



Algorithm Optimization Strategies of the UCAS System: Problem and Countermeasure Analysis Based on the Return of Chinese Overseas Students

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Abstract. In recent years, due to the implementation of a series of policies by China to attract overseas students to return, more overseas students have chosen to seek employment in their home country. However, during the process of returning to work, overseas students face numerous challenges, such as issues related to academic qualification certification and recognition, information asymmetry in the domestic job market, and mismatches between their skills and the requirements of domestic positions. This article analyzes the core algorithms of the UCAS (Universities and Colleges Admissions Service) system (including score conversion, course matching, competitive admission, and dynamic adjustment algorithms) and compares them with the Chinese admission model centered on college entrance examination scores. The study proposes potential directions for optimizing the UCAS system, such as improving the matching algorithm and developing personalized recommendation modules. However, it also points out that since the UCAS system prioritizes serving local British students, emphasizes the flexibility of university independent admissions and the comprehensive evaluation system, and that algorithm improvements are difficult to fundamentally solve problems such as employer recognition and information deficiency, the feasibility of these reform measures in the UK is relatively low. Ultimately, this article believes that the key to solving the problem of overseas students' employment in their home country lies with the students themselves, including making good career plans, accumulating relevant domestic experience, and actively breaking through information barriers.

Keywords: UCAS, Algorithms, employment.

1 Introduction

In the context of China's rapid economic development and the global flow of talents, an increasing number of Chinese students who study abroad choose to return to China after graduation to seek career development. This trend is not only attributed to the growing demand for international talents in the domestic job market but also supported by the policies at the national level to attract overseas talents. However, during the

transition from studying abroad to employment in China, these students encounter numerous obstacles, making it difficult for them to smoothly integrate into the domestic workplace.

This study focuses on three core challenges faced by returning overseas students in finding employment: First, the process of academic qualification recognition is cumbersome, and the recognition of overseas degrees varies in China. Some employers lack an understanding of foreign education systems, making it difficult to fairly assess the abilities of overseas students. Second, there is an information asymmetry issue. Students who have been abroad for a long time find it hard to keep abreast of the dynamics of the domestic job market in real time, such as industry trends, job demands, and recruitment preferences of enterprises. Third, there is a mismatch between skills and demands. The educational models and course contents in overseas institutions may not align with the actual needs of domestic enterprises, and returning students may have shortcomings in practical abilities and understanding of the domestic market.

To explore possible solutions to these problems, this paper takes the UK's core higher education admissions platform, UCAS, as the research object, analyzes its algorithmic mechanisms (including grade conversion, course matching, competitive admission, and dynamic adjustment, etc.), and compares it with China's admissions system centered on standardized test scores. By analyzing whether integrating elements of China's admissions algorithm into the UCAS system can better align overseas education with domestic employment demands, this paper aims to provide ideas for alleviating the employment difficulties faced by returning students.

The subsequent chapters will elaborate in detail on the current situation and problems of overseas students' employment upon returning to China, analyze the algorithmic principles of the UCAS system, assess the feasibility of integrating Chinese enrollment elements into the UCAS system, and offer specific suggestions for overseas students to enhance their competitiveness in domestic employment.

2 Situation and Problems of Overseas Students Returning to China for Employment

In recent years, the number of Chinese students returning to China has been increasing year by year. According to relevant data, the number of Chinese students returning to China reached 9090 thousand showing a significant increase compared to previous years [1]. This is mainly attributed to the rapid development of China's economy, the increased demand for overseas talents in the job market, and the series of policies implemented by the country to attract overseas students to return [2]. However, overseas students also face many problems during their return process, such as academic degree certification, information asymmetry regarding employment, and adapting to the domestic workplace environment [3].

2.1 The Most Serious Problem: Imbalance Between Supply and Demand

Perhaps the two issues mentioned above can be overcome. However, if the abilities of international students do not match the job requirements, then they will have great difficulty finding employment after returning to their home country. The educational model and course content that international students receive overseas may differ from the actual needs of domestic enterprises. For instance, some international students mainly analyze the British market when studying marketing, but the Chinese market and the British market are different; some international students learn regulations and strategies that are not applicable in China; some international students are good at theoretical research but lack the practical operation skills and project experience required by Chinese enterprises; some international students have advantages in cross-cultural communication and international perspectives, but they do not have a deep understanding of the Chinese market environment and industry rules, and thus find it difficult to quickly adapt to the working pace and requirements of Chinese enterprises. Moreover, domestic enterprises place greater emphasis on internship experience, social connections, etc. in recruitment, while international students have fewer internship experiences due to the tight course design and a small connection with the Chinese market [4].

2.2 Academic Degree Certification and Recognition

The primary issue for overseas students when applying for jobs in China is the verification and recognition of their academic qualifications. Due to the limited popularity of overseas education in China, some Chinese people and enterprises lack understanding of the difficulty of applying to British universities and their course offerings. As a result, they cannot fairly compare the abilities of overseas students with those of domestic university graduates. For instance, some companies might label universities other than G5 as "fake universities", even if overseas students have the same abilities as domestic university students and hold degrees from regular institutions. They may still face doubts from employers due to the differences in educational systems between China and the UK. Although the Ministry of Education has established an academic qualification certification system, the certification process is cumbersome and time-consuming. (China Service Verification Certification: In the United States and Canada, it takes approximately 10 working days; in the UK and Australia, it takes about 15 working days; for other countries, it takes approximately 20 working days. There is no express service. The certification fee is 360 yuan per item. In addition, different regional mailing service fees need to be paid. The process is as follows: Log in to the service hall to register an account, complete real-name authentication, accurately fill out the application form, upload academic certificates, travel documents and other materials as required, make the payment online, wait for the review. If supplementary verification is needed or the materials are incomplete, the certification will be temporarily suspended [5]. Moreover, some enterprises prefer graduates from well-known domestic universities during recruitment and do not attach sufficient importance to the qualifications of overseas graduates, preventing the advantages of overseas education experiences of overseas students from being fully utilized.

2.3 Information Asymmetry

With the continuous updates of China's policies and the changes in the international economic situation, the dynamics of the domestic job market are constantly changing. Information such as industry trends, job demands, and employers' recruitment preferences is all in a state of flux. However, as international students have been living abroad for a long time, they have limited access to such information, making it difficult for them to keep up with the latest domestic employment trends in real time. This results in many international students lacking understanding of the demand for talents in emerging industries in China, the employment policies of local governments, and the recruitment processes of enterprises. As a result, they have unclear goals when seeking jobs and miss out on suitable employment opportunities [5].

3 The algorithms used by the UCAS system

In the previous article, we analyzed a series of problems that Chinese students faced when they returned to China for employment after graduating from British universities. Therefore, we will attempt to solve this problem by improving the UCAS system. Now, let me introduce the UCAS system. The UCAS system is the core platform for university admissions in the UK, using a series of algorithms to efficiently process a large amount of application information. Its algorithms aim to achieve precise matching between students and university majors, ensuring the fairness and scientific of the admission process. In terms of processing student application information, the UCAS system uses multiple algorithms to evaluate students [6].

3.1 Grading Conversion Algorithm

The grading conversion algorithm is a fundamental part of the UCAS system's algorithmic framework. Through this method, the system converts diverse academic qualifications and grades into a unified quantitative standard, facilitating universities in comparing different applicants during the admission process.

The UCAS system collects students' academic grades and then, based on the standards of the British education system, standardizes the conversion of grades from different curriculum systems and from different countries and regions using a simple mathematical formula: $UCAS\ point = grade\ value \times course\ length$. Finally, it compares and converts them against the equivalent local-level examinations in the UK, assigning them corresponding weights [7].

3.2 Course Matching Algorithm

The course matching algorithm focuses on precisely aligning the students' preferred courses with the actual courses offered by the universities. The UCAS system database contains official course information from all UK universities. After a student submits an application, the algorithm quickly filters out university courses that meet the basic requirements based on the keywords of the selected courses. Then, it carefully considers the specific admission conditions of the courses, such as the requirements for spe-

cific subjects and the completion of prerequisite courses, further narrowing the matching scope to ensure that the courses applied for by the students are compatible with their own conditions.

3.3 Competitive Admission Algorithm

In the admission process, the competitive screening algorithm plays a crucial role. When a university department receives numerous applications, the algorithm will comprehensively evaluate various factors of the applicants to determine the priority order for admission. It combines this information to generate a comprehensive competitiveness index, helping the university efficiently select the most suitable students. This algorithm captures key information through text analysis, assessing the applicants' enthusiasm for the major, career planning, and the alignment of their own strengths with the profession.

3.4 Dynamic Adjustment Algorithm

In addition, the UCAS system also has a dynamic adjustment algorithm. During the admission process, the number of admission quotas for each college major and the number of applicants is constantly changing. This algorithm can promptly adjust the matching strategy based on these changes. For instance, if the number of applicants for a certain major is significantly lower than expected, the algorithm will appropriately relax the selection criteria to attract more potential students; conversely, in cases where the number of applicants for a popular major is excessive, the algorithm will strengthen the selection standards to enhance the quality of admissions.

4 Feasibility Analysis of the UCAS System in Addressing the Employment Issues of Chinese International Students

4.1 Comparison of the Admission Systems in China and the UK

From the perspective of evaluation dimensions: Unlike the multi-dimensional comprehensive evaluation model of British universities, the admission algorithm of Chinese universities takes the college entrance examination score as the core basis. The algorithm almost entirely revolves around the total score of the college entrance examination. The provincial education examination authorities set the batch lines based on the candidates' college entrance examination scores. Universities, based on the batch lines, determine the admission list according to the principle of "priority based on scores and following the application order" through a simple ranking algorithm. Apart from some special majors (such as art and sports) which may add professional examination scores, other factors such as comprehensive quality evaluation and personal experience are only used as references and are not included in the core algorithm system. This algorithm emphasizes absolute fairness based on scores and achieves efficient screening through standardized score ranking.

In terms of standardization, it differs from the characteristics of the UK, which combines standardization with flexibility. Different universities can add specific requirements and additional tests for certain disciplines. The admission algorithm in China is

highly uniform: the college entrance examination is uniformly by the state (some provinces have their own propositions, but the standards are consistent), the scoring criteria are unified nationwide, and the admission algorithm follows the same rules across all provinces. Universities have almost no room for adjustment. This high degree of standardization ensures the fairness of the admission process, but it lacks consideration for individual differences of students.

Overall, China's admission algorithm is centered on "score fairness", aiming for efficient and uniform screening; while the algorithm in the UK is oriented towards "professional fit", achieving personalized selection through multi-dimensional assessment [8].

4.2 How to Improve the UCAS System

(1) Optimize the Matching Algorithm Model

Based on the improved database, optimize the matching algorithm model of the UCAS system. Introducing advanced technologies such as machine learning. Through the analysis of a large amount of historical data, discover the correlation patterns between students' academic background, major selection and the subsequent development results in different countries. When matching students with British universities and majors, not only consider the academic match degree, but also fully combine the students' intentions for post-graduation development in their home country. This can improve the accuracy of information matching. For example, for students who wish to enter the financial industry after returning to their home country, the algorithm should prioritize recommending British universities and majors that have advantages in the financial field and whose curriculum settings are in line with the domestic financial industry demands [9].

(2) Develop personalized recommendation module

Based on the individual differences of Chinese international students, develop a personalized recommendation module. Through the analysis of students' application information, interest preferences, career planning and other data, construct a student profile. Based on the student profile, provide each student with personalized application suggestions, including suitable universities, majors and related guidance for return-to-country planning.

(3) Establish dynamic update mechanism

Establish a dynamic update mechanism for the database and algorithm model to ensure that the system can respond promptly to changes in different countries' employment markets, talent policies and other aspects. Regularly update and verify the information in the database, evaluate and adjust the algorithm model to ensure the effectiveness and adaptability of the algorithm. At the same time, by collecting feedback information from students and universities, continuously optimize the algorithm performance and improve the service quality of the system.

(4) Improve the grading conversion algorithm

Increase the conversion ratio for standardized grades and reduce the proportion of subjective parts such as recommendation letters and personal statements. This can enhance the recognition of the abilities of British graduates by enterprises in other countries (who are not familiar with the UK university admission system), as it increases the

objective level of recognition. Because it reduces the possibility of students being admitted to universities with better grades than their own due to excellent personal statements and backgrounds. This prevents the situation of cheating and improves the reputation of British university graduates.

5 Why Didn't the UK Choose to Implement These Measures for Improvement: What Should International Students Do?

5.1 Reasons

Firstly, the UCAS system is mainly a system serving British universities and students. To serve international students from other regions, the UCAS system needs to meet the admission requirements of the UK. Although Chinese students are the largest group of international students in the UK, compared to students from the UK and the EU regions, the number of Chinese students is not as large. Therefore, focusing too much on international students from other regions might be a case of putting the cart before the horse and having the appearance of not distinguishing between the important and the secondary.

Secondly, the main feature of the UCAS system is the flexibility of each university's independent admissions and the comprehensive assessment of students. Many international students choosing to study in the UK mainly do so because of the UK universities' reputation and possibly because they like the flexible measures of the UCAS system. However, such reforms might cause the UCAS system to lose its uniqueness, which might reduce the number of international students who recognize the UCAS system's philosophy and choose it.

Finally, the above improvement measures cannot effectively solve the problem of difficulty in employment for Chinese students after returning to China. The difficulty in employment for international students after returning to China is largely due to information deficiency and the recognition of enterprises. Even if the algorithms are improved, these problems may not be able to be solved.

5.2 Solutions

Firstly, making a career plan during the study abroad period is crucial. International students should clearly define their career direction as early as possible, combine domestic industry trends to choose majors or take relevant courses, avoid disconnecting what they have learned from the domestic market, and focus on accumulating relevant knowledge and skills in professional studies. At the same time, use spare time to study the recruitment standards of domestic enterprises, understand the specific requirements of target positions for education, skills, and internship experience, and specifically enhance their weaknesses.

Secondly, international students should actively accumulate relevant domestic experience to add points to their resumes. International students can participate in internships in domestic enterprises during their holidays, especially in positions related to the target industry. This not only helps them familiarize themselves with the operation mode of domestic enterprises but also accumulates local work experience and builds

professional networks. For students who cannot return to China for internships, they can participate in remote internships in multinational enterprises or overseas projects related to domestic business and understand the characteristics of the domestic market through practice. In addition, they can pay attention to domestic industry competitions, innovation and entrepreneurship competitions, etc., and through participation, improve practical abilities and obtain award-winning experiences, which can also become highlights in their job hunting [10].

Actively breaking through information barriers is an important way to improve employment efficiency. Establish multiple channels for information acquisition, pay attention to well-known recruitment platforms in China, enterprise websites, and official accounts of industry associations, and promptly obtain recruitment information. Join student return-to-China employment communities, alumni networks, and communicate with already employed senior students to obtain industry internal information and job-hunting experience. Before applying for a job, conduct in-depth research on the target enterprise to understand its business model, corporate culture, and development strategy, so that the resume and interview performance are more in line with the requirements of the enterprise [10].

Continuous improvement of professional skills and recognition of academic qualifications is also indispensable. International students should solidly master the professional knowledge at their universities and, when they have spare time, can study and obtain domestic professional qualification certificates recognized by the market, such as CFA in finance or the national unified legal professional qualification examination in law, to enhance their competitiveness.

6 Conclusion

The number of Chinese students choosing to return to China for employment is constantly increasing, highlighting the necessity of addressing their unique employment challenges, which stem from various factors such as the system, the market, and individuals. This paper identifies three core obstacles: the complex process of academic qualification certification and inconsistent employer recognition, poor access to information in the domestic job market, and a fundamental mismatch between the skills acquired overseas and the actual job requirements in China.

Although this article has explored the potential possibilities for reforming the UCAS system (such as optimizing the matching algorithm, strengthening the weight of standardized scores, and integrating domestic employment insights, etc.), the research concludes that these reforms are not feasible in the UK. The UCAS system is centered on serving local students, adhering to the flexibility of independent university admissions and the principle of comprehensive evaluation. Moreover, fine-tuning at the algorithm level is unable to address deep-seated issues such as employer bias and information deficiency. Therefore, a large-scale reform is unlikely to be realized.

On the contrary, the key to solving the problem lies mainly with the international students themselves. During their studies abroad, they should make a good career plan,

choose their majors or courses based on the domestic industry trends, accumulate relevant internship experience in the domestic market, and actively break through information barriers through targeted research and expanding their networks. All of these are of crucial importance. If international students can combine their international perspective with a deep understanding of domestic market demands, they will be able to better leverage the value of overseas education and enhance their competitiveness in the constantly changing job market in China.

In the end, solving the problem of Chinese students' employment upon returning to their home country requires individual initiative, a more efficient information dissemination mechanism, and widespread social recognition of diverse educational paths - all these factors working together can create a more inclusive environment for talent development.

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