

Research on the Influence of Teachers' Scientific Research Ability on Students' Job Opportunity and Competitiveness

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Abstract—Against the background of the increasingly demanding employment of college students, how to improve the competitiveness of graduates from average universities has become a research focus in personnel training of higher education. The relationship between teachers' scientific research ability and employment competitiveness of students had been discussed based on the employment situation of the vehicle engineering department of Tianjin University of Technology and Education. Studies have shown that teachers with strong scientific research skills can improve student employment rates about 20% higher than the average of the entire department through classroom instruction, instructing students to participate in technology competitions and off-campus internships. It is a feasible way to increase the employment competitiveness of students through activating the teacher's research vitality which can broaden their scope of knowledge.

Keywords—employment; average universities; personnel training; research vitality

I. INTRODUCTION

There are more than 3,000 colleges and universities in China, of which only one hundred is key university[1]. This means that non-key universities account for more than 95% has assumed the vast majority of social talent training tasks. In the context of society's rising expectations for the employ ability of university graduates, employment pressure for graduates from average universities is huge[2][3]. At the same time, the threshold for recruiting teachers in universities is getting higher and higher. Even entering these average universities, most of them require doctoral degrees or above from key universities[4]. These newly recruited teachers all experienced good research training during their doctoral studies. Under this background, it is a problem that has to be solved in the process of personnel training in colleges and universities that how to transform their research ability into the employment competitiveness of students[5]. The author's college had been made as a survey model to study the influence of teachers' scientific research ability on students' employment competitiveness.

II. BACKGROUND

A. School situation

Established in 1979, Tianjin University of Technical and Education is the only university in Tianjin that is jointly supported by the Chinese Ministry of Education and Tianjin government. It has been formed mainly by engineering and pedagogy. It ranks around 500th in the country's 3,000 colleges and universities, which mean a typical average university.

B. Teachers situation

The author is one member of the vehicle engineering department with a total of 10 teachers. Among them, five teachers, with an average age of 45 or older, are basically teaching. There are also another 5 young teachers with ages of 32-39 (Serial No. A-E), who focused on many research projects. All these five teachers have doctoral degrees, as shown in Table I. Those scientific research projects have both been sponsored by the national or local government funds besides companies. It proved that these five teachers have higher scientific research ability compared to the average level. The main research directions include electronic control of new energy vehicles, intelligent cars, automotive NVH matching, and auto parts quality management. These are hot areas in the automotive industry. Its cooperation company includes China Automotive Technology and Research Center, Tianjin FAW Toyota Motor Co., Tianjin Bool Technology Co., Ltd., and Tianjin University including scientific research institutes, universities, vehicle manufacturers and suppliers.

TABLE I. BACKGROUNDS OF ACADEMIC CREDENTIALS

No	Age	Academic credentials	University
A	32	Doctor	Tianjin University
B	34	Doctor	Jilin University
C	37	Doctor	Tianjin University
D	38	Doctor	Beijing Institute of Technology
E	39	Doctor	Jilin University

In the past three years, the total research fund of these five teachers was shown in Fig 1 and the total number of research project was listed in Table II. It had been proved that these five teachers have much higher research ability and resource than the left ones in vehicle engineering department.

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TABLE II. NUMBER OF RESEARCH PROJECT (2015-2017)

	A-E	Total department
Num of research project	26	35
National projects	2	2
Local government sponsored	2	3
Company sponsored	22	30

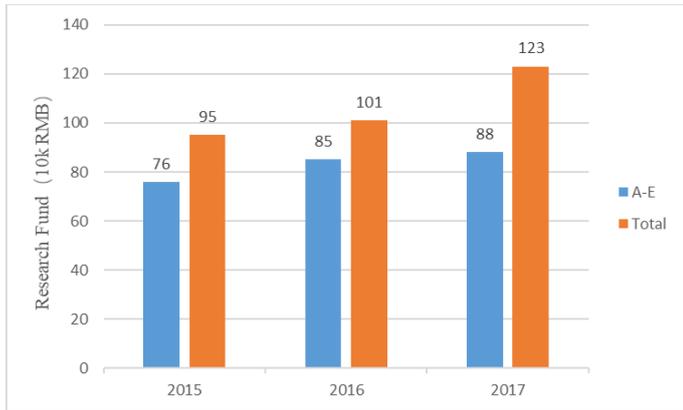


Fig. 1. Research fund proportion of the entire department

C. Student situation

The department of vehicle engineering has two classes, with an average of 73 students per year, including about 60 male students. Relative employment companies include automobile factories, advanced vocational schools and automobile components suppliers. The employment rate is basically stable at about 68%.

III. ANALYSIS

A. Teaching performance

They were two ways to make an evaluation about teaching performance including a real-time teaching performance evaluation system and annual scoring mechanism[6]. The course taught by these five teachers includes automotive electronics, new energy automotive technology, automotive theory, automotive quality management. From Fig 2 and Fig 3, it can be seen that teachers with strong scientific research ability will introduce industry trends into the class, and students also welcome this teaching mode.

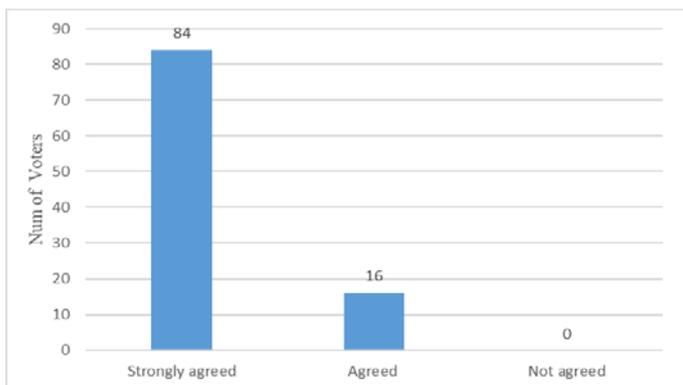


Fig. 2. Introduce industry trends into the class

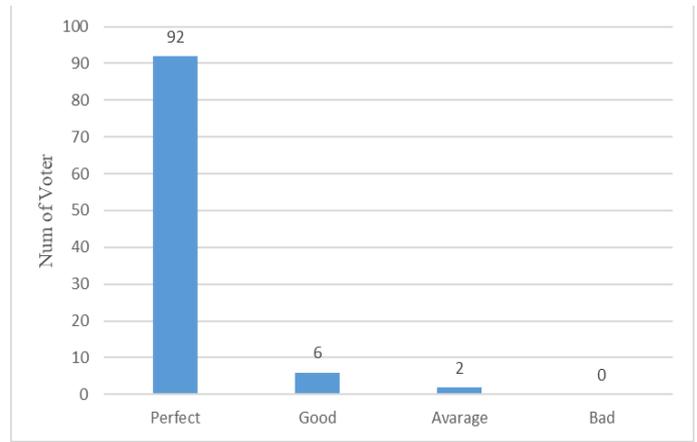


Fig. 3. Teaching performance evaluation

The statistical results of the annual teacher evaluation score were listed in Table III in the past 3 years. From the table, it can be seen that the overall teaching effectiveness of the teachers with strong scientific research ability is much higher than average of the college teachers. This shows that there way of teaching was accepted by the students. Students want to know the development of the industry. This is helpful to stimulate students' interest in learning and bringing students into the front line of the industry. Thereby enhancing their competitiveness in employment.

TABLE III. NUMBER OF RESEARCH PROJECT (2015-2017)

	2015	2016	2017
Average scores of A-E	91	92	91
Average scores of total department	82	81	83

B. Influence analysis

In addition to the influence of the teaching process, the teachers' scientific research capabilities also improve the employment competitiveness of students in the following three areas.

1) Research activities

The teacher separates some of the tasks from the research projects to the undergraduate. Teachers personally tutor students to take part in actual scientific research projects. Students use what they have learned in actual research and development to enhance their hands-on capabilities. Students taking part in such activities are highly motivated and responsible for things. This quality is valued by the employer company. Therefore, its employment competitiveness has been improved. The following table shows statistics on the employment situation of students participating in research activities in the past three years. It can be seen that the student employment salary and employment success rate involved in this activity is more than average.

TABLE IV. EMPLOYMENT DATA

	2015	2016	2017
Number of sample students	9	11	10
Employment success rate of the department	70%	67%	71%
Employment success rate of the sample students	88%	100%	100%
Average salary of the all students	3451	3621	3713
Average salary of the sample students	4205	4308	4561

2) Guiding competitions

Teachers with strong scientific research skills often have rich technical resources. This includes social resources, school research and development equipment resources and accumulated technical resources[6][7]. Statistical data of the students of the department of vehicle engineering participated in the technical competition in the last three years can be found in the following table.

TABLE V. COMPETITION PARTICIPATOR VS EMPLOYMENT RATE

	2015		2016		2017	
	Num	Rate	Num	Rate	Num	Rate
Formula Student China	6	83%	6	100%	6	83%
National Undergraduate Electronic Design Contest	8	87%	8	75%	4	100%
National Undergraduate CAD Design Contest	3	100%	4	75%	4	75%

3) Graduation project

The final semester of the student’s senior year consists of a 4-week graduation practice and a 12-week completion design. After investigation, it was found that the five teachers were responsible for the graduation practice and graduation design of 42 students each year. Most of these students worked in companies.

TABLE VI. EMPLOYMENT RATE OF STUDENTS WITH COMPANY EXPERIENCE

	2015	2016	2017
Employment success rate of the department	70%	67%	71%
Employment success rate of the students with company experience	83%	97%	90%

A total of 89 students had finished their graduation project in a company which involved research institutes, universities, vehicle manufacturers and suppliers as showed in Fig 4.

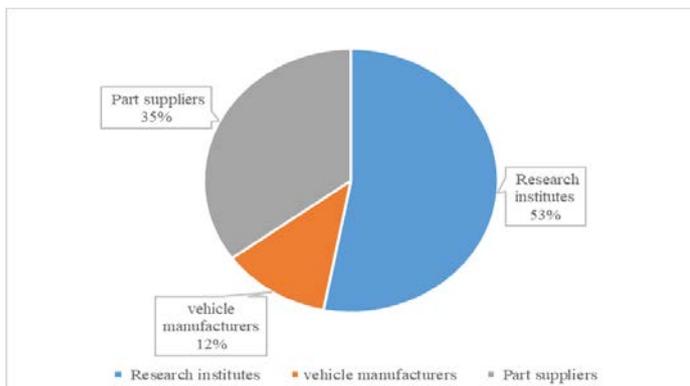


Fig. 4. Type of company

It can be seen that these students got much higher evaluation scores from the employers than the college's average score of all students.

TABLE VII. EVALUATION SCORES ABOUT WORKING ABILITY

	2015	2016	2017
Evaluation scores of the department	68	70	70
Evaluation scores of the students with company experience	75	78	80

From the above table, we can see that the ability of the students to perform the curriculum work has been accredited by the company. Its score is significantly greater than the average. Students trained in this course model received a welcome from the company. The fundamental reason lies in shortening the time gap from school to job and reducing the training cost of the company[8][9].

IV. CONCLUSION

Against the background of the slowing down of the development speed of the auto industry and the increase of employment pressure, colleges and universities should strongly encourage teachers to participate in scientific research and improve their scientific research capabilities. This will offer great benefit to improve the employment competitiveness of students. The students are also very willing to get to know the latest developments in the industry. The more teachers’ research business, the richer the industry vision and industry resources, and the more job opportunities and employment information for students.

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