



# The Advantage of Implementation of Raku Class in Elective Courses at Comprehensive University in China

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**Abstract.** This paper is to introduce what is Raku and what is the advantage of implementation of Raku class at comprehensive University under interdisciplinary background in China today.

**Keywords:** Raku · History of Raku · Techniques of Raku  
The elective courses · The comprehensive universities of China

## 1 Introduction

Nowadays, the elective courses of ceramic arts are getting popular at comprehensive University in China because students can easily have the fun of hand-on experience and have a finished ceramic art pieces through this kind of courses. Many students want to get into this type of elective ceramics courses. The conflict between the professional ceramics courses setting and elective courses that students do not have enough time to develop basic skills and this has become obviously in this short study period.

As a kind of fire technique of modern ceramic arts, the making process of Raku is full of the fun, and the final work also presents a unique artistic charm. It presents a unique character which satisfies both the elective ceramics courses setting at comprehensive university and the command of the students in China. Because it has short production cycle to complete quality of works to meet the demand of students who want to quickly get their works. In addition, Raku can be used to produce pottery in the short term, the effect of rich and unique pottery; also can make students participate in the greatest degree in ceramics. The combination of them has not only promoted the extensive and profound ceramic art cultures, but also solved the awkward situation that pottery art encountered of the number of elective courses in Colleges and universities in China.

## 2 The History of Raku

Raku was come from a type of Japanese pottery, which was traditionally used in Japanese tea ceremonies. Most often in the form of tea bowls. It is traditionally characterized by being hand-shaped rather than thrown. Fairly porous vessels, which result from low firing temperatures, lead glazes and the removal of pieces from the kiln while still glowing hot. In the traditional Japanese process, the fired raku piece is removed from the hot kiln and is allowed to cool in the open air.

In the 16th century, the Japanese tea master Sen Rikyū, was involved with the construction of the Jurakudai<sup>1</sup> and had a tile-maker; named Chōjirō, produce hand-moulded tea bowls for use in the wabi-styled tea ceremony. This technical of made tea bowls root goes back to tri-color glazed ceramics of the Ming Dynasty of China. During the Momoyama period colorful pottery based on this tri-color glazed ceramics came into production in and around Kyoto and Chōjirō was one of the potters practicing such techniques. The old document related to Chōjirō's father, Ameya, initially from China who brought tri-color glazed ceramics techniques from his native country. The oldest ceramic ascribed to Chōjirō is a two-color glazed lion sculpture produced in 1574. His first tea bowl was probably made in 1579. Hideyoshi presented Jokei, Chōjirō's son, with a seal that bore the Chinese character for raku. [1] Raku then became the name of the family that produced the wares. Both the name and the ceramic style have been passed down through the family to the present 15th generation Kichizaemon. The name and the style of ware have become mighty in both Japanese culture and literature [2] (Fig. 1).

In the raku ware tradition, Raku-family members or porters who apprenticed at the head family's studio have been founded branch kilns. After the publication of a manual in the 18th century, raku ware was also made in other studios by other potters or tea practitioners in Kyoto, and around Japan. Raku ware made an important point in the development of Japanese ceramics history because of it was the first ware to use a seal mark and the first to focus on co-operation between maker and patron (Fig. 2).

The familiar technique of placing the ware in a container filled with combustible material is an improved raku practice. Contemporary potters worldwide have modified raku techniques. Raku became popular in western potters with the help of Paul Soldner of American in the late 1950s. American potters remained the normal firing process, heating the pottery quickly to high temperatures and cooling it quickly, but also to make their own style of raku. Warren Gilbertson, who had studied raku in Japan, presented an exhibition of his work at the Chicago Art Institute. He was one of the first to call attention to the making of Japanese raku tea bowls even though his work was largely simulate.

American-style raku is especially the black surface produced by smoking the ware outside the kiln at the end of firing. Other innovations include the quenching of the red-hot vessel in cold water, the production of brilliant and many-colored copper lusters, the forced crackling of the glaze with smoke penetration, the white line halo or ghost image surrounding a black metallic decoration, and the discovery of a copper slip

<sup>1</sup> Was a lavish palace constructed at the order of Toyotomi Hideyoshi in Kyoto, Japan.



**Fig. 1.** Two-color glazed lion, Chôjirô I



**Fig. 2.** Tea bowl with crane design, raku ware by Ryōnyū (Raku IX) (Source: Encyclopædia Britannica)

that sometimes results in an unusual yellow matte surface. American raku also used shapes rather than the traditional tea bowl. American potters could be more experimental and inventive in making raku than their Japanese counterparts. Furthermore, the speed at which raku could be made allowed spontaneity and opened the way to the creation of new shapes that capitalized on the new freedom from the rigid control of the older utilitarian high-temperature tradition [3] (Fig. 3).



**Fig. 3.** Raku art works of Paul Soldner (Source: [www.paulsoldner.com](http://www.paulsoldner.com))

Unlike traditional Japanese raku, which is mainly hand built bowls of modest design; western raku tends to be vibrant in color, and comes in many shapes and sizes. Western raku can be anything from an elegant vase, to an eccentric abstract sculpture. Along some hands build piece, most western potters use throwing wheels while creating their raku pieces [4].

### 3 The Process of Raku

In the process of learning ceramic art in the west, I have learnt the ceramic art form of Raku, which combines the Eastern and Western cultures, and then mastered the technological essentials of raku after a lot of deep studies and researches. The following that I would like to introduce the process of American style of raku from how to make the clay bodies, glazes and kilns until how to work together to finish the raku firing.

Raku techniques is the most unusual feature, instead of warming and maturing the pottery in a cold kiln, glazed ware is placed in a hot kiln for only about one hour and then removed and forced to cool rapidly at air temperature. The process subjects the pottery to extreme stress and creates unique effects throughout the glaze and, sometimes, in the pottery itself. Because temperature changes are rapid during the raku process, clay bodies used for raku ware must be able to cope with significant thermal stress. The usual way to add strength to the clay body and to reduce thermal expansion is to incorporate a high percentage of talcum, grog, or Aluminum Oxide into the clay body before the pot is formed. I had a test that put the different materials into the Jingdezhen porcelain clay to determine which is best for the thermal shock of raku (Table 1).

As a result, the clay of A, talcum is best material to deal with thermal shock of the Jingdezhen porcelain clay for raku fire. It contributes both mechanical strength, and significantly reduces thermal expansion.

**Table 1.** Clay bodies added materials test in Jingdezhen porcelain clay

		Jingdezhen porcelain clay
Talcum	A	18%
Grog	B	10%
Aluminum Oxide	C	12%

Actually, people can use any molding techniques or skills to make pottery for raku. People need to pay attention to the connection parts of clay to ensure that they have completely together in the molding process. The works are typically through the biscuit firing temperature (about 800–850°) to ensure that theirs porous and withstand the thermal shock, and to protect the works are not easily broken when they remove from the glowing hot kiln. All the raku works typically glaze fired around 1,000 °C. As the porcelain has long rich tradition in China, there is phenomenon low temperature glazes are not enough used even exclude the of low temperature glazes. On the contrary, many foreign ceramicists are widely used low temperature glazes, and to use them as the prerequisite for raku firing. Although almost any of them can be used in Raku, potters often use specially formulated glazes that “crackle” or craze (present a cracked appearance), because the crazing lines take on a dark color from the carbon with smoke penetration (Table 2).

In theory, any type of kilns can be used for raku firing. It can easily install temperature control equipment for electric kiln, in order to rapidly heat up and keep warm. In the process of firing, it is necessary to open and close the kiln door many times for put in or remove the works, which will cause the heating loss. In fact, using metal pliers to remove hot bodies from an electric kiln has potentially dangerous unless the power is cut off first. The best way is to build a removable kiln for the firing and it will be more convenient for smoking and cooling treatment. In addition, the firing process produces a lot of water vapor and smoke, it is best to raku firing in an outdoor open environment. [5] One aspect that can affect the results is the use of electric versus gas kilns. Electric kilns allow easy temperature control. Gas kilns, which comprise brick or ceramic fibers, can be used in either oxidation or reduction firing. Gas kilns also heat more quickly than electric kilns, but it is more difficult to maintain temperature control [6].

The type and the size of kilns that are used in raku are important in the outcome. Generally the simple self-made outdoor kilns of raku are popular. That kind of kiln is built with about 3 cm thick ceramic fibers, fixation with thick iron wires, rolled into a cylinder. The base is to use firebricks paving a square pedestal and leave two blocks for put two gas-nuzzles in each side of it (Fig. 4).

The construction is more convenient for build an outdoor raku kiln, because of its light and easy handling. The size of the kiln should not big. It is to build a 60 cm high including the cover thickness 13 cm, and diameter of 85 cm to introduce the construction method of the raku (Table 3 and Fig. 5).

First step is to determine the kiln body and the cover size, and use the iron gauze connect a cylinder with a height of about 60 cm and a diameter of about 85 cm. Laying the ceramic fibers inside the cylinder from top and press them until about 15 cm thick. Make the same process for the cover of kiln. Use the electric stove wires for high

**Table 2.** The elements of Raku glazes analysis

Name of glaze	White Crackle (%)
Chemical components percentage of Raku glaze	Gerstley Borate 65
	Tin Oxide 10
	Nepheline Syenite 15
	Ball Clay 5
	Silica 5



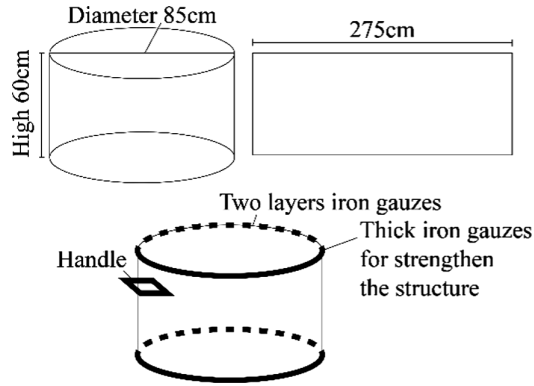
**Fig. 4.** A simple outdoor raku kiln

**Table 3.** Materials of building an outdoor raku kiln needs:

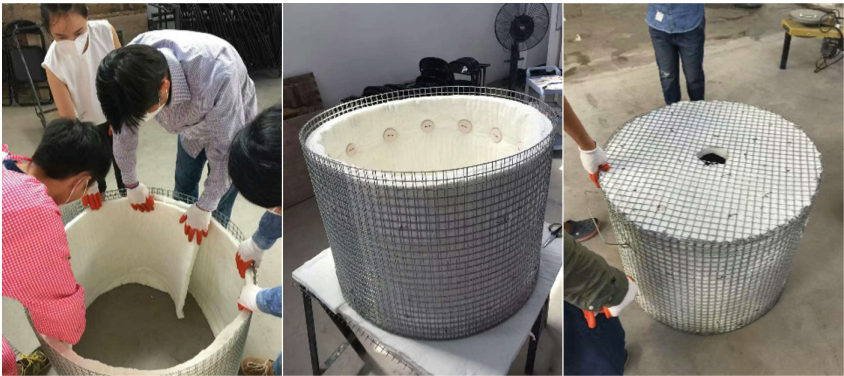
1.	Iron gauzes, 700 cm × 60 cm (hole 2 cm or 2.5 cm/thickness 2.5 mm)
2.	Ceramic fibers, 400 cm × 60 cm (thickness 3 cm)
3.	Electric stove wires of high temperature, 400 cm (diameter 2 mm)
4.	Thick iron gauzes, 30 cm (diameter 3 mm)
5.	Thick gloves for each members
6.	3 or 4 Scissors to cut the iron gauzes
7.	Dust masks for each members

temperature to fixed ceramic fibers. In the case of finished paving ceramic fibers, electric stove wires should be cut several parts; each has a length of about 20 cm, and in turn from the inner to the outer of the wall of the cylinder. The electric stove wires fixed on an outer cylinder and wire tight, hide the connector inside, so as they are not hurt hands. Don't forget to make two handles by thick iron gauzes of the kiln in case to remove the kiln in the raku firing procession. In order to make the gas fully burned, to make an opening of 15 cm on the center of the kiln cover (Fig. 6).





**Fig. 5.** Sketch map for make an outdoor raku kiln



**Fig. 6.** Process of make a raku kiln

Use the firebricks to paving a 1-m square pedestal for the kiln. The first layer was carpeted with the firebricks, and the second layers to leave two blocks for put two gas nuzzles in each side of pedestal. In order to reduce the thermal radiation from the kiln body to the ground, we used the kiln pillars to isolate the contact between the kiln body and the ground. The kiln has been finished after operators put the kiln on the bricks and adjusted the position of the gas nozzles (Fig. 7).

It is very necessary to make preparation like ware protective clothing, gloves, and facemask because of high temperature before raku fire. The place of raku firing is better to choose a well-ventilated area, and the water is more convenient. To avoid making mistake, it is better to divide operators the different types of work. Such as some people are in charge of remove the kiln when the temperature were reached, and some in charge of remove the works from the kiln to the chambers, and the other cover the chambers at last.



**Fig. 7.** Paving the pedestal of an outdoor raku kiln

Take a pottery pot as an example it can be put on any suitable special raku glazes after biscuit firing. This kind of glazes should be fired in the temperature range 900–1000°. However, whether glazed or not, it should be carefully fired to the above temperature then holding for a few minutes. If it is a glazed piece, its surface will appear effects like the gloss of melting snow. After waiting for body temperature decrease slightly it can be put into an iron chamber with sawdust, leaves, hairs, pine needles, or other similar combustible substance. Close the iron chamber with cover when it instantaneously burns at this moment. It can cause a strong reduction effect. It also can use bits of wood or other flammable organic materials such as dead leaves to bury it for reduction reaction. Crack of glazes is a feature of raku firing. If you expect this effect, make its more exposure in the air for a few minutes before put the pot into sawdust. As a result, this can increase the effects of glazes crack. The pot is covered up with sawdust sometimes hold in a few minutes, sometimes for an hour even longer until it completely cooling. Immediately put it into the water cooling after take it from the covering. This is to prevent the re-oxidation of the glaze of the pot. Especially those delicate or closed vessels, it reduces the risk of broken which cooled down in wet sawdust are better than directly cooled in water. When the pot is completely cooled, it can show all colors of glaze surface after cleaning with a metal wire [7] (Fig. 8).

The process is known for its unpredictability, particularly when reduction is forced, and pieces may crack or even explode due to thermal shock. Pots may be returned to the kiln to re-oxidize if firing results do not meet the potter's expectations, although each successive firing has a high chance of weakening the overall structural integrity of the pot. Pots that are exposed to thermal shock many times can break apart in the kiln, as they are removed from the kiln, or when they are in the reduction chamber (Fig. 9).

Raku's unpredictable results and intense color attracts modern potters. Depending on what effect the potters want, the pottery is either instantly cooled in water, cooled slowly in the open air, or placed in a barrel filled with combustible material, such as newspaper, covered, and allowed to smoke. [8] These patterns and color result from the harsh cooling process and the amount of oxygen that is allowed to reach the pottery.





**Fig. 8.** Wipe ashes and mud with sand to obtain a shining surface



**Fig. 9.** Reduction process of Raku firing

Water immediately cools the pottery, stopping the chemical reactions of the glaze and fixing the colors. The combustible material results in smoke, which stains the unglazed parts of the pottery black. The amount of oxygen that is allowed during the firing and cooling process affects the resulting color of the glaze and the amount of crackle.

Raku techniques is the most unusual feature: instead of warming and maturing the pottery in a cold kiln, glazed ware is placed in a hot kiln for only about one hour and then removed and forced to cool rapidly at air temperature. The process subjects the pottery to extreme stress and creates unique effects throughout the glaze and, sometimes, in the pottery itself. Reduction firing, in which the hot pottery is placed in a flammable substance to deprive the surface of oxygen, increases the chance aspects and dramatic surface variation of the glaze. Chance and process are the key elements of the raku aesthetic (Fig. 10).



**Fig. 10.** Process of Raku firing at night

In short, raku has the following characteristics compared with other type of ceramic techniques. The raku works are not vitrified enough it may still absorbed water because of low temperature firing and they are also fragile. The fast reduction reaction make the body absorbing carbon from the burned sawdust not only to present abundant changes of dark tonality to serve as a foil to its glaze but also restore the metallic oxide to pure metal from glaze. Another aspect it also makes the metal oxide in the glaze to be restored into pure metal and assemble with brilliant shining effects on the surface. Because of the rapid cooling, raku firing is easy to produce the crack effect of glaze and is also very good decoration. To mix the low temperature glaze, lead or boron, which is a sort of heavy metal containing poison, is usually blend with other mixtures to reduce the melting point of glaze. Therefore, the raku works cannot be used as food utensils. The time and temperature of reduction of the pot are different, and the combustible organics are also flexible in the iron chamber. They all make the result of raku firing tends to be vibrant, and difficult to imitate.

#### **4 The Application of Raku in Elective Ceramic Courses at Comprehensive Universities in China**

In recent years, with the continuous development of Chinese social economy and the improvement of people's living standards, people are paying more and more attention to the protection of intangible cultural heritage. As a traditional Chinese art and cultural category with a long history, ceramic art gradually attracts the attention of people. Moreover, the frequency of using the new-developing digital media is rapid increase of people, which also makes peoples' time and space become narrower and smaller in contact with natural. Ceramic art as a kind of beneficial adjustment and supplement of traditional handicrafts of shows its strong influence gradually.

Under this background, ceramic art practice education has been began to separate from professional ceramic education and gradually enters more and more elective

courses of comprehensive universities in China. As an elective course for quality training, these kinds of courses provide opportunities for students whose specializes in other disciplines but they are interest in practical and operational ability in ceramic art and crafts.

However, the practical course of ceramic arts has always been in a marginalized position in the liberal and art category of comprehensive universities. On the one aspect, the administration of universities is eager to acknowledge the status of ceramic art, which has been improved both new-developing art and traditional crafts, as a gimmick to attract students' attention. On the other aspect, the course has deeply troubled by its technological complexity in equipment and personnel settings. At the same time, it as an elective art course full of yearning for a large number of the students from science, liberal and history that have rarely touched in such courses. That lead ceramic art practice course to be embarrassed situation which is many students applied but can only select few of students to access the course (Fig. 11).



**Fig. 11.** Scenes of the ceramic elective courses in comprehensive university in China

In contrast, most of ceramic art course in foreign countries are establish for students who are in professional occupations and disciplines. There are no phenomena that I have encountered in carrying out ceramic art popularization education in comprehensive universities. For example, a large number of non-ceramic majors students study in elective courses will lead to more waste of materials and energies than professional students. There also exist the problems of disciplines management and so on. They all will increase of teachers' workload and the maintenance of teaching costs.

As I mentioned in previous part of this article, through my practice of raku, I think that raku's unique production and firing process can partly solve the contradictions. It is suitable for carrying out the practice course of ceramic practice at comprehensive universities in China. For example, its requirements of cost for production and firing are lower than other ceramic subjects, so that the range of application of students can scale up. It also could deal with the shortcomings of non-professional students in the aspect of crafts from mastery learning the raku technique. In addition, its equipment is relatively simple and easy to operate, and is benefit for arousing the interest of the

students from getting an effective product which is completed fired and has abundant effects very fast.

First of all, raku technique of ceramic art is very suitable for the application of the ceramics practice course in the foundation education because of the limits of the time and the space at comprehensive university.

Raku does not require very high technical level, and it can be made by any forming method or any ceramic techniques to make raku vessel. That conform to the practical conditions of the elective students of comprehensive university who do not have any ceramic art techniques meanwhile they hope to make a pottery from their practical ability. Most of the elective students in comprehensive universities are from majors such as liberal arts or science or engineering. They lack the experience of making ceramics by hands made practice, and do not have much skill for three dimensional design. Most of them hope to grasp the basic skills of making ceramics quickly through short-term training courses to get their works as soon as possible after the class. For example, I had been taught the students from the basic ceramic techniques like throwing and coiling clay to start with their own works. They can use different techniques to make the works, which can reflect the unique style after raku firing. As the students were all first time to make pottery, their works normally thicker than the usual pottery works. In the raku firing, the thicker works has better effects because they could against the thermal shock. That is also one of the reasons the raku firing easily grasped by the beginner of ceramic. Raku also can complete the firing process in a short period of time and students can immediately see the effect. Its rich and unique color effect, which is not only a kind of beautification for the imperfect beginner's defects, but also a powerful assistant to the course of the elective course in the short time and seeing the quick effect.

Secondly, Raku has low requirements for equipment and space conditions. The required equipment and materials of raku: take an example of American Raku kilns; they are generally simple hand-made kilns. Normally are made of fire-resistant ceramics fiber with a thickness of about 3 cm. It is fixed on a coarse mesh wire, rolled or folded into a kiln wall. The base is made of firebricks, and the middle of it is erected the gas nozzle to fire. The main materials is clay, adding some clinker or sagger, applying low temperature glaze fire with low firing temperature, sintering time is also short. These make the raku ceramics elective courses of university have lower investment cost, and also to avoid the environmental requirements of making the best use of everything to avoiding waste. Raku curriculums use simple and practical equipment and open space to attract more students who can get their works in a short time. That is an effective way to coordinate a large number of students with cockamamie course arrangement of the elective courses.

Under the premise of all disciplines asking for innovation, ceramic practice teaching should also introduce variety of ceramic techniques. Compared to the high cost, slow effect and non-environmental friendly of "wood fire" and "Salt fire", raku fire has some advantages that are suitable for the application of teaching.

The idea of integrating raku into teaching: The effect of raku works is different from that of Chinese traditional ceramic art works; it may even be an aesthetic way of subverting Chinese traditional ceramic appreciation. Chinese people pursuits the shape of ceramics from rounded and full, regular and symmetry and also the color of the glaze

surface feels like jade. The glazes of products which from Yue Kiln, Longquan Kiln, Ru Kiln and Yaozhou Kiln were entire fired though one thousand and three hundred Celsius degrees, and all looked like just take out of the water and desired to drops. Furthermore, raku is a continuation of the Japanese unique contribution for the ceramic arts of worldwide. They use mottled glazes, seemingly random shapes to be harmony with defects and cracks in their low-quality clay. Each pottery of raku seems like just been used for many years, and also it has been broken and old is called “the beauty of wabi-sabi” which come from the Japanese tea ceremony. Just rely on discover and appreciate of the beauty of the vicissitudes of the years which can also be made artificially in raku potteries is not simple. It indeed has opened up a new field of ceramic aesthetics in China. These play a role in good development, demonstration and guidance for the creative thinking of students in various disciplines.

To implement the practice, the teacher needs to guide the students to complete the shape of the form as soon as possible. On the other hand, the teacher should also guide the students to quickly and safely master the skills of raku firing. Therefore, raku is also can practice the students manipulative ability. We had previously described the process of raku with unpredictability. The clay, flame and water of ceramics are interacting with each other in the process of endless changes and effects. In the actual process of operation, students can fully appreciate the happiness of manipulative ability and enjoy the beauty of raku.

We even carried out the practice of combining Raku several times with the elective course of ceramic arts practice at Beijing Institute of Technology in 2017. They were all undergraduate students who came from of different schools of Beijing Institute of Technology include Arts and Design School took part in these elective courses. Also we held a “Raku Workshop” for one time in autumn semester, that cooperation with ceramic artist Powen Liu from the North Carolina State University in the United States. In the Raku workshop, we had taught the students from the basic ceramic techniques like throwing and coiling clay to start with their own works to made two American style Raku kilns until we had raku firing all together at the end of the workshop (Fig. 12).



**Fig. 12.** Scene of raku workshop in Beijing Institute of Technology, 2017

Get through the raku practice of different majors, I found that most of the students basically reached the effects as the author expected previously. Students were much faster in grasp the process and method of raku, especially interested for the raku firing scenes like to remove the hot pots from the kiln that were unusual atmosphere far from common ceramic firing during process. However, some of the students were still some doubts about the final effects of the raku works. I thought that was still a boundary between different disciplines and professions, and the students were also lack of aesthetic research for ceramic arts. It is required more popularization for aesthetic education of ceramic arts, and to improve the social status for the ceramic arts to contribute the increase of the aesthetic level of the comprehensive universities even for the whole society.

## 5 The Conclusion

In conclusion, with combining Eastern traditional arts and crafts and Western contemporary ceramic arts, the implementation of raku integrate ceramic arts practice courses at comprehensive universities in China which has significant influences both for the society and education system.

In the aspect of social effect, China has been the largest ceramic country from the ancient times in the world. But ceramic arts and crafts of China have been entered a serious recession since the modern times. In recent years, with the development of the social economy and the improvement of the living standards of the people, ceramic arts has attach importance in category of arts and crafts. The acceptance level of ceramics a sort of handicrafts, and people pay attention to the development of ceramic arts is getting increase. As a useful supplement to Chinese traditional ceramic arts cultures, raku has enriched ceramic views and improved cognition of ceramic arts of people. Ceramic arts education, also belongs to the category of arts and crafts, originally was not popular demand and belonged to marginalize classes in the arts and crafts schools or departments of education system. But in recent years, ceramic arts have been made potential development efforts through all aspects of society. The subject of ceramic arts is indispensable part of arts education, and it is also a useful supplement to training different subjects' students in the comprehensive university. The introduction of raku technique has provided the goal of sustainable development for the elective courses of ceramic arts, and found space and impetus of improvement and innovation for the quality-oriented education at comprehensive universities (Fig. 13).





**Fig. 13.** A student held her work which just fired from Raku kiln

The prospect of raku technique, combine the advanced teaching and education ideas within the marginal subject of ceramic elective courses, which are applied in the foundation teaching of ceramic arts at comprehensive universities can promote the effect and the status by promoting influence of the liberal and arts colleges in the quality-oriented education. The Raku Workshop that held at the Beijing Institute of Technology will have a good demonstration effects on the ceramic art courses for other comprehensive universities even in some high schools in China. It had been recorded as an enjoyable and beautiful procession from specific documents and exhibitions as example, and generalized to other universities or schools in the nationwide. It will not only solve the practical problems in the quality-oriented education of ceramics arts courses but also economize the materials and energies that are used in ceramic courses. In other words, it indirectly contributes to environmental protection.

## References

1. Byers, I.: *The Complete Potter: Raku*. Series Ed. Emmanuel Cooper, p. 16. B.T. Batsford Ltd., London (1990)
2. The Editors of Encyclopædia Britannica: Raku-ware, December 2017. [www.britannica.com/art/raku-ware](http://www.britannica.com/art/raku-ware)
3. Soldner, P.: Firing The Raku of American. *Ceramic Review*, vol. 124 (1990)
4. Jane Malvisi. [www.janemalvisi.co.uk](http://www.janemalvisi.co.uk). Accessed 05 Nov 2015
5. Zheng, L., Yu, Y., *Raku: Ceramic of Jingdezhen*, vol. 69, pp. 27–29 (1995)
6. Warshaw, J.: *The Practical Potter, a Step-by-step Handbook, a Comprehensive Guide to Ceramics with Step-by-step Projects and Techniques*. Hermes House, London (2003)
7. Sun, Z.: Peep at Raku study. *J. Nanjing Arts Inst.* **06**, 202–204 (2009)
8. Branfman, S.: *Raku: A Practical Approach*, p. 17. Krause Publications, Iola (2001)