

# Investigation and Research for the Education of FME

----Based on the Case study of China University of Petroleum (Beijing)

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**Abstract** - The number of full-time engineering master in China University of Petroleum, Beijing has increased year by year since 2010. In order to understand the current situation of full-time graduate students' education and help promote the overall quality of education, the author carries out a survey among the full-time graduate students from different colleges. Based on the results from the self - designed questionnaire, some suggestions are provided for education improvement.

**Key Words**- the Full-time Master of Engineering, the Quality of Education, Research Survey

## I. Introduction

Academic Degrees Committee of the State Council approved the Master of Engineering Degree Setup Program in 1997, and decided to enroll the Master of Engineering degree in our country. From then on the Master of Engineering Degree was officially born. The FME Degree, as one of professional degrees started in 2009, is drawing extensive attention from industrial and mining enterprises. China University of Petroleum (Beijing) began to enroll full-time professional masters (i.e., the Master of Engineering, the same below) in 2010. The basic information is shown in Fig. 1.

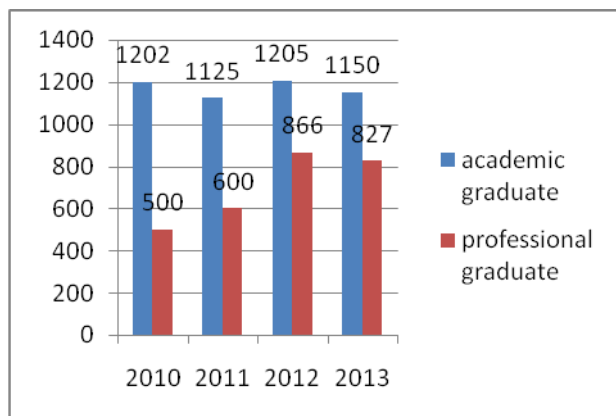


Fig. 1 the enrollment scheme of graduate

Fig. 1 illustrates that since the Ministry of Education and the National Development and Reform Commission issued the notice on 2010 Graduate of the Admission Scheme, China University of Petroleum (Beijing) started to offer master's degree for engineering students. Students enrolled for an Engineering degree are nearly as many as those enrolled for an academic degree. In order to understand the education of the Full-time Master of Engineering (FME) to further advance the

educational quality, the author conducted a survey among the full-time graduate students of engineering from different colleges between September and November in 2012. 30 questionnaires are issued to every engineering college and the total is 180, of which 165 are valid. Based on the data collected from questionnaire, problems are revealed and discussed. Then some suggestions are provided for education improvement.

## II. Survey and Analysis on the FME

### A. Brief Introduction to the FME in China University of Petroleum (Beijing)

According to the Academic Degrees Committee of the State Council regulation, the FME degree, one of the full-time Professional Degrees, aims to cultivate talents in the areas of application, multi dimensions and high-level technology and management. China University of Petroleum(Beijing) takes the "Double Tutorial System" and "three-phase model", course, practice and thesis, to cultivate the FME, who need to study for three years, including at least six-month practice and get credits ranging from 30 to 36, about 20 points of which are for degree. There is slightly different in different colleges.

Curriculum is shown in Fig. 2:

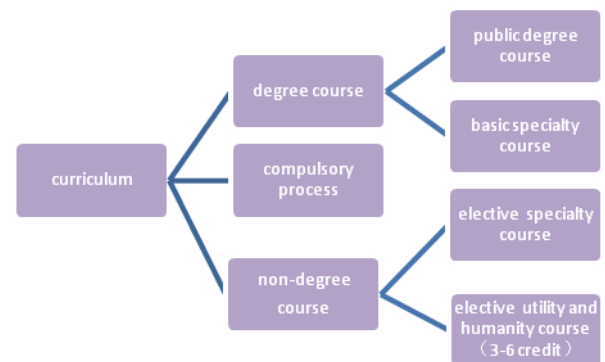


Fig. 2 the schedule of the full-time professional master

### B. Data Presentation of the Questionnaire

The questionnaire adopts the most widely used five-point likert scale and the satisfaction corresponds to 1, 2, 3, 4 and 5 points respectively, and therefore we select 3 points as the moderate intensity observation of this investigation. From Fig. 3, we can see students are not very satisfied with the education

of the FME, so the university has much to improve in terms of the quality of FME education,.

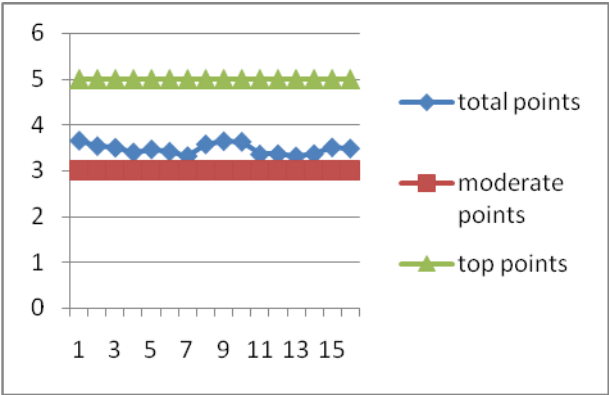


Fig. 3 the graph of the results of the survey

### C . Data Analysis

#### 1) Statistical analysis on education model:

Fig. 4 describes that 63.1% of the students give 4 more points, which indicates nearly a third of students have no idea about the education model so they cannot make their study plan reasonably. We suggest the university strengthening publicity about the education model of the professional master at the beginning of term, to make students have a clear positioning for their study in the future.

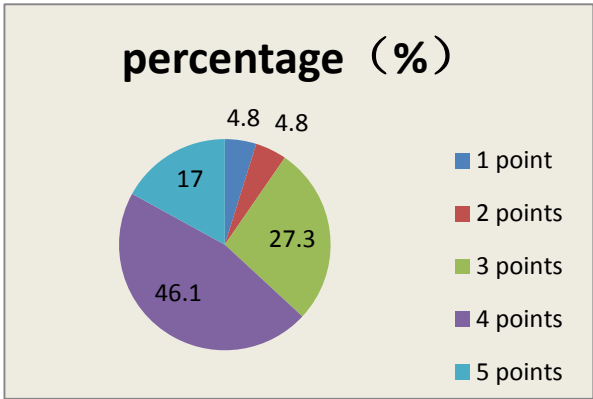


Fig. 4 the graph for the education model

#### 2) Statistical analysis on curriculum:

Fig. 5 shows that the students are generally satisfied with the curriculum and the mean of Q4 is the lowest, i.e. the curriculum needs to be reformed to meet the employment market needs. The curriculum is one of the most important facts in the degree education of graduate and the university should pay great attention to curriculum to stand out the characteristics of education of professional master and enhance the employment competitiveness.

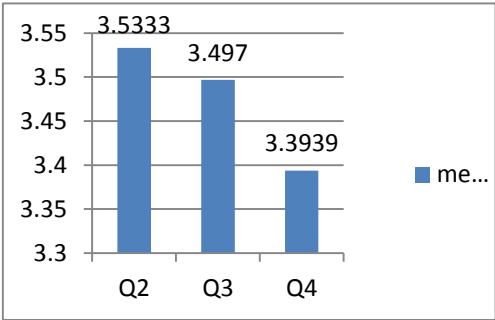


Fig. 5 the graph for the curriculum

#### 3) Statistical analysis on the extend, to which the curriculum is relevant to job market

Fig. 6 demonstrates that 53.3% of the students give 4 more points and 84.9% of the students give 3 more points, which indicates the students think the present education model fits the market, but according to the feedback of the subjective topics, some measures are not implemented.

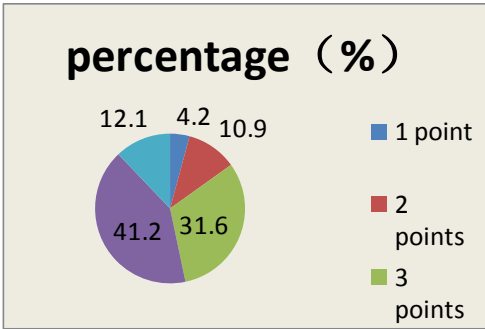


Fig. 6 the graph for education model for the employment market

#### 4) Statistical analysis on the contentment in the internship inside and outside school

Fig. 7 shows that the students are satisfied with the practice arrangement. The mean of Q8 is the lowest and Q9 is the highest, which indicates the practice outside school cannot meet the students' study needs but the market demand, so the quality of practice outside the school needs to be improved to make the students increase the theoretical and practical knowledge.

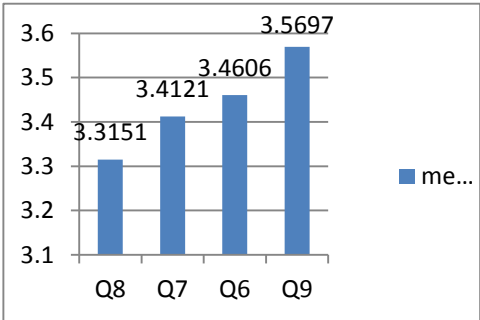


Fig. 7 the graph for practice inside and outside school

##### 5) Statistical analysis on the faculty ,career goals, curriculum differences and competitiveness

Fig. 8 and Fig. 9 show that the faculty, having good theoretical knowledge and emphasizing the practice teaching, win the approval of most students (87.3% of the students give 3 or more points) but the mean is only 3.6242, so it needs to be further improved. The lowest mean is Q13, i.e. compared with the academic graduate; the Master of Engineering is not competitive at all.

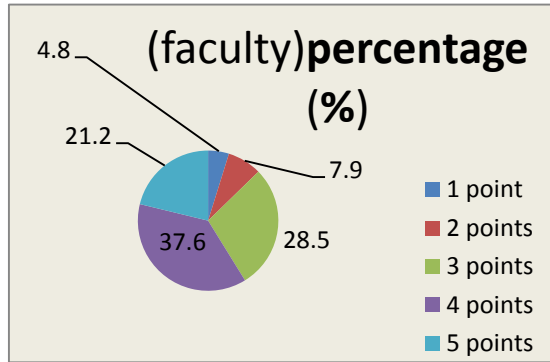


Fig. 8 the graph for the faculties

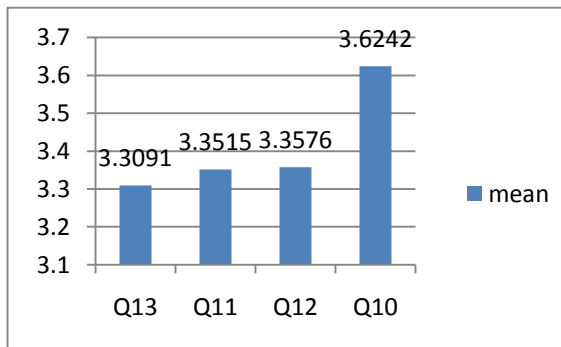


Fig. 9 the graph for faculty, career goals, differences and competition

Second, the education of professional degree has little help for the career goals and the students don't apparently feel their professional technique increasing in the process.

Finally, the mean of differences between professional and academic master is low. The subjective topics indicate that the courses of professional and academic master students are almost the same and there are only differences in practice. It's very difficult to use the same courses to cultivate two different masters, so the education of Master of Engineering should emphasize the specialization to form the customized special education model.

##### 6) Statistical analysis for incentive program and service

Fig. 10 indicates the students are generally satisfied with the incentives and service and the highest point is Q16 which illustrates the university does well in the quality of service but there are still aspects that need to improve. The lowest is the

question about incentives, so we suggest the university strengthen the awards to relieve the graduate's burden and attract excellent students and inspire their enthusiasm and finally improve the educational quality.

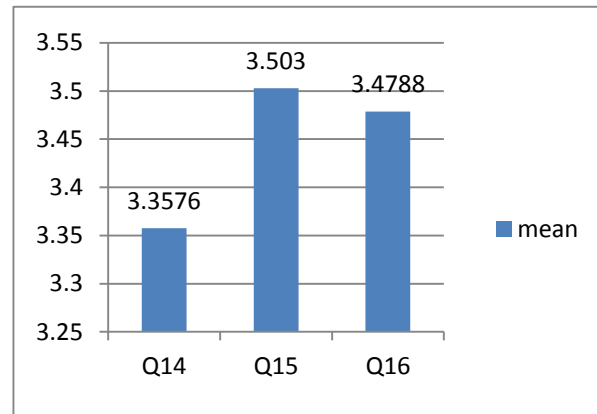


Fig. 10 the graph for incentives and price and quality of service

##### 7) Analysis for the subjective topics

We received about 80 comments in the part of the subjective topics, including the following five main aspects:

- People don't have adequate understanding of the FME, resulting in the fact that graduate students are ignored and disapproved.
- The curriculum, which is no clear difference from the Academic Master's, lacks of pertinence.
- The teachers are insufficient; the students' quality varies a lot; and the effect of Double Tutorial System is not obvious.
- The number of companies who provide internship opportunities is very limited and the quality of the internships is being suspected. Some of them don't match students' specialty. (The students can't choose the types of internships freely)
- The school lacks communication with the companies providing internships and since there is no professional management system to ensure the quality of the internship, the educational quality cannot be guaranteed.

### III. Suggestions to Advance the Education Quality of FME

Comparison of the analysis results of questionnaires and the China University of Petroleum (Beijing) policy is showed in the following aspects that requires further to improvement.

#### A. Change ideas and strengthen understanding and publicity

First of all, we should realize the importance of the FME, which are high-level applied talents of our country and share the same level with academic master but with different specifications and both of them have irreplaceable roles in social development process. The university should firstly make the engineering master students understand their education target and pattern so that they can have a clear idea of their study.

*B. Clarify the education target and reform the curriculum*

The FME is new talents and the curriculum needs to correspond to their education target and characteristics. But the current curriculum of engineering master is no outstanding difference from the academic master's, which needs to change urgently.

The curriculum of engineering master should maintain a close connection with the engineering application, represent its practicability and be different from the academic master's, so we can make course materials and the content of curriculum more practical.

*C. Build qualified faculty and improve the "Double Tutorial System"*

The education model of double tutorial system helps students to combine theory with practice to improve overall competitiveness. But the results of questionnaire show the current double tutorial system need to be further improved.

Firstly, the university should develop a rigorous selection procedure and an adaptive assessment mechanism to eliminate undesirable supervisors regularly. Secondly, the role of the supervisors should be defined. The supervisors inside school work in making training plans and guiding thesis and the supervisors outside school are responsible for practice and project research. Thirdly, communication is very necessary between supervisors and students, so we must build effective communication channels, for example, forums between students and supervisors and students' regular reports to supervisors, to avoid poor practice results.

*D. Select companies carefully to grantee successful internship and increase their quantity and quality*

The subjective topics show the companies, who provide the internships, few in number and low in quality, cannot

provide excellent practice platforms for the graduate students. They focus on the platform rather than enterprise's visibility. So the university may emphasize quality and increase quantity when seeking the companies and industries, and meanwhile select some small and medium sized enterprises of high quality.

*E. Improve the quality assurance system*

According to the subjective topics, we need to build up the quality assurance system of FME to ensure the educational quality. It consists of three parts as follows:

Quality management system: set up management agencies and rules to manage completely the enrollment and education of the FME.

Quality control system: a term consisted of academic leaders, business specialist, university leaders and student representative regularly supervises the education process.

Quality feedback system: students, teachers and administrator can feedback the problems found to correlative department to settle them in time.

**Acknowledgement**

We would like to express sincere thanks to some supervisors for their help and guidance. And also we want to thank all the respondents for helping fulfill this survey.

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