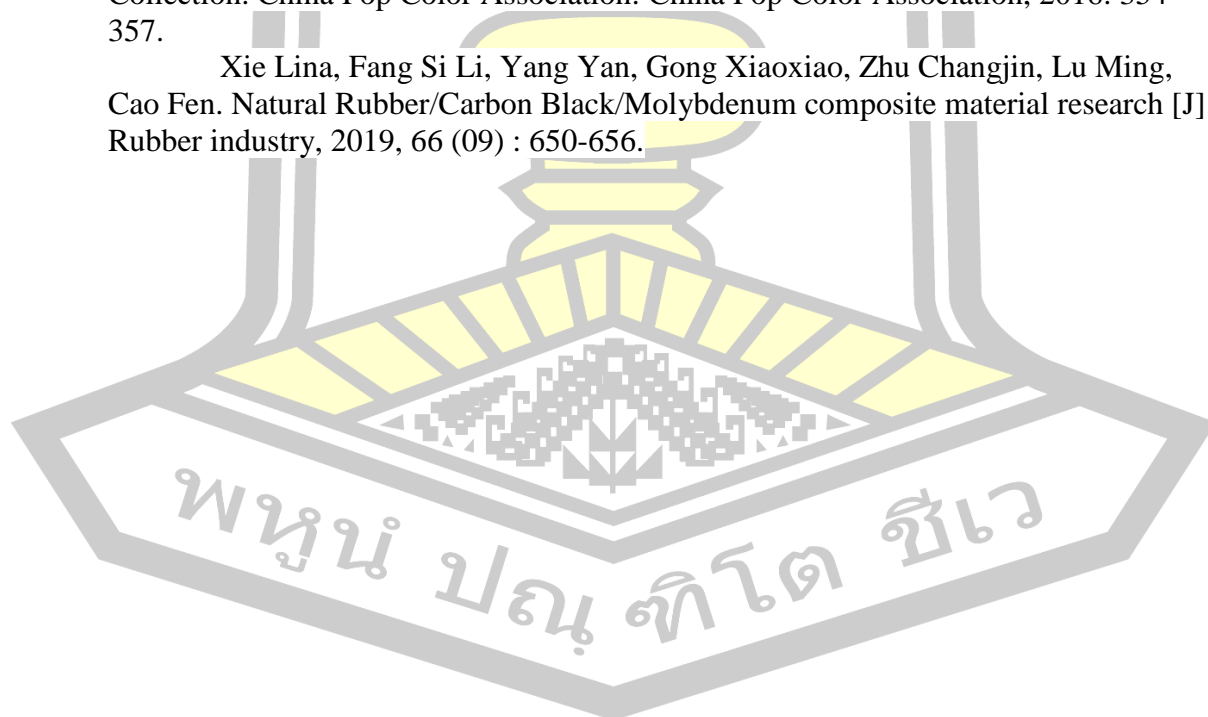
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Annex

Annex A

## Reuse of waste paper -Luoyang Zodiac Art Innovation Design Questionnaire

Hello! We are re -use the waste paper -the innovative design of the zodiac art of Luoyang. The questionnaire is anonymous and there is no correct or wrong answer. We invite you to join us. We will thank you for your understanding, support and cooperation.

Your age: Gender: Academic degree: Occupation:

1. What is your gender?

A: male

B: Female

2. What is your age?

A: Under 20 years old

B: 21-40 years old

C: 41-60 years old

D: over 60 years old

3. Is your education?

A: junior high school and below

B: technical secondary school and high school

C: College and undergraduate

D: Master's and above

4. Is your occupation?

A: Employee

B: Institution

C: Individual industrial and commercial households

D: Scientific research/educator

E: Student

F: Others

5. What is your monthly income?

A: less than 2000 yuan

B: 2000-4000 yuan

C: 4000-6000 yuan

D: 6000 yuan or more

6. Have you ever learned about waste paper?

A: Yes

B: No

7. Have you ever participated in any form of waste paper reuse?

A: Participated

B: No participation

8. Do you understand the innovative design of the zodiac art?

A: More understanding

B: Less understanding



C: Don't understand

9. Do you think that waste paper is reused -Is there a market prospect for the innovative design of the zodiac art of Luoyang?

A: Yes

B: No

C: Don't understand

10. Do you think the development trend of waste paper reuse in the future artistic creation is good?

A: Yes

B: No

11. What type of cultural and creative products will you choose during your trip?

A: Stationery

B: Office

C: Electronic

D: Home

E: Life

F: Others

12. Will you consider buying waste paper and then using the designed Luoyang Zodiac Cultural and Creative Products?

A: Will

B: No

13. What price will you choose to buy cultural and creative products?

A: 10-50 yuan

B: 50-200 yuan

C: 200-500 yuan

D: 500 yuan or more

14. Do you think the waste paper is reused -what is the problem of the existence of the cultural and creative products of the zodiac art of the zodiac signs of Luoyang?

A: Not practical

B: No creativity

C: Price factor

D: others

15. Do you prefer to use waste paper and reuse — the set of renderings designed by the zodiac signs of Luoyang?

A: The first set

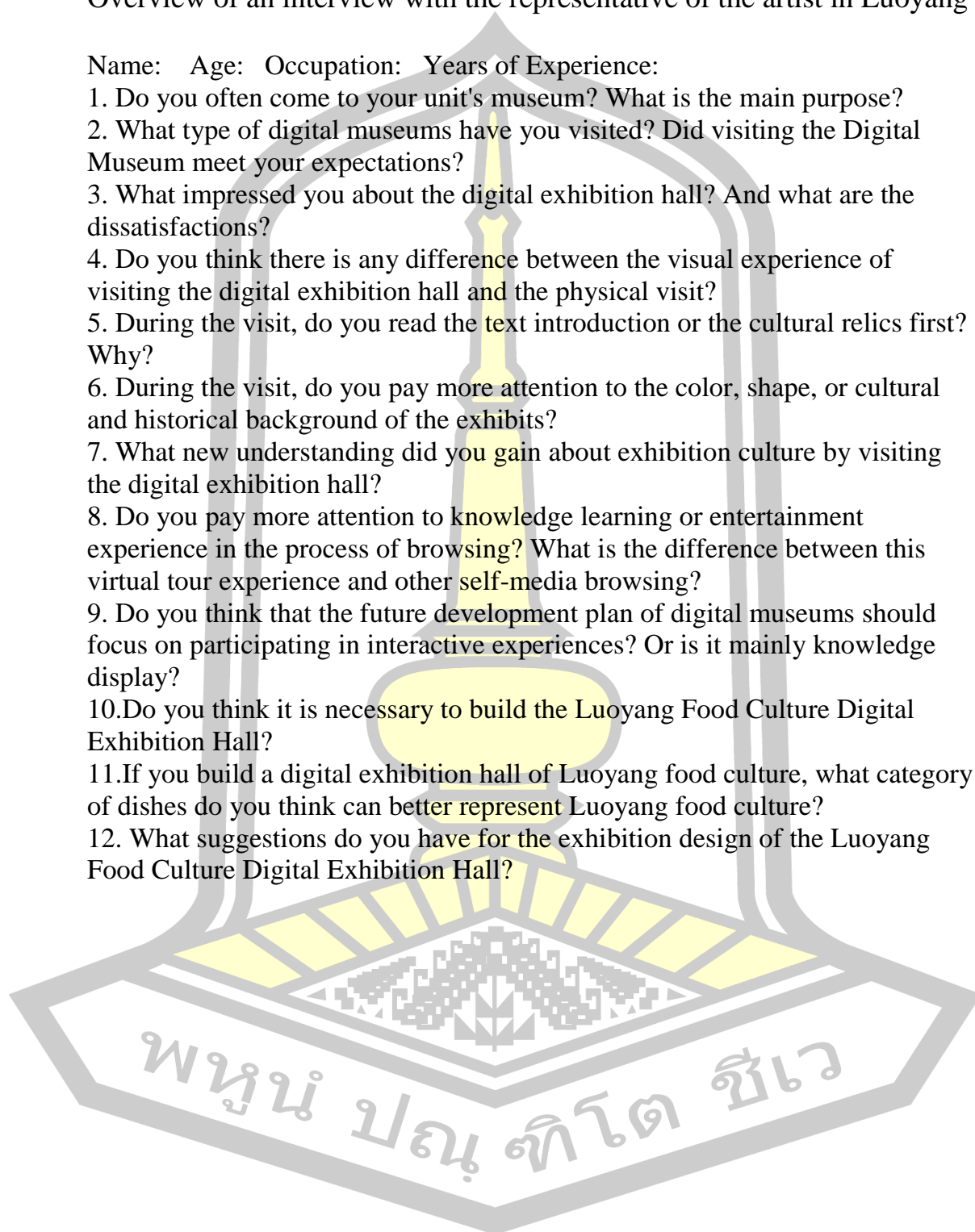
B: The second set

## Annex B

## Overview of an interview with the representative of the artist in Luoyang

Name: Age: Occupation: Years of Experience:

1. Do you often come to your unit's museum? What is the main purpose?
2. What type of digital museums have you visited? Did visiting the Digital Museum meet your expectations?
3. What impressed you about the digital exhibition hall? And what are the dissatisfactions?
4. Do you think there is any difference between the visual experience of visiting the digital exhibition hall and the physical visit?
5. During the visit, do you read the text introduction or the cultural relics first? Why?
6. During the visit, do you pay more attention to the color, shape, or cultural and historical background of the exhibits?
7. What new understanding did you gain about exhibition culture by visiting the digital exhibition hall?
8. Do you pay more attention to knowledge learning or entertainment experience in the process of browsing? What is the difference between this virtual tour experience and other self-media browsing?
9. Do you think that the future development plan of digital museums should focus on participating in interactive experiences? Or is it mainly knowledge display?
10. Do you think it is necessary to build the Luoyang Food Culture Digital Exhibition Hall?
11. If you build a digital exhibition hall of Luoyang food culture, what category of dishes do you think can better represent Luoyang food culture?
12. What suggestions do you have for the exhibition design of the Luoyang Food Culture Digital Exhibition Hall?



## BIOGRAPHY

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