Contemporary art casting’s education in Guangdong

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Abstract: Based on the practical experience of establishing three art casting laboratories in three different colleges of Guangdong, this paper focuses on the development of contemporary art casting’s education. By analyzing the reason for the shortage of professionals nowadays and the characteristics of modern foundry industry in the Pearl River Delta, the authors try to find out what kind of knowledge structures a modern foundry industry professional should have. Then, from the viewpoint of education, the authors introduce how to combine the art casting laboratory and the creative art casting course as a new teaching pattern, on the one hand, to attract more students to study casting technology, on the other hand, to train them to be qualified professionals for the modern foundry industry.

Key words: art casting; education; Guangdong

1 Development of art casting education in Guangdong

Guangdong’s foundry industry has a long history. In the Ming and Qing dynasties, Foshan was known for its good foundry products at home and abroad. Nowadays, in the temple of the ancestors of Foshan, people still can appreciate two famous art casting works, a statue of Pak Tai (weight 2.5 tons, cast in the Ming Dynasty) and a bronze incense burner (weight 2 tons, cast in the Qing Dynasty), which have been considered as the symbols of Foshan’s foundry industry, reflecting its ancient technical level and prosperity [1]. Currently, by combination of traditional craftsmanship and modern technology, Guangdong’s foundry industry has been advancing with the times. By the effort of a group of famous masters such as Pan He (Professor at Guangzhou Academy of Fine Arts) and many famous enterprises such as the Foshan Crafts and Arts Factory, a large number of large-scale bronze cast sculpture can bring beautiful scenes to delight our lives [2,3]. In the 1950s, a casting speciality was set up in the Department of Mechanical Engineering, South China University of Technology. That was the beginning of formal art casting education in Guangdong. Over the next 30 years, it trained a large number of casting professionals; many of whom were later to become chief engineers, the technical backbones or directors of enterprises. Their contributions led Guangdong’s foundry industry to flourish. The casting education seemed to face a challenge in the early 1990s. At that time, few young people want to study casting, since the working conditions and the workshop environment of most of the foundries were not satisfactory. Then, the casting speciality was canceled at the South China University of Technology. After 2000, the shortage of professionals became more and more serious. In this period, on the one hand, the Pearl River Delta has become the world’s manufacturing base. Many kinds of products, such as home appliances, telecommunications, toys, decorative arts etc, are dependent on the parts supplied by the foundry industry. On the other hand, the development of equipment manufacturing and automotive industries brings a high demand for cast parts. When Guangdong’s foundry industry was placed in an important position, the shortage of professionals restricted the development of many foundry enterprises.

From the marginalization of casting education in the university, to the shortage of professionals, and to the welcome of art casting course in the university nowadays, these changes reflect the contemporary industrial and social development reality of the Pearl River Delta in different periods. As educators, we face two main questions today: how to attract more students to study casting technology? Then how to train them to be qualified professionals for the modern foundry industry?

For a long time, “dirty, disordered and tired,” is a near instantaneous first reflection whenever people talk about the word of “foundry”. Meantime, this has also been a student’s first impression of the foundry industry. These negative ideas hinder their enthusiasm to join this field. So, for the first question, the solution is to give them a positive perception of the foundry industry at the very beginning and motivate their interest in learning casting technology. The second question concerns two aspects. On the one hand, as an elective course

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Received: 2011-11-15; Accepted: 2011-12-20
currently, the teaching/learning time of the casting course is very limited. Therefore, some simple casting cases, like some bronze casting art works, can help the students grasp the complete casting process. Then, some of the latest casting technology can be introduced to the students in order to expand their horizons. That is good for their future development in this field. On the other hand, the needs of the enterprises ought to be considered. In the Pearl River Delta, most of the enterprises are export-oriented. The vast majority of foundry products are related to daily necessities. Following the foreign trend, the replacement of these products is very fast. That means great emphasis on creative design [4]. So it is important to make the students know how to apply their casting knowledge in their creative design. By constantly thinking and trying, a new teaching pattern, which combines the art casting laboratory and the creative art casting course, has been proved to be successful. This new teaching pattern can find a good balance among stimulating the student’s interest, teaching basic casting techniques and training modern casting professionals.

2 Creative art casting course

2.1 Knowledge structure of modern casting professionals

The teaching goal of the new creative art casting course is clear. It is to train students to be modern art casting professionals with the knowledge structure, as shown in Fig. 1. Specifically speaking, through this course, students should gain a capability of artistic appreciation and design, master the various types of metal casting technology, and know the process involved to develop new art casting products [5].

Since the new art casting course integrates knowledge that comes from multi-discipline, such as casting technology and equipment, aesthetics, sculpture, metallurgy, materials science, mechanics, chemistry, computer software applications etc, we published two new books about the Art casting materials in 1997 and 2011, respectively. The books were printed with large page format and are color illustrated. Following the spirit of both our cultural heritage and technological innovation, these new teaching materials are just like telling stories of art casting. Most of the art casting cases involved are presented from multiple perspectives such as history, art, science, casting technology and casting process. So that students can acquire knowledge of art casting and feel fun at the same time.
of the casting laboratory. The art casting laboratory has also been used as the classroom to teach art casting course. During the course, the teacher and all of the students sit in the middle of the laboratory. Before teaching casting technology, the teacher will introduce the characteristics of different art styles in different periods, from China to Europe. By this means, students can master the elements of different art styles and learn how to use symbolic language to enrich their designs.

2.3 Using real cases to teach casting technology

To teach modern casting technology, the choice of cases is important. In order to cultivate the students’ practical ability, real cases coming from factory products are better than the artificially invented ones. For example, when teaching lost wax casting, we use “Analects of Confucius pen container” as a teaching case, and discuss with the students, what are the differences between this casting method and other casting methods, why we need to use this casting method, what are its advantages and shortcomings, and so on. Then, through showing the silicone mold, the wax mold, the plaster mold and a series of samples, as shown in Fig. 3, we enable the students to visualize the entire process of lost wax casting. Through this process of cognition, the students can receive perceptual knowledge at the beginning, and gradually establish rational knowledge. Since the exhibits in the laboratory cover various types of metal art works and different casting methods, the teacher can very easily choose the appropriate case to introduce the casting knowledge that initially seems abstract, such as the selection of cast alloy materials, surface color treatment etc.

In order to facilitate the further studies of the students in this field, some of the latest casting technology is also presented to the students during the teaching program; such as how to process the huge foam (EPS) mold of a 70 m tall statue of the Goddess of Mercy, the use of rapid prototyping machine to make sample of the product and so on.

Fig. 3: Use a series of samples to explain a teaching case

2.4 Development of practical capabilities

It is important that modern casting professionals should possess the practical capabilities. The previous curriculum design stopped “on paper” eventually. At the end of the new art casting course, according to practical needs, the teacher will assign a design topic for the students to design and develop a casting art product. Students need to independently complete the design drawings of the product and write down the appropriate casting process. Finally, after discussion between all the students, the teacher will select several outstanding designs for market development. Students’ designs can become real products. As their creative achievements, the real art products will greatly enhance their self-confidence and develop their practical capability.

3 Three art casting laboratories built in Guangdong

In the past five years, we have built three art casting laboratories in three different colleges in Guangdong. The three laboratories are located at: South China University of
The art casting laboratory located at the Wushan campus of South China University of Technology was the first purpose-built laboratory. The exploration of the new teaching pattern of art casting education has been mainly done here. The Art Casting laboratory itself is located on the first floor of an ancient style building built in the 1930s, beside the courtyard garden. With the atmosphere of such a building environment, the art casting laboratory there exhibits a lot of reduced scale reproductions of famous ancient Chinese art works, such as bronze bells, bronze tripods etc. Also many reduced scale reproductions of famous ancient European sculpture, such as Greece goddess of victory, Rodin’s meditation and Poseidon copper and so on. To study and create in this laboratory, students can feel a strong historical and artistic atmosphere. Since most of the students having lectures here come from the School of Mechanical Engineering, the theoretical aspects of the teaching content will be put in more detail and in greater depth. Currently, in this laboratory the art casting courses have been taught to students for five years and a series of student works has been developed. For example, a student named Zhen Guowei majoring in Mechanics, class of 2008, designed a vase for the 2010 Asian Games in Guangzhou, this elegant bronze art work expressed their best wishes for this event. Another student named Wei Ling majoring in Industrial Design, class of 2010 designed a bronze sculpture called "Fly of the SCUT" which later gained the Excellent Award in the First Casting Process Design Competition for Chinese University Students in June 2010, held by the Foundry Institution of Chinese Mechanical Engineering Society. The products of this art work have been collected by many alumni of South China University of Technology. These two works are shown in Fig. 4. Besides undertaking the task of teaching, this art casting laboratory also supervised the manufacture of a bronze sundial (shown in Fig. 5), which has become a beautiful feature of the cultural landscape in the Wushan campus of the university.
The second art casting laboratory, shown in Fig. 6, attached to the Guangdong Lingnan Institute of Technology, was founded in 2010. Since the laboratory is located in a new teaching building, in which the exterior environment tends to be simple and neat, most of the exhibits in this laboratory are modern design casting works, such as “Flying to the Moon”, “Dancing Girls” and so on. As a vocational and technical college, students there seem to pay more attention to the study of practical technology. Therefore, in teaching the art casting course, the emphasis is more on introducing engineering skills and training their practical capability.

The latest art casting laboratory, shown in Fig. 7, has just been founded this year. It is attached to the School of Design of South China University of Technology, in Guangzhou Higher Education Mega Center. Since the students major in industrial design, the corresponding art casting course will focus on training their innovation and design capability. The students will learn the art casting knowledge from the designer's point of view. The purpose is to cultivate more ”upstream” talent for the art casting industry. Meanwhile, because of its strong art atmosphere, this laboratory has often been used to receive foreign guests, as a foreign exchange window to show campus culture.

4 Conclusions

In the past ten years, we have made a useful exploration on casting’s education, and found that the teaching pattern combining the art casting laboratory and the creative art casting course is much more acceptable to the students than the traditional ones. From art appreciation → selection of materials → casting technology and process → surface treatment → creative design → product development, this new teaching pattern can supply a full-scale knowledge and work skills training for students. Today, hundreds of students have taken this art casting course and some of them are already serving in the foundry industry as qualified professionals.

References


