Employment Status and Countermeasures of Mining Engineering’s Postgraduate Employment

Yao-Bin SHI*, Yi-Cheng YE and Hong-Jie ZHANG

Wuhan University of Science Technology, Wuhan, P.R. China.
*Corresponding author

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Abstract. Based on the 2011-2016 annual report of Wuhan University of Science and Technology (WUST) graduate employment quality, postgraduate of mining engineering employment characteristics is analyzed in this paper. The result showed that the average employment rate of master degree recipients of mining engineering is 97.52% in nearly six years. The agreement/flexible employment rate and the employment industry categories total number are on rise year by year, as well as the employment ratio in Party and government organs, foreign-funded enterprises, private enterprise. Graduates have multiple regions employment with a significant correlation between locations of universities and the geographical distribution of employment. However, graduates' intention of entrance, proportion of employment geography and census register seat is consistent, and correlation between the types of their universities/specialties and sectors of employment are go down with each passing year. In practice, there are still serious contradiction between supply and requirement, and between cooperation and competition. With the analysis, it provide some guide in ideological and political education, employment guidance coordination model with multiple perspectives, and graduate quality education to the development of employment guidance.

Introduction

In today’s competitive and challenging China's high education with diverse demands, the enrolment scale of postgraduate is expanding. The national graduate education recruit students was more than 645000, the learning postgraduate was more than 1910000, the graduate was more than 552000 in 2015. Mining engineering, a professional appears with the industrial development, postgraduate education has been developing rapidly in recent years. In 2012-2016, China’s mining engineering graduate recruit students graduated from 1700-2400 per year, the total number of graduate nearly 15000.

With the number of graduates is rapid increase, there are serious contradiction between supply, requirement and competition in graduate employment, while the corresponding professional post demand growth is slow. On the one hand, as a result of innovation to drive the development of the huge demand for high-tech talents, higher education's development needs and personnel demand, postgraduate education enrollment scale will continue to steadily expanding[1]. With the situation of graduates of supply and demand independent-autonomous of choose and employ persons' trend will be more open and independent development, mutual competition and mutual influence between the graduates more intense, will bring great problems and challenges to mining engineering graduate. On the other hand, mining engineering graduate choose mining and manufacturing as professional rapid development comprehensive capacity and utilization. The configuration of talented student’s phased and structural problems are prominent [2]. The corresponding number of high-quality talents and the demand of the job in the years of growing situation tend to saturation, significantly reduce the trends [3]. The situation will not only change the characteristics of mining engineering major graduate student employment, but also increased the employment problems.
Therefore, in this paper, mining engineering major graduate employment is analyzed, practice professional obtain employment problem is discussed, countermeasures of improve mining engineering graduate employment is explored. It will be conducive to the timely adjusting the employment guidance work, rational allocate employment resources according to the situation of employment. At the same time, it has a certain practical significance to someone make basic judgment for the future graduate employment situation or put forward the related countermeasure.

**Characteristics of Mining Engineering Graduate Employment in WUST**

Research from mining engineering graduate training scale of WUST in 2011-2016. The mining engineering of WUST have two secondary discipline, mining engineering and mineral processing engineering. The data form the WUST quality of the graduate employment annual report.

**Graduates Numbers and Employment**

From 2011-2016, the number of mining engineering professional graduate were 14, 25, 24, 27, 25, and 37. The employment rate were 100.00%, 100.00%, 100.00%, 92.00%, 95.83%, 97.28%. Graduate employment situation is optimistic whit the average rate is 97.52%.

![Employment number and rate of mining engineering professional graduate.](image)

Figure 1. Employment number and rate of mining engineering professional graduate.

**Distribution of Graduates’ Employment**

According to the report, the graduate employment whereabouts can be divided into entrance (entering school of higher grade), abroad, agreement/flexible employment, entrepreneurship and underemployed. Figure 2 show the mining engineering graduate employment situation.

First, graduate average graduation rate is 8.04%. Among them, according to the entrance, 72.73% of the fresh graduates choose "985", "211", or "affiliated research institutes" as the main destination. On the whole, enters a higher school graduate’s intention decline year by year, a drop of about 26.65% on average.

Second, average ratio of go abroad is 3.09%, and entrepreneurial is1.12%. Research shows that, industry of entrepreneurship is associated with graduate professional, and 75.00% of abroad is "study overseas".

![Employment distribution of mining engineering graduates.](image)

Figure 2. Employment distribution of mining engineering graduates.
Third, the agreement/flexible employment rates were 78.51%, 84.48%, 88.00%, 84.48%, 91.67%, 91.89%, with the macro on increasing trend year by year (average 3.49%).

**Company Nature of Graduates**

According to the report, the graduates’ company can be divided into party and government organizations, universities, scientific institute (design institute and research institutes, etc.), state-owned enterprises and other enterprises, foreign-funded enterprises and private enterprises, etc. Figure 3 show the company’s properties.

![Figure 3. Company nature of mining engineering graduates.](image)

First, graduate choose the party and government organs were 0.00%, 4.55%, 4.55%, 5.00%, 13.64% and 14.71%, and the average ratio was 7.07%. AS a conclusion, the party and government organs have become one of the main jobs of the graduate employment intention.

Second, the total percentage of graduate choose scientific research company and state-owned enterprise were 90.91%, 77.27%, 50.00%, 77.27%, 36.36% and 26.47%. Among them, graduates choose scientific research company average was 28.80% in 2011-2013, graduates choose state-owned enterprises average was 56.82% in 2011-2012. Mining engineering graduate choose a scientific research company and state enterprises "adjustment" in 2013-2014, this also match the phenomenon of a large number of mining and manufacturing to carry out the "reserve talents scheme" [4]consistent in 2013.

Third, the proportions of graduates choose foreign invested and private or other enterprises showed an obvious trend of increase. This average ratio is 32.16% in nearly six years, while the average ratio is 46.13% in nearly three years. Among them, graduate choose other company year-on-year increase (3 times) in 2013. And graduates choose other enterprise proportion year-on-year growth of 10.00%, 13.64% and 16.47% respectively in 2014-2016.

Fourth, 4.55% - 9.09% of the graduates choose college employment since 2012.

**Industry Distribution of Graduates’ Company**

![Figure 4. Industry distribution of graduates company.](image)
According to the employment report statistics caliber, combined with the national economy industry classification standard, the graduate company can be divided into 14 industries, such as mining, manufacturing, construction. Figure 4 show graduate company’s industry distribution.

First, the total numbers of categories graduates’ employment industry were 3, 5, 7, 9, 9, and 11 respectively in nearly six years. Graduate employment showed a trend of obvious diversity. Graduates company industry distribution scales in the first three orders are mining (32.82%), scientific research or technical services (24.43%), and education (7.63%).

Second, graduates’ choose mining industry average is 36.73%, and employment trend decline year by year with a drop of about 21.58% on average. Overall, 2011 graduates choose mining ratio fewer than 72.27%, 2016.

Third, graduates choose industry of scientific research and technology service, mainly related to the mining engineering research institute, consulting firms, etc. The overall ratio showed a trend of increase after decreases first, which is shown the highest rate (40.91%) in 2014 and the lowest rate (14.71%) in 2016.

Graduate Employment Regional Distribution

![Graduate Employment Regional Distribution](image)

Figure 5. Graduate employment regional distribution of mining engineering graduate.

According to the employment quality of the annual report statistics caliber and national economy industry classification standard, graduate employment area can be divided into the eastern, central, western and northeast. At the same time, combines the condition of graduates to census register seat, graduate employment units whether or not census register seat is analyzed. Figure 5 show mining engineering graduates’ employment regional distribution as following features.

First, the graduate employment regional distribution is obvious "territorial" employment characteristics. Nearly six years graduate employment geographical distribution sequence in central (average 54.20%), eastern (average 28.24%), west (average 16.03%) and northeast (average 1.53%). Among them, graduates choose employment proportion central were 54.55%, 68.18%, 50.00%, 68.18%, 50.00%, 52.94%. While graduates choose employment proportion western increased year by year, were 0.00%, 9.09%, 9.09%, 9.09%, 13.64% and 26.47%.

Second, graduate employment area is consistent with the census register seat were 81.82%, 68.18%, 59.09%, 55.00%, 45.45%, 44.12% respectively. It decline year by year, the average decline is 11.44%.
According to the report statistics caliber, combined with the mining engineering courses and graduate jobs correlation, 2011-2016, mining engineering professional graduate student professional related situation is shown in figure 6. Proportion of graduates’ employment professional relevance were 100.00%, 81.82%, 72.73%, 70.00%, 63.64%, and 70.00% in recent six years respectively. It declines year by year, with the average ratio of 72.54%, the average decline of 13.64%. Among them, the year-on-year drops of 26.05% in 2016, for the largest proportion divide calendar year.

**Practice Problem of Mining Engineering Graduate Employment**

With the situation of graduate Labor market and of graduate education development, the influence of mining engineering graduate career choice is no longer to limit in university, academic and scientific research institutes. The diversity of graduate employment industry and its region was significantly properties. Besides, graduate employment professional relevance decline year by year, change career, graduate professional specialty applications and play are hard to come by. It not only caused the mining engineering graduate employment difficulty, also caused the education to cultivate professional talents resource waste. In practice, there still need to be mindful of mining engineering graduates in employment "graduation season" aging is more and more long.

First, the employment of professional relevance and compensation continues to reduce. With the higher education vigorously promoting, graduate student recruit and develop scale increased dramatically. Universities, research institutes and state-owned enterprises no longer demand for graduate as before. Meanwhile, due to a slowing domestic economy and less demand for the supply side post reform, mining engineering graduate innovation factors, such as career development, employment salary is generally low. Graduate professional relevance decreasing, professional training "glut" professional employment problem, with graduate choose a major in other industries in their employment choose. According to the WUST quality of the graduate employment annual report (2015) shows that, 47.06% graduates first time work with relevant professional obtain employment, is far lower than the average level (68.00%). The compensation of mining engineering graduate is more than 5000 RMB a month only 16.67%, well below the school 57.84% proportion.

Second, the mechanisms of supply, demand and competition of graduate employment have obvious change. According to the WUST graduate employment quality annual report (2015), and the WUST college graduates employment quality annual report (2015), mining and mineral processing engineering undergraduate employment rate were 95.05% and 97.06% respectively (average 96.05%). While, mining engineering professional graduate employment rate was 95.83%, below the undergraduate employment rate. Investigate its reason, on the one hand is due to the companies, especially in the joint venture, private enterprises, mostly demand for technical personnel, rather than the researchers. On the other hand, influenced by the overall employment environment, companies no longer blindly pursue higher education, but pay more attention to the comprehensive quality of graduates and the jobs between "equal capital value", and more inclined to pay a lower cost to choose plasticity strong undergraduate students.

Third, mining engineering graduate student employment market had a greater influence on the industry. In recent years, China's economic growth is still faced with multiple pressures. Economic
downward pressure obvious, external demand growth, boost domestic demand is slow, a new investment growth is not clear. Besides, Enterprise overall status has not been fundamental to improve production and management difficulties, and enterprises employing demand continues to reduce.

Fourth, the graduate student professional identity, professional cognition and prepare for the employment are adequately. Part of the graduate student in the graduate is under the influence of elite education ideas and mentality, their location, insufficient understanding external employment environment, that should be engaged in after graduation from high knowledge, high economic return, and high social status "professional". Poor part of the graduate student looking for a job enthusiasm, choosing employment concept needs further improve. If the graduate student can't change the employment psychology, pay more superiority than during the crisis, no improving personal ability to ascend, difficult to meet the needs of the society on employability, hoping for "professional", rather than taking the initiative to choose jobs, so the final result can only be negative passively waiting for jobs, employment, the unbalance of choosing a career.

Countermeasures for Postgraduate the Employment Guidance

Strengthening the Postgraduates’ Ideological-Political Education to Improve Employment Options

First, the construction of ideological and political education team of postgraduates is not only the need of graduation work, but also the need of the overall development of universities. This requires strengthening the postgraduates’ ideological and political education team building efforts and working as the main content. We should vigorously establish a postgraduate ideological and political education team with strong politics, fine business, and upright style, and give full play to the management and service role in education. We should improve the design of graduate student ideological and political education team according to a few full-time, most part-time, part-time combinations of ways to improve the quality of the team. Also, strengthen the team internal management system, improvement the evaluation, assessment and reward and punishment system.

Second, we should give full play to the leading role of ideological and political theory courses, grasp the professional development and graduate development hotspots. At the same time, actively promote the real-time political into textbooks, classes, and minds to stimulate graduates to establish ambitious ideal and correct career. The focus is to innovate the grass-roots party building work, build service-oriented party organizations, give full play to the advantages of high proportion of graduate party members, carry out internal self-education and learning of postgraduates, and correct the wrong view of employment in time.

Strengthening the Construction of Employment Work to Improve Its Service System

To realize the important goal of "stabilizing and expanding employment", perfect the employment and enhance its quality, in fact, it is a process of properly addressing the multi-interests of various game relationships, and finally realizing the maximization of whole interests. Rowley's Stakeholder Theory [5] is adopted in the study to build up relationship model of different stakeholders in the postgraduate employment. (As shown in Figure 7)

![Figure 7. Model of graduate employment stakeholders.](image)
The model shows that the employment training and service of universities, career planning and service are regarded as the center of employment service system (core interests[6]), while the efficient construction of management team, effective fulfillment of corporate social responsibility and the promotion of family education are the vital support in the employment service system (strategic interests[6]). And the preferential or supportive policies offered by relevant government departments and the development of social intermediary organizations are the adequate support to improve the employment service system (environmental interests [6]).

Therefore, it is necessary to form a comprehensive employment service system, with the involvement of government, social intermediary organizations and institutes. Besides, collaborative innovation between colleges and enterprises should be expanded, which is prioritized in professional collaboration, coordination of classroom teaching and extracurricular activities, internal and external universities experts, and the cooperation of stakeholders, taken the innovation and entrepreneurship development model as point of innovation, and has strengthened the core competitiveness and quality capabilities of postgraduate students.

**Strengthening Graduate Education's Quality to Improve the Graduates’ Core Competitiveness**

First, universities shall timely according to the talent market demand and employers demand to develop has effectiveness and pertinence of teaching content and training objectives, and constantly according to the development of universities, job market changes, such as students' professional development connotation, adjust, supplement and perfect the teaching content, professional planning and curriculum. In setting majors and courses, in line with the requirements of the talent market at the same time, universities should be comprehensive, scientific teaching content, build the development needs, and social needs of the talent market and graduate occupation career development needs consistent quality course. Enhance academic research and professional practice and development strategy of heavy construction project, the system should be step by step, level to carry out postgraduate professional training, practice, development and teaching training.

Second, it should strive to promote the subject construction and development, and promote graduate student "professional, self-confidence and innovation confidence”. Graduate employment quality is closely linked with the quality of education and training of graduate students. Clear subject orientation (direction and development level), strengthening academic teams (a leader and discipline echelon), increasing scientific research, promote the cultivation of talents, promote the discipline base construction (laboratory, key disciplines, equipment, etc.), the top management design disciplines, not only can integrate agglomeration optimization subject, improve state of their own discipline construction in colleges and universities; In its reflection in the process of postgraduate education to develop at the same time insufficiency, the graduate student innovation training mode, improve the condition of graduate student training, strengthening the innovation ability training of graduate students and to comprehensively improve the quality of graduate education, strengthen the key competitiveness of graduate students.

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