Reform of the Training Program on Bisheng Excellent Engineer Education of Printing Engineering

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**Abstract.** In this paper, some reform ways and practice processes were introduced in detail, which involved cultivating jointly excellent talents, revising training program of excellence class, reforming the ways of teaching and examining, strengthening the international communication and training, improving the quality assurance systems for practical teaching. At the same time, it gave a brief summary on the recent four years works for Bisheng excellence class. The future plans were also drawn up at last.

**Introduction**

In February 2012, printing engineering, an undergraduate major of Beijing Institute of Graphic Communication, was allowed to carry out excellent engineer education and training program (shorted as excellence program) as one of the second batch lists given by Ministry of Education of P.R. China. The execution plan for excellent engineer education and training program was released in November of that year; Bisheng excellence class, the experimental class of excellence program, was held firstly in December, which showed that the cultivation works for higher innovative talents have reached a new stage. At present, the students of 2011\textsuperscript{th} Bisheng excellence class have graduated, and then the 2012\textsuperscript{th} grade students have completed the intramural professional courses and the training tasks including Graphic Information Processing Project and Color Management Project, and it also has finished production practice; The 2013\textsuperscript{th} grade students have achieved the Graphic Information Processing Project (making E-Book) and a series of visiting some companies; The students of 2014\textsuperscript{th} Bisheng excellence class have been in the stage of learning professional courses tensely. The 2015\textsuperscript{th} Bisheng class has been set up just now. In the past four years, our college has gradually reformed and explored the new mode of engineering education and talent cultivation according to creating a better learning environment and increasing the degree of practice teaching via outstanding teacher resource, so some remarkable performances have achieved.

**Cultivating Jointly Excellent Talents with Off-campus Practice Education Bases**

At present, the students’ cultivation of Bisheng excellence class has still followed the 3+1 model. During the one-year practical process, it has made the companies concentrate on instructing students practice by the way of centralized training and decentralized one alternately [1]. The 12 companies were selected as the practice bases, and two technical personnel from each company were invited as the enterprise tutors, which could focus on strengthening the students’ special practice training on printing workflow or modules. This training could develop the students’ abilities to find and solve the problem of printing technology in the mode of subject researches, printing solutions and process design. In the process of practice, the enterprise tutors put forward the total goal and weekly plan of the practical training on the basis of the production characteristics of their company and the students’ interest, and they required the students submit a summary report so as to track and guide students in the internship process [2,3]. The enterprises gave the students a high commend for their performances in practice, and they recommended 7 students to make their graduate designs at the
companies. Several students also discussed employment ideas with the internship enterprises. This strict management and directional guidance process have pulled into the distance between students and enterprises and enhanced mutual understanding and trust.

The school invited entrepreneurs to join the training plan workshop for the talented in Bisheng excellence class in November 2014, while offering their comments and feasible schemes for the project. Since then, it has scheduled subject lectures for students on E-Book production and new printing science given by technicians from Beijing Z-one Co., Ltd. and Beijing Hongbo-Haotian Co., Ltd. Such lectures helped to guide students’ discovery into innovated printing materials and technics, while enhancing enterprises’ participation over personnel development.

Revising Project Plan and Integrating Curriculum Systems for Bisheng Excellence Class

The 2014 training plan has been improved from the following aspects.

**Change in Training Objective.** Training specialized personnel in traditional printing mode was the goal of the 2013 plan. It was based on printing duplication, aiming to develop designing ability of printing process. In the 2014 project plan, the objective has transformed into developing high-end specialists that have abilities to coordinate with other printing-related industries, steer its orientation. The new plan is based on the principles of information processing and reproduction, using printing duplication as its mean, emphasizing the application of modern printing technology, technics designing and developing capabilities and information processing technology aiming at various media output methods.

**Adding and Modifying Certain Courses.** According to the shift in objectives, the course schedules for Bisheng excellence class were adjusted in the following ways. It added computer programming course in order to improve students’ related skills and the ability to use it in application [4]; Two elective specialties as material science and digital process were set up, which could guide the students to set own goals by their hobbies. It increased the number of limited optional courses according to transforming certain elective courses, having an important influence in developing students’ researching abilities and structuring knowledge systems, into limited optional ones; Moreover, some courses, such as Variable Information Printing Technology and Printing Standards and Applications, were set to apply to modern digital duplication and quality control technologies; The course range of printing process technology was extended as Function Printing substituting for Specialty Printing; three bilingual teaching courses were established in order to increase the English application for students in printing fields.

Reforming Teaching Methods and Improving the Ways of Curriculum Assessment

The school increased the enterprises participation during the teaching process of the 2012 Bisheng excellence class. For example, in the Principle and Technology for Postpress Finishing curriculum, the technicians from Beijing Leigh-Mardon Pacific Packaging, Co., Ltd., Kurz, Co., Ltd. and Henkel Co., Ltd. were all invited to give speeches in class. These lectures gave the students a vivid experience to the current status and effects of such applications, which including packaging technology and sample analysis of cigarette case, anodized aluminum foil application and binder components.

In order to create more opportunities that students can learn and contact with industry directly, the school selected 15 students from the excellence classes for the first time and then sent them to attend the All in Print China that was held in Shanghai in November 2014. Every student participating in the exhibition reported the seen information to other students after visiting. The school also invited the off-campus experts, from the Printing Technology Association of China, the KBA Co., Ltd. and Beijing Hongbo-haotian Co., Ltd., to make a presentation on gravure printing, metal printing, commercial form and certificate printing for excellence class students. Besides, they answered questions on the scene for students. At the same time, in order to determine the students to the
professional identity, the school organized the students to investigate several printing and packaging enterprise in Langfang and Tianjin.

Using diversified evaluation methods, instead of traditional one that only paid attention to the experimental results, the school assessed correctly the students’ experimental achievements with the results and process as a whole, and lead students to change the way of study and exam into the way of study, thinking, research and innovation [5]. In the Printing Process Project course opened only for Bisheng excellence class, it has the requirement that students must design works by themselves and then choose the printing way and the related equipment system to obtain the final processing products. Finally, according to giving the score of practical operation, doing assessment of students’ internship report and asking the students certain questions randomly, it could carry out the assessment on the engineering training.

**Strengthening the Communication and Training for Improving the Students’ International Abilities**

Increasing the use abilities of language and mastering the development trends of international printing technologies have been important works for international connotation constructions. To increase the students’ abilities of use language, some bilingual courses and international lectures were carried out. The bilingual courses included Printing Quality Control and Standard, Digital Workflow, Printing Materials and Printability. Several experts from Swiss and Germany presented security printing, metal printing and the printing standard. These ways not only strengthened the students’ professional skills and communication abilities, but also improved their international perspectives.

Besides, an agreement of cultivating jointly the exchange students was signed between our school and Linköping University in Sweden in the last year, which could send about 5 students to the other school every year. The exchange learning has lasted for one year in order to push forward the professional learning and language training for excellence class students.

**Improving the Practical Quality Assurance Systems and Promoting Students Success through Various Channels**

After summer production internship for 2011th and 2012th grade excellence class students, their internship achievements depend on the evaluations from instruction teacher and enterprise tutors and the quality of internship report submitted by the students. The internship monitoring and evaluation of the result represented truly the students’ internship performances [6].

The school has promoted students to participate in the declaration and research on Beijing municipality college students’ research programs, and participate in various competition such as professional design competition, innovation and entrepreneurship competition and vocational skills competition. It can not only make students get exercise and improvement, but also won the honor for the school. Besides, the school set up Innovation Print professional printing competition so as to guide students to put forward printing design and processing plan using what they learned, and then they can solve the actual problem and accept inspection and evaluation of the professionals.

The school has encouraged and promoted excellence class students to participate in the international competition as Shots printing simulation software. The organizing committee of the contest employed the previous winners to conduct professional training for students, and organized actively the students’ training processes. This international competition could test strictly and appraise the students’ abilities.

**Future Plans**

The next key work would be the implement of new excellence program, which involved the design
of 2015 training programs, the raise of the practice teaching and the improvement of the mechanism of selection and withdrawal for Bisheng excellence class. In addition, the preparation works for the evaluation and inspection of excellent engineer education would be carried out gradually.

**Conclusion**

From the above illustrations and analyses, the following conclusions can be obtained:

Five reform ways and practice processes were introduced and explained in order, and the future plans and work ideas were proposed. At last, it gave a brief summary on the recent four years works for Bisheng excellence class.

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