

# Employment Big Data Analysis of Higher vocational colleges based on python -- A case study of civil and architectural majors

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**Abstract.** In recent years, with the increase of graduates, the impact of the novel coronavirus pandemic led to economic slowdown and other factors, the problem of difficult employment has attracted wide attention from all walks of life. This paper takes the employment data of civil engineering graduates of a vocational college as an example. Through data collection, data cleaning, data analysis, data visualization and other methods, it shows the employment rate of graduates, employment industry, matching degree between employment units and majors, salary level, geographical distribution and other information, so as to provide reference for students' career planning and employment choice. It also provides job market data support for universities and government departments. Finally, countermeasures and suggestions are put forward to help students better plan their career development.

**Keywords:** College students; Employment; Salary; Industry; region.

## 1. Introduction

College students employment is a practical problem, but also a social problem. At present, the number of graduates is increasing year by year. It is expected that there will be 11.58 million graduates in 2023 (see Figure 1). Although college graduates have a high level of professional knowledge, they are the dominant group in the labor market, but with the development of globalization and the impact of knowledge economy, college students must have the core employability to meet the requirements of the new economy in order to develop successfully. The research shows that in the current job market, vocational college graduates are faced with great employment pressure and more obstacles in the employment process, such as weak occupational identity, lack of vocational skills, information asymmetry and other problems. In addition, the employment situation of vocational college graduates is affected by some factors, such as personal quality, the degree of matching between major and market demand, and the novel coronavirus epidemic [1].

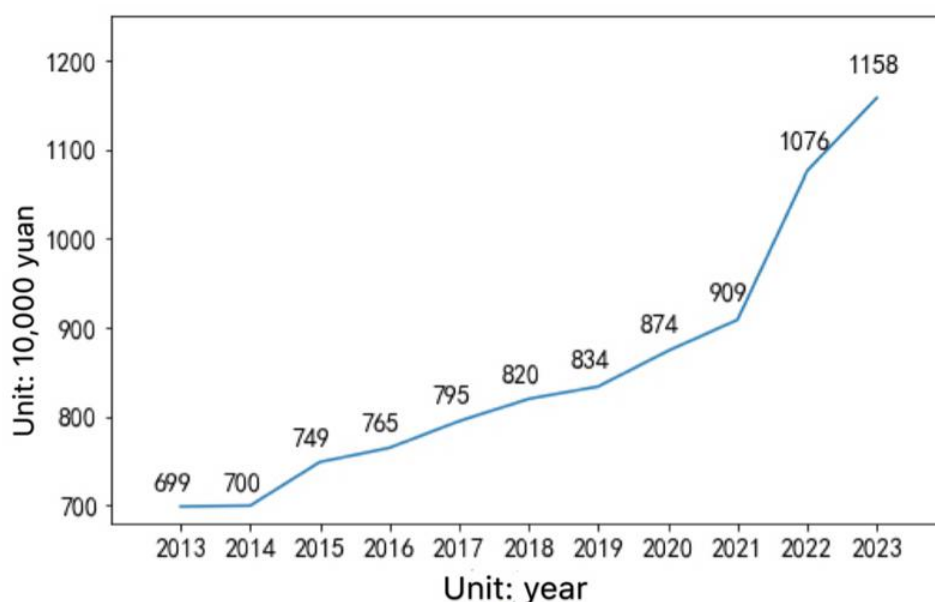


Figure 1 The number and growth trend of national graduates in recent ten years

A comprehensive big data analysis of the employment situation of vocational college graduates is of great significance for understanding the demand and trend of the job market and improving the employment competitiveness of graduates: (1) Vocational colleges can better understand the social demand for vocational skills, guide vocational colleges to carry out teaching reform, and cultivate talents more in line with the market demand. (2) The government and education departments understand the current situation and development trend of vocational education, and can designate educational policies with a clear aim to further promote the development of vocational education. (3) The government needs to know the supply and demand of professional talents when making employment policies. (4) Information such as regional distribution, industry distribution and salary level displayed by employment analysis can provide employment guidance and help for graduates, which can help them make preparation in advance and improve their employment competitiveness.

## 2. Analysis of employment data

This paper selected a vocational college computer and related major graduates for analysis, the total number of students 786. From the employment success rate, industry distribution, regional distribution, salary level for visual display.

### 2.1 Employment success rate

From the perspective of graduation destination, the situation of employment, non-employment, self-employment and higher education is shown in the figure below. The number of students employed by enterprises was 687, accounting for 87.4% of the total number, and the number of students employed by joining the army, starting their own businesses and going to higher schools was 84, accounting for 10.6% of the total number. The number of unemployed is 2 per cent of the total.

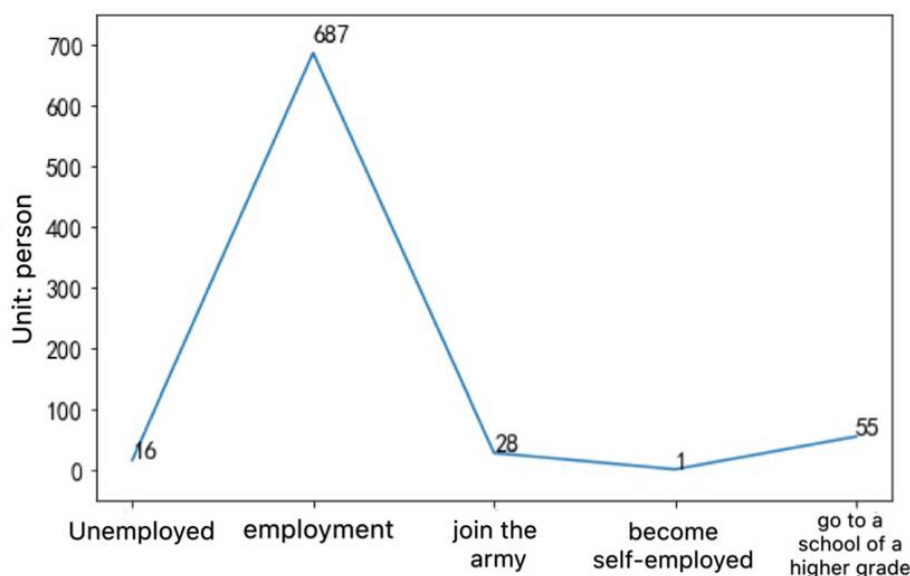


Figure 2 Overall distribution data of employment

## 2.2 Industry distribution

According to statistics, the graduates of this school are mainly employed in civil engineering and construction and other related industries, and the employment matching rate reaches about 82%, which is very good match with the major. In addition, 38 people are engaged in technical service industry, 21 people are engaged in business industry, 14 people are engaged in information technology industry, 16 people are engaged in wholesale and retail industry, and 4 people are engaged in catering industry, all of which are small proportions. This shows that the students of the school are basically able to apply what they have learned to their professional field.

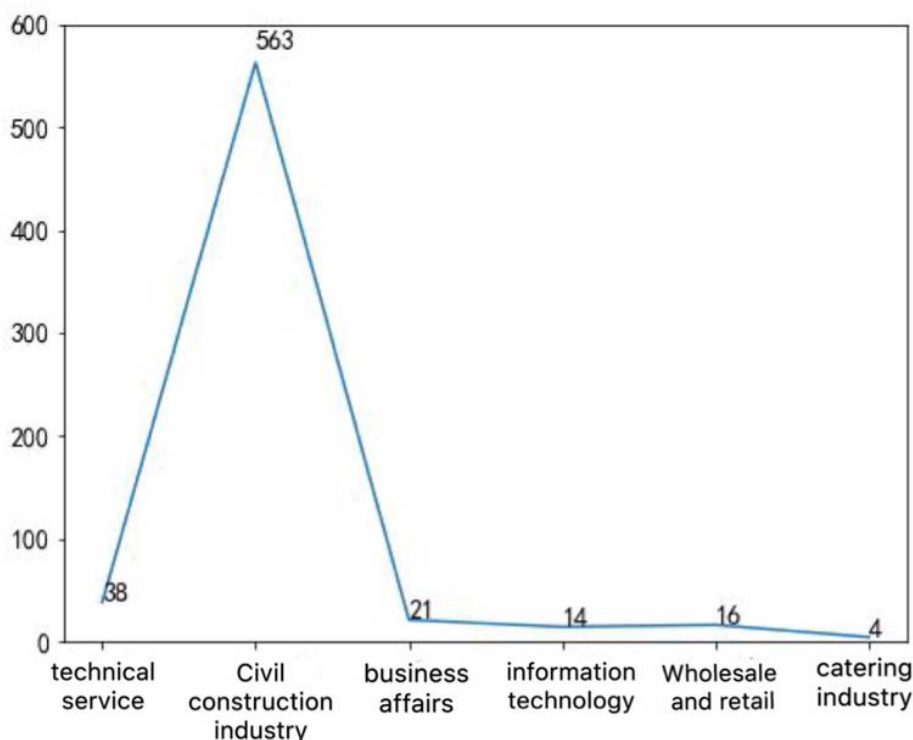
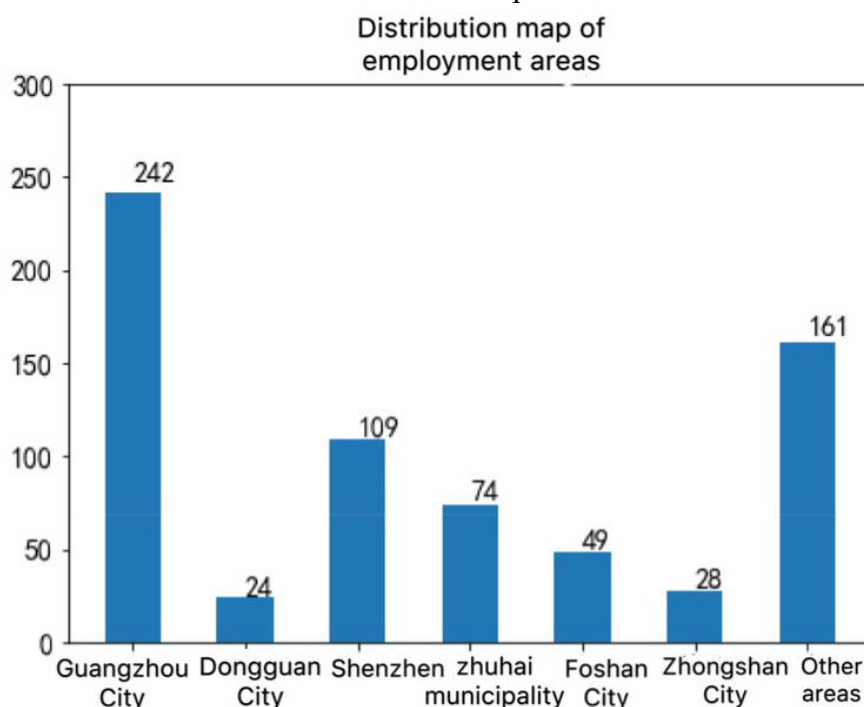


Figure 3 Industry distribution

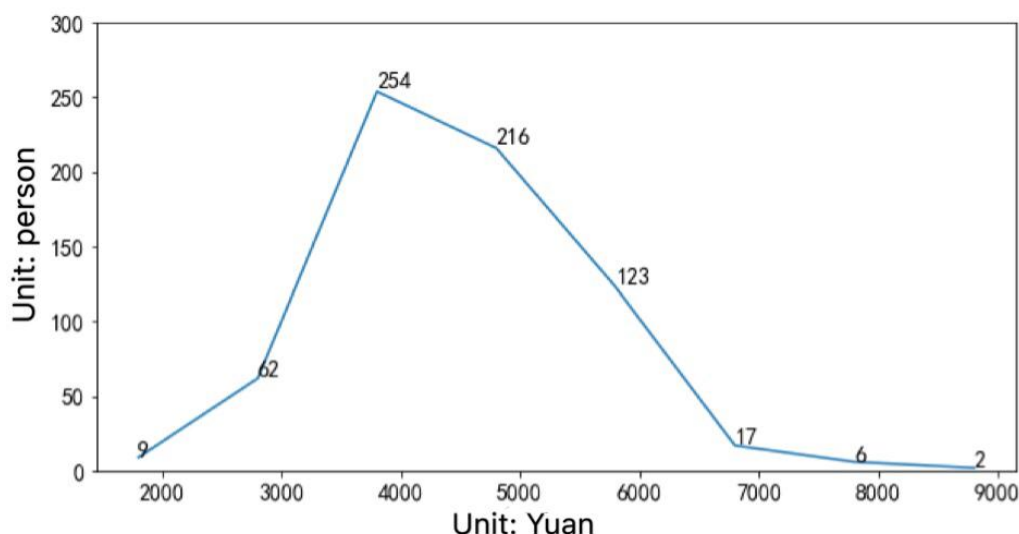
### 2.3 Geographical distribution

From the perspective of employment region, most students are concentrated in Guangzhou and several economically developed cities in Guangdong region. On the one hand, first-tier cities have a high degree of economic development, relatively more job opportunities, relatively high salary and favorable welfare benefits, which attract many graduates to pursue their careers. On the other hand, many enterprises in second - and third-tier cities also need a large number of graduates. However, due to the lack of regional development, relatively low salary and less development space, the attraction of graduates is limited. The cluster of junior college students in economically developed cities also faces some problems, such as high competition for jobs, high living costs, concentration of highly skilled talents and soaring housing prices, all of which have put them to the test. Therefore, junior college students should properly consider going to small and medium-sized cities to realize their own value and make contributions to local development.



### 2.4 Salary level

According to the data statistics, the average salary of graduates in this sample is 3976 yuan. Among them, most of the students' salary level is between 3000 and 5000 yuan. The number of students who are distributed between 3000 and 4000 yuan is 254, and the number of students who are distributed between 4000 and 5000 yuan is 216, accounting for 68% of the total number. About 21 per cent of graduates earned between RMB5,000 and Rmb8,000. As can be seen from the statistical results, the overall salary level of graduates is relatively average, and the proportion of graduates with high salary level is relatively low.



### 3. Countermeasures and suggestions to solve the employment problem of college students

#### 3.1 Guidance on employment area

Select the employment area according to the needs of the profession and industry. Different professions and industries have different requirements for the region. Some professions and industries may have more advantages in employment in big cities, while some industries are more suitable for employment in small cities or rural areas. Considering the cost of living and development opportunities, the living cost of big cities is high, but they also provide more development opportunities and resources [2]. Small cities or villages have low living costs but relatively few development opportunities and resources. When choosing a job location, you need to consider the cost of living and development opportunities. Pay attention to policy support. In order to promote local economic development, the government has introduced some employment support policies, such as subsidies, tax incentives, etc., which can help graduates of higher vocational colleges get more opportunities in employment. Coordinate the urban-rural dual structure differences and regional disparities. Resources should be appropriately tilted to small and medium-sized towns, the difference between cities and regions in political resources should be narrowed, and college students should be better guided to move to underdeveloped areas and small towns, which can not only bring human resources to small and medium-sized cities, but also relieve the pressure of large and medium-sized cities and promote a virtuous circle of social development.

The choice of employment region should be based on their own conditions and development needs, but also need to consult and learn more about the employment situation and policies of different places, to make a more sensible choice.

#### 3.2 The government has introduced measures to encourage college graduates to find jobs and start businesses

The government provides more job opportunities for college graduates through recruitment, internship and training, and strengthens the publicity of employment information channels. Entrepreneurship support funds shall be set up to provide financial, technical and managerial support for college graduates to help them start their own businesses [3]. We will strengthen employment services and support, establish employment guidance centers and employment information platforms, and provide college graduates with services and support in job-hunting

information, career planning and job-hunting skills. We will strengthen vocational education and training to improve the professional quality and competitiveness of college graduates and help them better adapt to the job market. Formulate relevant policies, such as employment priority and tax incentives, to provide more opportunities for college graduates to find jobs and start businesses.

### **3.3 Schools should be market-oriented and promote the combination of education and employment**

Adjust the specialty setting, according to the market demand and employment prospects, rationally set up the specialty, pay attention to the training of competitive talents. Establish the cooperation mechanism of industry, university and research, strengthen the cooperation with enterprises, integrate the needs of enterprises into the teaching content and practice, improve students' practical ability and employment competitiveness. Campus recruitment and internship employment services are carried out to provide students with job search training, resume preparation, career planning and other services to help students better adapt to the job market [4]. Establish an employment information platform to provide students with the latest employment information and job information, so that students can timely understand the market changes and employment opportunities. Strengthen the school career guidance, help graduates to scientifically analyze the market, objective understanding of themselves, to help graduates to master certain skills in choosing a career. The vocational guidance Center provides career counseling, employment counseling and other services to guide students in career planning and employment preparation. Through the above measures, the school will open its schools to the market, promote the combination of education and employment, and provide better education and employment services for students.

### **3.4 Reform of teaching methods**

Teaching methods were reformed to integrate subject content with practical projects, allowing students to acquire knowledge and skills through participation in projects. Use project themes to teach. Combining subject content with practical projects, using projects as teaching topics to guide students to learn knowledge and skills through practice. To promote the "classroom revolution", build a modern classroom, take learners as the center, carry out the integrated teaching design of "teaching, learning, training, doing and evaluation", and explore new teaching methods such as "action-oriented" teaching, project-oriented teaching, context-oriented teaching and process-oriented teaching. The project provided by the enterprise is incorporated into the teaching plan, so that students can master practical skills and work experience through practical exercise and project practice [5]. Let the students participate in the planning, implementation, evaluation and other aspects of the project, and cultivate the students' project management ability. Cultivate students' teamwork ability. Let the students do the project practice in a team to cultivate the students' teamwork ability and communication ability.

### **3.5 Deepen school-enterprise cooperation**

School-enterprise cooperation aims to promote common development and win-win cooperation between the two sides. School-enterprise cooperation can provide more practical opportunities for students, so that students can better integrate into the enterprise, understand the operation mode and actual work situation of the enterprise, so as to better cultivate talents. School-enterprise cooperation to jointly carry out research and development innovation projects, solve practical problems of enterprises, promote education and teaching reform and technological innovation of enterprises, schools to improve the quality of talents, enterprises to improve core competitiveness. School-enterprise cooperation needs a long-term and stable cooperation mechanism, and a reasonable system of profit distribution, risk sharing and intellectual property protection should be established to ensure the sustainability and long-term nature of cooperation. School-enterprise cooperation is a mutually beneficial and win-win way of cooperation, which can promote the

positive interaction between schools and enterprises and promote economic and social development [6].

## Conclusion

Based on the big data analysis of the employment situation of civil engineering graduates in a vocational college, this paper presents the data from several aspects, such as regional distribution, salary level, industry distribution and matching degree. The results show that in terms of geographical distribution, students prefer to go to big cities, which is a big challenge for graduates of higher vocational colleges. In terms of salary level, the average salary is about 4000 yuan. From the perspective of industry distribution, most of the students are engaged in their major, and the matching degree between the employment unit and the major is good. This study provides important reference and guidance for students in vocational colleges. The research methods and analysis results of this paper can also provide reference for the analysis of employment situation in other higher vocational colleges.

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