



Exploring the Path of Artificial Intelligence-Enabled Precision Employment Service Model in Colleges and Universities

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Abstract.In recent years, the increasing number of individuals awaiting employment has made graduate employment one of the key issues affecting livelihoods. The advancement of artificial intelligence technology - an important driving force behind the latest wave of technological revolution - has led to the intelligentization of various applications, significantly influencing the digitalization of education. This intelligence-enabled digitalization improves educational efficiency, optimizes resource allocation, and improves quality, while also offering a novel path to implementing precision employment strategies in colleges and universities. This paper aims to analyze the adaptation mechanism between artificial intelligence technology and precision employment service models through reviewing the challenges and issues faced by graduates in precision employment. The findings will provide a valuable framework for leveraging artificial intelligence technology to facilitate precision employment in colleges and universities.

Keywords: Artificial Intelligence; Precision Employment; Path; Digitization of Education

1 Introduction

As information technology continues to evolve iteratively, the era of 'digital intelligence', characterized by advancements in artificial intelligence, has profoundly changed people's lives. Currently, China is in a critical phase characterized by a large population base, abundant labor resources, and increasing employment challenges. As a vital stage in talent education, China's colleges and universities bear the historical responsibility of cultivating the future successors and builders of the country. To innovate the service model and achieve high-quality and connotative development of graduate employment, it's essential for colleges and universities to implement precision employment guidance. This is also an indispensable pathway to improving the quality of employment for graduates and a critical step in advancing the moderniza-

tion of the education management system. To achieve this goal, Artificial intelligence will provide robust technological support.

With the application of data analytics and personalized services, precision employment guidance is a student-centered service model aimed at improving the graduates' chances in employment success[1]. In contrast to traditional, generalized guidance, precision employment guidance in colleges and universities will provide targeted services in areas such as tailored education and guidance, employment skill enhancement, as well as personalized guidance services. These services encompasses all aspects of the graduate employment process, including labor market trends and policies, career planning, employment skill development, job-seeking training, internship practice activities. This approach aims to establish a platform for promoting high-quality employment tailored to the specific contexts of colleges, thereby enabling graduates to connect with the job market in a precise and efficient manner. Consequently, it can enhance graduate employment satisfaction, increase employment rates, and improve overall job quality.

2 Problems and Challenges

In recent years, due to a rising number of graduates, the growing prevalence of individuals awaiting employment, the evolving recruitment strategies of employers and other factors, the job market has become increasingly competitive. This situation leads to the following three challenges faced by precision employment guidance services in colleges and universities.

2.1 Gap between Employability and Expectations

There is a mismatch between graduates' employability and the needs of the job market. Generally, graduates tend to have overly high expectations of themselves. However, many possess a weak sense of career planning and have inaccurate self-assessments. Additionally, their considerations regarding job-seeking goals, personal abilities, interests, and hobbies are often neither accurate nor sufficient. As a result, graduates may blindly send out their CVs to recruiters, making them more likely to encounter obstacles during the job search process, which can severely affect their motivation to seek jobs[2]. Moreover, some graduates subjectively lack the spirit of exploration and may be complacent, neglecting the significance of skills and information in the job-seeking process, thereby diminishing their competitiveness in the job market. Furthermore, many graduates do not have outstanding professional skills and lack social and life experience, making it hard for them to meet the requirements of their desired jobs. Consequently, graduates from colleges and universities are less likely to succeed in securing employment compared to other groups of young people. Nowadays, the ongoing development of new quality productive forces has brought about the rapid rise of a bunch of new industries, new business forms, and new models, putting forward stricter requirements on the employability of graduates. However, the mismatch between the employability of graduates and the demands of markets

leads to a structural contradiction in employment: while plenty of jobs need staff, many graduates are still unable to find their desired jobs[3]. In addition, there are growing concerns about graduates' competencies in jobs related to the digital economy, especially in the use of network tools, Internet data analysis and processing, as well as the ability to innovate and so on.

2.2 Inadequate Mobility on Employment Data

Every graduate desires high-quality employment, yet many of them have limited self-assessments and tend to overlook that the key to succeeding in job hunting is matching personal ability with job requirements[4]. As a result, graduates from colleges and universities are often in a position of being fastidious but incompetent. The coexistence of diverse employment information and insufficient access to it has led to an overwhelming amount of employment data characterized by increasing ubiquity, fragmentation, and subjectivity, which exceeds students' capacity to integrate. Consequently, some students possess inadequate knowledge of the job market and struggle to extract useful information. This impedes their ability to make rational judgments and informed decisions, leading to a 'choice barrier' among graduates. Moreover, the prominent issues of business barriers and data silos make it difficult for traditional information systems to effectively address real challenges such as career planning, school-enterprise interactions regarding supply and demand, precision employment matching, and information resource sharing, causing obstacles in both graduates' employment and employers' recruitment.

2.3 Lack of Innovation in Current Employment Guidance Services

Nowadays, employment guidance in colleges and universities predominantly relies on staff from the employment department, career planners, college counselors, and others to provide services. However, employment guidance services delivered by college counselors often lack professionalism, flexibility, and innovation, negatively impacting graduates' employment outcomes. Furthermore, due to the absence of systematic employment guidance services, there is a pressing need to enhance relevant knowledge and skills and establish a comprehensive employment guidance service system. At the same time, the relevance and effectiveness of employment guidance services require further improvement. Several critical issues need urgent attention, including how to innovate the employment guidance model, address various risks and challenges, and achieve higher completion rates and improved quality of graduate employment. Traditional employment guidance courses primarily focus on theoretical knowledge acquisition. This makes it challenging for students to transition effectively from the professional skills they have learned to the practical operations required in their careers. Their limited understanding of new topics, problems, and strategies results in a significant lack of systematic thinking when faced with transdisciplinary issues.

3 Principles of Precision Employment

Artificial Intelligence (AI) is one of the key technologies for the digitalization of education[5]. When utilized effectively, AI can enhance the efficiency of precision employment guidance services in colleges and universities, while also facilitating qualitative improvements in these services.

It fully embodies the concept of putting people first. As society continues to progress, the diversity of the market and the expansion of occupational fields provide a wealth of opportunities for individuals to participate in social production. Under this circumstance, people's needs have evolved from the satisfaction of basic physiological and survival needs to the achievement of their self-worth and all-round development. As a result, there have been significant changes in individuals' considerations regarding their careers, interests, and aspirations. Focused on individuals, precision employment meets their understanding, pursuit, and selection of self-worth and career goals, thereby fully mobilizing their motivation and promoting comprehensive, balanced, and sustainable development.

It aligns with the shift in service style from sloppy to precise. The core of the precision employment guidance service lies in its relevance. It requires extracting key information from extensive data and assessing various factors, including the learning process, behavioral change trends, employment skills, competitiveness, and other potential issues faced by individuals. Through recording, measuring, calculating, analyzing, and predicting these aspects, the service can provide timely assistance and counseling, ultimately delivering personalized employment and educational services to targeted individuals.

4 Path to Conduct Precision Employment

4.1 Establishment of the Digital Employment Guidance Platform

A well-developed digital employment guidance platform for colleges and universities integrates big data and AI technology to generate students' profiles based on their growth and job-seeking needs. This platform offers customized career planning and employment support, assisting students in gaining a better understanding of the dynamic job market[6]. Moreover, it is essential to intelligently match and prioritize relevant employment information based on students' individual circumstances and actual needs. This approach enables students to more effectively access the information they require within a limited timeframe, allowing for a more confident job selection process. Consequently, digital employment guidance platforms must incorporate fundamental functionalities such as career planning assistance, vocational skills coaching, intelligent job matching, and market information gathering, as illustrated in the Fig.1.

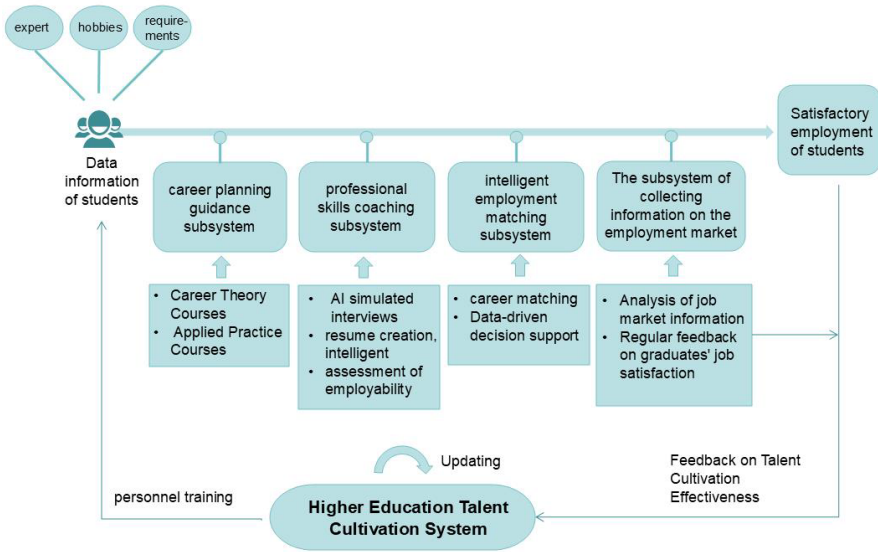


Fig. 1. Operational structure of the digital employment guidance platform.

Establishing a Career Planning Guidance Sub-system.

Through recording students' learning status and development needs in the system, it is possible to capture their dynamic data on abilities, personalities, hobbies, career expectations, and more. Multi-dimensional analysis of this data can match students with relevant career planning courses, thereby formulating refined and adaptable fostering programs, offering them better understanding of their own advantages and employment targets. This personalized service will enable students to explore themselves in depth, clarifying their employment goals, and aligning their characteristics more closely with job market needs. This system serves not only as an assessment and decision support tool that provides personalized career planning advice but also as a pathway for students' future employment and career development. It effectively enhances the fairness and accuracy of educational assessment as well as the quality of education.

Establishing a Professional Skills Coaching Sub-system.

On one hand, leveraging AI technology allows for the establishment of a coaching system with functions such as online learning, on-the-job training, disadvantage analysis, competence counseling, and career planning. This system can provide students with AI-based interview rehearsals, resume diagnoses and other simulation services, improving their interview skills, clarifying their career orientation, and determining their actual employment needs. On the other hand, intelligent evaluation models can be developed to accurately assess the employability of graduates through online tests and simulated tasks. This system will effectively help students identify their weaknesses for targeted vocational training and skills enhancement. Furthermore, it will

assist the employment guidance services of colleges and universities in delivering personalized counseling and targeted skills training.

Establishing an Intelligent Employment Matching Sub-system.

By utilizing AI technology, it is feasible to establish an intelligent matching system that can obtain the recruitment needs of enterprises and the employment intentions of students through big data analysis. Consequently, the system can provide job matches that align with students' professional backgrounds and skills, while also recommending suitable candidates to companies. This intelligent employment service represents an effective initiative for student-centered employment support and a necessary step toward achieving greater accuracy and efficiency in employment outcomes. By processing and analyzing large amounts of educational data, the system can offer a scientific basis for educational decision-making. Additionally, AI technology facilitates data-driven decision support, allowing faculty at colleges and universities to use this data for resource allocation, policy formulation, and other purposes to ensure that services are delivered precisely.

Establishing an Employment Market Information Collection Sub-system.

On one hand, real-time monitoring of market demands facilitates timely analysis of the employment market, enabling forecasts of changes and providing students with up-to-date information and advice. This assists students in making timely adjustments to their career plans and seizing employment opportunities. On the other hand, real-time monitoring also offers regular feedback on the working status of graduates and employer evaluations, helping schools adjust their fostering methods and teaching structures in promptly. This approach can promote the compatibility between talent fostering and the market demands, thus enhancing the employment competitiveness and sustainable development capacity of graduates. Based on the above analysis, we constructed an employment information system with the login interface shown in Fig. 2..This system is capable of integrating process data such as students' job-seeking needs, companies' hiring requirements, as well as past year's contracting records, providing important references for students' career choices.

The login screen features a left sidebar with the following elements:

- Welcome back to the signing platform**
- Student login:** The user name is my student number, and the initial password is the last six digits of my ID card number (in lowercase if there are letters). No need to register a new account! You can also log in through the Soaring Portal!
- Employer and student login portal**
- Employer login:** A text input field.
- Your registration password:** A password input field with a visibility toggle.
- Verification code (case insensitive):** A text input field followed by a CAPTCHA image and the text "Can't see clearly. Change one".
- Sign in** button.

The right main area contains the following elements:

- Employers register a new account**
- If you are not a member of the employer, please click the button below,**
- You will register as a member of our website's employer.**
- Register a new account** button.
- Forgot login password?**
- If you forget your login password, please click**
- Retrieve password** button.

Fig. 2. Login screen of the digital employment guidance platform.

4.2 Support and Implementation of Policies

The employment departments of colleges and universities should prioritize national policies, such as the Action Plan for Artificial Intelligence Innovation, and expedite the establishment of innovation bases, talent teams, and think tanks in the field of AI with policy support[7]. This approach can enhance collaboration among innovative entities, including colleges and universities, research institutes, and enterprises, facilitating the precise matching of employment information and contributing to the development of a precision employment guidance service system. Consequently, it can facilitate the ongoing enhancement of the modernization of the education management framework.

4.3 Practice and Application

Northwestern Polytechnical University integrates AI technology into precise employment service, and establishes a digital employment guidance platform, including AI-based career planning assessment tools, AI interview booths, AI resume modification, and consultation on career choice and employment issues. Since its commissioning in 2023, an average of more than 5,000 students have benefited annually, achieving full coverage of recent graduates receiving career guidance services.

Taking the electronic information majors and automation majors of our university as an example, the employment situation of the 2023 and 2024 students is shown in Figure 3-4. As the data shows, for both undergraduate and graduate students, the AI-enabled precision employment service has promoted their employment success rate; among them, it has more significant guidance significance for undergraduate employment. We also conducted a survey on the satisfaction of employment guidance for two classes of students, and the results show that, with the introduction of AI technology, 86.4% of fresh graduates believe that the employment guidance service system is able to give them more pertinent advice, and 83.2% believe that the system is capable of recommending “the employment information they want”, and the overall satisfaction rate of graduates with the system was over 96%. It can be seen that the student body has a high level of acceptance of AI technology, and AI technology has a more significant effect on improving precise employment services.

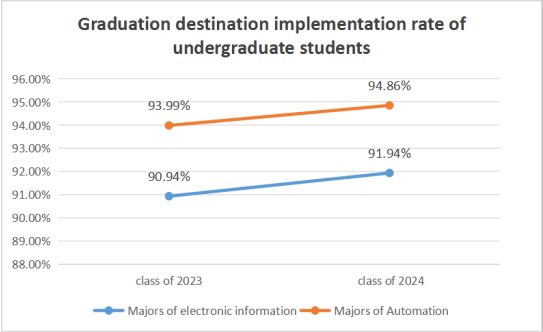


Fig. 3. The graduation destination implementation rate of undergraduate students

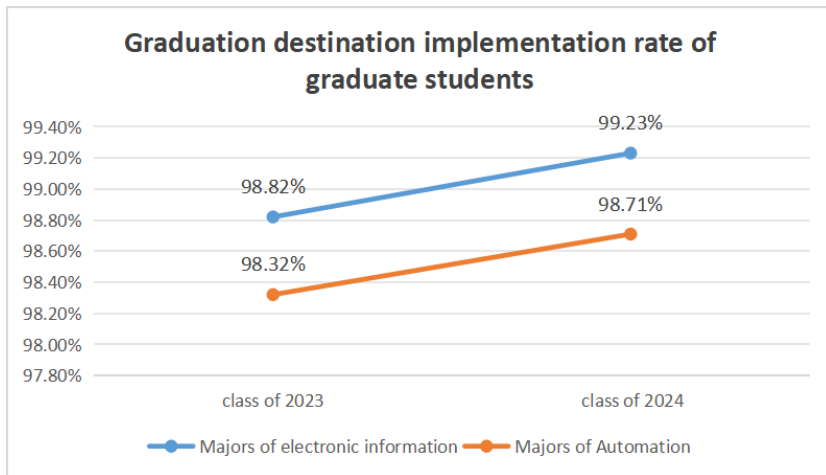


Fig. 4. Thw graduation destination implementation rate of graduate students

5 Conclusion

In this paper, we have done the following three aspects. Firstly, we have sorted out the difficulties and challenges faced by the current precise employment service in colleges and universities. Secondly, we have analyzed the implementation mechanism of precise employment service in colleges and universities empowered by AI technology. And lastly, we have clarified the implementation paths in the light of the actual job-seeking and employment needs of college and university students and carried out the practical validation of the service for some majors. With the updating and development of technology, the path of AI technology into precise employment service will be enriched, and we will continue to explore in practice, contributing to the realization of the goal of “higher quality employment” and the modernization of education management.

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