



Discussion on Teaching Mode of Garment Industry Plate Making Based on the Background of Industrial Technology

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Abstract. This paper selects the major of clothing “industrial template design” course practice training guidance strategy as the entry point, and combines the latest development of garment industry technology, so that students can master the latest science and technology, adapt to the enterprise, and make study serve the practical purpose. This article is guided by conduct course training guidance strategy exploration with “industry-university cooperation”, “field research”, “analogy reasoning” and other training methods. After three stages of teaching, the students completed from the “principle derivation and practical training to extension experience” of advanced learning, students know the “industrial template design” course from “ignorance, knowing, practice and expanding to summary” the process of acquiring skills course after the review.

Keywords: garment industrial plate making · industrial technique · practical training

1 Introduction

“Industrial template design” is a professional course for the junior students majoring in fashion design and engineering. As a highly technical work, the course is professional and covers a wide range of knowledge, involving many knowledge such as garment industry production technology, garment processing industry, import and export garment trade, garment marketing and management, fabric properties, etc. It is also an important link for students majoring in garment to enter the garment industry.

We summarized some problems in students’ practice after practical training of the garment industrial template design course. It is the first principle that the principle of plate making in the garment industry is very strong, which often make students confused and difficult to start in the study of the principle, and further make them lose interest in the course. Therefore, there is the phenomenon of reading according to the book and they mechanically follow the data of the coding point given by the teacher, but they don’t know why when asking questions, which leads to the failure of the transformation from principle to practice. In the later learning, it is rigid and unable to adapt to circumstances, and can not be applied to problems in work. This is also why businesses often make

complaints about what college students need to retrain their skills. How to take apart the pushing plate principle step by step and teach it to students easily, so that students can fully understand it, apply this knowledge to practice, connect with garment enterprises and be able to adapt to different styles, which is an urgent problem to be solved in this course.

2 Practice and Exploration of “Industrial Template Design” Course

The main task of industrial template design course is to enable students to master the skills and rules of garment industry punching, industrial template pushing and industrial template making, draw the professional skills of industrial template required for garment production and understand the working ability required for the professional post of industrial template making in the enterprise. When introducing this course to students, students should clearly understand the concept of “industrial template”. Its future environment must meet the mass production needs of garment enterprises. In template making, we should consider the style, fabric, specification and size. These data are determined by the enterprise after comprehensively considering the factors such as market, cost, audience, region and so on. For example, enterprises must consider the performance of fabrics when designing a series of paper patterns. Taking the shrinkage of fabric as an example, under the experimental conditions, it measures the length of the sample in the warp or weft direction (L/mm) before immersion in water and the length in the warp or weft direction (Y/mm) after immersion for 24h under corresponding conditions according to the national standard. Therefore, the calculation formula of sample shrinkage S (%) is as follows [1]:

$$S = \frac{L - Y}{L} \times 100\%$$

Then, if you are required to make a skirt with mulberry silk fabric, the skirt length is 100cm and the warp shrinkage of mulberry silk is 5%, you can calculate that the fabric to be cut by the skirt $L = 100 \times (1 + 5\%) = 100 \times 105\% = 105(\text{cm})$ according to the experimental formula. The above knowledge is learned in the prerequisite courses of the student training program. In this course, the teacher still needs to briefly describe it to achieve the role of review and emphasis, so that the students can understand the skill points required by this course and pave the way for the follow-up principle practice. When carrying out the practical knowledge content of the “industrial template design” course, the teaching method is set in the order of “principle derivation”, “practical training” and “expanding experience” [2].

2.1 Principle Derivation

The first stage is to solve the problem of “what is the principle of garment industry template design”. How to make students understand the understanding principle easily? The understanding principle is mainly introduced from the principle criteria, methods and basis. The principle of garment plate making comes from the similarity transformation

of any graphics in mathematics, so teachers can infer the law from simple graphics analogy. Simple words are boring and difficult for students to understand, but they can be expressed by simple graphics (Table 1) [3]. Through simple graphic inspiration, students can find the development law between graphs and understand different drawing methods. After the above explanation, the students discuss in groups and find their similarities and differences in the form of discussion: the graphics only change in size, but still maintain the original rectangular shape, which also makes the students deduce the key principle of template pushing through classification, induction and summary: the consistency of structural modeling is the unity of “shape”.

However, in the template pushing of garment industry, because each part of the human body is different, it is not as simple as rectangular zoom and the zoom size of each part is also different. Therefore, when determining the push drawing drawing method, we should also consider the zoom on the same coordinate axis. When teaching this part of knowledge, we should also grasp students’ acceptance ability from shallow to deep (Table 2). We ask students through heuristic methods: why design baselines? What is the application principle of the datum line (Fig. 1)? Through thinking about relevant problems to deepen students’ impression, we summarize another key principle of pushing board: template pushing is the reproduction of template making and the change of quantity [4].

Table 1. Simple Graph Representation and Drawing Method

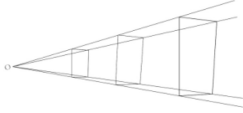

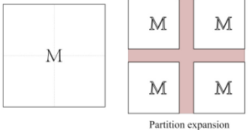
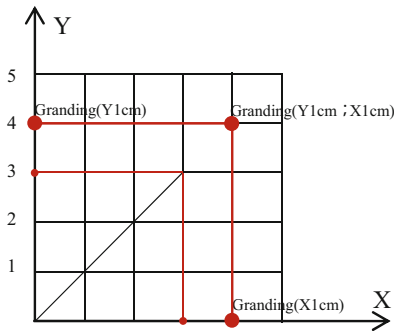
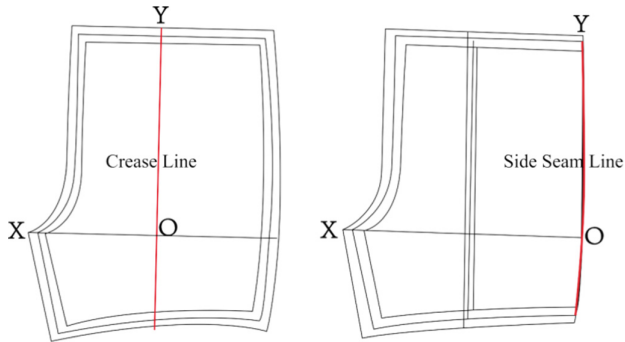
Ray Method	Crotch Difference Method	Segmentation Method
		

Table 2. Two-way Coding of Same Datum Line





a. The reference line is the crease line and the side seam line

Fig. 1. Using Simple Pictures to Represent Different Skill Points in Teaching. a. The reference line is the crease line and the side seam line

After teaching the principle, the practice of basic garment prototype can be carried out in the second class. The basic garment is the simplest and easiest to start, and the principle can be tested and consolidated at the same time. There are many ways to push the garment plate, but most enterprises often use the crotch difference method in pushing the garment plate. According to the education policy of applied talents, the use of crotch difference method will be mainly taught in the following practice. In terms of the blouse prototype template pushing, we should ask questions and answer questions in time. For example, the armhole depth formula: $\text{chest}/6 + 7$ [5]. By analyzing the values of S and M models, it can be found that the difference between the two sizes is only related to $\text{chest}/6$ and the looseness of 7 cm can be ignored, which is an important calculation rule in crotch difference method. Completing template pushing can verify the industrial template pushing principle: quantity change and “shape” unity. After the training of garment base, the students check themselves: whether they understand the principle of plate making; whether the pattern-making design violates the principle. Students should not only be able to correctly get the point code data, but also know how the data is calculated. And only in this way can they achieve the skill goal. Through combing and practicing, students can gradually clear their minds and realize the significance of this course.

2.2 Practical Training

The second stage is to solve the problem of how to use the principle for practical training. Garment industrial template design is a course that requires a lot of practice to achieve the course objectives and consolidate knowledge. After the first two courses, students have basically realized the principle of template making. At this stage, through the industrial template design of various classic garment shapes, students can master the coding formula and pushing method of various garment, and master the industrial model design and production of garment changing styles. Through plenty of training, teachers

lead students to find out problems and solve them together. In the process of practice, teachers should pay attention to three principles:

- 1) *Explanation and application of technical equipment.* Pattern making in the garment industry is a course that depends on industrial equipment. Teachers should effectively introduce the application techniques of garment CAD/CAM equipment to students in the teaching practice session. For example, CAD software commonly used in the garment industry, foreign software such as OPTITEX(PGM), Gerber AccuMark, Lectra, Sunrise and so on. Domestic software such as ET, Richpeace, Modasoft, etc. Teachers can focus on explaining the software used by the internship enterprises. For example, ET is simple to operate, easy to master, and powerful (Fig. 2). It is a commonly used software in domestic enterprises [6];
- 2) *In practical cases, the garment style should be representative and expansive.* For example, teachers let students do the template pushing practice of suits and skirts, and then do the template pushing practice of A-shaped skirts to achieve the teaching effect of drawing inferences from one instance. And case style should be market-oriented. The teaching materials used by teachers may lag behind the current popular styles in the garment market, so when selecting cases, we should investigate the popular specifications and sizes in the market. For example, the shoulder width, chest circumference and other specifications and sizes of the current popular women's oversize sweater change more than the slim style. Meanwhile, it adds the research training that students conduct market research in groups to observe the changes of specifications and sizes in the current garment market and consumers' trial feelings; teachers can choose the best case from the cases provided by students as teaching cases to increase students' sense of participation in this course;
- 3) *Explain special cases appropriately.* During the market research, the author found that cheongsam as the quintessence of China was originally a single cut and single fashion product, but there are many cheongsam manufacturers with mass production have appeared in recent years due to the huge consumer group. After investigating the market and visiting enterprises and experts, it finally summarizes and determines the style, specification and size, structural design and size of ready-made cheongsam, and explains it to students in the course, so that students can understand the personalized development in the ready-made garment market. Through the explanation of special cases, students can not only connect the courses before and after, but also have a good inspiration for the pushing, blocking and coding of senior graduation works.

2.3 Extension Experience

In the first and second stages of learning, students have accumulated a lot of practical training experience, so it is to solve how to use experience for comprehensive expansion practice in the third stage. According to the cultivation of applied talents, the ultimate goal of this course is to meet the market demand. Teachers lead students to conduct market enterprise research, understand the whole process of garment from fabric to ready-to-wear and finally into the store, write internship reports and independently complete a series of garment designs according to the research. The main contents to be completed by students include garment product name, effect drawing, style drawing (style description;

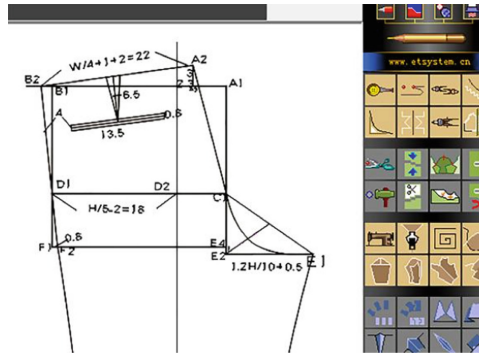


Fig. 2. ET Software Application

specification/cm), structural design and pushing and blocking. During the third stage of practice, teachers and students should maintain communications at any time and give relevant guidance. The design of works should take the market, cost, crowd, etc. into consideration; the comfort shall be considered in the design of specifications and dimensions; unreasonable plans shall be revised in time and the final plan shall be determined.

After the comprehensive training, the teacher and students discuss together. Student A introduces his work design and ideas, the teacher and other students raise questions, student A answers and finally student A makes a summary of the work orally. Comprehensive extension exercises effectively train students' knowledge and skills, and enhance students' sense of community and social responsibility as future designers to serve the people.

3 Teaching Results and Analysis

After three stages of teaching, the students completed from the "principle derivation and practical training to extension experience" of advanced learning, students know the "industrial template design" course from "ignorance, knowing, practice and expanding to summary" the process of acquiring skills course after the review, the student feedback, the class first class he is confused, I feel that the course content is complicated and difficult to understand, but after learning from easy to deep, I have mastered the principles and laws of plate making, and can easily solve the later complicated garment plate making. We also collected part of the students' opinions at the same time and the teaching results summarized are as follows.

3.1 Introduction Stage

In the first stage of principle derivation, most students can clearly understand the principle of garment template making, which has laid a good foundation for subsequent practice. It improves the students' abilities of observation and thinking, reasoning and judgment, analysis and problem-solving [7].

Problem finding: some students rely too much on teachers' courseware and black-board writing, and can not fully understand the principle. So summarize the improvement measures.

- 1) *While teaching in the whole class, teachers can join the teaching mode of one-to-one guidance between teachers and students and one-to-one mutual assistance between students and students.*
- 2) *sampling diversified teaching equipment can make full use of garment CAD, PPT, network video, flash and other equipment to interact with students and assist students in understanding.*

3.2 Theoretical Cognition Stage

In the second stage, the students successfully completed the industrial template design of various garment styles, summarized the law of template pushing in garment industry, verified the principle of industrial template design and improved the students' ability of industrial template making. The fashion trend of the garment market is changing rapidly. In the next teaching, teachers should have an insight into the popular styles of the market, constantly cultivate comprehensive quality and strengthen the learning of experience.

3.3 Cooperation Between Colleges and Enterprises

The comprehensive training of the third stage is the embodiment of teaching objectives and tasks, and students have mastered the complete ability of garment imitation technology and garment industry template making. Through the course practice, students are trained to establish good social ethics, personal ethics and professional ethics, and improve humanistic quality.

Problem finding: Students have a vague understanding of the production process of the garment industry.

Reform measures: Strengthen the industry-university cooperation of this course and form school-enterprise cooperation course.

- 1) *students can enter enterprises for short-term internship to supplement the knowledge vacancy of traditional courses.*
- 2) *business mentors come to campus to share market experiences and the latest methods of enterprise template making with students.*
- 3) *teachers will study in enterprises and constantly enrich their experience and knowledge.*

4 Conclusion

In the teaching modules of "principle derivation", "practical training" and "extension experience", they simply introduce the industrial template pushing principle, consolidate the students' grasp of the basic principles, transform the knowledge into practical training and complete the construction of the whole knowledge frame of the course. There are still some shortcomings in the teaching reform: for example, the lack of the introduction of modern intelligent equipment in the teaching process, and the introduction of enterprise

mentors under the premise of the education and cultivation of applied talents. With the development of the garment market, garment is bound to enter a new level with big data and artificial intelligence technology, and the production technology of the garment industry is constantly developing. Enterprises are bound to continuously update production equipment. Teachers should constantly update their technical capabilities and teaching methods, introduce advanced technical means, establish the ideal and belief of “lifelong learning”, consolidate basic theories and enrich market experience according to market demand. The author will continue to learn the latest technology and explore in depth.

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