

The Comparison between the Faculty Team Structures of China's and American Universities

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Abstract—In this paper, we conduct thorough comparison between the faculty structures of China's and American universities. We point out the existing problems in China's universities' faculty structure and their negative impact on the student training, such as the problems in professional ranks and titles, faculty educational structure, age structure, the student-teacher ratio and the student-employees ratio, etc.. By drawing from the successful experience of American universities, we explore appropriate ways of improving the faculty structures in China's universities. It is suggested to accelerate the process of society-sourced faculty team so as to broaden the sources of teachers, increase the number of high-grade teachers, improve the education levels of teachers, improve the age structure and reduce the ratio of students to teachers and employees.

Keywords—comparison; China's and American Universities; faculty team structure

I. INTRODUCTION

The former president of Harvard University Conant said: "The honor of a university does not lie in its school buildings and the number of employees, but in the teachers' quality from one generation to another". The former president of Tsinghua University Yiqi Mei said: "What makes a good university is the amount and quality of masters it owns, rather than the amount and quality of buildings that stands." Obviously, a university can only attract good students and improves its teaching quality through a team of prestigious and excellent professors and scholars. Therefore, the development of faculty team is a main task of a university. To optimize the faculty team structure is an important part of the human resource management in universities [4]. The rationality of the faculty team is directly related to the overall level and the teaching level of the teachers, and the integrated quality of a university.

The faculty structure refers to the proportions of different elements in the faculty team and the relationship between their combinations. Typically, the faculty structure includes the educational structure, title structure, age structure, the student-teacher ratio, the teacher-employee ratio and the proportion of part-time teachers, etc.. Currently, the faculty team structure in China is improving and has made some achievements, including some useful experience and effective ways of teacher team construction. However, there are still many problems in the construction of faculty team, especially in the structure construction. American universities have accumulated many successful experiences in the structure

optimization of faculty team, which could be leaned by China's universities.

II. THE COMPARISON BETWEEN THE FACULTY TEAM STRUCTURES OF CHINA'S AND AMERICAN UNIVERSITIES

We can get useful inspirations from analyzing the similarities and differences between China's and American universities' faculty team structures. We summarize the specific comparison as follows.

A. The structure of teachers' title

The title structure of teachers refers to the ratio relation between different titles (e.g., professors, associate professors, assistant professors and lecturers). According to statistics, the number of full-time teachers in China's universities is 1,440,292 in year 2012, in which there are 169,423 full professors (accounting for 11.76%), 412,692 associate professors (about 28.65%) and 858,177 assistant professors (accounting for 59.59%)[10][2][3]. This data model appears pyramid type: the uneven distribution of different titles. Specifically, the number of senior professors is small and the number of junior professors is too large.

Unlike the pyramid structure in China's universities, the teacher title structure in world leading universities appears reverse triangle. The main body of faculty team is the senior professors, accounting for about 60%, in which full professors account for about 42% and the number of associate and assistant professors is smaller than that of full professors. There are two kinds of teachers in American universities, full-time and part-time teachers, in which the full-time teachers are the main body. They have four titles for full-time teachers: professors, associate professors, assistant professors and lecturers. The faculty structure of American universities appears spinning mallet type. Namely, the ratio of lecturers is low and the ratio of professors and assistant professors is high. In the United States, the employment of professors and associate professors has high requirements. Teachers have to go through a long time accumulations of knowledge and experience and fierce competition to get possible promotion[7][9].

Inspirations: the reverse pyramid type of teacher title structure reveals that the overall level of teachers in China's universities is not high and some teachers lack the accumulations of acknowledge and experiences. Compared

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with United States, the spinning mallet type of teacher title structure in America reflects that the quality and experiences of American university teachers are better than those of China's teachers.

B. The structure of teachers' education background

The education structure of faculty team refers to the ratio structure of teachers' highest degree. In recent years, the education background of university teachers is gradually improving in China. The number of master degree teachers is growing and the number of bachelor degree teachers is decreasing. As shown in Table 1, the ratio of Ph.D. degree teachers is 17.66%, master degree teachers is 35.67%, and bachelor degree teachers (or even lower degrees) is 47.67% [5][2]. To analyze the degree structure of American university teachers, we need to differentiate between the tenure and non-tenure teachers. The professors, associate professors and some tenure assistant professors are all tenure teachers. Their employment has high requirements and they need to hold Ph. D. degrees. Non-tenure teachers are mostly fresh graduated Ph.D.s and those who have extensive practical experience in external corporations or senior government officers. Overall, the ratio of Ph.D. is high in American universities [8][7].

TABLE I. DEGREE STRUCTURE OF FULL-TIME TEACHERS IN CHINA'S UNIVERSITY IN 2012

	Total	Ph.D.	Master	Bachelor and below
Full-time teachers	1440292	254399	513793	672100
Proportion	100%	17.66%	35.67%	46.67%

Inspiration: The educational level of the teacher to some extent reflects the academic ability and knowledge level, which have positive relationship with teaching ability and research ability. Generally speaking, the overall level of faculty team increases with the educational level. The career of the teachers who have low educational background is constrained. Due to the low base, their career improving space is limited and they are at an unfair disadvantage in promotion. Without improving the educational background, the teachers' personal development and the school development will be affected.

C. The structure of teachers' education background

The age structure of faculty team refers to the ratio of different ages, namely, the ratio of the number of old, middle-aged and young teachers. In recent years, the number of teachers who are under 35 years old is increasing year by year. The proportion of young and middle-aged teachers is high and there are big proportion gaps between different age segments. As shown in Table 2, the number of university teachers who are under 45 years old is 1,076,114, accounting for 74.71% [2]. This reveals that the university teachers are becoming younger in age in China. From the table, we can see that China's universities lack the teachers who are over 45 years old. However, in the age structure of American university teachers,

the main body is the teachers who are between 45 and 54 years old and the teams remain relatively stable.

TABLE II. THE AGE OF FULL-TIME UNIVERSITY TEACHERS IN CHINA

	Total	Aged 35 and below	36--45 years old	46-50 years old	51-60 years old	Aged 61 and over
2012	1440292	634503	441611	200304	141786	22088
	100%	44.05%	30.66%	13.91%	9.84%	1.54%

Inspiration: Teachers of different ages appear differences in the knowledge, experience, energy, ability, agility, creativity and other aspects. Therefore, the age structure of teacher team largely reflects the teaching ability and research activities of teachers[6][2]. To measure the university teacher team age structure's rationality, we should consider whether the team structure helps the teachers to maintain fruitful experience and high creativity. Generally speaking, it is reasonable to have the middle-aged teachers as main body, make the proportions of old aged and young teachers at reasonable levels, and keep a sustainable and ever-growing team. Although young teachers like new concepts and have enthusiasm and innovative ability, they lack teaching experiences and their teaching ability needs to be improved. In China, the number of university teachers who are under 35 years old is too large, which counts for about a half. This kind of age structure is unreasonable and bad for the improvement of the overall teaching quality.

D. Student-teacher ratio

With the enlarging of student enrollment in China's universities, the student-teacher ratio is increasing. At the beginning of the enlarging (around year 2008), there are 855,728 faculty and employees in China's universities, in which there are 407,253 full-time teachers. There are 3,408,764 students. The student-teacher ratio and student-employee ratio are 8.37:1 and 3.98:1. In 2012, there are 2,254,376 faculty and employees, in which there are 1,440,292 full-time teachers. The number of university students is 25,632,973 in 2012. The student-teacher ratio and student-employee ratio are 17.797:1 and 11.37:1 [11][2]. Compared with the United States, the student-teacher ratio is too high in China's universities.

Inspiration: The student-teacher ratio is an important indicator of teaching quality and school effectiveness. Theoretically, reducing the number of teachers and keeping the student number unchanged can improve the utilization of human resource. However, reducing the number of teachers will cause the increase of working load and scarify teachers' energy and teaching quality. Therefore, it is critical to keep a reasonable student-teacher ratio.

E. The proportion of full-time and part-time teachers

In 2012, China's universities hire 387,673 part-time teachers, accounting for 21.21% in the total number [12][2]. In

United States, the part-time teachers are also becoming an important part in the teacher team. The ratio of the part-time teacher in American universities is high. Hiring a large number of part-time teachers is an effective way to fit the market. According to the statistics from the National Center for Education Statistics, the ratio of the part-time teacher in American university reaches 47.64%. Since too many part-time teachers will affect the teaching quality and the team stability, American universities tightly control the number of part-time teachers and do not allow the part-time teacher ratio to exceed 50% [8], which is much higher than that in China's universities.

Inspiration: Hiring part-time teachers helps to optimize the teacher resource allocation. Part-time teachers mainly are responsible for teaching and are the main roles in the teaching of basic and practical courses. They satisfy the need of professional and practical causes and could help to relieve the working load of full-time teachers. In this way, they help the full-time teachers in research time and energy, and provide fresh blood for the academic communication. The salaries of part-time teachers are relatively low, which can help to relieve the universities' finance pressure and reduce the operation cost. In addition, the enrollment and firing processes of part-time teachers are much simpler than those of full-time teachers, which make the universities, enroll and fire part-time teachers at any time according to their needs by keeping the good ones and dropping the bad ones. In this way, the flexibility and the self-adjusted ability of the teacher team is strengthened [1].

III. THE REASONS OF THE IMPERFECT FACULTY STRUCTURE IN CHINA

The rationality and scientificness of the teacher team structure will directly affect the teaching quality and the overall quality of the university. From quantitative analysis, the teacher team structure in a university reflects its ability and level as an important indicator of university performance. The differences between the teacher team structures of China's and American universities reflect the performance difference of universities in these two countries. To improve the teaching and research quality in universities, we have to optimize the teacher team structure. Therefore, it is necessary to investigate the reasons that cause the unreasonable teacher team structure in China and make improvement accordingly.

A. The problems in teacher hiring

1) *Unscientific hiring criteria:* Traditionally, the hiring of teachers emphasizes the academic level and research ability and overlooks the practical ability and practical experiences. Some teachers' research abilities do not match their practical ability, which is bad for training students in using the theoretical methods to solve the practical problems. It will also affect the job hunting ability of the graduates.

2) *Myopic hiring plans:* The number of hired teachers cannot catch up with the expanding of student number, which causes the increase of student-teacher ratio, the overload work of teachers and the declined teaching quality.

B. The problems in teacher training

Chinese universities emphasize the enrollment of teachers but ignore the ongoing training.

1) *Problematic pre-service training:* Some fresh teachers directly transfer to teacher roles from student roles. China's universities lack corresponding training on teaching skills, teacher content and teaching effect to help them fit the role transfer. The weakness in the pre-service training is bad for improving the teaching quality.

2) *Ignored on-the-job training:* Many universities in China ignore the on-the-job training. Being haunted by work and living, teachers are easily to break away from the outside world, which will affect the enhancement of practical teaching ability.

C. Related mechanisms are inadequate

In China's universities, the awards, promotion and projects prefer the teacher with more research achievements. Therefore, university teachers are self-driven in research. This makes teachers put too much energy and time in research and ignore their effort in teaching.

IV. THE INSPIRATIONS FROM THE OPTIMIZATION OF AMERICAN FACULTY TEAM STRUCTURE CONSTRUCTION

Compared with the structure of teachers in China, American teacher team structure is more reasonable. Rational faculty structure produces a virtuous circle, making the faculty level higher. Compared with American teachers, one of the reasons of low level teachers is that faculty team structure is irrational. Therefore, faculty team optimization is needed. Through the comparative research above, we summarize the ways of optimizing faculty team as follows.

1) *Make talent introduction plan under the objective of faculty team structure optimization.* According to the disciplines and professional development, China's universities may make talent introduction plan under the objective of faculty team structure optimization by considering the degree, title, age of the enrolled teachers. The number of different level teachers, the detailed procedures, and detailed plans should be specified in the plan. The enrollment and training of teachers should be scientific, periodical, and purposeful and designed.

2) *Adjust the faculty team by attracting teachers from external systems. The common method of changing the faculty team structure is to attract teachers from outside.* Universities could attract talent teachers by providing competitive development environment, improvement space, working conditions and living conditions. When hiring teachers, both degree and the ability should be considered, especially the verbal ability and practical ability. Through the hiring, we could construct a strong faculty team with fruitful experience, good practical ability and teaching ability. The talent person in companies and governments could also be considered in the faculty enrolment.

3) *Innovative young teacher training mode - to achieve "generalist" of talent education model.* According to the development needs of discipline, universities' talent training

program should rebuild the structure of knowledge ability and quality. By further improve the education system of serving teachers' teaching and research activities, we can improve teaching methods and enhance teachers' application ability of modern teaching technologies.

4) *Reform the talent configuration.* Through the research on how to configure up-down, horizontal and internal-external talent structure, we can achieve the purpose of scientific teacher team configuration and optimize the faulty team structure.

Following aspects could be tried to improve.

1) *To improve talent training mechanism.* Personnel training is the focus of university faculty team construction. University faculty team construction relies mainly on talent introduction and self-cultivation in two ways. Universities mainly attract talent teachers by providing competitive development environment, improvement space, working conditions and living conditions. The self-cultivation mainly relies on the school's own training mechanism, a certain academic potential from the unit selection and training and training future teachers to learn future studies, in order to achieve the purpose of the appreciation of talent. Two methods have played positive roles in the construction of teacher teams. But in the actual operation, we often emphasize the enrolment and ignore the on-going training.

2) *To improve teacher training mechanism and enhance the teaching ability of teachers.* The training of teaching personnel is the focus of university faculty team construction. We should further strengthen the existing teachers' training and management, improve the operational mechanism of continuing education, and constantly optimize the knowledge structure of teachers. Young teachers should pay attention to the cultivation. We should accelerate training young teachers and team leaders. Attention should be paid to young teachers' training. By encouraging teachers to participate in international academic conferences, study for a degree or apply for senior visiting scholar, they can constantly update their knowledge structure. Furthermore, we should also answer the following questions: how to arrange full-time teachers to the enterprise as part-time staff and how to manage? How to improve the ability of engineering practice?

3) *To improve the recruitment mechanism and personnel allocation mechanism.* The rationalization of university faculty team mainly relies on talent introduction and self-cultivation. The focus is on improving the recruitment system selection criteria and the ability of testing candidates. The recruitment and the training of teachers should be based on the team construction plan, and be designed, scientific and periodic. The recruited teachers should be allocated to different disciplines and positions, especially the practical and experimental causes, so as to achieve a reasonable resource allocation.

4) *To improve other related mechanisms.*

The teacher appointment mechanism, promotion mechanism and encourage mechanism, etc. all need urgently improved. Firstly, the teacher appointment mechanism should

be improved, including the evaluation criteria. In the appointment and evaluation, we should consider the teaching quality, engineering practice experience, engineering project design, patent, and technology service. Appropriate weights of different aspects should be determined. Secondly, we should explore effective encouragement method and policies, through increasing the weights of teaching awards, encouraging young teachers to improve teaching ability. We can strengthen the team building and management, through the introduction of competition mechanism and the strengthening of the assessment indicators.

V. CONCLUSION

In order to improve the quality of teaching, we should correctly understand and grasp the working law. The faculty team construction in universities should be coordinated between the academic development and talent gathering, faculty team and teacher improvement environment, teacher hiring and teacher training, teacher resource and hardware resources. It is important to reform and polish the faculty team and build appropriate encouragement mechanism.

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