

Constructing A Digital Resume And Sustainable Development Of Science And Technology Education For The Glass Bead Craft Industry Of The Paiwan Ethnic Group

Chia-mei, Liang¹

¹ National Yunlin University of Science and Technology
123 University Road, Section 3, Douliou, Yunlin 64002. (Taiwan)

Author E-mail : liangchiamei@gmail.com

Abstract. The colored glass beads are ancient heirlooms that cannot be traced back their ages for the Paiwan group (Rukai and Paiwan), and they are also important possessions and collections between tribal leaders and noble families. Due to the implementation of the Aborigine controlling policy (1895-1915) and till to the assimilation education in the mid-term (1916-1937) during the period of Japanese colonial rule in Taiwan, the traditional social structure and cultural activities within the tribe had gradually became static as a result of external interference. The glass beads were originally collected in private and then the glass beads had disappeared as they were forced to turn over to the authority. For Christians had introduced into the tribes in 1950, the traditional cultural rituals were not recovered even the regime had been transferred after World War II. Umas Zingrur from Paiwan tribe had initiated the research and development of the revitalization on the production of the glass beads and then the beads have handed down widely among the Paiwan tribes. This research is a longitudinal field study. The new generations have the possibility to develop the creation and entrepreneurship, as well as collaborating the tribal culture with business. Therefore, the tribal culture can be established the circulated and sustainable economic benefits, accompanied by the inheritance and continuation of tribal culture to achieve the purpose of sustainable technology and education research.

1. INTRODUCTION

1.1. Research Motivation

Glass beads are mainly used in the daily life of the Paiwan ethnic group to demonstrate aesthetics and culture. In the early stages, glass beads was not a local-produced goods, and it has become the aboriginal craft and cultural development projects since the 1970s. Taiwanese people generally didn't know much about the colored glass beads of the Paiwan group. Even aboriginals from Paiwan tribe didn't understand the meaning behind these beautiful beads while wearing these beautiful beads during the traditional cultural ceremonies. People have started the attentiveness of these beautiful beads among the Paiwan ethnic group from a famous movie, "Cape No.7", since 2008. The beauty of glass beads was demonstrated in that movie, but the meaning behind the beads have not been seen from the movie. In fact, each type of beads has its own name in different regions, and the name is given with a beautiful narrative.

The glass beads had always been the exclusive processions of tribal leaders and noble families since ancient times. Common people could only have simple beads which shared or given by the tribal leader. Nowadays, the glass beads have been introduced with creativity and become the tribal craft industry. This conveys the confusion and gap on cultural context and inheritance because of lack of traditional culture values. This study is aimed to build the systematic knowledge of the glass beads through the well-established research design and data collection of field study. Therefore, this study anticipates to provide the possibility of future development on the craft aesthetics and traditional culture for the tribe. This also intends to resolve the difficult



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](https://creativecommons.org/licenses/by/3.0/). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

Published under licence by IOP Publishing Ltd

situation of limited information acquirement in a single geographical environment.

1.2. Research Purposes

Based on the research background and motivation, the purpose of this research is as listed below :

- (1) To explore the cultural interpretation of the pattern on the glass beads and the meaning of sustainable science and technology education for the Paiwan ethnic group.
- (2) To classify the context of the different social class, including: people, objects and time.
- (3) To provide the basis for the sustainable development of science and technology education as well as maintaining the cultural tradition of the tribal craft industry by building the platform of modern technology and incorporating with the tribal elements.

2. Literature Review

2.1 The origin of the appearance of glass beads from the Paiwan group

Peter Francis, Jr (2002) had mentioned that glass beads were the small objects of decorations, enchantments, and the symbols of counting and marking. These beads are small objects used as decorations, enchantments, counting and annotation symbols, and revealing status symbols. They are one of the oldest forms of human expression and can be used by any Made of solid material (Francis 1982a). Glass beads played a considerable role in the fields of culture, economy, society, concept and aesthetics. It encodes human behavior and also includes behaviors that are difficult to evaluate in archaeological research. The ancients awed them and believed that glass beads were both magical and useful. Its special value is also considered to be a proof of combined power and wealth.

There are different names for glass beads in various regions. In the Paiwan ethnic group in Taiwan, "ata" and "qata" mean beautiful fruits, and they are also the collective names for glass beads by the Paiwan ethnic group. "Silu" is the general term for glass beads by the Rukai people. At present, the glass beads collected and used in the households of the Paiwan ethnic group are divided into several types. The common point of the source and the way of obtaining are all derived from maritime trade, small-scale trade exchanges on land and other reasons. The first type is ancient colored glass beads, whose source is ancient beads obtained through sea trade or small transactions on land hundreds or thousands of years ago; the second type is also through the sea between island chains in the South China Sea. Trade to obtain more modern imported beads or trade beads; the third is to obtain beautiful imported beads from the Netherlands, Venice, Czech Republic and other places in the 18th and 19th centuries during the exchange of goods from merchants and tribal people in southern China; the fourth is recent The period is from the late 1970s to the present. The glass beads collected in north-paiwan and the Rukai people have made antique glass beads through their own research and experimentation. Later, they were even made of kaolin and clay in 1990, Nano and other materials have been developed into crystal beads that are as smooth as jade.

The monochromatic beads, colorful twill beads, glass manufacturing waste, etc. excavated at Glass Remains at Jiuxianglan are estimated to date as early as the 3rd to 8th centuries BC, but the monochromatic beads among these beads are the same as the Indo-Pacific beads. The system is different from the monochromatic beads worn by the Paiwan people in the past few hundred years. The ancient glass beads collected by the Paiwan ethnic group in just a few hundred years have their origins in the islands of Southeast Asia-the Philippines, Borneo, Timor, Java, Sumatra, the Malay Peninsula and Indochina. Since the 16th century, More are the exquisite colored glass beads obtained through trade exchanges by Dutch, Spanish and Chinese merchants or Han people in the western plains of Taiwan.

The origin and time of the ancient glass beads in the Paiwan tribes are in a floating state. In different times and years, people of different tribes have been in contact with the outside world, through the exchange of resources through bartering, and through going out to sea. Ancient glass beads obtained in various forms, such as the small-scale trade of the ancient ancestors who crossed the sea to Taiwan and brought them to Taiwan, vary greatly in appearance, form, color, place of manufacture, and time of manufacture.

2.2. Types of glass beads seen among the Paiwan ethnic groups

(1) Common Mutisalah beads : Mutisalah

In the chain of islands in Southeast Asia, Mutisalah beads are also known as Indo-Pacific beads (Peter Francis, 2002 : 19-20), or as synonymous with heirloom beads (2002 : 186-187). This kind of beads are not only widely distributed among Southeast Asian countries and islands, but also among the various tribes of the Paiwan Group. They are found in all classes of leaders, nobles, and commoners, and they are in the ancient glass bead chain. Common beads; at the same time, they are huge in number, and their names vary among tribes depending on the size of the beads.

Indo-Pacific beads such as Mutisalah beads are only dark red, orange, or beads close to inscribed yellow in color. They do not have the light yellow and jade-like green commonly seen in the Paiwan tribe. Some of the Mutisalah beads obtained from the Paiwan ethnic group may be newly manufactured products later in the bead-making centers in Southeast Asia; their age is also much longer than the time when the Dutch came to Taiwan. Please refer to Table 1 below for the names of the single-glassbeads of different colors in the Paiwan ethnic group.

(2) About the flower beads commonly used by the Paiwan ethnic group

The common colored beads in the Paiwan ethnic group are combed polychrome beads. This kind of beads are early Chinese beads manufactured in Quanzhou in large quantities, and they are only exported to Southeast Asia. This kind of beads are mainly made of a single glass background, plus multi-glassbrushed glass preconceived by the designer. Under the torch, wrap these colored drawing wires on the beads of the main body, and then use fine needles to draw the desired curvature and curve on the surface of the beads, so that the glass will appear beautifully wavy afterwards. This kind of production method, with different drawing directions, will pull out beads with different effects; the most common one is the noble bead of mulimulitan mentioned in the Paiwan tribe. This type of beads can be manufactured earlier than Chevron Bead.

(3) Precious trading beads imported from foreign countries and Chevron Bead copied from China

Among the Paiwan and Rukai tribes, the most imported Chevron heirloom orbs are currently seen. Some scholars believe that when they came to Taiwan through foreign missionaries or merchant ships such as Spain and the Netherlands in the 16th and 17th centuries, they were brought to the aboriginal tribes through various goods transactions or other means. The origin of the ancient glass beads in the Paiwan Group, according to the Rukai people, the early tribes did for some time be one of the trade items brought back when they went to the Philippines to trade with other more distant islands by sea. The ancestors involved in these interviews date from the ancestors between the 18th and 19th centuries. Therefore, it is speculated that the "imported beads", "trade beads", "Dutch beads" and other heirloom beads obtained and regarded as rare by the tribesmen should have been obtained in the past two to three hundred years. Generally speaking, among the private collections of nobles, especially among the Rukai tribe, most of the trade beads among the ethnic population are still mostly Dutch beads and Chevron beads made in Venice; secondly, there are many Rosetta Beads made in the Czech Republic, etc.

3. Research methods

This research is to apply the daily life theory of Walter Benjamin, 1989 [N1a, 8] to find the unusual in daily life. Benjamin research on history is mainly done by trash, which is the outdated and abandoned materials that are flooded in life; these materials and differences that are missed in daily life shape their unusualness. The characteristics of observing historical changes. Traditional narrative forms are no longer suitable for reproducing today's modern daily life. This discourse is not because these forms have been eliminated or outdated, but because daily life is highly influenced by modernization, making these daily experiences no longer suitable for reproducing. These past and traditional forms are presented through reappearance.

The ancient research of glass beads culture has been influenced by mainstream culture in daily life, and has become fragmentary and forgotten fragments. People are accustomed to the operation mode of simplification and simplification, replacing many ancient beads with beautiful names and the social and cultural meaning

behind them with a very simple name. Some precious cultures appear insignificant and insignificant in the torrent of the times, and become like obsolete scavengers struggling to live by finding value in lost value and obsolescence. These forgotten cultural fragments provide a historical perspective, that is, if people are not concerned with the irrational (perceptual) level, they will get nothing (Benjamin, 1982 : 252-260).

4. Research analysis

The older generation perceived the traditional glass beads (Liuli-Chu) as the family heirloom, the betrothal presents or the burials. However, the glass colored beads are the beads with patterns for those tribes who never possessed the ancient glass beads has been considered.

4.1. *The application of glass beads in daily life*

The scope of application on traditional ancient glass beads can be discussed in two parts. The first one is from the traditional and ancient parts, and the second is from the modern and real life perspectives.

(1) Traditional and ancient usage concepts

The ancient glass beads have been used on the following occasions, such as: family heirloom, the ceremonies of acknowledgment at the birth of a baby, the betrothal present of wedding, the alliance relationship between tribes and tribes or between individuals, funeral objects at the time of death, accessories of traditional tribal ceremonies or celebrations, a tribal patron saint, and etc.

(2) Modern and new usage concepts

The glass beads maintain the traditional patterns and shapes, but the occasions of using and wearing them has more flexibility and is no longer restricted by traditional concepts and social class.

4.2. *The practice of attitudes, social values and cultural forms*

(1) Attitudes and Values for the Practice of Ancient Glass Beads

Among the ancient traditional practice of glass beads, the social class concept and marriage system have the deepest and most obvious effect on the development of glass beads. The wearing of colored glass beads in the Paiwan group needs to match with their social class in the tribal society. Common people cannot wear beads for nobles and above. In the ancient culture of glass beads (Liulizhu), the marriage relationship is an important key to reconstruct the social structure or to equalize the social class. Whether in Paiwan or Rukai, the choice of marriage partner will directly determine the individual and the newly formed family on promoting, declining or equalizing the social class in the tribe. The well-matched social status on marriage was a very important perception to the tribe. The social class could be downgrade because of unequal class of two families..

(2) The cultural form glass bead

The age and marital status can be easily identified from the way of wearing and decorating the glass beads. It is a privilege for a single Paiwan girl to wear earrings while dressing up at an important festival. However, the single girl is not allowed to wear the earrings if the girl lost her virginity, and everyone in the tribe can tear off the earrings from this unchaste girl in public.

The Paiwan tribe is still maintain this tradition to demonstrate that the single lady should cherish her virginity and should not have a complicated gender relationship. The married women should not wear earrings, nevertheless, they will still tie the earrings on the both sides of long necklace for their beautiful appearance.

The single ladies can wear glass beads bracelets on the wrists and married women should not wear the glass beads bracelets. In the north-Paiwan ethnic group, the married women are allowed to wear the bracelets, but the bracelets need to be twisted 180 degrees while wearing them.

Among the Paiwan ethnic group, men also have their own necklaces. The married men can wear the single-strand long necklace with large beads while the unmarried men should wear the necklace with smaller beads. The other accessories include shoulder straps and headwear for both gender, and shawls for women.

The glass beads became neglected and invisible culture, and then have reconstructed the important intangible cultural assets by the oral stories and ancient ballads among tribes through the word-of-mouth

| | | | | | | | | | |
|----------------|---|-------|-------|---------|-------------------------|------------------|----------------|-----------------|--|
| Nobility class | 男 | ●■□★◆ | ●◎■□◆ | ●■◎□★◆▼ | ●■★◆△▼▽○ or ●■★◆△○\$ | ----- | ----- | ○□☆◇♾️\$ | ○☆*◇▲▼ ▽○\$\$ |
| | 女 | ●■□★◆ | ●◎■□◆ | ●■◎□★◆▼ | ●■★◆△▼ or ●■★◆△▽○ | ●■★◆ or ●■★◆▲ | ○*◇◆▲▼ ▽○\$ | ○●□*◇▲ ▽♾️\$ | ○□☆*◇ ▲▼▽○\$\$ |
| Civilian class | 男 | ●■□★◆ | ●◎■□◆ | ●◎■◆ | ●★◆△▼▽○ or ●★◆△○\$ | ----- | ----- | ●☆◇♾️\$ | ○☆*◇▲▼ ▽○\$ |
| | 女 | ●■□★◆ | ●◎■□◆ | ●◎■◆ | ●★◆△▼ or ●★◆△▽○ | ●★◆ | ○*◇◆▲▼ ▽○\$ | ○☆★◇∞ | ○☆*◇▲▼ ▽○\$\$ or ○*◇▲▼ ▽○\$\$ |

Symbol Description :

| | | | | | | | | | |
|--------------------------|---|-------------------------------------|----|---------------------------|---|--------------------------------------|---|---------------------------------|----|
| small single color beads | ○ | medium and small single color beads | ● | large monochromatic beads | ◎ | small and medium colored glass beads | ■ | large glass beads | □ |
| round shell board | ☆ | long strip of shell board | ★ | small shell | * | cotton and linen | ◇ | cotton rope and thin linen rope | ◆ |
| silver chain | ▲ | small silver chain tassel | △ | locking plate | ▽ | bells | ◎ | coin | \$ |
| iron | ▼ | bristles | ♾️ | boar tusks | ∞ | Colored yarn | § | | |

5. Conclusion

This research is a longitudinal field study, and a massive of data regarding to the glass beads was collected and compared from Northern Paiwan and Western Rukai tribes. The classification and names of glass beads have been systematically analyzed, therefore, the tribe people could have the opportunity to understand the cultural meaning of beads through the designed contents of digital information and technology education. In the meantime, this research could provide the opportunity for the new generation to participate the creation and entrepreneurship of the craft industry and the new generation can achieve the circulated and sustainable economic benefits. Moreover, this study is anticipated to realize the precious culture of traditional indigenous peoples through the sustainable engineering and technology education.

References

- [1] Chen, Chi-Lu, 1968, *Material Culture of the Formosan Aborigines* · The Taiwan Museum.
- [2] Peter Francis, Jr, 2002, *Asia's Maritime Bead Trade-300 B.C. to the Present*.
- [3] Lois Sherr Dubin, 2016, *Beads : A History and collector's guide*.