Construction and Practice of Practice Teaching System Based on Printing and Packaging Characteristics

Yong-Gang YANG¹,a, Yue-Heng DING¹,b, Zheng-Tan WU¹,c and Qiao-Zhuo GAO²,*

¹Beijing Institute of Graphic Communication, Beijing, China
²The Emerald City Branch of Beijing Primary School, Beijing, China

a2207063089@qq.com, b1395962420@qq.com, c wuzhengtan@bigc.edu.cn, *gaoqiaozhuo@sina.com

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Abstract. In order to better serve the printing and packaging industry and highlight its characteristics, it is essential to build a relatively perfect practical teaching system. This paper first introduces the composition and construction of the practical teaching system, and then focuses on practical training, social practice, curriculum design and graduation design and other practical teaching methods and the ultimate results. Perfect practice teaching will certainly be conducive to the cultivation of practical and innovative talents.

Introduction

Printing and Packing institute is the backbone of Beijing Institute of Graphic Communication. It has the pilot specialty of "Education and Training Plan for Excellent Engineers of the Ministry of Education"—Printing Engineering. It also has the "Beijing Demonstrative School Innovation Practice Base”—Comprehensive Innovation Practice Base of Printing and Packaging. In the past three years, based on the industry characteristics of printing and packaging, Printing and Packing institute has constructed a relatively perfect practical teaching system, and carried out practical teaching such as practical training, curriculum design, graduation project and social practice, with good results.

Construction of Practical Teaching System

The practical teaching system of Printing and Packing institute mainly includes the experimental courses of basic subjects and professional courses and their curriculum design, practical training or comprehensive training, graduation project (thesis) and scientific and technological innovation activities (second classroom).

The experimental courses include three types: verifiability, design and comprehensiveness. The experimental courses of core courses generally account for 15-25% of the total class hours. The important properties of materials, technological principles and design methods involved in the courses are designed and verified through experiments. It can deepen understanding and exercise students' practical operation and innovation ability[1].

Course design, practice training or comprehensive training are all belong to the centralized practical teaching link, which is the extension of the course. Starting from a certain practical goal and task, comprehensive design and training are carried out, generally lasting 1-2 weeks. Through the combination of theory and practice, students' abilities of analyzing and solving problems, engineering design and operation management are emphatically trained. Course design provides syllabus, task book and scoring criteria. Students are divided into groups of 3-5 people to design the course plan, and cross to complete different design tasks. Teachers check the reliability of test data, the rationality of work flow and the achievement of design goals at last[2]. Understanding practice, professional
practice or skill training, skill practice of printing engineering, packaging engineering and polymer materials and engineering are usually arranged in school practice factories (printing comprehensive training center) and printing and packaging comprehensive innovation centers, under the joint guidance of teachers and factory teachers.

Production practice and scientific and technological innovation practice, graduation project and so on, are generally arranged in enterprises outside the school, in order to integrate the theoretical knowledge which learned in school with the actual production process of enterprises, so that students can understand and familiarize the basic structure of equipment, working principle, production process and quality control methods of printing and packaging products. If the practice conditions permit, they can also complete some simple start-up operation and two-color, four-color printer under the guidance of the enterprise mentor, to achieve the real purpose of practice[3].

Graduation project (thesis) is the last teaching link and the most important part of practical teaching for college students. In the past three years, the Printing and Packing institute has increased its guidance on the topic selection of undergraduate graduation project (thesis), advocated students to do the real topic, and encouraged teachers to select part of the tasks from the horizontal and vertical scientific research topics as the graduation project. At the same time, the Printing and Packing institute strives to implement the political education into professional education. According to the requirements of the new era, new orientation and new request of the graduation project, the Printing and Packing institute will guide teachers and students to carry out relevant research from the perspectives of inheriting printing civilization and innovating media culture, integrate printing civilization and red printing culture into graduation projects, and complete unique and meaningful finished projects or thesis[4]. The whole graduation project process from the beginning to the mid-term examination, and then to the final reply, should submits materials in the completion system, completes the examination and marks, not only avoids the lag of work in some links, but also achieves the traceability of the graduation project.

Scientific and technological innovation activities refer to extracurricular practical activities or specialized training projects related to courses, such as practical training programs, national and Beijing undergraduate research programs or deepening training projects, various disciplines competitions and double-creation activities. The innovative activities are supported by special funds or awards. Teachers and students are enthusiastic about participating in the activities. They can also produce some high-level research results. Students' innovative ability and engineering practice ability can be effectively developed and exercised.

The Situation of Experimental Teaching and Laboratory Opening

As a secondary engineering college of Beijing Institute of Graphic Communication, It always attached great importance to experimental teaching, focusing on the cultivation of students' practical ability and innovative consciousness. Through the construction of experimental teaching platform (teaching laboratory and innovative practice base), the reform of experimental teaching faculty, the innovation of experimental teaching methods and means, students are encouraged to design experimental process and verify experimental conclusions independently, continuously improve students' spirit of exploration. The experimental teaching includes in-class experiments, concentrated practice and other teaching links. For the theoretical courses in the first classroom, whether basic courses or professional courses, the compulsory courses include in-class experiments (experiments or computer), and the core courses include curriculum design (or engineering training, professional skills training, etc.); in the elective courses, nearly two-thirds have in-class experiments (experiments or computer). At the same time, there are metalworking practice, electronic technology practice, professional practice, production practice and other internships, as well as independent experiments, graduation projects and other centralized practice links. At present, the experimental teaching of various specialities in Printing and Packing institute can basically reach 25% of the first class, and the Bisheng excellent class can reach 30%, which lays a foundation for the cultivation of applied talents.
The Laboratory of Printing and Packing institute has formulated opening management measures to expand the openness and radiation of the laboratory through visits and joint training of personnel and cooperation in surgical research. In the past three years, relying on the comprehensive innovation practice base of printing and packaging, Bisheng Excellent Class, Creative Printing Design Competition and Packaging Double Creative Design Center, we have continuously strengthened the opening exchange of platform resources, and attracted social forces, such as enterprises, to participate in the research, product design and to promote the cultural heritage and education of experimental or practical innovation projects. It can strengthen the function of personnel training and social service in our institute[5].

Implementation and Effect of Practice Training, Social Practice, Course Design, Graduation Project (Thesis)

Implementation and Effect of Practical Training

Practice training is an important link of combining theory with practice. Practice training in Printing and Packing institute is mainly implemented through a series of practice training courses and skills training courses, which are completed in various training centers or practice teaching bases both inside and outside the school. The following aspects of work have been carried out.

In order to do a good job in practice and training, it is generally necessary to use 2 hours to do a practice mobilization, including ideological mobilization, safety education, explanation of practice and training plans and publication of assessment methods. At the same time, the Printing and Packing institute should arrange the practice instructors to communicate effectively with various practice enterprises, determine the practice plans, the quality monitoring and assessment management methods, strengthen the management of the practice process, and effectively promote the practice and training work[6].

To sum up, in the past five years, the training works both inside and outside school have achieved good results because of the clear objectives, orderly arrangement and emphasis on process monitoring, and enthusiasm of students for participation. A stable school-enterprise cooperation relationship and a team of instructors both inside and outside the school have been formed, and good results of practice and training have been achieved.

Implementation and Effect of Social Practice

Social practice is the thematic off-campus exploration and practice activities which combine students’ professional knowledge with social demands. Generally, there are at most six members and at least three members in the group which supported by the school funds. It is of great significance to carry out social practice activities to guide college students to go out of the campus, to the vast world, to shoulder social responsibility, and to investigate hot spots and key issues in the development of society and industry with a sense of industry mission. Printing and Packing institute actively declares social practice topics to the school on the theme of inheriting and promoting printing civilization, innovating and developing media science and technology. Practice cycle is usually 7-10 days, after the practice, the group have to write a detailed social practice survey report. The most excellent one will be recommended to participate in the evaluation of outstanding achievements in summer social practice of college students in Beijing.

In recent years, Printing and Packing institute has successively obtained advanced social practice workers, advanced individuals, excellent teams and excellent achievements of the summer social practice of capital college students. It has had a wide impact on students, and has a positive role in guiding students to "patriotism, love school, love specialty".

Implementation and Effect of Curriculum Designs

Printing and Packing institute requires that professional compulsory courses must be offered curriculum designs, so that students can deeply understand and grasp the basic concepts and working
principles of professional courses in the design and comprehensive training. Currently, 80% of the core courses of printing engineering specialty have curriculum designs, one non-core compulsory course "Digital Image Processing I" has set up a curriculum design, and another non-core compulsory course "Digital Workflow" and "Graphic Information Processing and Reproduction I" have set up a "Graphic and Text Processing and Digital Processing Course Design". There are eight core courses in Bisheng Excellence Class of Printing Engineering, but nine engineering training courses have been set up (Table 1), which lays a foundation for improving students' innovation abilities and practical abilities in an all-round way. There are eight core courses in packaging engineering specialty, but there is no curriculum design in transportation packaging and packaging technology, and the training of packaging design skills has been strengthened. There are nine core courses in polymer materials and engineering specialty, but only three of them have curriculum designs. There is no curriculum design for courses like chemical principles, printing and packaging materials, polymer materials forming and processing. This is not conducive to professional students to design, synthesize or modify printing and packaging materials from the perspective of polymer materials[7].

Table 1. Courses and Engineering Training Courses for Bisheng Excellence Class of Printing Engineering.

<table>
<thead>
<tr>
<th>No.</th>
<th>course</th>
<th>credit/hour</th>
<th>semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Graphic and Text Design (Basis of Visual Application)</td>
<td>2/two weeks</td>
<td>2</td>
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<tr>
<td>2</td>
<td>Course Design of Color Science and Technology I-I</td>
<td>1/one week</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Design and Production of Digital Interactive Media</td>
<td>2/two weeks</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Color Management Course Training</td>
<td>1/one week</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Course Design of Graphic and Text Processing in Graphic Printing</td>
<td>1/one week</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Printing Technology Training (SHOTS)</td>
<td>2/two weeks</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Training of the Establishment of Printing Quality Standard System</td>
<td>2/two weeks</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Printing Material and Adaptability Course Design</td>
<td>2/two weeks</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Product Forming Training</td>
<td>2/two weeks</td>
<td>7</td>
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Implementation and Effect of Graduation Project (Thesis)

Printing and packing institute attaches great importance to the implementation of graduation project (thesis) work. At the beginning of November each year, the graduation project work schedule should be submitted to the school, and according to the plan, the project declaration, student topic selection, task book issuance, student writing report, organizing to propose a thesis and expound its feasibility, organizing mid-term examination and mid-term defense, revision and finalization of graduation thesis, duplication of graduation thesis, graduation theory should be organized. Printing and Packing institute actively introduces enterprise resources into graduation project, and encourages students to explore and investigate key technologies or medium-term and long-term development plans in practice units. Every year, students do graduation projects in enterprises, and they are jointly guided by tutors in schools and enterprises to complete the project. The mid-term reply can be conducted by remote video, which provides convenience for students to the greatest extent and ensures the continuity of graduation projects. At the same time, in order to better display the results of graduation projects and publicize the characteristics and highlights of personnel training in Printing and Packing institute, it has organized a graduation project exhibition in the past five years. Especially since 2017, about 30% of the outstanding graduation project works have been selected from the three majors of the whole Printing and Packaging institute to participate in the joint exhibition of outstanding achievements of school graduation projects[8]. The unique presentation of three-dimensional books, the application of functional printing electronics and intelligent packaging, the design and production of digital media interactive works and the excavation and expression of red printing culture are fully displayed in the finished works. It also conveys to the society and industry that the Printing and Packing institute is still spared no effort to inherit printing civilization, adhere to printing authenticity and innovate the future of printing.
References


