

# A Strategic Study of Establishing the Industrial Needs in Pattern Design and Technology in Mainland China

Joe S. AU(欧秀全)\*, Allan C. CHAN(陈志驹), ZHANG Lei(张雷)

*Institute of Textiles and clothing, The Hong Kong Polytechnic University, Hong Kong*

**Abstract:** Pattern design and technology play a very important role in the garment industry. In order to improve the level of pattern making and design of the garment industry, a survey was conducted to investigate the industrial needs in pattern design and technology in mainland China. The data were collected from the employers and employees from the garment industry and students in the major of fashion and clothing studies. It indicated that there was a gap between the employer and employee especially the requirements of the industrial needs and the course contents covered by the tertiary schools. The employers expected to recruit more experienced pattern designers at the same time they were not reluctant to hire fresh graduates and spent more resources on the training of employees. The students knew little about their employment situation of the garment industry, spent too little time on the course study and learned too little practical skills in pattern design. They could not make use of the knowledge which prevented them from being employed by the garment industry. Efforts should be taken by both the tertiary schools and the garment industry. The students should be aspirated towards the profession of pattern cutters and the syllabuses of pattern making should be more practical and industrial orientated. The solution might benefit the garment industry a lot in a long run.

**Key words:** pattern design and technology; skills of pattern cutters; needs of garment industry

**CLC number:** TS 941      **Document code:** A

**Article ID:** 1672-5220(2007)04-0488-06

## Introduction

Fashion and clothing industry is one of the most important industries in mainland China. The textiles and clothing trade plays a very important role in the economic prosperity and growth of China. In 2005, the total export of garments and clothing accessories in mainland China exceeded US \$61 billions<sup>[1]</sup>. However, problems still exist in the garment industry, as many garments manufacturers cannot meet the requirement of the international buyers, which limit the competition advantages in the international environment. Pattern design is one of the most important

processes in the garment industry, which directly affect the quality of the ultimate products. As far as the garment industry is concerned, the lack of pattern designer has been reported currently in the literature<sup>[2]</sup>. It has been identified that fashion and clothing industry in mainland China is faced with a shortage of pattern designers and technologists. The education status, learning motivation and employment attitude of the students have great effect on the aspiration of working in a specific industry<sup>[3-7]</sup>. Furthermore, there is a constant demand of skilled pattern designers and technologists who are capable to meet the needs of the industry.

By now, no detailed study has been reported on the employment ideas of the students studying fashion and clothing in China. Concerning the controversial phenomenon facing the college and the labour market, a study was conducted and aimed to identify the possible factors that may significantly influence the students' choices of future careers. It helped us to understand the wants and needs of the industry. More reasonable courses and academic programmes can be offered to the students and specialists in this area according to the real needs in the industry which will benefit the garments industry in a long run.

## 1 Method

Data collection was completed either through personal interviews or questionnaire surveys. Three different groups of respondents constituted the total samples from mainland China and they were the employers of garment industry, employees working as pattern cutters and students studying fashion and clothing. The questionnaires of the different groups were specially designed according to their special situation. The questionnaires of employer and employee were divided into 4 parts with some differences in details. The first part was intended to collect the company background information. The second part aimed to gather information on the present situation of the company. The third part focused on the present situation of the pattern cutters. The fourth part concerned with the present situation of the staff training. The questionnaires of the students were made up of four different parts and they were the student background, course details, and knowledge on garment industry and opinions on employment as pattern cutters.

\*Received date, 2006-10-05

\*Correspondence should be addressed to Joe S. AU, Dr., E-mail: tcjoeau@inet.polyu.edu.hk

A total of 435 respondents were successfully either interviewed or returned the questionnaires. There respondents were made up of employers (27 respondents) and employee (103 respondents) from garment industry of mainland China, and students (325 respondent) in the major of fashion and clothing in mainland China, the details of the respondents are shown in Fig. 1.

Different types of companies were included in this investigation, non-corporate firms, limited liability companies, limited liability company shares, and individual industrial and commercial households, state and private enterprises and private partnerships, etc. They were companies with different business status and were involved in different or similar types of garments products dealt with domestic or international market. The students were from different grade level with different education background. Therefore, results of the questionnaire could reflect the present status of pattern making and design in the garment industry and education systems. The reliability of the investigation was sound.

## 2 Results and Discussion

### 2.1 Present Situation of Company

Data of the present situation of company were collected from the employers and employees of garments industry from mainland China. It was found that half of the companies developed new clothing and process according to sample for domestic or international market. They were involved in different types of garment production; menswear, womenswear and also childrenswear, details of the garments types produced were shown in Fig. 1. Most of them supplied patterns to their clients and the satisfaction level was good in the fit and sizing of the garments production. As for an important process of the garment production, pattern design was paid enough attention which resulted in the good quality. Most of the companies were willing to use new technologies in their current production processes. Some of the companies still were unable to use new technologies because they were lack of funding available for investment.

Table 1 and Table 2, which were collected from the questionnaire of employers and employees respectively. Nearly all the employers recruited the pattern cutters by advertising and personal recommendation. The attitude of the employers on the employment was shown in Fig. 2. More than 60% of the employers thought that it was very hard to recruit skilled cutters, as the human resource market was shortage of skilled cutters. In addition, they were not reluctant to use freelance pattern cutting services, and the data of those who used is below 20%. Unfortunately, more than 50% of the employers in mainland China did not employ students without work experience because when they recruited new staff, industrial experience and skills of pattern design were the most considerable factors. One reason for this situation was that nearly 60% of them wanted to hire the pattern cutters with more than 5 years working experience. The data collected from the employers also showed that nearly 10% of the employers were very satisfactory with their employee and 80% more were satisfactory with their work. From the data collected from the employees, it was found that nearly half of the respondents had working experience over 7 years in the garment industry. The difference between the working experience in the garment industry and in the present company also indicated that most of the employees had experience in changing their job. In a long run, the frequency of changing job was not high. The data indicated that most of the employees did not have a qualification in pattern. As for their pattern cutting, they adopted both flat and draping in their pattern design by manual pattern or with the help of fashion CAD. For a successful pattern cutter, they thought that the skills of the pattern design, pattern cutting for samples and CAD/CAM pattern cutting were very important. In order to be successfully hired, most of them thought that personal recommendation was a better way comparing to the recruitment agencies.

**Table 1** Present situation of pattern cutters, data collected from the employers

Mainland employer (27 respondents)					
Employee recruit mode	Advertising		Self recommendation		Recruitment agencies
	14	16	7		
It is easy to recruit pattern cutters with the required skills?	very easy	easy	common	difficult	very difficult
	—	1	9	17	—
Work experience required for pattern cutters?	1-2 yrs	2-3 yrs	3-4 yrs	4-5 yrs	> 5 yrs
	—	4	5	6	12
Use of freelance pattern cutting services	Regularly	Occasionally	Never		
	—	9	18		

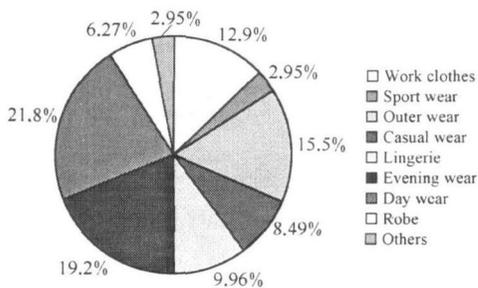


Fig. 1 Types of garment be produced in apparel industry of mainland of China

### 2.2 Present Situation of Pattern Cutters

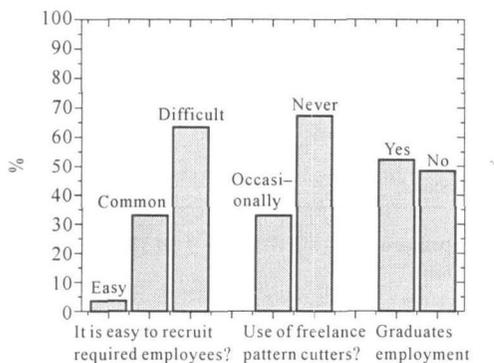
The present situations of pattern cutters were shown in

(Table 1 continued)

Mainland employer (27 respondents)					
Evaluation of your present pattern cutter's level	very good	good	common	bad	Very bad
	3	17	7	—	—
Graduates employment attitude	YES		NO		
	14		13		
If hire graduates, what is scope of their job?	Fashion design (9)	Pattern design (19)	Sewing Technology (9)	Quality control (13)	Others (3)
	Production management (13)	Fashion marketing (5)	Fashion merchandising (6)		

**Table 2** Present situation of pattern cutters, data collected from the employees

Mainland employee (103 respondents)					
Work experience in current company	< 2 yrs	2-3 yrs	3-5 yrs	5-7 yrs	> 7 yrs
	48	21	16	8	10
Work experience in garment industry	< 2 yrs	2-3 yrs	3-5 yrs	5-7 yrs	> 7 yrs
	6	8	17	22	50
Qualification in pattern	YES		NO		
	24		79		
Pattern cut mode	Flat	Draping		Both	
	50	2		51	
Pattern by manual or fashion CAD?	Manual	Fashion CAD		Both	
	49	12		42	
How can pattern cutters be recruited more easily? (multi-choice)	Advertising	Personal recommendation		Recruitment agencies	
	37	78		46	
What are the important skills for cutters?	Pattern design and pattern cutting for samples				

**Fig. 2** Employers attitude on employing pattern cutters

### 2.3 Present Situations of Staff Training

The present situations of the staff training were collected both from the employers and employees. The questionnaire was based on the training availability, training mode, training results and training cycle and the training expenses. Data collected from the employers and employees were shown in Table 3 and Table 4, respectively. The results of training availability and training results of employer and employee were shown in Fig. 3. It was found that training availabilities from the employers and employees were near. And it was found that more than 40% of the companies had not offered training for their pattern cutters. A big difference came from the training results evaluation. Nearly half of the employers thought their trainings were unsuccessful, at the same time, more than 80% of the employers thought that trainings were successful. Companies that with training available would prefer spot guidance for their training mode. The expenses that the employers and employees would like to spend on training were shown in Fig. 4. It was found that the employers would not like to spend much in training most of them only agreed to pay about 10% of the total employers' earnings on the training. The employees would like to spend more on the training as they thought the training was successful and they expected the companies to invest more money in their training. In addition, the employees preferred a yearly training cycle and not a quarterly cycle recommended by the employers.

**Table 3** Present situation of staff training, data collected from the employers

Mainland employer (27 respondents)				
Training availability	YES		NO	
	16		11	
Training mode	Apprenticeship	Day releases	School short courses	Spot guidance
	3	3	4	17
Training results evaluation	Successful		Unsuccessful	
	15		12	
Expense in training (/ total earning)	0-5%	5%-10%	10%-15%	> 20%
	10	13	3	1
Training cycle	Yearly	Quarterly	Monthly	Weekly
	5	18	4	—

**Table 4** Present situation of staff training, data collected from the employees

Mainland employee (103 respondents)		
Training availability	YES	NO
	55	48

(Table 4 continued)

Mainland employee (103 respondents)				
Training mode	Apprenticeship	Day releases	School short courses	Spot guidance
	23	6	23	51
Training results evaluation	Successful		Unsuccessful	
	87		16	
Expense in training (/total earning)	0-5%	5%-10%	10%-15%	> 15%
	25	28	30	20
Training cycling	Yearly	Quarterly	Monthly	Weekly
	49	35	12	7

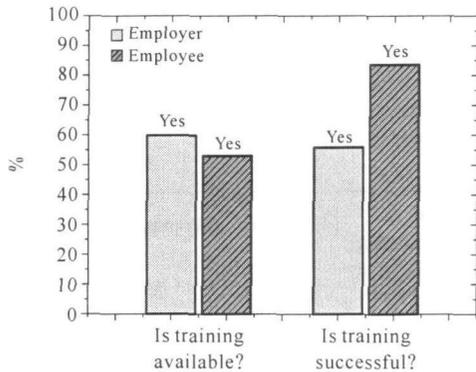


Fig. 3 Different attitudes on training between employer and employee

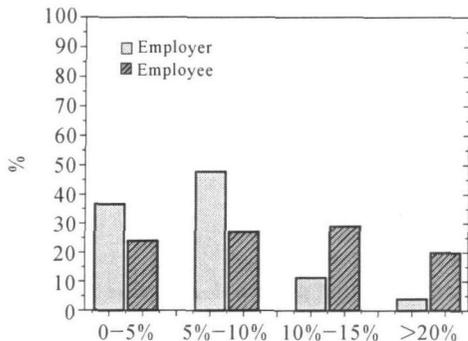


Fig. 4 Percent of earning that would like to spend on training of employer and employee

### 2.4 Analysis of Student Course Details

Results of the questionnaire related to course details of the students in mainland China were summarized in Table 5. This part aimed to gather the information on the interest and difficulty of students on pattern design. The differences between the course interest of the students and requirement of the employer were shown in Fig. 5.

It was found that more than half of the respondents did not have high interest in pattern design and had only some basic knowledge on the pattern design. On the contrary, nearly 80% of the employers expected their job duties were in the area of pattern design. Comparing with other courses more than 60% of the students were

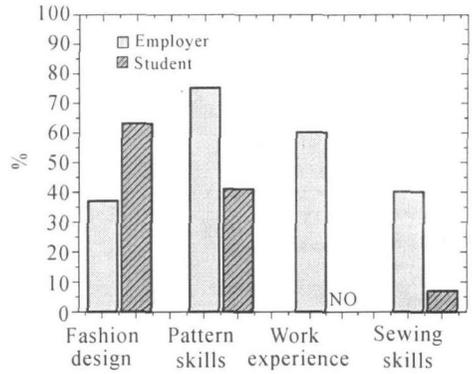


Fig. 5 Comparison of the students' course interests and employers' requirement on recruitment

interested in fashion design, which was different from the employers' requirement.

In addition, the sewing skills of the students could not meet the requirement of the employers. More than 60% of the employers wanted to hire those who had working experience. The gap between the ability of students and the requirement of the employers was sound. In fact, the students knew that they were not skilful in producing garment pattern because they only learned some basic knowledge of pattern cutting. It was the fact that they could not fully understand the course and spent too little time on the subject. It also indicated that they were not satisfied with their skills in pattern design. Therefore, they could not make use of the skills learned from the subject. Two reasons might contribute to this situation. On one hand, difficulty of the subject might prevent them spending more time on the subject. On the other hand, lack of interest in the subject also affected their study on the subject. Improvement in the teaching styles and course design might help to change the situation of the student's motivation.

Table 5 Course details of the students in the major of pattern design

Mainland students (325 respondents)					
Which subject are you most interested in?	Fashion design	Pattern	Sewing	Fashion CAD	Others
	204	64	21	31	5
Interest in the subject of pattern design	Very interested		fair	No interested	
	127		182	16	
What do you learn in pattern design?	Basic knowledge in pattern design		How to design pattern well		others
	289		25		11
What do you think the quantity of contact hrs on the subject?	Too many	enough	Fair	Not enough	
	5	42	95	186	

(Table 5 continued)

Mainland students (325 respondents)					
Do you think the subject of pattern design is difficult?	Very difficult	Difficult	fair	easy	Very easy
	8	76	205	31	5
Self evaluation on your skills in producing pattern design?	Very good	Good	Fair	Bad	Very bad
	8	68	193	49	7
What are the potential barriers to learn pattern design?	Cannot understand the pattern design	Pattern grading	This course is boring to learn	others	
	193	47	59	26	

## 2.5 Opinion of Students on Garment Industry

This part of the questionnaire was to collect the opinion of the students on the garment industry in mainland China, the data of which is summarized in Table 6. The status, salary, benefit and function of the pattern designers in garment industry were included. Most of them believed that the status of the pattern designer was very good and could obtain a good salary and reasonable benefit. They were sure that pattern designer played a very important role in the garment industry. Therefore, most of the students had a positive opinion on the pattern design.

**Table 6** Opinion of the students on garment industry

Mainland students (325 respondents)					
What is the status of pattern designer in garment industry?	Very good	Good	Fair	Bad	Very bad
	194	123	6	2	—
What is the salary of a pattern design in garment industry?	Very good	Good	Fair	Bad	Very bad
	58	215	52	—	—
What is the benefit of the pattern designer in garment industry?	Very good	Good	Fair	Bad	Very bad
	43	177	105	—	—
Function of the pattern design in garment company?	Very important	Important	Fair	Not important	
	253	60	12	—	
Ranks of importance of function	Fashion design (112)	Pattern design (75)	Sewing Technology (50)	Quality control (43)	
	Production management (22)	Fashion marketing (11)	Fashion merchandising (9)	Others (3)	

## 2.6 Opinion of students on employment

This part mainly focused on the opinions of the students related to the employment of the garment industry

in mainland China. The details were shown in Table 7. It was found that most of the fashion students did not have much idea on the employment status. In addition, they also had little knowledge in the employment of pattern design and most of them in this major would like to work as a pattern designer. They also had preference in working for the womenswear and casual wear.

**Table 7** Opinion of the students on employment of garment industry

Mainland students (325 respondents)					
Do you know about the employment status of the fashion students?	Known	A little	Not much		
	34	64	227		
Employment status of students in pattern design	Known	A little	Not much		
	94	177	54		
Willingness to work in garment industry	Yes	Consider	No		
	291	28	6		
Which of the garments production are you interested in? (multi-choice)	Menswear	Womens wear	Children wear		
	63	259	64		
Which of the following types of garment production are you interested in? (multi-choice)	Works clothes (45)	Sports wear (98)	Casual wear (226)	Outer wear (83)	Lingerie (81)
	Evening wear (145)	Day wear (92)	Robe (119)	Suiting (84)	Others (—)
Willingness to be pattern cutters	Yes	Consider	No		
	82	210	33		

## 3 Conclusion

It is obvious that pattern design plays a very important role in the garment industry. The industry shows high demands in skilled employees working in the area of pattern design. As for the present education system, students could not meet the industrial needs. This is the reason why the employers prefer to hire experienced pattern designers rather than fresh graduate. On the other hand, the employers should give more chances to the fresh graduates with talents or interests in pattern design. Appropriate training should be offered to employees so that they can learn more about their skills. The companies as well as the garments industry will benefit a lot from the skills promotion of the pattern design.

The tertiary institutes should also make contribution to provide excellent students in pattern design. The contents of the pattern design courses should be improved and make the courses more interesting in order to attract more

students to the field. They can cooperate with the garment industry and provide more chances for students to contact with industry and know what the really needs are. The institutions are advised to:

a. improve the skills of the students in integrating fashion design, pattern making and sample making by introducing more concepts of 3-D modelling or draping,

b. introduce series of promotion exercises for industry towards pattern profession (i. e. job seminars of pattern designers),

c. develop up-to-date learning packages in the area of flat pattern design and 3-D modelling techniques for teaching and industrial training

d. introduce tailored made courses for the industry according to their business nature.

As for the employment status, the students will pay more attention to the pattern design and spend more time in studying the theoretical knowledge as well as practical skills. Improvement of the pattern skills will help the students obtain more chance to be hired by the garment industry.

This paper presented a report about a survey on the status of pattern designer and also the education status included the employers, employers and students from mainland China. It showed a profile of the situation of the pattern designer, the training status of the employees in the garment industry of mainland China and the status of education. The data collected indicated that there was a gap between the employer and employee, especially the industrial needs and education system. The employers expected to hire more experienced pattern designers, at the same time, they did not reluctant to hire fresh graduate and spend more money on the training of employee. Another pleasant discovery was that the students realized the importance of pattern design for garment industry and had willingness to work as a pattern designer. But, they

knew little about their situation, spent too little time on the course study and learned too little practical skills from the subject of pattern design. Efforts should be taken by both the educators and the students to satisfy the needs of the industrial needs. The big gap between the industrial needs and education confirmed the significance of the presented project and the solution of which might benefit the garment industry a lot in a long run.

## Acknowledgements

The authors wish to thank the Hong Kong Polytechnic University for funding this research project.

## References

- [ 1 ] China Customs Statistics Information Service Centre. 2006, *China Exports of Textiles and Related Products*, Available from: < <http://www.tdctrade.com/chinastat/img/gte.xls> > [ Accessed 1 August 2006]
- [ 2 ] Yan, L., 2005 *China fashion weekly*. <http://www.modeChina.com/Newscenter/NewsDetail.php?channel/ID=139&NewsID=18375>. Accessed on 10/ 5/ 2006
- [ 3 ] Liu C. S., 2005, Differences of learning motivation of college students in different sex, grade and major[ J ]. *Chinese Journal of clinical Rehabilitation*, 2005, 9(20): 96-98
- [ 4 ] Long S. Y., 2005, A regression Analysis of the learning Motivation-behaviour Affecting Factors of English Majors in Vocational Colleges[ J ], *Journal of Jiangsu Teachers University of Technology*, 2005, 11(3): 21-28
- [ 5 ] Tam, M., Measuring the effect of higher education on university students[ J ]. *Quality Assurance in Education*, 2002, 10(4): 223-228
- [ 6 ] Zhang, Z. Y. & Bian, H. M., 2003, *Employment Guidelines for Graduate Student*[ M ]. Southwest University of Finance and Economics Press, 105-136
- [ 7 ] Li, H & Zhou, Z. X., 2001, *Career Planning in 21 Century*[ M ], Jincheng Press (Beijing): 41-50
- [ 8 ] Qi, J.P., Shao, S.H., Zhu, Y., Yu, G.Z., A mathematical model of P53 gene regulatory networks under radiotherapy[ J ], *BioSystems*, 2007, 33(1): 75-83
- [ 9 ] Siim Pauklin, Arnold Kristjuhan, Toivo Maimets etc. ARF and ATM/ATR cooperate in P53-mediated apoptosis upon oncogenic stress[ J ], *Biochemical and Biophysical Research Communications*, 2005, 334: 386-394
- [ 10 ] Bert Vogelstein, Kenneth W Kinzler, Cancer genes and the pathways they Control[ J ], *Nature Medicine*, 2004, 10: 789-799
- [ 11 ] M Oren, Decision making by P53: life, death and cancer [ J ], *Cell Death and Differentiation*, 2003, 10: 431-442
- [ 12 ] Martin Kühne, Enriqueta Riballo etc. A Double-Strand Break Repair Defect in ATM-Deficient Cells Contributes to Radiosensitivity[ J ], *Cancer Research*, 2004, 64: 500-508
- [ 13 ] Andrew R. Cuddihy, Robert G. Bristow, The P53 protein family and radiation sensitivity: Yes or no? [ J ], *Cancer and Metastasis Reviews*, 2004, 23: 237-257

(Continued from Page 487)